The entire August 2011 Issue of Current Womens’ Health Reviews is about KC

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The annotations are done by Dr. Susan Ludington and do not represent the opinions or reviews of other members of the

...
International Network of Kangaroo Mother Care, United States Institute for Kangaroo Care, or anyone else.


The following is a list of published articles and materials related to Kangaroo (Mother) Care. For professionals, the resource that will be easiest and most comprehensive to have about Kangaroo Care is Dr. Susan Ludington’s book called “Kangaroo Care: The Best You Can Do for Your Preterm Infant.” Published in 1993 by Bantam Books. You can buy a copy from any e-reader book seller, from Dr. Ludington at Frances Payne Bolton School of Nursing, 10900 Euclid Ave. room 322D, Cleveland, OH 44106-4904 or from La Leche League at 1400 N. Meacham Rd., Schaumburg, Ill. 60173 for the same cost. As of Sept. 2011 the book is available on ereader services such as Nook, Amazon.com, etc. For consumers, the best book to have is Jill Bergman’s book, (2011). Hold Your Preemie. Captetown: New Voices Publishing, Pp. 1-144. It is a wonderful book for parents, interactive, helpful, practical advise, clear guidelines, and eases anxiety about the preterm birth experience as well. Now available from Geddes Productions in Los Angeles. Contact them at http://www.geddesproduction.com or orders@geddesproduction.com. Several of the articles on this bib are available for $1.00 (U.S.) each plus $4.00 for mailing and we will be able to fulfill orders for up to five articles per request for items you are unable to retrieve from your library resources. Please circle those you want and submit payment and we will copy and send the articles to you. Thank you.

Kangaroo Mother Care: Baby’s Right – Mother’s Delight! (Kangaroo Mother Care Initiative of India – see AIIMS et al., 2004 and Parikh et al., 2004).

Mrs. Kangaroo, is it true
You are hiding someone new
In the pocket part of you?
There must be someone new and growing
It’s little ears have started showing.

Kitty McCausland RN, BSN, UCLA

In talking to the kangaroo,
Its opinion would be
To care “for your child as
My mother cared for me.”
   In order to be stable,
   When you are able,
   “Care for your child the way
   My mother cared for me.”

Close to her heart –
Warmth, gentle beating,
Love unfleeting.
   Research shows it’s so,
   This Kangaroo Care.
   No matter what the species,

“Keep them bare for Kangaroo Care”. Created by Kellie Kinas, RN of Fairview Hospital, Cleveland, OH.

Oh, tiny baby a few minutes old
All bundled up to fight off the cold,
Kangaroo care, or skin-to-skin,
Much more resembles the past world within.
Before I take a needed rest
I want to place you on my chest,
This will calm you and help you grow,
Keep you safe from things you don’t know
This world is so big to one so small,
My breathing and heartbeat you can recall.

Skin-to-sin and close to my heart,
In my memory forever, will not part.
Although life’s not easy, I can attest
Yours will be healthier when fed at the breast.
This new phenomenon called Kangaroo Care
Has been with us forever, we weren’t aware.

So rest little one, close to my heart
And know you are loved, right from the start. Sandra D. Brown, RN, IBCLC

Close and warm, skin-to-skin
Is a loving way for life to begin.
Parent and baby make a loving pair
Sharing the embrace of Kangaroo Care. Intensive Wear, Rt 2, Box 4310, Berryville, VA 22611 (540) 955-9513 or (800) 556-4230.

UPCOMING CONFERENCES:

June 1-3, 2012. 6th Annual National Intensive Kangaroo Care Certification Course by the U.S. Institute for Kangaroo Care at the Bolton School of Nursing of Case Western Reserve University in the first floor faculty lounge (entrance to School of Nursing is on Emergency Drive, opposite the entrance to Bolwell Hospital). Starts Friday night with a KC film fest (and popcorn, soda pop, and candy bars and many KC films), and then two full days (8:30-15 on Saturday and 8:30-5:15 on Sunday) of certification lectures, demonstrations, skills labs, question and answer periods and family panels. For more information contact US Institute for Kangaroo Care at USIKC2010@gmail.com or register at USIKC, 6803 Forest Avenue, Parma, OHIO 44129. Participants at the last course said the course was “‘AWESOME,” “FABULOUS” and “REALLY STRETCHES YOUR MIND.”


Nov. 22-25, 2012. Ahmedabad, India: 9th International Meeting of the International Network of Kangaroo Mother Care. Contact the website for the conference(http://Kmcindia2012.org is best) or try www.kmcindia2012.org or (http://www.ipa-world.org/brochure%20%20Website.pdf for call for abstracts and hotel information., or email kmcindia2012@gmail.com or you can contact Natalie Charpak at her Foundation (www.fundacioncanguro.com/co/es/profesionales.html) or at her own email (herchar5@colomsat.net.co or ncharpak@programacanguro.org) for more information. The cost is $300.00 registration which includes meals, Program is developing and will include TOOLKIT for global dissemination of KC and up-scaling its practice.

April 12-14, 2013 7th Annual National Intensive Kangaroo Care Certification Course by the U.S. Institute for Kangaroo Care. This will be held in Spokane Washington through the sponsorship of the Perinatal Outreach Education department of Providence/Sacred Heart Hospital. Contact Ms. Sherri Hajjar at Sheri.Hajjar@Providence.org

May 31, June 1, 2, 2013. 7th Annual National Intensive Kangaroo Care Certification Course by the United States
Institute for Kangaroo Care in Cleveland, OH. Contact the United States Institute for Kangaroo Care at www.kangaroocareusa.org or by sending an email to usikc2010@gmail.com or info@kangaroocareusa.org

Fall 2016  20th Anniversary of the International Network of Kangaroo Mother Care (INK). The meeting will be in Trieste, Italy. The 10th Anniversary special was in Cleveland, and the celebration was hosted by Johnson & Johnson Pediatric Institute.

PAST INK (International Network of Kangaroo Mother Care) Meeting:
Oct. 6-11, 2008  All of the lectures and their slides are streamed on the Akademikonferens, PO Box 7059 SE-750 07 UPPSALA, Sweden. Email: kmceurope08@akademikonferens.uu.se; phone +46 18 67 10 03 web site. Two publications of results of the meeting are being published in May 2010 in Acta Paediatric under Nyvist, K as first author.

Sept. 14-16, 2011. Neo-BFHI 2011 in Uppsala Sweden. Conference was in English on Sept. 14 and the workshop on Sept. 15, 16 developed BFHI –Neonatal Intensive Care Unit guidelines and criteria using a template manuscript developed by Kerstin Nyqvist. This conference was for lactation consultants who want to assist in expansion of the 10 Steps to Successful Breastfeeding for neonatal intensive and intermediate care. The conference will have presentations by renowned experts on topics related to the 10 steps from the perspective of supporting BF in NICU. A draft of a modified version of the 10 steps “BFHI in the NICU” prepared by a Nordic group of experts (Kerstin Nyqvist RN, Uwe Ewald, MD, Anna-Pia Hagghkvist, IBCLC), will be available on the conference website early in 2011 to be discussed in the workshops. All info available from www.akademikonferens.uu.se/neobfhi2011 or neobfhi2011@akademikonferens.uu.se.

THE KANGAROO CARE BIBLIOGRAPHY

This bibliography contains original articles from all around the world, published abstracts, published articles in foreign languages, a list of sample pamphlets and protocols that are available and a list of researchers in the area and what they are studying. Some of the articles listed are annotated. The bibliography is available from:

Susan M. Ludington, CNM, Ph.D., FAAN
Walters Professor of Pediatric Nursing,
FP Bolton School of Nursing, Case Western Reserve Univ.
10900 Euclid Ave. Room 322D  Cleveland, OH 44106-4904
(216) 368-5130 Email: Susan.ludington@case.edu

Terminology:  KC = Kangaroo Care; KMC = Kangaroo Mother Care (KC given by mother); KFC = Kangaroo Father Care (KC given by father); KPC or PKC = Kangaroo Parental Care (KC given by mother and father and data reported as results of parental KC); KSC = Kangaroo SURROGATE Care (KC given by someone other than biological parents).
PT = preterm; FT = fullterm, KCBF = breastfeeding while in Kangaroo Care position, BF = breastfeeding, RCT= randomized controlled clinical trial.

ORIGINAL ARTICLES

(2007). Better births feature continuous care for moms: “Kangaroo” care for kids. Medical News, 2007. Available from http://www.newswise.com/articles/view/531475/?sc=mwhr. Released July 12, 2007..Author may be “newswise” or “health behavior news service”. 30 studies with 1925 mother-infant pairs were reviewed in this updated meta-analysis of KC immediately after birth and within 30 minutes of birth. Pairs who had early skin-to-skin contact were more likely to breastfeed and to breastfeed for longer than those who did not. The review also showed that babies who had KC immediately after birth “interacted more with their mothers, stayed warmer, and cried less.” See following citation which is very similar. Review of new Cochrane (Moore et al., 2007) results, BirthKC, VEKC, Breastfeeding, crying, interaction, fullterm

recent publications, one being Hodnett’s review of 16 studies and 13,391 women showing that continuous supportive one-on-one care throughout labor and massage (i.e. doula care) has many benefits and “should be the norm, rather than the exception.” The second study reviewed is Moore et al.’s 2007 Cochrane review of 13 randomized controlled trials and 1,925 subjects (some were in control groups so not all were KC). Relates that Moore says time immediately after birth is a sensitive period for programming future infant behavior and maternal behavior. Some near term infant studies were included in Moore’s Cochrane of 2007. Review, full term infants, meta-analysis, BF, near term (late preterm)________(2006). Management of asymptomatic hypoglycaemia in healthy term neonates for nurses and midwives. Australian Nursing Journal, 13 (2) (June), pg. 13. Evidence Based Practice report. An increasingly litigious society has caused the lower level of euglycemia to rise from that which existed in the original work by Hartmann and Jaudon in 1937 (i.e. the limits are within 2 standard deviations of population mean for both healthy term and preterm infants). “Healthy term newborns that are breast-fed on demand need not have their blood glucose routinely checked and need no supplementary foods or fluids” is a WHO 1997 recommendation that is still considered a grade A recommendation. Other WHO 1997 recommendations that still have grade A best practice status are: “Thermal protection (the maintenance of normal body temperature) in addition to breastfeeding is necessary to prevent hypoglycaemia” and “Given the importance of thermoregulation, skin to skin contact should be promoted and “kangaroo care” encouraged in the first 24 hours after birth.” The standards for evidence based practice used in this article are those of the Joanna Briggs Institute (www.joannabriggs.edu.au) and are:  Grade A=effectiveness established to a degree that merits application; Grade B=effectiveness established to a degree that suggests application, Grade C=effectiveness established to a degree that warrants consideration of applying the findings, Grade D= Effectiveness established to a limited degree, Grade E= Effectiveness not established. Recommendations, hypoglycemia, breastfeeding, birth KC, evidence-based guidelines, fullterm.________(2004). Holding the very low birthweight infant: skin-to-skin techniques. Neonatal Network. Rest of citation? Article describes the nursing considerations and techniques involved to successfully implement skin-to-skin holding for VLBW, technology dependent infants. Implementation, PT.________(2002). Newscape: Kangaroo Care. American J. Nursing. April 2002. This is an early report of the US Survey by Engler in MCN. Survey report. PT________(2001). Third International Workshop on Kangaroo Mother Care: Indonesia November, 2000. Report and abstracts from the meeting. Meeting report. PT How do we access these?______(1999). Kangaroo care tops incubators. Childbirth Instructor Magazine, 9(1), 7. Clinical Report, Warming, fullterm. Birth KC/VEKC________(1997). “Kangaroo care” helps preemies. Indian Med Trib 5 (1-2),1. This is a summary of the Bier study. Clinical report, Preterms______, 1995. Appropriate technologies can help make motherhood safer. Safe Mother, 18, 4-8. Review of available technologies and KC is one that is identified as keeping the infant warm against the mother’s skin and is recommended. Review, Temperature, Fullterm______, 1985. The marsupial mother. Lancet 2(8446), 99-100. Review PT GET THIS______, (2008). Community Kangaroo Mother Care Manual. Available for free from http://kangaroo.javeriana.edu.co/sitio_ingles/de_nuevo_eng.html. Community KC PT Not on Charts yet.. Abdel Razek, A & Az El-Dein, N. (2009). Effect of breast-feeding on pain relief during infant immunization injections. International J Nursing Practice, 15(2), 99-104. Doi: 10.1111/j.1440-1721.2009.01728.x Quasi-experimental study of FT infants under 1 year of age coming to Jordan clinic for immunization. 60 infants in (short
duration? Less than 5 minutes? Unspecified in study but says that shot was given as soon as infant had full areola in mouth and that KC occurred before, during and after the study) KC group (private room, seated, reclined mom, awake infants in arms, no cloth, with clean diapers, cradled during breastfeeding to maintain full body skin-to-skin contact during immunization. 60 infants in control group. Control was routine (mom in room and clothed infant seated on table not breastfeeding, not being held, just touched by mother for positional support, nurse give shot). Pain measured by Facial Pain Rating Scale and Neonatal/Infant Pain Scale before, during and after injection.  HR measured before (KC=129; control = 125) and after (KC= 149; Control = 162) injection – text says there was significant difference between groups but the table reports a p = 1.33 which is not significant, so I do not know the effect on HR between groups except to guess that HR after injection was lower in KC group than controls (Pg. 101, 102) and the variability in HR for KC group was half that for the control group in both before and after measurements. Stopwatch for crying from insertion of injection up to cessation of crying: duration of crying was shorter in breastfed + KC group during and after injection (M=125.33) than control (M=148.66) seconds (10 KC infants had audible cry vs. 39 controls, so fewer KC infants cried than controls), also KCers spent 16.7% of time crying and controls spent 65.3% of time crying (pg. 103), free cry and end cry were also measured but not explained as to what they meant (pg. 102). Crying time was shorter in KC Breastfed group (duration of crying shorter during and after KC (Residual effect). No changes in HR, NIPS, or facial coding scale scores. NIPS pain scores consistently lower in KC than controls (no significance level computed), and more facial pain in KC group than control (p<0.05, pg. 103). KC and breastfeeding significantly reduce crying during immunization. On page 103 it says that crying was reduced in BF+KC group because “this reflects the peculiarity of BF over other types of pain reduction as destruction of attention.” What this means is beyond me! Does also say that “function of mother-infant interaction serves as a means of preventing and/or reducing pain and stress among infants” pg. 103 and cites Barr R, Young S. 1999. A two phases model of the soothing taste response implication for temperament and emotion regulation, soothing and stress. Hillsdale, NJ: Erlba Um. (This is an incomplete reference). Quasi-experimental (no randomization to groups), HR, stability, crying, NIPS, pain, FT, facial coding, not on Charts yet.

Abolyan, L.V. (2006). The Breastfeeding Support and Promotion in Baby-Friendly Maternity Hospitals and Not-as-Yet Baby Friendly Hospitals in Russia. Breastfeeding Medicine 1(2), 71-78. Randomized evaluation of 741 mothers (383 experimentals from the 4 Baby Friendly Hospitals; 358 controls from not as yet Baby Friendly Hospitals) interviewed about infant breastfeeding rates. Mothers in Baby Friendly Hospitals had positive effect of BFH on increased rate of exclusive BF, duration of BF, mothers and baby’s health, and maternal knowledge about BF. BFH moms liked rooming-in, BF on demand, taking care of baby by themselves. Initiation and one year BF rates higher in BFH group. Baby Friendly Hospitals in Russia have a few shortcomings: frequent use of labor anesthesia, insufficient placing of newborns on the mother’s abdomen (birth KC), rooming-in insufficient, and insufficient initiating of breastfeeding immediately after birth, and a short length of “skin-to-skin” contact (<30 minutes total). But, Russia is in compliance with Baby Friendly Intiative Goals for the country. RCT, fullterm, Breastfeeding duration and exclusivity, birth KC, Put on Charts.

Aboudiah, T., Vue-Droy, L., Al Hawari, S., Attier, S., & Chouraki, J.P. (2007). Is there a risk with skin-to-skin practice at baby’s birth? Archives de Pediattrie, 14(11), 1368-1369. Two case studies in France of healthy, normal APGAR, full term infants, one boy and one girl, who were given Birth KC and then had cessation of breathing while on the mother’s chest. The baby girl was placed in Birth KC immediately after birth and in the first few minutes experienced cyanosis, cessation of breathing and was hypotonic. She was taken from the mother’s chest and given oxygen by mask and stimulation and recovered quickly and did not go to the NICU. The baby boy was also placed in Kangaroo Care immediately after birth and at 45 minutes post birth was seen to have palor and be hypotonic and was treated with stimulation and oxygen by mask, but persistence of palor and bad coloring required him being taken to the NICU where his lactate was elevated to 8.7 nmol/l. He recovered rapidly and the mother was very tired. Birth KC is a risk factor for apparent life threatening events. Pediatricians and obstetricians believe that observation of the newborn is very important and that this responsibility is the nurses’ and is particularly important for mothers during the immediately postpartum period. Nurses should not abstain from vigilant observation. Case studies, Birth KC, Fullterm, life threatening events.
Abouelfetoh A., Ludington-Hoe SM, Burant C, Cartner T, & Visscher M. (2011). Effect of skin-to-skin contact on preterm infant skin barrier function and hospital-acquired infection. *Journal of Clinical Medicine Research, 3*(1), 36-46. Doi: 10.4021/jocmr479w  Descriptive study (N=10) of infants 30-32 wks GA tested within 9 days of birth and without signs of infection who received 5 days of KC (1.5 hours/day). On Days 1 and 5 pretest (incubator) values of stratum corneum hydration and TEWL (transepidermal water loss) were taken and compared to values at beginning, middle, and end of KC session and then posttest values were taken too. Stratum corneum hydration and TEWL increased during KC, indicating a higher humidity environment, better skin barrier function (increased stratum corneum hydration), and the expected higher humidity (transepidermal water loss – water in the skin-to-skin interface) in the enclosed interface occurred. No infant had any infection while hospitalized after KC had begun and no mothers reported signs of infection within the first month post-discharge. **PT, pretest-test-posttest within subjects control descriptive (or quasi-experimental) study, skin hydration, TEWL, infection, barrier function, separation.**


Academy of Breastfeeding Medicine (2002). Peripartum breastfeeding management for the healthy mother and infant at term. *American Academy of Breastfeeding Medicine Protocols, protocol #5, 1-2.* All protocols are on their website. “The healthy newborn can be given directly to the mother for skin-to-skin contact until the first feeding is accomplished. The infant may be dried and assigned APGAR scores and the initial physical assessment performed as the infant is placed with the mother. Such contact provides the infant optimal physiologic stability, warm, and oppprtunities for the first feeding. Delaying procedures such as weighing, measuring, and administering vitamin K and eye prophylaxis (up to an hour) enhances early parent-infant interaction”. Available from website: [www.bfmed.org/ace-files/protocol/](http://www.bfmed.org/ace-files/protocol/) THEN type in peripartum.pdf (2002) or cosleeping.pdf (2003) or mhpolicy_ABM.pdf (2004a) or near_term.pdf (2004b) or NICUGradProtocol.pdf (2004c)for the ones relevant to KC.  **Fullterm, BF, Birth KC, guideline**

Academy of Breastfeeding Medicine. (2010). Clinical Protocol Number #23: Non-pharmacologic management of procedure-related pain in the breastfeeding infant. *Breastfeeding Medicine 5*(6), 1-5. DOI: 10.1089/bfm.2010.9978.  It states on page 1:  “Coordinating a breastfeeding session with the timing of the procedure is best, but, if this is not possible, skin-to-skin contact can comfort infants undergoing a procedure such as heel lance. Skin-to-skin contact also gives the mother a caretaking role during the procedure that is unobtrusive, and by diminishing infant stress, it can increase maternal confidence as to her value to the infant ( based on Gray, Watts, and Blass). “Sucrose and pacifier can both be combined with the skin-to-skin component of parental contact”. On page 2 it says “Skin-to-skin contact provides effective pain reduction for premature infants.” **Guidelines, Pain, Not on Charts Yet 2/1/7/2011**


Academy of Breastfeeding Medicine Protocol Committee. (2008). ABM Clinical Protocol #5: Peripartum breastfeeding management for the healthy mother and infant at term. Revision, June 2008. *Breastfeeding Medicine, 3*(2), 129-133. These revised guidelines state the prenatal education should be given to the mother, give group discussions, and peer counseling. Under labor and delivery it says that” women will benefit from the continuous presence of a close companion (doula) throughout labor and delivery”pg. 129. Under immediate postpartum it states “1. The healthy newborn can be given directly to the mother for skin-to-skin contact until the first feeding is accomplished. The infant may be dried and assigned APGAR scores, and the initial physical assessment performed as the infant is placed with the
mother. Such contact provides the infant with optimal physiologic stability, warmth, and opportunities for the first feeding. Extensive skin-to-skin contact may increase the duration of breastfeeding.” (pg. 129-130). Under #2. It speaks to separation: “Whenever possible, mothers and infants are to remain together during the hospital stay. To avoid unnecessary separation, infant assessments in the immediate postpartum time period and thereafter are ideally performed in the mother’s room.” (pg. 130). **FT, Guidelines, BF, Birth KC, non-separation** Not on Charts as of 9/9/09

Acolet, D., Sleath, K., & Whitelaw, A. (1989). Oxygenation, heart rate, and temperature in very low birthweight infants during skin-to-skin contact with their mothers. *Acta Paediatrica Scandinavica,* 78, 189-193. KC for 10 minutes in 14 very low birth weight infants 6-134 days old and between 1000-1200 grams (five infants had BPD; two on nasal cannula, and 9 had no lung disease). When asleep, infants placed prone in incubator or prone 60° incline on mom’s chest. 5 minutes of stabilization and then VS every 30 seconds for 10 minutes. Then positions were changed (KC went to incubator; incubator went to KC) for another 10 minutes. During KC HR rose significantly within normal limits, BPDers had significant rise in transcutaneous PO2, no infant had apnea, bradycardia during KC, all maintained their temperature. Concluded KC was safe for BPD babies. No change in RR. States they do not do KC with infants having serious apnea/bradycardia. **Descriptive comparative (Cross Over Study), PreTerm, VLBW (Micropreemie), BPD, Nasal cannula, HR, RR, SaO2, Axillary Temp, Bradycardia, apnea, Safety**

Adam, T., Lim, S.S., Mehta, S., Bhutta, Z.A., Fogstad, H., Mathai, M., Zupan, J., & Darmstadt, G.L. (2005). Cost effectiveness analysis of strategies for maternal and neonatal health in developing countries. *British Medical Journal, 12,* 31(7525), 1107-1113. Descriptive study of the cost of 21 interventions (ie. Screening for pre-eclampsia, management of LBW babies by giving feeding support, additional warmth, close monitoring, and treatment with oxygen if necessary). Kangaroo Care or skin-to-skin contact is not mentioned per se anywhere in the article, but is ASSUMED to be referred to by the “additional warmth for LBW infants” because of Zupan’s and Darmstadt’s inclusion as authors. The researchers took trials and expert opinion papers and WHO guidelines and assigned costs to the 21 interventions. Concluded that preventive interventions at community level for newborn care are highly cost effective (pg. 3 of 6) followed by antenatal screening. **Descriptive, Fullterm, preterm Community-based interventions (may include KC for warmth).**

Advance for Nurses. (2009, November 24). Joint Commission introduces perinatal care core measures set. Retrieved from [http://nursing.advanceweb.com/Article/Joint-Commission-Introduces-Perinatal-Care-Core-Measures-Set.aspx](http://nursing.advanceweb.com/Article/Joint-Commission-Introduces-Perinatal-Care-Core-Measures-Set.aspx). This is a review of the perinatal care core measures set (see also Joint Commission for Accreditation of Health Care Organizations citations in this bibliography). This review lists the exclusively breastmilk fed by discharge for healthy term infants and says that skin-to-skin contact is the key to exclusive breastfeeding and should be the new vital sign for maternity care. **Review, Guidelines, BF, Exclusive breastfeeding, birth KC, Vital Sign (Not on charts 9/9/2011)** See also US BF Committee that put out many things to help hospitals achieve this new guideline.

Affonso, D.D., Bosque, E., Wahlberg, V., & Brady, J. (1993). Reconciliation and healing for mothers through skin-to-skin contact provided in an American tertiary level intensive care nursery. *Neonatal Network 12,* (3), 25-32. Mothers interviewed two years after preterm birth who had KC during hospitalization had better resolution of the birth experience and were able to move on better than control mothers who were still asking basic questions about the hospitalization experience. KC helps closure over preterm birth. **PT, Qualitative, maternal feelings.**

Affonso, D.D., Wahlberg, V., & Persson, B. (1989). Exploration of mothers’ reactions to the Kangaroo method of prematurity care. *Neonatal Network,* 7, 43-51. Mother’s have lots to say about preterm birth as it is very stressful to them, and KC helps with the maternal “psychological hemorrhage” associated with preterm birth (pg.50). **PT, Descript. Maternal confidence, psychological stability.**


Ahmed A.H. & Sands L.P. (2010). Effect of pre- and post-discharge interventions on breastfeeding outcomes and weight gain among preterm infants. *J Obstetric, Gynecologic, and Neonatal Nursing (JOGNN)*, 39(1), 53-63. A systematic review of 310 studies revealed that RCTs revealed that KC (along with peer support, in home breast milk intake measurement, and postdischarge lactation support) improved breastfeeding outcomes, and that maternal satisfaction improved with post-discharge interventions. KC during hospitalization was associated with improved EXCLUSIVITY and DURATION of BF (pg. 58). Also tested cup feeding before discharge and found no differences in BF outcomes and a high non-compliance rate with cup feeding. Late preterm infant costs are 3 times higher (12,247.00) than term infant costs (4069.00) (McLaurin K Ket al., 2009, Persistence of morbidity and cost differences between late-preterm and term infants during the first year of life. Pediatrics 123(2), 653-659). **Review, preterm, BF, Exclusivity, Duration, post-discharge intervention, COST of Prematurity, cup feeding, peer counseling. Not on Charts as of 6/19/2010 LOOK AT FOLLOWING CITATION**

Ahmed AH & Sands LP. (2010). Effect of pre- and postdischarge interventions on breastfeeding outcomes and weight gain among premature infants. *J Obstetric, Gynecologic, and Neonatal Nursing, 39*(1), 53-63. 310 studies were reviewed and 8 met inclusion criteria (<37 wks GA, RCT in English, in developed countries and had BF and weight gain outcomes). The systematic review of 8 RCTs revealed that KC (along with peer support, in home breast milk intake measurement, and postdischarge lactation support) improved breastfeeding outcomes, maternal satisfaction improved with postdischarge interventions, and no difference in weight gain found between pre and post discharge interventions. Used Hake-Brooks & Anderson 2008 for the KC RCT and says that national “guidelines are now available and provide a protocol for implementation of KC by health professionals (pg. 58)” **PT, BF, Meta-analysis**

Ahn, J.Y., Lee, J., & Shin, H.J. (2010) Kangaroo Care on premature infant growth and maternal attachment and postpartum depression in South Korea. *Journal of Tropical Pediatrics, July 3*  epub ahead of print. Experimental study of 10 sessions of 60 min KC for 3 weeks in a level III NICU. KC infants had increased length, larger head circumference but not weight differences. Maternal attachment scores were higher in KC group. Kc has beneficial effects on infants and mothers. **RCT? Experimental PT, weight, length, head circumference, postpartum depression.**

AIIMS - New Delhi, IOG – Chennai, KEM- Mumbai, KG MU-Lucknow, & PGI-Chandigarh. 2004. Presentation at “Workshops on KMC at Neoncon 2004. XXIV NNF Annual Convention at Chandigarh, 28October, 2004” Available from file://E:\KangarooMotherCareInitiative(KMCI).htm. This is a report of a KMC network in India that has the goals to disseminate awareness about KMC among health care providers by conducting workshop in the country and by providing knowledge and evidence for KMC through the website, to catalize initiation of KMC practice at selected hospitals by onsite training of personnel in outreach hospitals, to provide in service training opportunities about KMC for healthcare providers, and to promote research and generate evidence about feasibility of KMC in the community. The network gives support for implementation of KMC and wants KMC to spread around India. **Policy report, Preterm, 3rd world, network, implementation. Not yet on charts**

Akcan E, Yigit R, & Atici A. (2009). The effect of kangaroo care on pain in premature infants during invasive procedures. *Turkish J Pediatrics* 51(1): 14-18. Randomized controlled trial of 25 KC (30 minutes of KC before invasive procedure and then 10 minutes after procedure) vs. 25 controls (in incubator for invasive procedure). Infants were 26-36 weeks gestational age and 0-28 days postnatal age when tested once. No infant received narcotic analgesic. Behavioral (crying), physiologic (HR), and PIPP were measured. PIPP was significantly lower during and after the procedure in KC group. HR results???, behavior results???. KC is effective in decreasing pain during and after invasive procedure in preterm infants. **PT, RCT, pain, HR, crying, PIPP. Not on Charts 4/30/09. Get this.**
Albright, L. (2001). Kangaroo Mother Care: Restoring the Original Paradigm for Infant Care and Breastfeeding. LEAVEN, 37(5), 106-107. Review of Nils Bergman’s talk about habitat and original paradigm. Available from nhtml:file:///G:\Research\Articles\BFDG Initiation\1-18-2007\KMC original paradigm 200… FTGET COPY FROM BARB

Ali Z & Lowry M. 1981. Early maternal-child contact: Effects on later behaviour. Developmental Medicine and Child Neurology 23, 337-345. 50 fullterm healthy newborns given 45 minutes of skin-to-skin contact immediately after birth in Jamaica. These infants were compared to matched controls at 6 and 12 weeks age. More early contact moms Breastfed exclusively than non-contact moms, early contact infants were less likely to be crying or restless during 6 and 12 week interviews. At 12 weeks, early contact moms were more likely to rise and follow their babies when babies were taken from them, gazed more frequently at their infants, and were more likely to vocalize to the infants during interview. Early contact promotes a closer relationship between mom and infants. RCT, Fullterm, BF, Maternal Behavior, birth KC, 3rd world, crying, restless, Interaction


Als, H.B. & McAnulty, G. (2011). The Newborn Individualized Developmental Care and Assessment Program (NIDCAP) with Kangaroo Mother Care (KMC): Comprehensive care for preterm infants. Current Women’s Health Reviews, 7(3), 288-301 doi: 10.2174/157340411796355216. NICU has costly repercussions. Everyone caring for these infants needs to know about preterm infant personhood as well as the neuro-essential importance of the parents, otherwise even the best care jeopardizes infants’ long term potential and deprives parents of their critical role. This is time of rapid brain growth, conventional NICU contributes to long term physical and mental health problems and developmental disabilities. NIDCAP aims to prevent iatrogenic sequelae of intensive care and to maintain the intimate connection between infant and mother, one EXPRESSION of which is KMC. NIDCAP embeds the infant in the natural parent niche, avoids over stimulation, stress, pain, isolation and supports self-regulation, competence, and goal orientation. NIDCAP improves brain development, functional competence, health and life quality. It is cost effective, humane, and ethical, and promises to become the standard for all NICU care. (To Susie, this sounds like an advertisement for NIDCAP and puts KMC as only one feature of NIDCAP, and it is a separate, independent intervention that should be joined with NIDCAP, not considered one piece of NIDCAP which has been previously identified as having 27 components to its program (Als, 1986). Not until 1992 did Als acknowledge that KMC could be different than skin-to-skin contact as she said at the International Conference of Infant Studies in Miami Beach in 1992, “having the baby at breast is skin-to-skin contact.” And then Susie got up and told her that skin-to-skin contact, and using those words, indicated chest-to-chest skin-to-skin positioning of the infant, not breastfeeding. And in fact, Als has failed to identify any parameters of frequency, duration, intensity of KMC as part of NIDCAP in any of her publications about NIDCAP and its results.) PT, Review, developmental care, NICU environment. Not on Charts 10/2/2011.

Altitmer L. (2001). Preface: Alternative therapies. Newborn and Infant Nursing Reviews 1(4), 204. This is an editorial introduction to themove from “minimal handling” to providing developmentally supportive care. She presents the Eichel article on KC with ventilated infants and an article by Jones and Kassity in the same issues. The editor comments that KC benefits are improved oxygenation, stable heart rate and respirations, thermal synchrony, longer periods of sleep, and faster weight gain. Review, PT, comment, vent kc, wgt, HR, RR, stability, oxygenstaion, sleep, temp. Not on Charts Yet

American Academy of Family Physicians (2001). Appendix 1: Recommendations for Breastfeeding Promotion and Management. Available from url www.aafp.org (accessed June 5, 2009). This is a policy statement from the Academy. Recommendation 2b says “If mother and baby are stable, facilitate immediate postpartum breastfeeding. Minimize separation of mother and infant and wait until after the first breastfeeding to perform routine newborn procedures such as weighing, ophthalmic prophylaxis, vit K injection, etc.” (pg. 15). Recommendation 2C says “Provide warming for the stable newborn via skin-to-skin contact with the mother, covering both mother and baby if necessary.” (pg. 15) FT, PT, BF, separation, warming, temp. NOT On Charts 7/72010

American Academy of Pediatrics & American Heart Association, (2006). Neonatal Resuscitation Textbook- 5th Edition, (pp. 1-18) Washington, DC: American Heart Association. Lesson #1, page 18 states: “Nearly 90% of newborns are vigorous term babies with no risk factors and with clear amniotic fluid. They do not need to be separated from their mothers after birth to receive the equivalent of the initial steps of resuscitation. Thermoregulation can be provided by putting the baby directly on the mother’s chest, drying, and covering with dry linen. Warmth is maintained by direct skin-to-skin contact with the mother. Clearing of the upper airway can be provided as necessary by wiping the baby’s mouth and nose.” Fullterm, Guideline, Birth KC.

American Academy of Pediatrics & Canadian Pediatric Society. (2006). Prevention and management of pain in the neonate: An update. Pediatrics, 118(5), 2231-2241. On pg 2232 it says “…each neonatal unit should provide effective nonpharmacologic and/or pharmacologic pain relief for all procedures.” On page 2234 it states: A variety of nonpharmacologic pain-prevention and relief techniques have been shown to effectively reduce pain from minor procedures in neonates. These include use of oral sucrose/glucose, breastfeeding, nonnutritive sucking, “kangaroo care” (skin-to-skin contact), facilitated tuck (holding arms and legs in a flexed position), swaddling, and developmental care, which includes limiting environmental stimuli, lateral positioning, use of supportive bedding, and attention to behavioral cues.” Page 2236 relates” Reducing Pain from Bedside Care Procedures. 2. Use of a combination of oral sucrose/glucose and other nonpharmacologic pain-reduction methods (nonnutritive sucking, kangaroo care, facilitated tuck,swaddling, developmental care) should be used for minor routine procedures. FT, PT, pain

American Academy of Pediatrics, Section on Breastfeeding, (2005). Breastfeeding and the use of human milk. Breastfeeding in full term healthy newborns. Pediatrics, 115 (2), 496-506. On page 498, as #3 of 15 recommendations, it is stated that “3. Healthy infants should be placed and remain in direct skin-to-skin contact with their mothers immediately after delivery until the first feeding is accomplished. The alert, healthy newborn infant is capable of licking on to a breast without specific assistance within the first hour after birth. Dry the infant, assign APGAR scores, and perform the initial physical assessment while the infant is with the mother (pg. 498). The mother is an optimal heat source for the infant. Delay weighing, measuring, bathing, needle-sticks, and eye prophylaxis until after the first feeding is completed. Except under unusual circumstances, the newborn infant should remain with the mother throughout the recovery period (pg. 499).” On page 500 there are “Additional Recommendations for High-Risk Infants. Hospitals and physicians should recommend human milk for premature and other high-risk infants either by direct breastfeeding and/or using the mother’s own expressed milk. Maternal support and education on BF and milk expression should be provided from the earliest possible time. Mother-infant skin-to-skin contact and direct breastfeeding should be encouraged as early as feasible.”Guidelines, FT and PT, BF, birth KC, spontaneous search for nipple and latch. Not on charts yet.


American Academy of Pediatrics Section on Breastfeeding (2012) Feb. The recommendations now state that “skin to skin contact should begin immediately after birth and continue uninterrupted for two hours and throughout postpartum” and that exclusive breastfeeding should be for 6 months (used to be just three months). FT, Guidelines, BF, Postpartum KC,

American College of Obstetricians and Gynecologists [ACOG] Committee on Health Care for Underserved
Women and Committee on Obstetric Practice. (2007). Special report from ACOG. Breastfeeding: Maternal and infant aspects. *ACOG Clinical Review* 12(Suppl. 1), 1S-16S. retrieved May 31, 2007 from http://www.breastfeedingaskforla.org/ACOG%20statement%20on%20BF.pdf. Recommends KC from birth for better BF outcomes “Delivery. The immediate postpartum period should allow the woman and her newborn to experience optimal bonding with immediate physical contact, preferably skin-to-skin. The initial feeding should occur as soon after birth as possible, preferably in the first hour when the baby is awake, alert, and ready to suck. Newborn eye prophylaxis, weighing, measuring, and other such examinations can be done after the feeding.” (pg. 279.) Full term, Guideline, Birth KC

**OR the same recommendation is in:**


Anand, K.J. (2008). Analgesia for skin-breaking procedures in newborns and children: What works best? *Canadian Medical Association Journal, 179* (1), 11-12. doi: 10.1503/cmaj.080834. This is a review and it says: “Healthy newborns routinely experience acute pain during blood sampling for metabolic screening, injection of vitamin K or hepatitis vaccine, or circumcision. Children are similarly exposed to acute pain due to vaccination, invasive procedures or trauma. Acute pain caused by skin-breaking procedures can lead to physiologic instability and behavioural distress, and it has downstream effects on subsequent pain processing, development and stress responsivity. Because of these detrimental effects, reduction or prevention of pain are worthy clinical goals that are also expected by most parents. Opioids, such as fentanyl and morphine, form the mainstay of pediatric pain management, but they may not be effective against injury-induced acute pain in newborns or children. Accumulating data suggest that opioids lead to harmful side effects, tolerance and possibly altered brain development. Other analgesic and anesthetic agents also appear to increase brain cell death in animal studies, fuelling concerns about their use, particularly in newborns. Such concerns have led to the development of nonpharmacologic therapies such as sucrose, massage and kangaroo care for neonatal pain, and distraction techniques, hypnosis and cognitive-behavioural interventions for pediatric pain. Abstract, page 11 for quote. Review, PT, FT, PAIN.


Ancora, G. (2010). The well-being of the newborn infant in neonatal intensive care. *Minerva Pediatrics, 62*(3 Suppl), 55-58 (No DOI). This is a review of developmental interventions to improve preterm infant outcomes from Italy. Abstract states” We are shaped by our environment and in early life the environment has a particularly important role, so minimally invasive treatment and a developmentally appropriate environment is best for preterms. “Pain control, music therapy, massage, kangaroo care and a family centered care are essential to optimize results obtained from the intensive care unit: (p. 55). PT, review, developmental care, NICU environment. Not on charts 2/1/2011

Anderson GC (1977). The mother and her newborn: mutual caregivers. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 6*(5), 50-57. NOT A KC study, but relevant because it describes how mother and baby take care of each other when not separated and this has become know in the early 2000’s as CO-REGULATION.

negative outcomes of separation. THIS IS A CLASSIC separation REPORT, so it is included here. Non-separation is highlighted in the Nyqvist et al., 2010a and 2010b reports of the 2008 meeting of INK in Uppsala, Sweden.

Anderson GC. (1989). Skin-to-skin: Kangaroo care in western Europe. American Journal of Nursing, 89, 662-666. This article relates the practice of KC in Europe and how helpful it has been found to be in relation to breastfeeding and reducing infant crying. Review, BF, Crying, PT

Anderson, GC (1989). Skin-to-skin: The kangaroo technique in Western Europe. Servir, 37(6), 316-320. This is a copy of the article listed above. PT

Anderson GC. (1991). Current knowledge about skin-to-skin (Kangaroo) care for preterm infants. Journal of Perinatology, 11(3), 216-226. All of the KC studies are classified to the type of design so one can clearly differentiate randomized controlled trials from others. Good summary statements and terminology related to KC nomenclature. Literature Review, HR, RR, crying, oxygen, temperature, nomenclature, PT


Anderson, G.C. (2005). Waking up baby: Barrier to Kangaroo Care as an aid to breastfeeding. Presentation at the Conference of the International Lactation Consultant Association, Chicago, July 7-12, 2005. A fascinating descriptive study of the frequency with which newborn infants were awakened or self-awakened and the association of each with success of breastfeeding because when infants self-awakened and were put in KC, they then latched well and successful breastfeedings occurred, but infants seldom self-awakened. 20 multiculturally diverse healthy BF dyads were observed. Mothers used a pager to notify the researcher sitting outside her postpartum door when infant sleeping and feeding began and ended. After each feeding, the researcher and mother discussed the feeding and awakenings. Infants were awakened 74% (141 times) and self-awakened 50 times (26%). The top 4 reasons for awakening infants were vital signs, feedings, changing diapers/clothes/linens, and assessments. 62% of infants awakenings were by hospital staff, 12% by mothers, 7% by visitors. Average sleep time before self-awakening was 32 minutes. After infants were awakened, 42 feedings occurred (2% formula, 69% exclusive, 5% mixed and 24% unsuccessful. When self-awakened, 24 BF's occurred, 0% formula, 88% exclusive, 0% mixed, and 12% unsuccessful. More exclusive and successful breastfeeding occurs after self-awakening. Remaining questions are: how can clinicians reduce interruptions? Why didn’t infants sleep longer than 30 minutes before self-awakening? Were infants hungry when self-Awakened? Did
infants ever complete a sleep cycle? For more information, contact Gene Anderson at Gene.anderson@case.edu.


Anderson GC, Burkhamer M, Morrison B, Ludington-Hoe SM, & Chiu S-H. (2003). Skin-to-skin contact improves breastfeeding outcomes. Abstract #346, pg 188 at Research ShowCASE, CWRU, April. 4, 2003, Cleveland. **This is same as Anderson, Chiu, Morrison et al. 2004 publication below.** 50 fullterms who were having “difficulty” (a yes/no answer to the question “Are you having any difficulty breastfeeding?”) BF between 11-24 hours postbirth, were given 3 consecutive KC sessions (n=50) with BF (KCBF) in the presence of lactation consultant on Postpartum Day 2 and one on the morning of discharge (postpartum day 3 n=48 as 2 withdrew). At the end of the KCBF on postpartum day 3, 98% were BF, 75% (n=36) were EXCLUSIVELY BF, 11% (n=23) partially exclusive. At one week post discharge, 73% (35/46) exclusively BF, 5/46 partially, 6/46 none and 2 lost (So n=46). One month postdischarge 52%(25/45) exclusive, 9/45 partial, 13/45 none, 1 lost (so n=45). Rampant interruptions to infant sleep and BF (nine in one hour). The data at discharge are better than the 71.9% in Ross Mothers’ Surveys (Cadwell, 2002), and the 75% as the Healthy People 2000 objective and 2010 National Health Objectives (USDHHS, 2000). **Abstract, Fullterm, KCBF, exclusive BF, Discharge BF, one week post discharge, one month post discharge, BF interruptions,**

Anderson GC, Chiu SH, Dombrowski MA, Swinth JY, Albert JM, & Wada N. (2003). Mother-newborn contact in a randomized trial of Kangaroo (skin-to-skin) care. J Obstet Gynecol Neonatal Nursing, 32 #5, 604-611. This reports the actual number of hours mothers got KC in an RCT of early KC with preterm infants from 0-48 hours postbirth. 47 Kcers and 44 control LBW preterm infants given KC or wrapped holding during first 48 hours after birth. KC moms did very little KC when its practice was not structured (28.5% of observations (not of time) if on Postpartum, 10.0% of observations if infant in NICU). KC moms did wrapped holding 14.8% of observations on postpartum and 2.6% of observations in NICU. (wrapped holding of Kcers = to wrapped holding of controls on postpartum unit). Observations taken q 15 min for 1st 6 hours and then as seldom as q3 hours for 24-48 hours postbirth. Kcers had 2x as much contact as controls. When KC began was not specified and KC was given much less than 82% of time as in Syfrett 1996 abstract. VERY LITTLE KC occurs naturally and amount was much less than expected. Reasons were unavailability of infant or mothers and hospital staff interrupting contact. Total contact time of KCers was almost double that of controls. Hospital and social supports for families are needed to facilitate early initiation of KC, prolonged periods of KC contact, and reduction of maternal stress. RCT, Preterm PT, Very Early KC, Early KC, maternal stress, has data on swaddled holding too.

Anderson, GC, Chiu, SH, Morrison, B, Burkhhammer M & Ludington-Hoe, SM. (2004). Skin-to-skin Care for Breastfeeding Difficulties Postbirth. In Field, T. (Ed.). Touch and Massage in Early Child Development (pp. 115-136). Skillman, N.J.: Johnson & Johnson Pediatric Institute. 50 Mother/infant dyads who said they were having difficulty BF within 11 hours of birth were given three consecutive supervised BF in the KC position on postpartum day 1 and another on Day 2. Amount of KC varied but occurred between 11-24 hours postbirth. Several measures were recorded with each BF and at discharge, 7 days postbirth. 2 dyads withdrew before discharge, so 48 finished KC sessions: 39 (81.3%) were exclusively BF & 9/48 (18.7%) were partially BF. At 1 week postdischarge, 35/48 (72.9%) were exclusively BF; 5 (10.4%) were partially, 6 (12.5%) were not BF, and 2 (4.2%) were lost to FU. At one month postdischarge, 25 dyads (52.1%) were exclusively BF, 9 (18.8%) were BF partially, 13 (27.1%) were not BF, and 1 (2.1%) lost to FU. These data compare favorably with with the 71.9% of Ross Mother’s Survey and the 75% designated as Objectives 16-19 of Healthy People 2010. **Descriptive, Fullterm, BF at discharge, 1 week, 1 month, exclusive BF, KCBF, Early KC**

Anderson GC, Dombrowski MAS, & Swinth JY. (2001). Kangaroo Care: Not just for stable preemies
those were normal and then case of apparent life threatening events (ALTEs) presumably healthy newborns during Kangaroo Care.


Anderson GC, Moore E, Hepworth J, & Bergman N. (2002). Early skin-to-skin contact for mothers and their healthy newborn infants (Cochrane Review). In The Cochrane Library, Issue 2, 2002. Oxford: Update Software. 16 RCTs were reviewed and showed significant and positive effects of KC on BF, neutral thermal range, blood glucose, crying and maternal affectionate love, touch, and contact behavior during an observed BF. Meta-analysis procedure, BF, temperature, blood glucose, maternal behaviors, late PT, FT

Anderson GC, Moore E, Hepworth J, & Bergman N. (2003). Early skin-to-skin contact for mothers and their healthy newborn infants. (Cochrane Review). In The Cochrane Library, Issue 2, 2003 Oxford: Update Software. or Cochrane Database Systematic Review 2003: CD003519.. 806 mother-infant pairs studied across eight randomized controlled trials. Pairs with early KC had significantly better performance on all measures of BF status up to three months postbirth and on BF duration up to 12 months postbirth. KC infants were more likely to maintain temperature within neutral thermal zone, were less likely to cry, and had higher blood glucose and a lower respiratory rate. Infants in KC are more settled/calm/lower behavioral state. Mothers with early skin-to-skin contact displayed more affectionate behaviors Meta-analysis results. Cry, Behavioral State, Blood Glucose, RR, Temp., maternal behaviors, early KC, BF, late PT, FT


Anderson, GC, Radjenovic, D., Chiu, S., Conlon, M., & Lane, A. (2004). Development of an observational instrument to measure mother-infant separation post birth. Journal Nursing Measurement, 12(3), 215-234. It says on page 217 that from birth “mother and their newborns are dependent upon each other for mutual caregiving, meeting each others’ needs when they are in their proper habitat together, undisturbed and in skin-to-skin contact.” Research method, separation, closeness, FT, PT NOT on CHARTS 3/31/2010

Anderson GC, & Swinth JY. (2004). Concerns about parents sleeping while holding their infants in Kangaroo Care [Letter to the editor]. Neonatal Network, 23(2), 53. Sleeping, PT,

Andres, V., Garcia, P., Rimet, Y., Nicaise, C. & Simeoni, U. (2011). Apparent life-threatening events in presumably healthy newborns during early skin-to-skin contact. Pediatrics, 127(4), e1073-e1076. DOI:10.1542/peds.2009-3095. ALTEs in delivery room are uncommon (6 citations to this statement). This is a report of 6 case of apparent life threatening events (ALTEs) in the delivery room during the first 2 hours of life over four years (2004-2007) in Provence-Alpes, Cote d’Azur FRANCE). In all cases, infants were given physical examination and those were normal and then infant was placed in direct skin-to-skin contact with mothers while in delivery room.
Breastfeeding was then initiated. In each case, the incident occurred in a healthy infant who was in prone position in skin-to-skin contact. Baby 1 was found motionless at 30 mins postbirth; cardiac and respiratory failure mandated resuscitation, sent to NICU and improved rapidly. No obvious neurologic deficit, no early onset neonatal sepsis, no abnormality of EKG, brain MRI, malformations. Baby 2 had cardiorespiratory arrest at 90 minutes postbirth and then needed resuscitation, respiratory support, inotrope, anticonvulsants, and severe HIE and died at 23 days. Baby 3 had cardiorespiratory arrest at 60 min postbirth, resuscitation with intubation and mechanical ventilation, inotrope, anticonvulsants and antibiotics took place, but infant had severe cerebral bleed and HIE and died at 15 days. Baby 4 at 120 minutes postbirth became motionless with facial cyanosis. Recovered rapidly after vigorous stimulation. Baby 5 became motionless, cyanotic, and bradycardic ‘several minutes after birth’ (pg. e1074) with rapid recovery after vigorous stimulation. Baby 6 had cardiorespiratory arrest at 120 mins postbirth. Resuscitated, intubated, inotrope, severe HIE, and died at day 15. Other possible causes such as abnormal EKG or brain MRI, early-onset sepsis, malformations, metabolic abnormalities, myotonic dystrophy, hypoglycemia, upper airway obstruction, asphyxiating position, covered face, increased vagal tone were ruled out. Most mothers were primiparous, and in ALL CASES, mother and Infant WERE NOT OBSERVED during the initiation of birth KC and breastfeeding. Birth KC DID NOT INCREASE THE INCIDENCE OF NEONATAL MORTALITY: “overall incidence of ALTEs is 0.025-0.032 per 1000 births and mortality of 0.018 per 1000 birth; those rates were concordant with the findings of ALTEs of 0.034 per 1000 and a mortality rate of 0.017 per 100 births during the 4 years of BIRTH KC practice that were studied” (pg. e1075). SURVEILLANCE of newborns is needed and a standardized investigational workup should be performed after an ALTE. KC may be a risk factor for ALTE (pg. e1075), and mothers who have had sedatives, sepsis, tiredness (especially in primips), and unavailability of health observer are contraindications for Birth KC. “Promotion of early mother-infant skin-to-skin contact and breastfeeding in the delivery room should be encouraged, but perinatal medical personnel should be aware of ALTEs and carefully monitor and ensure proper positioning of healthy neonates during this delicate period of mother-infant attachment, especially for primiparous women.” (e1076). FT, Birth KC, negative effect, mortality, life threatening events, mortality, guidelines, No increase in ALTE nor mortality rate. See also Aboudiab, Andres, Becher, Branger, Dageville, Espagne, Gatti (Not KC, so only in related literature on the life threatening chart), Nakamura articles and life threatening events and on/negative effects charts. FT, Birth KC, Life threatening events, BF, guidelines

Angood, P.B., Armstrong, E.M., Ashton, D., Burstin, H., Corry, M.P., Delbanco, E.F., et al. (2010). Blueprint for action: Steps toward a high-quality, high-value maternity care system. Women’s Health Issues, 20(Suppl 1), S18-S49. This review article says that current maternity practice data are aimed at data that result in medical billing and do not measure the maternal care experience and measures that indicate quality according to the mPinc guidelines from CDC. Better data collection about duration of skin-to-skin contact at birth is needed to show how exclusive breastfeeding goals can be met. Review, guidelines, Birth KC, BF, Not on Charts 9/10/2011 GET THIS

Anisfeld, E., & Lipper E. (1983). Early contact, social support and mother-infant bonding. Pediatrics 72(1), 79-83. On one day all moms (29) given KC (immed. After birth put naked on moms abdomen for a total of 45-60 min. Then transferred to nursery), on other day all moms(30) got routine care (taken to warmer, wrapped, shown to mom, then to nursery) Then routine – saw moms q 4 hrs for feed, most bottle fed. – day determined randomly. At 2 days observed q 1 min x 15 min during feeding. KC moms had more affectionate behavior than controls and if in low social support group as compared to hi social support group. Quasi-experimental, Fullterm, Delivery KC, Maternal behavior


Argote, L.A., Rey, H., Ludington, S., Medellin, G., Castro, E., & Anderson, G. (1991). Management of difficult transitory respiration using early skin-to-skin contact. Presentation made at XVII Congreso Colombiano de Pediatria, Nov. 1, 1991, Cali, Colombia. Preterm infants from 1500-2499 grams were given KC 10-20 minutes (M=11.00 +/-1.200) after birth and continued for 6 hours. One infant who weighted 1920 grams began having difficult respirations, but SaO2 was > 88 so KC continued. At 2 hours and 10 m inutes post-birth, all signs of transient respiratory distress disappeared and infant remained with mother in KC for 6 hours and then in postpartum. Infant and mother were discharged at 24 hours post-birth. Since this first infant, 6 more infants had respiratory distress. All improved with KC. Observed by neonatologist and if deterioration occurred would have been admitted to NICU but deterioration in KC did not occur and all infants showed higher tempp than in incubator, and end of signs of distress. First time this method is described in the world and KC can be used for respiratory distress in villages and small towns. **PT, descriptive report, case study, respiratory distress, temperature.**

Arivabene GC & Tyrell MA. (2010). Kangaroo Mother Method: Mothers’ experiences and contributions to nursing. Revista Latino Americana Enfermagem 18(2), 262-268. Descriptive study of focus group derived stories of KMC experiences of mothers in Brazil. Themes were survival and recovery of the infant, mothers’ daily life modified by KMC, valuation of family affective bonds, increased maternal-infant bonding, decreased separation of infant from family, increased confidence in parental care before and after discharge, and improved maternal relationship to infant and to infant’s care team. **PT, Qualitative study, maternal feelings, confidence, non-separation, daily life adaptations, 3rd world**

Arora, S., (2008). Kangaroo mother care. Nursing J of India, 99(11), 248-250. Review of KMC (method of caring for the newborn… it is particularly useful in caring for low birth weight infants. Relates the definition of KMC with frequent and exclusive breastfeeding and early discharge, relates breastfeeding, thermal and metabolic benefits to infant and increased confidence, self-esteem and fulfillment in mothers. Then presents eligibility criteria (BW>1200) and says one of the best ways to transport an infant is in KC (p. 249); Mothers should be willing and in good general health. Parents may need counseling, need to be told how to clothe the infant, and how to position the infant and feed and have psychological support. Relates that mothers can sleep with baby in KC position, should initiate KC as soon as infant is able, start KC gradually, working up to continuous KMC and it says that one hour sessions of KC should be avoided because frequent handling is stressful (pg. 250). Says other family members should KC when mom is unable to do so, and when infant is in good general health, feeding well, gaining at least 15g/kg/day for 3 consecutive days, has regained birthweight, temp is stable and within normal limits for at least 3 consecutive days and mother is confident of her ability to care for infant at home and is able to come for regular follow-up, early discharge is encouraged (pg. 250). Nurses need to be informed of KMC. **PT, FT, Review, early discharge guidelines, KC at home. Not on Charts as of 8/12/09.**


Ashmore, S. (2001). Implementing skin-to-skin contact in the immediate postnatal period. MIDIRS Midwifery Digest 11(2), 247-250. This is a review of the reasons for implementation and the barriers cited against implementing and the midwives say that skin to skin contact takes time and Ashmore points out that it is not the midwife who has to have skin contact, but the mother. **FT, Birth KC, implementation, barriers. TRY TO GET THIS FROM UK. Not on Charts 5/2/2011**


Promoting breastfeeding. Women encouraged to nurse their infants for six months or more. *AWHONN Lifelines, 8/(4), 366-367. KC should be provided within 30 minutes of birth and procedures should be delayed during this time. FTfullterm, BirthKC, guidelines.

Association of Women’s Health, Obstetric and Neonatal Nurses (AWHONN). (2008). AWHONN Members: Help Moms Breastfeed. August 5, 2008 from AWHONN. In honor of Breastfeeding Week, each member was sent the following message in which “From the birth of the baby through the first two weeks postpartum, healthcare providers should: 1. facilitate uninterrupted skin-to-skin contact at birth and during hospitalization, whenever possible. Ideally the first feeding should occur within one hour of birth if mother and infant are stable.” This tip is from Breastfeeding Support: Prenatal Care through the First Year. 2nd Edit. AWHONNs’ evidence-based guideline. On page 2443 it states that KC decreases incidence and severity of infection in infants. **BF, Fullterm, Birth KC, Guidelines, infection**


Awi, D.D. & Alikor, E.A. (2004). The influence of pre-and post-partum factors on the time of contact between mother and her newborn after vaginal delivery. *Niger Journal of Medicine 13(3), 272-275 and erratum in Niger journal of Medicine 2005 (Oct-Dec) 14(4), 460. Analysis of interviews and observations and medical records of pre and postpartum factors influencing time interval from vaginal delivery to first KC between 250 moms and newborns in a University Nigerian hospital showed that only 38.4% of moms started KC within 30 minutes of birth. Factors associated with early KC were maternal age < 25 years, primiparity, labor <12 hours, and later episiotomy repair. Factors associated with late KC (after first 30 minutes post-birth) were early performance of routine cleaning and measurement of newborn. A higher proportion of mothers who had BF assistance had had early KC (48.8%) than those who did not have any assistance (17.1%). A delay in the time of repair of episiotomy is associated with early Breastfeeding initiation. 96/242 (39.7%) moms who received information on BF had early contact compared with none of the 8 moms who did not get BF education. Marital status and moms’ education had no association with KC. Immediate contact between newborn and mother should take precedence over hospital routines. **Fullterm, Descriptive, Regression Analysis, Birth KC, Very Early KC, episiotomy repair, BF education., 3rd world, barriers**

Badr LK & Purdy I. (2007). Brain injury in the infant: The old, the new, and the uncertain. *J Perinat Neon Nurs 20/(2): 163-175. This is a review of brain injuries in newborns and it states several important things: on page 170 it states” maintainence of respiration and physiologic stability is essential in reducing the risk of brain injury”, on page 170 it relates”measures aimed at reducing stress in the term or preterm infant may actually reduce the incidence and negative consequences of brain injury” and on page 171 it states “Kangaroo Care may reduce the need for respiratory support.” **Review, PT, FT, dev, stess reduction NOT ON CHARTS as of 5/20/09**

Baker, A. M. (1993). Maternal perceptions of the kangaroo care experience. Unpublished master’s thesis, The College of St. Catherine, St. Paul, Minnesota. Focused interviews with 3 mothers. KC decreased or eliminated maternal anxiety. Physical and emotional intimacy were HIGHLIGHTS of experience-they had much pleasure. KC heightened the dilemma of caring for other children, and KC supported mat-infant interaction, and moms were more aware of infant’s behaviors and cues.KC also helped moms develop awareness of their own feelings and responses to infant. **Qualitative, Maternal Anxiety, maternal pleasure, PT**


Bakewell-Sachs, S. (2002). Physiologic stability of intubated VLBW infants during skin-to-skin care and...
incubator care. Comment by Susan Bakewell-Sachs. *MCN. American J. Maternal Child Nursing, 27*(2), 123. This is a short one paragraph reiteration of Smith’s report in *Advances in Neonatal Care*, vol. 1, pg. 28-40 and concludes that incubator care may be less stressful for intubated infants than KC. Ventilated KC, Preterm, Summation, Stability

Bakewell-Sachs S, & Blackburn S. (2003). State of the science: achievements and challenges across the spectrum of care for preterm infants. *J. Obstetric, Gynecologic, and Neonatal Nursing 32*(5), 683-695. This is a review article of advances made in relation to perinatal intervention, resuscitation, retinopathy, nutrition and feeding, pain management, developmental care, discharge management, transition to home and implications for neonatal nursing practice and research. On page 688 under the section on developmental care it states “Many developmentally supportive care strategies were implemented before undergoing adequate scientific testing. More research is needed, but the evidence base is growing for interventions such as cycled lighting, kangaroo care, nonnutritive sucking, containment, touch, and positioning, due in large part to the work of nurse researchers.” Also, “Individualized developmentally based care is a third focus of need for neonatal nursing research. Research demonstrating the effect of developmental care and other nursing care on infant outcomes, consistency of care, and costs will emphasize the importance of skilled nursing care.” (pg. 691). *PT, Review, developmental care, Not on charts 4/30/09*

Bakewell-Sachs S & Gennaro S. (2004). Parenting the post-NICU premature infant. *MCN, the American J of Maternal/Child Nursing* 29(6), 398-403. This article is designed to assist nurses in giving comprehensive, evidence-based care in preparation for discharge and when working with the mother after discharge. Mothers need information, guidance from nurses, support from other mothers, and interventions that improve parent-infant interactions. “Most studies have focused on interventions such with mothers such as kangaroo care, developmentally based care,…Kangaroo care has been shown to have beneficial effects for infants and parents; a recent study found that mothers who participated in kangaroo care had more positive mood, touch, and adaptation to infant cues,and their infants showed greater alertness and less gaze aversion compared to control group (Feldman, Eidelman, Sirota, Weller, 2002).” (pg. 400). On page 402 in Figure 1, entitled “nursing interventions for the care of the NICU graduate”, #5 is “Encourage use of kangaroo care and infant massage.” *Clinical review, post-discharge, maternal mood, PT*


Barbier, D., & University of Louisville University Hospital Center for Women and Infants. (2010). Jumping into Kangaroo Care. A comprehensive educational toolkit. University Hospital. Available from: Denise Barbier, 34 hill Road, Louisville, KY 40204, 502-458-2324. Disc 1 is a DVD that contains “everything you need to know to implement Kangaroo Care, from prenatal visits to patient discharge. Disc 2 is a CD ROM that contains instructor guide, participant guide, sample hospital policies, research references, patient education brochures, national and international policy statements and other supportive materials. The program is designed to promote KC in the delivery room and throughout the hospital stay in order to increase the number of infants who are breastfed upon discharge. BF rates at University of Louisville Hospital rose from 45% to 64% in 7 months when new mothers were encouraged to be skin-to-skin with their healthy full term infants immediately after birth. KC is a simple and effective way to increase the number of newborns who are breastfed and, as a result, will increase the number of mothers and their infants who enjoy the significant health benefits of breastfeeding. Disc one has 10 chapters of content and is absolutely BEAUTIFULLY DONE. All USA Safety precautions followed, and they demonstrate birth KC procedure (but they put baby head up on mother’s chest), all babies have head caps and they emphasize uninterrupted continuous BIRth KC for one hour and stress the important of this one hour even if mom is formula feeding her infant. EXCELLENT film. THE BEST SUSIE L HAS SEEN YET!!! Birth KC, BF, antenatal KC, PP KC. Not on Charts in 11/2010.

Barnes, N.P., & Roberts, P. (2005). “Extrasystoles” during Kangaroo Care. *Pediatric Critical Care Medicine, 6*(2), 230. GET THIS. This is commentary on Kluthe et al.’s 2004 case study of an extrasystole appearing on the EKG of a preterm infant during KC and concluded that they were picking up maternal heart beat. It was Not A Life Threatening Event during KC. *PT, Apnea. Life threatening event*. 1.
Barradas J, Fonseca A, Guimaraes CL, & Lima GM. (2006). Relationship between positioning of premature infants in Kangaroo Mother Care and early neuromotor development. Journal Pediatrics (Rio Journal), 82(6), 475-480. Kangaroo Care is considered normal, routine and infants were placed either in lateral decubitus position or in full prone position while receiving 24/7 KC. Better flexed positioning and motor development in 24/7 KC infants. Correlational study, preterm, development, motor, position

Bar Yam, N.B., (2002). Kangaroo mother care: Restoring the original paradigm for infant care and breastfeeding. J. Human Lactation, 18 (3), 289 for a review of the film in the title that was made by Nils Bergman. FILM, BF, FT

Bauer K. (2005). Interventions involving positioning and handling in the neonatal intensive care unit: Early developmental care and skin-to-skin holding. In J. Sizun & JV Browne (Eds.). Research on Early Developmental Care for Preterm Infants. Montreouge, France; John Libbey Eurotext, pp. 59-65. This is a review that covers prone positioning, SIDS, prone sleeping helps acquire motor milestones earlier (pg. 60), supine positioning does not prevent asymmetrical postures which increases functional asymmetries that prone positioning does not, head up positioning minimizes apnea and bradycardia for 6 hours (Jenni OG et al, in Pediatr1997, vol 100, 622-625), swaddling, nesting, postural support, sling carrying, minimal handling, and KC is on page 62-63. They conclude on page 63 that “skin to skin care has several aspects that support the infant’s neurobehavioral development. It promotes stability of heart and respiratory function, it is a time when infant is protected from painful interventions, it offers opportunity for maternal proximity and interaction, and provides stimulation by skin to skin contact, stroking, and by the sound of the mother’s body and voice. Reported short term benefits are an increase in sleep time. Yet, there are few studies of medium-term or long-term effects of skin to skin holding on neurodevelopment. Review, Preterm, development, devel care, HR, RR, A/B, prone, interaction, swaddling. Not on charts as of May 20, 2009.


Bauer K, Pyper A, Sperling P. Uhrig C, & Versmold H. (1998). Effects of gestational age and postnatal age on body temperature, oxygen consumption, and activity during early skin-to-skin contact between preterm infants of 25-30 week gestation, AGA, and their mothers. Pediatri Res, 44(2): 247-251. 27 infants spontaneously breathing infants (GA=25-30 wks) given 60 min in incubator and then 60 min in KC and 60 min. back in incubator in wk 1 and then got KC DAILY for 1 hr each day until 7 days later (2nd week of life). Interfeeding observations made with 1 hour periods of observation. No change in oxygen consumption, more sleep in KC, 25-27 weeks lose rectal heat during KC, 28-30 weeks gain heat in KC (0.3°Cin 1 hour). No sig change in oxygen consumption. In week 2 all infants slept more in KC (Sig diff). Maternal chest temp at 2 cm below clavicle. Maternal chest temp stayed at 34.3-34.4 during KC. Sleep was Brueck score of 3or 4, based on behavioral observation. Humidity was 80% in incubator., 40% in room air. Temp dropped during transfer into and out of KC in 25-27 weeks. Oxygen consumption did not increase during SSC or during temp drop with transfer. Maternal temp under towel was same as surface temp in incubator. In wk 1 infants slept >90% time in incubator and KC. IN wk 2 infants spent more time asleep in KC (pretest 78%, KC 90%, posttest 82% for25-27 wkers; 92% to 97% to 85% for 28-30 weeks. KC had no effect on HR and O2 consumption. Pretest-test-posttest, one group, NOT an RCT, oxygen consumption, sleep, temperature, HR, Small vs. not so small, Maternal temp., sleep , transfer, micropreemie, PT

Bauer, J., Sontheimer, D., Fischer, C., & Linderkamp, O. (1996). Metabolic rate and energy balance in very low birth weight infants during Kangaroo Care holding by their mothers and fathers. Journal of Pediatrics, 129(4), 608-611. 25-27 weeks did not gain body heat during KC, 28 weeker or more did. Gain in body heat is not accompanied by increased metabolic rate nor increased oxygen consumption. No difference in infection rate in infants with paternal or

Bauer, K., Uhrig, C., Sperling, P., Pasel, K., Wieland, C., & Versmold, H.T. (1997). Body temperatures and oxygen consumption during skin-to-skin (Kangaroo) care in stable preterm infants weighing less than 1500 grams. *Journal of Pediatrics*, 130(2), 240-244. 22 stable preterms <1500 grms and AGA given first KC in first wk of life. Continuously measures HR, rectal temp, foot skin temp and oxygen consumption for 1 hr in incubator, during 60 min of KC, and 1 hr in incubator. HR never changed from 151. During KC, rectal temp is 0.2C and foot temp 0.6C higher than pretest. During posttest, body temps returned to pretest. O2 consumption during KC (6.1±0.9 ml/kg/min.) was not higher than in incubator (5.8±0.8 ml/kg/min). Time in Quiet sleep (Brueck score of 3 or less –behavioral state) as % total time was 93 ± 7 pretest, 96±7 KC, 91±9 posttest and state was NOT SIG DIFF. Everything returned to pretest value in posttest period. For stable preterm infants <1500 grms and < 1 week of age, one hour of KC is not a cold stress compared with incubator care. TRANSFER to mom took 9±4 min.GERMANY. **Pretest-posttest, one group, NOT an RCT.** Transfer time, rectal temp, foot temp, oxygenation, oxygen consumption, stability, First week of life. QUIET TIME, <1500 gm. Stability. PT

Bauer, K., Uhrig C, & Versmold H. (1999). How do mothers experience skin contact with their very immature (gestational age 27-30 weeks), only days old premature infants? *Z Geburtshilfe Neonatol*, 203(6): 250-254. **English Abstract.** 17 mothers recorded their experiences with ad lib KC over 14 days beginning 3 days postbirth with 27-30 (median was 27.5wk;median wgt of 1130g). They increased KC from 60-120 minutes. 21% wanted longer KC periods. 62% said positive feelings and 78% said KC increased attachment to baby. **Descriptive Qualitative Study, duration of KC, mat feelings, attachment. Same subjects as in Tornhage’s two studies. Micropreemie PT, longer KC visits**


Becher, J-C., Bhushan, S.S., & Lyon, A.J. (2012). Unexpected collapse in apparently healthy newborns – a prospective national study of a missing cohort of neonatal deaths and near–death events. *Arch Dis Childhood Fetal Neonatal Edition*, 97(1), F30-F34. doi: 10.1136/adc.2010.208736. A prospective study in Scotland of sudden, unexpected, postnatal collapse (SUPC) to determine the incidence over 13 months 2008-2009. Sudden and unexpected postnatal collapse of a healthy newborn is a rare event, carries high risk of mortality and significant neurodisability. Previous work has shown associations with prone positioning, breast feeding, and primiparous status. SUPC during Birth KC is rare but well-recognized. 13 months of data from British Paediatric Surveillance Unit data were examined from all hospitals in UK (England, Scotland, Ireland). Infants were ≥37 wks GA, Apgar ≥ 8 at 5 minutes, collapsed within 12 h of birth in hospital and required resuscitation, and died or received NICU care. 91 cases reported, but 32 were in error and 10 were duplications and four did not meet eligibility. Thus 45 cases of SUPC were reported out of 858,466 births, 12 (27%) died and 33 survived till discharge. 15 infants had an underlying condition responsible for collapse and 6 of these died. In the remaining 30 cases, no underlying condition was found, and 24 postmortem showed accidental suffocation. In the further 6 cases, no cause was determined and 1 died. Incidence of SUPC within the first 12 hours of life was 0.05/1000 (1/19,000) term live births and mortality was 0.01/1000 (1/72,000) term live births. When no underlying disease/abnormality of infant was present (n=30), incidence was 0.0353/1000 (1/29,000) term live birth. In infants without underlying condition, 23 (77%) of mothers were primiparous, and all were in good health. Two smoked and 4 had hypertension. 16 infants born NSVD, 4 by instrumental vaginal delivery, none by cesarean. In four cases there was mec staining, in 11 cases cord gas median pH was 7.18 (R=7.09-7.3) and base deficit was 5.3mmol/l (R=209.5 nmol/l). GA median was 40 wks (37-42 wks), and Mean Birth weight was 3328g (R=2260-4030g). All had Apgar scores of 8 or more at 5 minutes of age and were assigned routine postnatal care with mother. Age of collapse 1.
was Median=70 (6-643 mins) and 73% (n=22/30) collapsed in first 2 hrs. One of 2 (20%) mothers who were alone in the room recognized baby was not well. 7 sets of parents were with infant when collapse occurred and 71% (5/7) of these parents recognized infant not well. In 13/30 cases clinical staff were present at time of collapse and 100% of them recognized when infant was unwell. In 18/30 cases (60%), the infant was PRONE on mom’s breast, chest or abdomen, 9 cases (30%) occurred when infant was in mom’s arms, 3 (10%) occurred when baby was in cot. It is interesting that 8 of the mothers were health professionals and only one of these recognized signs of deterioration of their infant. Two babies died immediately despite resuscitative efforts (one with sepsis, one with transposition of the great arteries), 23 infants (58%) developed multiorgan dysfunction and 17 others (40%) had single organ dysfunction. In the whole population of SUPC, 8 kids (24%) had neurological abnormalities at one year. Of the 30 SUPC kids without underlying cause, all had accidental suffocation as cause and 5 of the 19 who lived to discharge had neurological abnormalities (26% [3 CP, 1 probably CP, 1 with mild global delay & hypotonia]). All six with no identified cause for collapse were normal at follow-up. Moore’s 2007 meta-analysis showed BF duration and bonding improvements without serious adverse events, and BF benefits of KC are not disputed, so early S2S and BF are increasingly promoted accompanied by withdrawal of clinical staff to facilitate uninterrupted bonding. S2S, BF, prone position, frequency of maternal sedation, co-bedding on soft surface, blankets covering infant head are risk factors for SUPC immediately after birth and during this critical adaption period of the first two hours of life, the newborn is less able to cope with hypoxic stress, such as airway obstruction (Poets et al. 2011). Majority (BUT NOT ALL) of moms were primiparous. This study shows that Mom and parents were often left alone and that parents don’t recognize problem signs in infant (due to inexperience, lack of knowledge, distraction, sleep). “For the significant majority of newborn infants, it is clear that breast feeding and skin-to-skin practices are safe, beneficial and should be recommended. For such recommendations to be safe for all infants, guidelines should include appropriate vigilance of infants. Responsibility should be within clinical staff to ensure that during breast feeding and skin-to-skin practices, parents are able to assess the airway, breathing, and colour of their infant. Where parental observations of these parameters may be impaired by exhaustion or sedation, the responsibility should reside with the clinical staff.” Pg. F4 of 5. FT, descriptive, United Kingdom, Birth KC, life threatening events, mortality, guidelines.

Begley, C.M., Guilliland, K., Dixon, L., Reilly, M, & Keegan, C. (2011). Irish and New Zealand midwives’ expertise in expectant management of the third stage of labour. The “MEET” study. Midwifery. Oct. 18 Epub ahead of print. Descriptive study fo 27 midwives who related what they routinely practiced in the third stage of labor and they believe that the 3rd stage is a special time of parent-baby discovery and ‘watchful waiting’, with no intervention necessary. Skin to skin contact, breastfeeding, not clamping the cord, upright positions and maternal effort were also used. FT, Descriptive, Birth K Not on charts 2/12/2012.

Begum EA, Bonno M, Ohtani N, Yamashita S, Tanaka S, Yamamoto H, Kawai M, & Komada Y. (2008). Cerebral oxygenation responses during kangaroo care in low birth weight infants. BMC Pediatrics 8(1)(Nov. 7, 2008), 51-60. online publication available from http://www.biomedcentral.com/1471-2431/8/51 SLEEP, HRV, Sao2, RR, cerebral oxygenation of both hemispheres. The manuscript has been reprinted below in Neonatal Intensive Care and has actual page numbers for reference. So the review is under the Neonatal Intensive Care citation that follows. PT

Begum EA, Bonno M, Ohtani N, Yamashita S, Tanaka S, Yamamoto H, Kawai M, & Komada Y. (2009). Cerebral oxygenation responses during kangaroo care in low birth weight infants. Neonatal Intensive Care 2(2), 2-25. Quasi-experimental one group pretest-test-posttest design. Because preterm infants are susceptible to cerebral lesions due to immaturity, the effects of KC on cerebral hemodynamics should be known. Cerebral oxygenation is an important parameter in cerebral hemodynamics. 19 stable (no o2 support) preterms with birthweight <1600g (Median=1228g), gestational age <33 wks(median=28 wks), postconceptional age>32(actually were 33-42) weeks (M=36 weeks), entry wgt M=1458g), 8 by c/s, 7 had a median of 6 days of mechanical ventilation prior to study. 4 infants got theophylline on KC day. 30 minutes in incubator, one hour of KC, then 30 min in incubator, moms at 60 degree angle, covered with light blanket. Infants fed 1 hr before KC (30 min before incubator pretest). Near Infrared Spectroscopy (NIRS) probes placed on bilateral frontoparietal areas. Data recorded every 10 seconds (averaged over 10 seconds). First 30 min of KC data not included to allow for adaptation time. Behavioral state (Brazelton Neonatal Behavioral Assessment Scale states) at beginning and end of KC, before KC, & 30 min after end of KC. HR was 149.4(6.3) pretest, 150.0±10.0; KC, 150.4± 8.7
post; RR = 39.4±8.9 → 44.0±5.1 → 39.7±7.9; SaO2= 98.0±1.3 → 97.6±2.5 → 97.5±1.7; left regional cerebral oxygenations (left Rso2%) = 46.8±5.6 → 47.3±6.1 → 47.5±7.3; right Rso2% = 48.6±6.9 → 49.1±9.4 → 47.8±6.9; infant temp = 37.0±0.2 → 37.3±0.3 KC. Sig differences only in RR (increase during KC was p<0.05; temp gain in KC was p<0.01; the coefficient of variance of HR indicated a drop in variance by 2.2% p<0.05 and it increased after KC by 2.9%(p<0.05). Spectral analysis of the power of all variables was calculated and total power of HR decreased during KC and increased after KC (drop in power indicates more parasympathetic control)(total power of HR = 635±280 preKC=268±134 KC → 618±240postKC; total power of SaO2 had same trend as HR; total power of RR increased from before (458±186)to KC(713±175)and decreased after KC (461±231ms²/Hz) (all p,0.01). KC significantly decreased total power of right and left cerebral oxygenation and it increased after( total power right Rso2 preKC=123±69 → 55±30KC → 98±46ms²/Hz postKC); (total power left Rso2 prekc =121→kc=54±41 →postkc =90±56) ( all p values were <0.001). Low frequency HR increased significantly during KC (41.4 preKC to 48.3KC)(increase in sympathetic activation) and %High frequency HR declined (45.9 preKC to 33.5KC)(less parasympathetic influence). Percent of low frequency RSO2 decreased during KC for both left (preKC 63.5 to 49.2K to postKC63.8; p<0.01) and right (preKC59.1 to49.9KC to 57.0 postKC; p<0.05). The %High frequency RSO2 decreased during KC for right region only (preKC28.1 to kc 22.6 to postkc26.2; p<0.01). The % of low frequency RR increased significantly (increase in sympathetic activation) and % high frequency decreased significantly (less parasympathetic) after KC and LF/HF ratio for RR increased significantly after KC (more sympathetic control). Infants who got theophylline acted same way as non-theophylline infants. The number of infants with Behavioral state Quiet Sleep increased from prekC (15.4%) to KC (61.5% beginning of KC to 76.9% at end of KC) to 38.5% 30 min after KC. Percentage of infants with active sleep was prekc 53.8%, kc 23.1% in middle of KC, and 54.0% 30 min after KC. In summary, changes occur during KC and go back to prekc values when KC ends. Temperature and RR increase significantly during KC, KC induces predominance of parasympathetic system (seen in HR) but not in regional oxygenation. Spectral characteristics of cerebral oxygenation differ during KC even though nodifferences in mean values were found. Spectral analysis showed LF of HR was increased during KC and the LF of cerebral oxygenation was decreased during KC. An increase in sympathetic activity and a decrease in cerebral oxygen delivery with the head in an upright position are assumed to be due to gravity causing pooling of blood and activating baroreceptors (Smith 2004 in Biol Neonate). Activation of the CNS and brain function occurs during KC(pg. 23). The decrease in coefficient of variance and total power during KC is probably associated with reduced activity and increased quiet sleep during KC and can be interpreted as “physiologic stability elicited by the KC intervention.”(pg. 23). The lack of HF dominance in HR in this study, which is quite unusual because during quiet sleep there is dominance of HF of HR, was due to the high upright position of the head (pg. 24). All results similar toMcCain et al., 2005. Discrepancy between right and left RSO2 might have been due to infant’s head position. Infants were placed onto the skin between the breasts and head position was not described in the manuscript (pg. 22). So, next study should control the way the head is positioned and turned. In summary, because the results are quite extensive, significant differences were: RR and temperature increased during KC; HR variation decreased by 2.2% during KC(indicating stability), decreased cerebral oxygenation during KC because of 60 degree upright and less stress, and increased sympathetic activity during KC and predominance of parasympathetic activity during KC. Preterm, quasi-experimental pretest-test-posttest, HR, RR, SaO2, cerebral oxygenation, behavioral state, stability of HR, heart rate variability, behavioral state, QS, AS, Low Frequency/High Frequency, LF/HF ratio, stress (parasympathetic vs sympathetic control)

Belizan, J.M. (2011). Kangaroo Mother Care: A paradigm of a wise and humanitarian solution to a limiting situation in developing countries. Current Women’s Health Reviews, 7(3), 226. A one page editorial that says Kangaroo care is one of the most compelling interventions to save newborn lives in the world. Many studies in all parts of the world have concluded that KC, when compared with conventional neonatal care, is associated with a reduction in mortality, severe infection/sepsis, hypothermia, length of hospital stay, as well as an increase in weight gain, exclusive or any breastfeeding (cities Conde-Aguedelo 2011 Cochrane). Results show consistency that neonatal deaths can be reduced by 40% and that approximately 40 infants need to be treated to prevent one death. KC should be widely and strongly recommended; it is desirable to stimulate the creation of a leading KC initiative advocating for the use of the intervention and providing support and training to those willing and supposed to implement it. KC should be used at all levels of care. PT, commentary/editorial, mortality, sepsis, length of stay, KC initiative. Not on charts 10/1/2011.


Bell, R.P., & McGrath, JM (1996). How to implement a research-based Kangaroo Care program in the NICU. Nursing Clinics of North America, 31(2), 387-403. Relates their step-by-step procedure to implementing KC so that it became routine care. Lack of consistency in KC implementation was major factor in lack of KC use. They developed the evidence-based procedure with detailed eligibility policy and procedure for staff and parent education. After the protocol was fully implemented, BF rate in NICU rose by 41%. IMPLEMENTATION, BF rate – Excellent Resource. PT


Bellergs, Barbara (2010). Skin-to-skin quality improvement project at Geauga. Available from Barbara.Berges@UHhospitals.org, or Barbara Berges, BS,RN, IBCLC, Lactation Consultant, UH Geauga Medical Center, 13207 Ravenna Road, Chardon, OH 44024, phone 440-285-6005; Fax: 440-285-6629. This is a proposal that instead of swaddling babies after birth, babies are placed skin-to-skin with mother while baby recovers from the stress of delivery and adapts to extra-uterine life. It is not a “breastfeeding project”, but a project to enhance care of all infants and mothers and it is presented as such. Before they began their initiative, they collected information on temperature regulation (temps in 1st 90 minutes postbirth to assess time to temp stabilization in swaddled vs KC at birth, time to first successful breastfeeding, number of breastfeeding in first 24 hours, amount and number of supplementations vs exclusive breastfeeding during stay to address the new Joint Commission measurements. The only change that was made was “No change in routine care of infant after birth from current practices, except instead of swaddling the baby and placing in mom’s arm, the baby, wearing only a diaper, is placed upright against the mother’s bare chest in a prone position. The baby’s back is covered with a warm blanket to maintain warmth and privacy.” Unfortunately, the starting time, and duration of uninterrupted KC time may be compromised by this simple method, but the simple change from swaddling to skin-to-skin may facilitate later adaptation of the finer points of Birth KC. Fullterm, Birth KC, breastfeeding.

Bergh A-M, Arsalo I, Malan AF, Patrick M, Pattinson RC, & Phillips N. (2005). Measuring implementation progress in kangaroo mother care. Acta Paediatrica 94, 1102-1108. This is a report of testing an implementation model (pg. 1104) and recording benchmarks that show progress in adapting and using KMC in hospitals in South Africa. She offers indicator (bench marks) for each of the implementation constructs: creating awareness, adopting the concept, taking ownership, evidence of practice, evidence of routine and integration, sustainable practice. Model and quantification of progress has worked well. PT, Implementation Plan, Benchmarks

Bergh A-M, & Pattinson RC. (2003). Development of a conceptual tool for the implementation of Kangaroo Mother Care. Acta Paediatrica 92, 709-714. This provides a conceptual model to assist the implementation of KC. A Qualitative research approach used in South Africa to elicit main issues in establishing a program of KC and they developed a set of core questions to assist in decision making about using KC at the institution level. Implementation, staff issues , PT


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Bell, R.P., & McGrath, JM (1996). How to implement a research-based Kangaroo Care program in the NICU. Nursing Clinics of North America, 31(2), 387-403. Relates their step-by-step procedure to implementing KC so that it became routine care. Lack of consistency in KC implementation was major factor in lack of KC use. They developed the evidence-based procedure with detailed eligibility policy and procedure for staff and parent education. After the protocol was fully implemented, BF rate in NICU rose by 41%. IMPLEMENTATION, BF rate – Excellent Resource. PT


Bellergs, Barbara (2010). Skin-to-skin quality improvement project at Geauga. Available from Barbara.Berges@UHhospitals.org, or Barbara Berges, BS,RN, IBCLC, Lactation Consultant, UH Geauga Medical Center, 13207 Ravenna Road, Chardon, OH 44024, phone 440-285-6005; Fax: 440-285-6629. This is a proposal that instead of swaddling babies after birth, babies are placed skin-to-skin with mother while baby recovers from the stress of delivery and adapts to extra-uterine life. It is not a “breastfeeding project”, but a project to enhance care of all infants and mothers and it is presented as such. Before they began their initiative, they collected information on temperature regulation (temps in 1st 90 minutes postbirth to assess time to temp stabilization in swaddled vs KC at birth, time to first successful breastfeeding, number of breastfeeding in first 24 hours, amount and number of supplementations vs exclusive breastfeeding during stay to address the new Joint Commission measurements. The only change that was made was “No change in routine care of infant after birth from current practices, except instead of swaddling the baby and placing in mom’s arm, the baby, wearing only a diaper, is placed upright against the mother’s bare chest in a prone position. The baby’s back is covered with a warm blanket to maintain warmth and privacy.” Unfortunately, the starting time, and duration of uninterrupted KC time may be compromised by this simple method, but the simple change from swaddling to skin-to-skin may facilitate later adaptation of the finer points of Birth KC. Fullterm, Birth KC, breastfeeding.

Bergh A-M, Arsalo I, Malan AF, Patrick M, Pattinson RC, & Phillips N. (2005). Measuring implementation progress in kangaroo mother care. Acta Paediatrica 94, 1102-1108. This is a report of testing an implementation model (pg. 1104) and recording benchmarks that show progress in adapting and using KMC in hospitals in South Africa. She offers indicator (bench marks) for each of the implementation constructs: creating awareness, adopting the concept, taking ownership, evidence of practice, evidence of routine and integration, sustainable practice. Model and quantification of progress has worked well. PT, Implementation Plan, Benchmarks

Bergh A-M, & Pattinson RC. (2003). Development of a conceptual tool for the implementation of Kangaroo Mother Care. Acta Paediatrica 92, 709-714. This provides a conceptual model to assist the implementation of KC. A Qualitative research approach used in South Africa to elicit main issues in establishing a program of KC and they developed a set of core questions to assist in decision making about using KC at the institution level. Implementation, staff issues , PT

score of 62.1. One hospital had not reached the level of “evidence of practice”, five hospitals had reached the level of “evidence of practice” and 2 hospitals scored on the level of “evidence of routine and integration.”. The 2 training hospitals were on the border of “evidence of sustainable practice”. Implementation of KC is a process that requires dedication and support for a number of years. Some items in the progress monitoring tool could be used to set standards for KMC that hospitals must meet for accreditation purposes. **PT, 3rd World, guidelines, implementation**

Bergh AM, van Rooyen E, & Pattinson RC. (2008). Scaling up kangaroo mother care in South Africa: ‘on-site’ versus ‘off-site’ educational facilitation. *Human Resources & Health*, 23(6), 13 + 6 pages. Descriptive comparative study. Implementation study of 36 hospitals implementing KC were assigned to two matched groups: one received 2 on-site education visits and the other matched site received one off site hands-on workshop education session at a training hospital. Evaluation was 6-8 months later. Successful implementation was a score >10 on Bergh’s scale. No differences between groups. 15 of on site hospitals and 16 of off site hospitals were successfully implementing KC. Site of training/education did not influence ability to successfully implement KC. Local circumstances should guide educational strategy. **PT, Implementation**

Bergman, J. (2010). *Hold Your Prem*. Capetown: New Voices Publishing, Pp. 1-144. This is a great book for parents and has many fantastic resource chapters with good documentation of sources to validate factual statements. The chapters in the book are: the first few hours, how preemies are different from full term neonates, what parents can do to help their baby, emotions and coping, skin to skin contact, breast milk and feeding, how the brain develops and works: neuroscience, protect sleep, separation and stress, developmental care, technology, problems preemies face in the NICU, long term problem preemies face and how skin-to-skin contact can help, how friends and family can help, going home, parenting, compassionate care for a dying baby, and resources. **PT, parent, guides, book, dev., stress NOT on Charts as of 3/24/2010**

Bergman, J. (2011). Hold Your Preemie. Capetown: New Voices Publishing, Pp. 1-144. This is an Americanized version (i.e. instead of ‘nappies’ the text has ‘diapers’, instead of ‘prem’ it says ‘preemie’, etc) of the J. Bergman book reported above. It is a wonderful book for parents, interactive, helpful, practical advise, clear guidelines, and eases anxiety about the preterm birth experience as well. Now available from Geddes Productions in Los Angeles. Contact them at [http://www.geddesproduction.com](http://www.geddesproduction.com) or orders@geddesproduction.com. They take credit cards and mail the same day.


Bergman, N. (? ? ? ? ) Kangaroo mother care: Rediscover the natural way to care for newborn baby. *International J of Childbirth Education* 18 (1), 30 & 27. This is a simple to read reason why KC should be practiced with fullterm infants. Article conveys two concepts: No separation and Breastfeeding. **Review, Full Term, BF**

Bergman, N. (2005). More than a cuddle: skin-to-skin contact is key. *Practicing Midwife* 8(9), 44. Short commentary on the importance of kangaroo care for breastfeeding and providing the natural niche for the infant. **PT, FT, Commentary, Review.**

is needed. Does not have an actual measure of breastfeeding success (such as Carfoot’s desire and final study had), but is talking about overall success. This is very similar content to Winberg’s article. 

Bergman N, Carney G, & Ludington-Hoe SM. (2010). Kangaroo Care for the preterm infant. *Infant, Child, and Adolescent Nutrition*, 2(3), 165-169. This is an article that is a roundtable in which the three authors were asked the same questions and their answers are posted. The first question was KC has distinct known advantages for our preterm infants. Can you briefly outline those advantages from your perspective? Nil’s related; Carney related, and Ludington-Hoe related a one sentence answer of all outcomes reported in Ludington-Hoe, Morgan, & Abouelfettoh, 2008). The second question was “the practice of KC for the preterm infant is not always standard protocol. From your perspective, when should KC be initiated? Bergman says the question should be “when should incubator care be initiated?” Carney replied: Ludington replied that the American Academy of Pediatrics and WHO say it should begin as soon as possible, continue for as long as possible, and be uninterrupted during hospitalization, whether full term, preterm, vaginal or cesarean birth, singleton or multiple birth and she refers to the two Nyqvist et al., 2010 publications in Acta Paediatrica. PT. Review, c/s, multiple birth, etc.

Bergman NJ, Linley LL, & Fawcus SR (2004). Randomized controlled trial of skin-to-skin contact from birth versus conventional incubator for physiological stabilization in 1200- to 2199-g newborns. *Acta Paediatrica* 93(6), 779-785. RCT, Over first 6 hours post birth, gave either KC or incubator care to LATE PRETERM/NEAR TERM infants and measured number of times infant’s physiologic values exceeded clinical norm range and scored the values using SCRIP, a stability scoring system. “Newborn care provided by KC on the mother’s chest results in better physiological outcomes and stability than the same care provided in closed servo-controlled incubators. Cardiorespiratory instability seen in separated infants in the first 6 hrs is consistent with mammalian “protest-despair” biology, and with “hyperarousal & dissociation” response patterns described in human infants. Newborns should not be separated from their mothers.” (pg.779).

PT, RCT, HR, RR, stabilization, birth KC, stability. See also Nagai et al., 2010 for 24/7 KMC starting in first 24 hours postbirth with premature infant, LATE PRETERM/NEAR TERM


Bergman N, Malan A, Hann M, & Organizing Committee. (2003). Fourth International Workshop on Kangaroo Mother Care. J. Tropical Pediatrics 49 (5), 311-312. Report of the 4th Workshop is Cape Town in 2002. Reports that objectives of the workshop were to review clinical research, examine KMC public health policy, empower delegates to more effectively implement KMC, and equip delegates with ability to promote KMC to general public. KMC starting at birth with 1200 gramers and larger was shown to be safe (pg. 311),developmental and bonding benefits of KMC beyond 12 months were shown, Cochrane (Anderson et al., 2003) of fullterm early KMC outcomes – BF outcomes most marked, less crying, improved attachment were reviewed. Many provinces and countries have adopted KMC as formal government policy, and WHO’s Kangaroo Mother Care – a Practical Guide was reviewed. Social marketing principles (selling KMC to the public) were presented on Day 3 by Dr. Amy Seidel Marks. Principles are: identify stake holders, package the message separately for each target audience or market sector, sometimes putting aside was the medical manager knows and what for the community and instead putting in what the people’s needs and wants (the consumer’s perspective) are. Thus, KMC requires marketing not just a product,but new behaviours and values associated with KMC.Each segment of the market has a different value. Packaging must also match client’s stage of change. Barriers to change need to be understood and addressed for each market (readers are referred to Prochaska & DiClemente, 1983. Stages and processes of self-change of smoking: toward an integrative model of change. J. Consult Clin Psychol 51,390-395). Report, Birth KC, preterm birth KC, longitudinal KMC (AFTER 12 MONTHS), Fullterm, cry, attachment, BF, policy, implementation.

Bergstrom A, Okong P, & Ransjo-Arvidson AB. (2007). Immediate maternal thermal response to skin-to-skin care of newborn. Acta Paediatrica 96(5), 655-658. 39 Ugandan moms who had normal spontaneous vaginal delivery and non-asphyxiated newborns were studied. Maternal skin and axillary temps were taken immediately before KC, then every two minutes for 20 minutes and 10 minutes after neonate was removed. Infant axillary and forehead temps were measured immediately before KC, twice after initiating KC, and 10 minutes after newborn had been removed from KC. Maternal breast skin immediately displayed a rapid thermal response after KC was initiated (rose by 0.5 C p<0.0001 within first 2 minutes of KC and then dropped by 0.5C by 10 minutes after end of KC. Maternal axillary temp similarly rose by 0.5C). Descriptive, Fullterm, birth KC, maternal breast temperature, maternal axillary, infant axillary and forehead temps. 3rd world

Berman J. In press for April 1, (2010). The A to Z Guide to Raising Happy Confident Kids. Los Angeles: New World Library. She has a chapter in her book about the importance of touch and has tracked down the baby Steven who was born at 24 weeks at Brigham Women’s and Children’s Hospital in Boston and who survived (with many disabilities) with KC by his mother Dorothy. Dr. Berman used KC with her twin daughters and found it to be so helpful. You can contact Dr. Berman at 310-278-9666; fax is 310-278-9669, email is BermanPsych@aol.com, DoctorJenn@DoctorJenn.com, www.DoctorJenn.com FT


Bieda, A. (2007). Where are the data? Applying evidence to neonatal care. Nursing for Women’s Health, 11 (3), 316-318. This is a review about using evidence to guide practice and how to use Cochrane reviews. States on page 316, “Neonatal nurse researchers have contributed to evidence-based practice through well-documented nursing research in many areas, including neonatal skin care, infant massage, kangaroo care (cites Ludington-Hoe et al., 2000), pain management, infant bathing, developmental care, NICU environment, and infant feeding.” Reference to PT KC only, review of evidence-based practice procedure.

Bier, J-A.B., Ferguson, A.E., Liebling, J.A., Morales,Y., Archer, D., Oh, W., et al. (1995). Skin-to-skin contact improves physiologic states of breast-fed low-birth-weight (LBW) infants. Pediatric Research 37(4) part 2, 103A. Abstract of study that appears in 1996. N= 21 KC; 13 swaddled. Gave KC for 10 minutes each day for 10 days but mean KC was 13 mins/day. HR in KC was 165, HR swaddled was 174 PT, RCT, BF, HR, RR, Axillary Temp, # desats, BF, milk production, KCBF.

10 minutes only each day x 10 days and measured every minute HR, RR, SaO2, Axillary Temp, # Desats. First 10 minutes of 176 KC sessions and first 137 standard contact sessions were scored. RR, HR, temperature were same between groups. SSC temps rose in first 5 minutes and then matched control group thereafter. A warming effect of KC was seen. SaO2 was higher during KC and fewer desats (<90%) during KC (11% of 1716 SaO2 recordings during KC) and 24% of 1334 recordings during standard care (swaddled by moms). No diff in mean daily maternal milk expression, more stable milk production in KC. 90% of KC moms vs 61% non-KC moms were breastfeeding throuth hospitalization and 50% vs 11% were still BF at 1 month after discharge. At 6 months, 20% of KC & 10% control still BF. All mothers of multiples who Kced breastfed at discharge, and only 50% of multiples in standard care were BF at discharge, but no mother of multiples was still BF at 3 and 6 months. Moms and babies calm in KC. RCT, PT, KCBF, BF, milk production, milk expression, duration of BF, SaO2, oxygenation, HR, RR, Axillary Temp, #Desats, stability, twin KC

Bier J., Oliver T, Ferguson, A., & Vohr B .(2002). Human milk improves cognitive and motor development of premature infants during infancy. J Human Lactation 18 (4), 361-367. 29 preterm got mother’s milk and 10 preterm got formula only. Infants were assessed at 3, 7, and 12 months with Peabody Picture Vocabulary Set was administered to mothers. Milk fed infants had higher motor scores than formula fed at 3 months (63±20 vs 46±15) and at 12 months.(101±11 vs 90±9). Mom’s milk’s had higher motor score than formula too, adjusting for oxygen requirements and maternal vocabulary score. Human milk is associated with improved development of premature infants at 3 and 12 months age. PT, BF, Development – NOT A KC STUDY AT ALL!!!! But shows how to test for maternal intelligence in follow-up developmental studies.


Bigelow, A., & Power, M. (2012). The effect of mother infant skin to skin contact on infants’s response to the still face task from newborn to three months of age. Infant Behavior and Development, 35(2), 240-251. FT, interactions, still face. Full term infants who got KC (n=26) (not birth kc but Early kc starting in first 24 hours of life and then 5 hrs/day for first week and then 2 hrs/day for weeks 2,3, and 4 of life) were compared to full term infants who did not get KC (n=51) on still face tasks at one, two and 3 months of age. KC infants engaged with their mothers in Still Face Task at ages 1 wk, 1.2, and 3 months and began responding to CHANGES in still face at 2 months (controls did not respond to changes in Still Face until 3 months) KC infants increased their non-distress vocalizations during still face phase at 3 months – suggesting social bidding to their mothers. KC accelerated infant’s social expectations for their mother’s behavior and enhanced infants’ awareness of themselves as active agents in social interactions. FT, RCT, Early KC, maternal-infant interactions, Still face, infant vocalizations, and self-identity, brain maturation/brain studies, home KC. Not on Charts.

Black, Am. (2012). Breastfeeding the premature infant and nursing implications. Advances in Neonatal Care, 12(1), 10-14, DOI: 10.1097/ANC.0b013e3182425ad6 This is a clinical review of effects of breastfeeding on premature infant, his mother,nurses, and ends with nursing implications. On page 12 it states: “The skin-to-skin contact that is involved in breastfeeding can provide additional advantages for the mother. Typically it will make the mother feel much closer to her infant and she tends to perceive a much more intimate connections. The… goes on for a whole long paragraph. Will finish later.

Blaymore-Bier, J-A. See Bier, JAB above.

Blencowe H, Kerac M, & Molyneux E. (2009). Safety, effectiveness and barriers to follow-up using an ‘Early Discharge’ Kangaroo Care policy in a resource poor setting. J.Tropical Pediatrics, 55(4): 244-248. Prospective descriptive study of all 272 babies admitted to KMC ward in Malawi from Nov to May. When infant weight 1300 gram and gained weight daily he was discharged. Follow up continued until 2500 grams. 201/272 (73.9%) reached 2500 grms; 46(16.9%) died, unknown outcome in 25(9.2%). Mortality was highest in weights of 1300 to 1500 grams. Barriers to seeking healthcare postdischarge were transportation problems, late recognition of illness. Early discharge is safe, feasible, but issues regarding access to healthcare need to be addressed. PT, descriptive, 3rd world, KMC, early discharge, weight gain, mortality.

Blomqvist, Y.T., & Nyqvist, K.H. (2010). Swedish mothers’ experiences of continuous Kangaroo Mother Care. Journal of Clinical Nursing, 20(9-10), 1472-1480. (doi:10.1111/j.1365-2702.2010.03369.x.). Descriptive study to characterize the infants receiving continuous 24/7 KMC from birth to discharge in Swedish NICU and report mother’s experiences of this model of care. Retrospective survey with purposive sampling of 23 mother-infant pairs. Infants were 31-41 weeks GA, birthweights were 1715-3700 gms., moderately preterm and ill newborn infants. Moms showed good acceptance of the idea of 24/7 KMC during NICU stay, their evaluations of 24/7 KMC were predominantly positive, negative comments concerned lack of information about practical application of the method and some mothers perceive their infants’ care during the night exhausting. No mother would have preferred NOT to perform KMC or to terminate KMC earlier than they did. Mothers accept the model well when giving help and support they need. Moms should be offered opportunity to do 24/7 KMC to the extent that they are able and willing to do so and as permitted by infant’s medical condition and care. PT, 24/7 KMC, maternal feelings, implementation. Not on charts 2/1/2011


Blomqvist, Y.T.(for Thernstrom), Rubertsson, C., Nyqvist, K.H. (2011) Parent-infant skin-to-skin contact: How do parent records compare to nurse records? Acta Paediatrica, 100(5), 773-775. DOI: 10.1111/j.1651-2227.2011.02160.x. A descriptive study of measurement of daily amount of time infants spend in KC and who best documents the amount of time. Parents and nurses differed in the documentation of the actual number of times infants were in KC.Agreement between nurses and parents for KC duration and starting/termination times was 40%. Parents also noted more people who provided KC than did nurses. “Another relevant consideration is that parental documentation of KC may serve as a strategy for empowerment of parent.” Be sure to read commentary by Boukydis in 2011. PT, duration of KC, parent records. Not on Charts 11/10/2011


Bohnhorst B, Gill D, Dordelmann M, Peter CS, & Poets CF. (2004). Bradycardia and desaturation during skin-to-skin care: No relationship to hyperthermia. J Pediatr 145 (October), 499-502. This is a second study of the 2001 study and authors state that second study was conducted because in first study they did not control the infant’s airway position during KC and some infants had flexed their heads and occluded their airways. 22 preterm infants (median age 32 weeks) with postconceptional age <36 wks at study time underwent three 2-hour recordings of breathing movements, nasal airflow, HR SpO2, and oximeter waveforms. Pretest was prone in incubator at neutral thermal temperature, followed immediately by KC at 15-30 degree incline prone, and posttest was back in incubator where ambient temp had been elevated by 1 degree C (or up to 2 degrees C if infant’s body temp did not rise at least 0.4 degrees C during posttest). Head was uncovered and body covered by towel. Took rectal temp every 5 mins and uncovered baby if necessary to keep temp stable during KC. Desats <80%, brady (>1/3 of baseline HR for at least 5 seconds), apnea ≥10 sec were rare, Periodic breathing (3 or more central apneic pauses of 4 sec or more, separated by less than 20 breaths) were recorded as %. Temp did not rise during KC, but rose 0.6C in posttest. Proportion of regular breathing was lower during KC than pre & posttest. Baseline HR (154) & RR (66) did not change with KC (HR = 156, RR =67), rose in posttest (HR = 162, RR = 78). SpO2 did not change at all (Pretest = 97.5, kc=98.0, posttest=98.0). # of bradys + desats (combined together) was significantly higher during KC (3.0/hr) than posttest (1.7/hr) & higher (but not significantly) than pretest (2.2/hr). # of bradys alone/hr was 0.0 during KC, versus 0.3 during pretest and 0.6 in posttest. # of desats/hr was 1.0 pretest, 2.3 KC, 0.9 posttest (Sig. Differ between KC and posttest only). Mean nadir of bradys and desats did not change, & PB showed trend to increase during posttest (pretest = 0.01%, KC = 0.0%, posttest = 0.75%). “Frequency of apneas remained largely unchanged”(pg. 500) (pretest = 1.0/hr, KC=0.8/hr, posttest = 1.2/hr). ALL VALUES ARE MEDIANS, not means. Authors conclude that POSITIONAL FACTORS interfering with respiration play a role during KC. KC effects had disappeared with 3 hours of KC’s cessation. KC was associated with less regular breathing. Authors suggest continuous monitoring of HR, oxygenation, and temp during KC. PT, pretest-test-posttest Quasi Exp. Rectal temp, HR, RR, SPO2, desats, bradycardias, apnea, periodic breathing, irregular breathing pattern, negative effect, ALL MEDIANS, NOT MEANS, residual effects

Bohnhorst B, Heyne T, Peter CS, & Poets CF. (2001). Skin-to-skin (Kangaroo) care, respiratory control, and thermoregulation. J. Pediatr 138 (2), 193-197. 22 spontaneously breathing preemies (28wks, 26 days, 1310g) had a 2hr recording B4, during, after KC (of 2 hrs duration). HR, RR, # of bradys, # hypoxemia (<80%) & rectal temp (from 36.9 to 37.3) increased proportion of regular breathing decreased during KC. Changes may be due to heat stress. SaO2 decreased in second hour of KC by ?????%. The irregular breathing was due in part to airway obstruction from flexed head and no nursing monitoring to be sure positioning was correct was conducted. KC effects had disappeared within 3 hours of KC’s cessation. Pretest-Test-Posttest Quasi Exp., Negative Effect. PT, HR, RR, Brady, apnea, desats, temp, breathing pattern, residual effects. safety

Boju, S.L., Gopi Krishna, M., Uppala, R., Chodavarapu, P. & Chodavarapu, R. (2011). Short spell Kangaroo Mother Care and its differential physiological influence in subgroups of preterm babies. Journal of Tropical Pediatrics, Sept. 9 Epub ahead of print. A quasi-experimental, pretest-posttest study of 86 preterm infants in India who got one hour of Kc done because mothers said that 4-6 hours of KC was too much. KC was given when infants were 7.7 +/-5.2 days old. One hour of KC created many physiologic changes: HR: in all infants, HR decreased by 3 bpm; in SGA decreased by 5 bpm; RR: in all infants decreased by 3 per minute; in females decreased by 6/min; SaO2 increased by 1.1% in all infants, increased by 2.1% in SGA, and increased by 1.5% in females; Axillary Temp Increased by 0.4F in all infants; increased by 0.6F in SGA, and by 0.3F in Females. Concluded that preterm infants benefit from one hour of KMC and that SGA and female preterms had different and greater responses than males and AGA infants. PT, Quasi-Exp pretest-posttest, HR, RR, Temp, SaO2, and 4-6 hours of KC was TOO LONG for mothers, 3rd world, duration of 
Bonner, K (Krista,) M. (2007). A case study comparing kangaroo care with conventional holding and the effects on heart rate, respiratory rate, oxygen saturations, and ventilator settings in the very low birthweight infant. Presentation at National Association of Neonatal Nurses’ 2nd Annual Research Summit, April 10-12, 2007 Scottsdale, AZ. Watch for this in Advances in Neonatal Care: Official Journal of NANN. Preterm, ventilated KC, descriptive, HR, RR, SaO2, swaddled holding (Not on charts yet)

Bonner, K. M. (2008). A case study of the effect of kangaroo care on physiologic parameters and ventilator settings in very low birth weight fraternal twins. Advances in Neonatal Care 8(2), 134-135. Case study of fraternal twin sisters on mechanical vents, born at 25 wks ga, bw = 740 grams- one got KC, the other swaddled holding at 29 wks postmenstrual age. HR, RR, axillary temp SaO2, and ventilator settings taken before, then every 15 minutes during 2 hours of KC or swaddled holding, and 15 minutes after KC/swaddled holding. This was repeated 4 times over a 2 week period. NO sig difference in temp between the twins but KC twin tended to have higher mean overall temp (98.0SD 0.33 than swaddled, 99.6 (0.69) . No differences in HR, SaO2, and vent settings trended downward with both types of holding. KC was not harmful to the VLWB infant. PT, Descriptive Case Study, Vent KC, micropreemie, VLWB, temp HR, RR, SaO2, swaddled holding

Boo, N-Y (for Nem-Yun), & Jamli, F.M. (2007). Short duration of skin-to-skin contact: Effects on growth and breastfeeding. Journal of Paediatrics and Child Health, 43(12), 831-836.126 STABLE preterm infants were randomized into KC(n=64) who got 10.0+/-.5.6 days of one hour/day KC (wearing only diaper and head cap while semi-upright between breasts and for at least one hour per day) for a mean total duration of 11.3 +/-5.9 hours of KC) or to control (n= 62, no kc, stayed in incubator. KC was with mother or father. 8 KC infants received KC less than 50% of hospital stay because moms were too frightened to handle infant (n=3), unable to visit regularly (n=4), or afraid KC would prevent weight gain (n=1). They found KC improved head circumference growth

PT, RCT, stable, 3rd world-Malaysia, paternal KC, duration of KC, head circumference NEED to finish THE

Results Not on charts 11.13.2011

Borck, M., & dos Santos, E.K. (2010). Third stage of the Kangaroo method converging investigative and care practices with families in outpatient care. Rev Gaucha Enferm, 31(4), 761-768. Qualitative study to assess how KC at home (3rd stage) with premature and LBW newborns is progressing. Six mothers and family members were observed and participated in semi-structured interviews. Results showed that there is a need to strengthen the role of the family when mother and newborn leave the hospital and communication among the multidisciplinary team, as well as rethinking criteria for discharge to home KC. PT, qualitative study, HOME KC/Community KC, Not on charts 8/19/2011

Bosque, E.M., Brady, J.P., Affonso, D.D., & Wahlberg, V. (1995). Physiologic measures of kangaroo versus incubator care in a tertiary level nursery. Journal of Obstetric, Gynecologic, and Neonatal Nursing, 24(3), 219-228. Pretest in incubator-test in KC-posttest in incubator. All 8 infants got this 4 hrs/day, 6 days/wk x 3 weeks for 18 data collection periods per infant. Infants served as own control. Reports that skin temperature was lower in KC than before or after (p=0.03). Control over insolation across the infant’s back was questioned even though manuscript reports control. State measured every 10 minutes using Anders and Parmelee scale and showed no difference in apnea, bradycardia or lowest SaO2 between KC and incubator periods and there was lower % of total sleep, and lower Active Total % Sleep time was lower and more transitional sleep during KC(p=0.003), no differences in % or amount of Quiet Sleep. Bradycardia increased with gavage and bottle feedings and decreased frequency associated with breastfeeding independent of KC or incubator care. Sleep and temperature differences were statistically significant but were so slight they were not clinically significant. Quasi-Experimental pretest-test-posttest design. Not an RCT. Preterm, Negative Effect., skin temp. HR, RR, SaO2 during KC and posttest, Quiet Sleep, Active Sleep, Total sleep time, Transitional Sleep, Apnea, Bradycardia

to handle preterm infants. **GERMAN, PT**

Bouanene, I., Elmhaamdi, S., Sriha, A., Bouslah, A. & Soltani, M. (2010). Knowledge and practices of women in Monastir, Tunisia regarding breastfeeding. *East Mediterranean Health Journal, 16*(8), 879-885. No DOI. 354 women were assess for prevalence, exclusivity and duration of breastfeeding when attending child’s 6-month vaccination appointment. 94.4% initiated BF after birth but only 1.9% continued exclusive BF until 6 months. Exclusive Breastfeeding over 3 months was associated with Birth KC contact (OR=1.93; 95% CI: 1.016-3.69) (pg. 881). **PT, FT. Breastfeeding, exclusivity. Birth KC.**

Bouchez C. (2002). The magic of ‘kangaroo care’. USA Today Health & Science 6/27/2002. This is an interview with Dr. Karen Hendricks-Munoz, director of NICU at NY University Medical Center who reports that parents who feel a sense of depression and anxiety about birth of baby feel more connected when they do KC. Infants sleep better and deeper, grow faster, are more stable and go home sooner and that there is no evidence of increased risk of infection. **PT, review, interview, infection, stability, growth, sleep, maternal feelings, length of stay. Not on charts as of 6/6/09.**

Boukydis, Z. (2011). Parent-infant skin-to-skin contact: parents’ views versus nurses’ views. *Acta Paediatrica, 100*(5), 638-640. DOI:10.1111/j.1651-2227.2011.02195.x. From Turku, FINLAND. This is a commentary on Blomqvist, Robertson & Nyqvist’s 2011 study of measurement of daily amount of time infants spend in KC and who best documents the amount of time. Parents and nurses differed in the documentation of the actual number of times infants were in KC. Agreement between nurses and parents for KC duration and starting/termination times was 40%. Parents also noted more people who provided KC than did nurses. He believes the parent’s count might be more accurate because they were actually there holding the infant and sometimes were behind screens so nurses could not see. He says that videorecording (suggested by Blomqvist) is not needed to confirm accuracy, infant temperature and HR changes can be used as a criterion measure as could sensors indicating infant’s position in space and rhythmic movement on maternal chest. He quotes considerable literature on reliability of parental verbal or questionnaire report of infant’s behavioral, temperament, and documentation of 24 h cycles of cry and sleep patterns (Salisbury A, Minard K et al., Audio recording of infant crying, Int J Beh Dev 2001, 25;458-465). Parental records are 50-85% in comparison with independent measure of the child’s behavior. He says that parental anxiety might decrease reliability in charting or that parental ‘alertness’ might be heightened as some parents want to do everything possible and be more reliable in charting. Future study should control for parental mental health status, stress, depression, early attachment, sense of competence, self-esteem, and understanding of the rationale or purpose for charting. Parents volunteered and this could cause Hawthorne Effect. For this he recommends a collegial ‘reliability check’ between nurses and parents who collaborate on the documentation. Also, one should question parents about how they felt about completing the charts: did they value it as a contribution to their infant’s care, see themselves collaborating with staff in care of infant, or was it an unnecessary chore or even an intrusion on their private time – he cites the Axelin study in which some parents wanted to do facilitative tucking to reduce pain, some did not, and some were ambivalent about doing so (Axelin A, Lehtonen L, Pelander T., Salantera, S., (2010). Mothers’ different styles of involvement in preterm infant pain care. J Obstet Gynecol Neonatal Nurs, 39, 415-424 doi: 10.1111/j.1552-6909.2010.01150.x.). **Commentary, parental feelings, attitudes about doing interventions for PT infants (Not on charts yet).**

Bouloumie E. (2008). The kindness of skin-to-skin contact during labor and delivery. *Soins Pediatrie Puericulture, 245*, 36-38. Available from ebouloumie@hbh-paris.com. Study of 47 questionnaires that were returned by 17 moms and staff of Full term birth KC infants from birth (and 40% of these got KC both day and night for the first 3 nights of life) and 30 from infants who got routine care before initiation of birth KC and postpartum KC. No difference in groups in birth weight loss, nor in recovery of birth weight rate. Mothers felt very much pleasure with KC and more confidence. Staff think that KC is okay if mother is very vigilant and they reported that infants were calm during KC. Better cardiorespiratory stability in KC than when not in KC. **FT, Birth KC, early KC, weight loss, mat feelings, HR-RR stability, calmed infants, staff feelings, postpartum KC, quasi experiment.**

Bowden VR, Greenberg CS, & Donaldson NE. (2000). Developmental care of the newborn. Online Journal of Clinical Innovations or CINAHL Information Systems (Glendale, CA). 3, issue 7, 77 pages with 286 ref. Available online at http://www.cinahl.com or from Cinahl Information Systems, 1509 Wilson Terrace, Glendale, CA 91206. The 14 pages that appear online do not include all references (only 27 pages are in the online version). In the full text, in essence, KC is part of development care for all NEWBORNS. This review starts with cost of NIDCAP program over 3 years was 440,00 but saved 2.19 million in hospital charges (129,000 per infant) and excluded physician charges. Lower cost attributed to earlier discharge from NICU to transitional unit and infant’s lower intensity of care needs. 60 VLBW infants cared for in NIDCAP unit had average cost savings at time of discharge of $4,340 per infant (page 2) when discharge occurred within the first 35 days of life. Page 2 relates NIDCAP results. Behaviors indicating less stress and signs of stability are in table on page 8. On page 10 it identifies all the resources needed to implement NIDCAP (developmental staff positions, initial and ongoing NIDCAP training, leadership involvement, multidisciplinary team involvement, Reflective process. Then it reviews the WEE CARE program of developmental care on page 11, and then the FIRST program on page 11, and then on page 12 it lists Kangaroo Care as “data-based intervention” for infant handling aspect of developmental care with full discussion of KC on page 20-24. Page 20 states: “However, the intervention, the protocol for implementation, and the documented benefits to the infant have still not been clearly defined” (this was published in 2000). “An an intervention, KC has different description depending on the location of the practice. In international literature KC is most often termed KMC or kangaroo mother method and has three components: the Kangaroo position (skin to skin, between breasts for up to 24 hrs/day), kangaroo feeding (unlimited and exclusive breastfeeding) and Kangaroo discharge (early discharge when infant has overcome all major adaptations to extrauterine life, and continuation of Kangaroo practices in the home setting… In western countries, KC or skin to skin contact is associated solely with placing the preterm diaper clad infant upright, vertical, chest to chest with parent. Such contact may last from 60 minutes to several hours.” “Two seminal articles exist which discuss KC as an intervention to promote neurobehavioral organization of the infant (and it cites Ludington-Hoe and Swinth, 1996 and Anderson, 1991). Page 21-22 lists the problems with KC studies: “...critical evaluation of individual studies reveals that many methodological problems exist in this body of research, and that continued investigation is warranted. The major methodological problems can be attributed to 1) lack of consistency in KC implementation protocols (amount of time in KC and not enough time to determine if negative consequences exists. 2)feeding the infant during Kc occurs in some studies and not in others and not accounted for as a controlled variable. 3) Use of headcaps is inconsistent among investigators. 4) Only non-ventilated, medically stable infants have been tested. 5) some studies included a teaching component in which parents are taught to recognize and respond to infant cues. 6) small sample size, 7) lack of control groups, 8) lack of randomization, and 9) short testing periods (and for this one is cites only one study, Bosque’s 1995 and she practically tethered moms to babies for 4 hours per day for every day per week for 4 weeks). Page 22 says that more ventilated KC studies are needed as are studies with ELBW and phototherapy infants. The practice of KC would benefit from the development of an interdisciplinary and internationally developed protocol of care, with criteria and contraindications for infant selection, nursing care monitoring and documentation, the procedure for the entire KC episode with assessments before and after implementation of KC, and minimal standards for parent education and staff development.” (pg. 22-23). On PAGe 36 it has another section on KC under Tactile Stimulation and says “KC is another form of tactile stimulation that has produced many beneficial outcomes for the infant and parent caregiver (See Table 4). This intervention was discussed earlier.” Pg. 36). Table 4 is on page 21 and is entitled “Benefits Asssociated with Kangaroo Care and the categories of benefits are 1) Autonomic stability and improvement in basic physiologic functions, 2) motor regulation, 3) state regulation, 4) parental attentiveness and interactions with the infant, 5) serf regulatory abilities, and 6) others (i.e. decreased maternal stress, psychological healing of mother, decreased pain, decrease hospital stay, better weight gain, better breastfeeding outcomes). Review, Preterm, Developmental Care, stress signs, stability signs, needed research, vent KC, phototherapy KC. Limitations of studies, NIDCAP vs. other developmental programs.
Braga DF, Machado MMT, & Bosi, MLM. (2008). this is on www.scopus.com and is an article on kc’s effectiveness as pain reducer. PT Get from Barb. Pain

Bramson, L., Lee, J.W., Moore, E., Montgomery, S., Neish, C., Bahjri, K., & Melcher, C.L. (2010). Effect of early skin-to-skin mother-infant contact during first 3 hours following birth on exclusive breast feeding during the maternity hospital stay. *Journal of Human Lact ion*, 26(2), 130-137.19 hospitals participated in this prospective descriptive study of breastfeeding among 21,842 patients delivering 37-40 week term singleton infant. Maternal demographics and prenatal feeding method intention and very early KC (in first 3 hours of birth) were correlated with exclusivity of breastfeeding during maternal hospitalization. Exclusive breast feeding was higher in KC moms than in moms who got more rather than less KC in first three hours: If mom got 1-15 mins KC Odds Ratio (OR) was 1.376; 16-30 mins (OR =1.665), 31-59 mins KC (OR= 2.357); and > 1hour (OR = 3.145). So, there is a dose response relationship between duration of very early KC and breast feeding exclusivity. FT, population study, dose response, BF, exclusivity, implementaton, quality-improvement project. Authors are certified Kangaroo Caregivers by USIKC. See Romano 2011 review of this article because she states that data is consistent and compelling.

Branger, B, Savagner C, Roze JC, Winer N, & Pediatries des Maternites des Pays-de-la-Loire. (2007). Eleven cases of early neonatal sudden death or near death of full term and healthy neonates in maternity wards. *Journal de Gynécologie, Obstétrique et Biologie de la Reprod (Paris)*. 36(7, Nov): 671-679. Descriptive report that over 5.5 years there were 7 deaths and 11 apparent life-threatening events (1 life threatening event/26,000 births; one death/40,000 births). Five times in 8 ‘well-known’ cases the newborn was in maternal KC at the time, one other case the infant was in maternal arms and the last one in the delivery room far from mother at 3 minutes of life. In two deaths (of all the deaths, not just the KC deaths) the infants were prone on their own bellies. One baby was declared dead in maternity, ten transferred to NICU, and 6 died on postpartum. They don’t know if the frequency of these events is increasing or not or if it is related to birth KC, but have undertaken a province wide survey. On pages 337 and 338 it states that “Skin-to-skin has many benefits, ameliorates maternal-infant difficulties, and benefits the newborn by aiding sucking, prolonging breastfeeding, and improving neurological outcomes. So, skin to skin should not be questioned because it is a positive practice for infants. Nonetheless, if the organization’s condition and surveillance are not adequate, or if the health of the mother or infant are not optimal, skin-to-skin may be contra-indicated. Better surveillance is needed.“ so, this is a CONTRAINDICATION guideline. They provide a sample of the questionnaire that could be used to determine region wide the incidence of ALTEs and early deaths in this part of France. Descriptive, Full term, mortality, negative outcome. Life threatening event, Birth KC. Bradycardia, apnea, support KC, questionnaire for survey, guidelines.

Breast crawl. See UNICEF, 2007 for this reference to the manuscript and to the video. Video is at www.breastcrawl.com FT, birth KC, breastcrawl

Brett, J., Staniszewska, S., Newburn, M., Jones, N. & Taylor, L. (2011). A systematic mapping review of effective interventions for communicating with, supporting and providing information to parents of preterm infants. *BMJ Open*, 1(1), e000023. A systematic review of interventions to improve communication with parents of preterm infants. The review of the 72 studies showed that parents felt supported through individualized developmental and behavioral care programmes, through being taught behavioral assessment scales, and through breastfeeding, kangaroo-care, and baby massage programmes. On page 5 it reports that Randomized controlled trial evidence suggests that KC reduces maternal anxiety, gives mother a greater sense of competence and greater sensitivity with their infants (cites TESSIER et al., 1998) and that music with KC significantly lowers maternal anxiety (cites Lai & Chen, 2006). On same page it says Feldman et al., study (Feldman, Eidelman, Sirota, et al., 2002) that KC produced better levels of maternal infant interaction, more touch, better adaptation to infant cues and better perception of the infant, and less maternal depression at 37 wks. Then it credits LeGault and Goulet (1995) finding that mothers preferred the kangaroo method because the baby is close to them and touch is important to mothers because it induced feelings of well-being and fulfillment in parents. Affonso et al. (1993) reported that KC helped parents get to know their infant, increased their confidence and made them feel that their baby needed them, and study showed that parent mood was improved and that they perceived their infant differently and that they felt a strong sense of identifying with their infant (Gale, Franck,
Lund, 1993). Review, PT, massage, NIDCAP, maternal feelings, maternal behaviors, maternal anxiety, maternal perception of infant, music, communication.


Britton, G.R., (1980). Early mother-infant contact and infant temperature stabilization. Journal Obstetric, Gynecologic, and Neonatal Nursing, 9(2), 84-86. FT, is this KC? Says contact so it may be early extra contact and that uninterrupted dyad has better thermoregulation. **FT, Birth KC??** GET THIS, not on charts 1/1/2011


Brown, L.D.,& Heermann, J.A. (1997). The effect of developmental care on preterm infant outcome. Applied Nursing Res, 10(4), 190-197. On pg. 193 they identify that they encouraged KC as soon as possible on the tiniest of infants as part of their intervention (and they have a picture of VENT KC on page 196). 25 infants <1500 grm given NIDCAP and compared to RETROSPECTIVE sample. Treatment grp had fewer and less severe IVH, fewer days of ventilation, shorter hospitalization, greater wt gain. Retrospective comparison, IVH, Days of Vent, LOS, WGT, VENT KC, PT

Bulfone, G., Nazzi, E., & Tenore, A. (2011). Kangaroo Mother Care and conventional care: A review of the literature. Professioni Infermieristiche, 64(2), 75-82 (ITALIAN). An effective and efficient human care model is Kangaroo Mother Care. Literature review conducted to compare short and long term outcomes of KMC compared to conventional (incubator) care. Short term outcomes were HR, RR, SaO2, tcpO2, body temp, sleep wake cycles, stress and pain; Long term outcomes were mortality, somatic-psychomotor and cognitive development, infections, length of stay. 19 of 80 studies looked at were reviewed and showed that KMC reduces pain, infections, LOS, favors breastfeeding, and results in earlier and better cognitive and motor development. No differences in body temperature were found and data on HR, RR, and oxygenation are so contradictory from one study to the next that comparison between KC and incubator was not completed. PT, FT, Review of Lit, separation, sleep cycles, HR, RR, SaO2 and TcpO2, Temp, stress, pain, long term outcomes, short term outcomes, length of stay, mortality, dev,infections, BF, **Not on charts 8/19/2011.**

Burkhamer MD, Anderson GC,& Chiu S-H. (2004). Grief, anxiety, stillbirth, and perinatal problems: Healing with Kangaroo Care. J Obstetric, Gynecologic, & Neonatal Nursing, 33 (6), 774-782. Case study of one mother with history of stillbirth who had anxiety and Bf difficulties with term newborn. When she Kced first time, she cried, had memories of stillbirth baby, then relaxed. Infant moved unaided to breast, self-attached, and had successful BF. Infant breathing pattern became more regular in KC. She learned to BF on cue, protecting her baby’s sleep-wake cycle and contributing to 100% BF success, 4% nipple pain, no breast pain. Got 8 KCBF sessions in hospital, and was exclusively BF at 1 week post discharge & had 100% BF success score, 2% nipple pain, and no breast pain. “There is a sense of calm and peacefulness between Makaia (baby) and me while kangarooing. KC and BF helped ease my unsteady
emotions…After coming home from hospital, we spent most of our time kangarooing…Within seconds of KC, Makaia’s whole body relaxes, his breathing slows to a soothing rhythm, and he has the most tranquil look in his eyes.”

Pictures of KC are on page 778. Case study, FT fullterm, relaxation, mat stress, BF, BF success, nipple pain, breast pain, KC post-discharge, sleep, respiratory pattern.


Byard, R.W. (2011). Breastfeeding and unexpected neonatal and infant death. Archives of Disease in Childhood-Fetal Neonatal Edition, Published online Sept. 19, 2011, one page only. DOI: 10.1136/archdischild-2011-300804). This is a review of the Becher et al. 2011 publication in same journal. “Of concern was the high percentage (53% based on 24/45 infants) of cases classified identically whwere the episodes were attributed to airway obstruction associated with breastfeeding, skin-to-skin, or the prone position…certain infants may suffer lethal airway obstruction while feeding. The problem was reported a number of years ago now, not only in neonates in hospital but also in infants up to 9 There are a range of potentially lethal conditions to newborns that remain unsuspected until sudden collapse. BF is important, situations may arise where certain infants may suffer lethal airway obstruction while feeding. This problem exists in hospital and at home up to 9 weeks of age (Byard RW. 1998. Is breast feeding in bed always a safe practice? J Paediatr Child Health 34, 418-419). Such events may be under-reported. Certain difficulties arise in making diagnosis of suffocation or choking. There are no pathognomonic features at autopsy to enable the diagnosis of asphyxia to be made, although occasionally congenital abnormalities or tumors of the oral cavity may be found to obstructive (Byard RW, Jensen L. 2007. Fatal asphyxia episodes in the very young- classification and diagnostic issues. Forensic Sci Med Pathol, 3, 177-181.) In the absence of such lesions, conclusions must be based on an evaluation of the circumstances of death and the exclusion of other possibilities. Some infants are particularly vulnerable to airway compromise and may stop breathing very quickly and without struggle once their airways are occluded (Byard RW, Burnell RH, 1995. Apparent life threatening events and infant holding practice. Arch Dis Child 75, 502-504), and this can even occur during breastfeeding while the mother is awake (Byard, 1998 citation above). A certain level of caution is needed, particularly in situations in which the mother may fall asleep due to fatigue, sedation. Potential dangers should be minimized by vigilance and supervision so that safe BF can be facilitated and promoted. weeks of age (Byard RW, 1998. Is breastfeeding in bed always a safe practice? J Paediatr Child Health 34, 418-419). FT, BF, Very Early KC, ALTE NOT ON CHARTS 12.10.2011


Byaruhanga, RN., Bergstrom A, Tibemanya J, Nakitto C, & Okong, P. (2008). Perceptions among post-delivery mothers of skin-to-skin contact and newborn baby care in a periurban hospital in Uganda. Midwifery 24, 183-189. Qualitative with focus group discussions, five focus groups (6 moms in each group) with moms of normal spontaneous vaginal delivery 24-48 hours before (n=30 of 249 moms) to learn mom’s perceptions of skin-to-skin contact and newborn baby care as a way to understand factors influencing acceptability of KC. Two main themes were: acceptability of health practices is influenced by knowledge and sensitization, and pregnant women’s choices are dependent upon social, cultural, and economic factors. Mothers had varying opinions about the usefulness of KC because some knew it would reduce the risk of infant hypothermia, others were ignorant, some believed KC was intervention to distract mother from the pain of post-delivery period. Moms perceived vernix caseosa and amniotic fluid with blood to be dirty and infectious and worried about spread of HIV when baby had not been bathed and the umbilicus was bloody and raw. Moms reported that KC gave them immediate access to their babies, enabled them to feel close to babies, and helped them initiate breastfeeding and moms considered it ‘natural.’ Some mothers were very tired after birth and found it hard having the baby on their chest (pg. 187). Some moms thought vernix is dirty and...
Sebaceous glands open into the hair canal, at same time lanugo first appear cycle all over again. Vernix caseosa contains sebaceous gland secretions and desquamated corneocytes. Cortex gives pleasant feeling (Olausson et al., 2002), and pleasant feelings increase fetal movements, starting the cycle all over again. VERNIX CASEOsa contains sebaceous gland secretions and desquamated corneocytes. Sebaceous glands open into the hair canal, at same time lanugo first appears. Vernix at core body temp is much infectious (this is misconception but a common one – see page 188 for two references about how common this misconception is). The best informants for helping mothers understand KC were health care providers. A gap between knowledge and practice of KC in hospitals exists and needs to be closed. Health care providers need to be encouraged to continuously advocate for, educate, and regularly implement KC. FT, Qualitative study, Birth KC, breastfeeding, episiotomy pain, hypothermia, implementation, maternal feelings, Fullterm, 3rd world-Uganda. Temp, EDUCATION IS NEEDED

Bystrova, K. (2009). Novel mechanism of human fetal growth regulation: A potential role of lanugo, vernix caseosa and a second tactile system of unmyelinated low-threshold C-afferents. Medical Hypotheses, 72(2), 143-146. Doi: 10.1016/j.mehy.2008.09.033 Not KC per se, but tells why KC works and mentions KC on page 144. This theoretical review talks about regulation of human growth by GI hormones (their growth effects are promoted by activation of the parasympathetic system [vaginal nerve] and inhibited by the sympathetic system), C-Afferent nerves, lanugo, and amniotic fluid. Vagal nerve is mainly activated by stimulation of sensory nerves in oral mucosa during sucking, resulting in GI hormone release to optimize digestion and direct metabolism toward anabolism and growth(Uvnas-moberg, K. 1989. The gastrointestinal tract in growth and reproduction. Scientific American, July, 78-83). Growth is probably achieved through the incretin effect which is glucose-induced release of insulin (pg. 143). Cholecystokinin is a GI hormone and in 24-34 wkGA infants it is doubly present during KC with NG tube feeding (Tornhage et al., 1998). The recently discovered low threshold unmyelinated C-afferents that are exquisitely sensitive to light, slow, gentle touch because it produces pleasure, so the C-afferents play a role in growth too, and these same C-afferents also reduce pain. The C-afferents constitute the second tactile system; the first tactile system is large myelinated tactile A-afferents (pg. 144). C-afferents are in the hairy skin, not the glabrous skin of the elbow, palm, etc. C-afferents convey pleasure, no pain, no temperature, itch or tickle. The C-afferents go to the insular cortex but not the somatosensory areas which are served by myelinated tactile A-afferents. Elevating vagal tone in infant occurs via activation of somatosensory skin nerves by massage, stoking, and touch (Diego MA, Field T, Hernandez-Reif M. 2005. Vagal activity, gastric motility, and weight gain in massaged preterm neonates. J Pediatr 147, 50-55.) she proposes enhancement of vagal nerve tone due to the unmyelinated, low-velocity low-threshold C-afferents in human, lanugo hairs, and amniotic fluid (Nordin M. 1990. Low-threshold mechanoreceptive and nociceptive units with unmyelinated (C) fibers in the human supraorbital nerve. J Physiol (London), 426, 229-240.) The C-afferent nerves are found in the hairs of skin (lanugo) and at term birth only the back has lanugo which is where mother touches with her fingertips during KC and where she holds the infant’s head in position. Lanugo is silky fine hari that starts to grow at 18 wks gestation and is abundant at 20 weeks (5-7mm long hairs) densely coat almost all skin area (not palms, dorsal finger & toes, soles, prepuce, glans penis, labia minora), begins to dissipapre at 33 wks and at term covers scapula and upper limbs. Lanugo hair follicles have free nerve endings which are slowly adapting mechanoreceptors. Amniotic fluid is 98% water, 2% solids and has same density as water which is 800-fold higher than air. So when baby is moved or moves in amniotic sac, sensory stimulation of the lanugo hairs is enormously potentiated. So, for preterm infants who still have lanugo and/or the term infant with some lanugo over the brown fat deposits on the back of the neck, this is very important skin and nerve stimulation because the pleasure settings in the brain also convey “social relevance.” The novel mechanism of promotion of growth is: repeated oscillations of lanugo during fetal movements in amniotic fluid activate highly sensitive mechanoreceptors connected to unmyelinated C-afferents which send impulse to spinal cord and activate the vagal sensory zone (nucleus tractus solitaries NTs, hypothalamus and insular cortex. Activated vagal zone increases vagal tone which leads to releas of GI hormones and stimulates glucose-related secretion of insulin, directing metabolism to anabolism and growth. GI hormones stimulate thickening of GI mucosa which leads to maturation of the GI tract (Mulvihill SJ et al., 1989 J Surg Res).The NTS is directly linked to paraventricular nucleus in hypothalamus which, when activated, causes release of oxytocin which directly stimulated vagal motor zone and facilitates activation of GI endocrine system. Oxytocin released within the brain causes strong anti-stress effect (Uvnas-Moberg K, 1998. Antistress pattern induced by oxytocin. News of Physiologic Science, 13, 22-26), which is a prerequisite for anabolism and growth. Oxytocin appears in hypothalamic nuclei after 16th week gestation. Activation of insulin cortex gives pleasant feeling (Olausson et al., 2002), and pleasant feelings increase fetal movements, starting the cycle all over again. Vernix caseosa contains sebaceous gland secretions and desquamated corneocytes. Sebaceous glands open into the hair canal, at same time lanugo first appears. Vernix at core body temp is much
more viscous than when at room temp and vernix in utero coats the lanugo hairs, making them ‘heavier’ and significantly potentiating the effect of oscillations. After birth, c-afferents are integrated to reverse stressful situations (like the stress of being born if KC is allowed as Ludington-Hoe et al., 1999 and Bystrova et al., 2003 mention). As adults, friendly skin to skin contact is LIMBIC touch and it is an affiliative behavior (pg. 144). Research should detect response to gentle touch in the somatosensory cortical areas allows to be affected by stimulation of c-afferents – in the dorsal posterior insular cortex (limbic area). Concludes with “There is sufficient evidence for advantages of mother-infant closeness in postnatal care as opposed to separation. Skin-to-skin contact leads in an infant to an increase of parasympathetic nervous tone, central decrease of sympathetic nervous tone (anti-stress effect) and therefore enhanced peripheral circulation, warmth (Bystrova et al., 2003) as well as mental calming (Christenssen et al.,1995). The efficacy of these antenatal mechanisms (C-afferents, lanugo, and amniotic fluid movements) after birth depends on the postnatal sensory input. Such input is the greatest during mother-infant skin-to-skin contact. Thus, implementing skin-to-skin mother-infant contact in early postpartum as a compulsory post-birth practice is supported.” (pg. 145). Review, lanugo, fetal, PT, FT, stress, weight, growth, parasympathetic, sympathetic, separation Should also see Olausson et al, 2010 reference for same sort of information.

Not on charts July 10, 2010

Bystrova K, Ivanova V, Edhborg M, Matthiesen AS, Ransjo-Arvidson AB, Mukhamedrakhimov R, Uvnas-Moberg K & Widstrom AM. (2009). Early contact versus separation: effects on mother infant interaction one year later. Birth 36(2), 97-109. Episiotomy repair was delayed to facilitate maternal-infant contact after birth. 176 mother infant pairs were randomized into grp 1: KC at birth (starting 25-30 minutes after being under receiving/warming unit and all baby care done before going to mother and continuing to 120 minutes postbirth); gp 2 infants dressed and placed in mom’s arms after birth (25-30 minutes after birth because also under warmer and got all newborn care before going to mother and continuing until 120 minutes postbirth) and roomed-in, grp 3: infants kept in nursery after birth and while mom is in maternity ward. Grp 4: infants kept in nursery after birth, but roomed-in with mom. Equal number of infants were either swaddled or dressed in baby clothes. Infants are usually swaddled for 4-5 months in Russia. Maternal infant interactions were videotaped using Parent Child Early Relational ASsessment (PCERA) at 1 year after birth. KC, early suckling or both during the first 2 hours after birth compared to separation between mom and babies positively affected PCERA variables of maternal sensitivity, infant self-regulation, and dyadic mutuality(mothers respond to infant cues and then baby responds to mother’s cues and actions and then mom responds to infant’s cues – this is mutuality in the dyad), and reciprocity at 1 year. The negative effect of 2 hour separation was not compensated for by the practice of rooming-in. These findings support the presence of a sensitive period during which contact between mother and infant may induce long-term positive effect on maternal infant interactions and they come strongly that it was the KC that produced the improvement in interaction at 1 year. Swaddling was found to decrease the mothers’ responsiveness to the infant, her ability for positive affective involvement with the infant, and the mutuality and reciprocity in the dyad. Swaddling was detrimental to maternal-infant attachment and interaction. KC for 25-120 minutes after birth, early suckling,or both positively influence mother-infant interaction one year later. Behavior at 12 months was significantly altered by KC 30-120 minutes post-birth; KC infants demonstrated self-regulation, dyadic mutuality, and reciprocity. KC mothers showed greater interaction and interest in the infant and greater reciprocity than controls. Separated infants in the nursery for first 2 hours were less regulated at 1 year, were more irritable, and had less dyadic mutuality and their mothers had less interest in infants, and less interaction. In the absence of KC, early BF from 30-120 minutes postbirth could elicit self-regulated behavior, a calm baby, and interested/interactive mother. Thus the first 2-3 hours postbirth is a short sensitive period. KC in this period promoted interaction between mother and infant such as visual contact and smiling and promoted ability of infants to handle stress even one year after birth. FT, RCT, dev, Birth KC, stress, maternal-infant interaction. BF, swaddling, episiotomy. See also comment in Birth 2009 June 36(2), 110-112 (Klaus, MH) and Chalmers B. (2009) in Birth 36(2):113-114. NOT ON CHARTS YET as of 10/10/2010. Check this reference because I have seen it quoted as Bystrova, Edhborg, Lundh et al and my citation does not include Lundt at all and the sequence of names varies.

Early suckling was shown to positively affect milk production irrespective of parity. Multips had higher perception of breast engorgement and lower intensity of feeling “low/blue” than primip mothers. From infants and feeding on the schedule of 7 feeds/day. Data collected at 25 daily maternal feelings of being “low/blue.”

Bystrova K, Matthiesen A-S, Widstrom A-M, Ransjo-Arvidson A-B, Welles-Nystrom B, Vorontsov I, & Uvnas-Moberg K. (2007a). The effect of Russian Maternity Home routines on breastfeeding and neonatal weight loss with special reference to swaddling. *Early Human Development* 83, 29-39. Randomized controlled trial with four groups 176 mother-infant fullterm dyads. KC began 20-25 minutes after birth (after drying, eye treatment, weighing, length, head circumference, APGARS and cord care and bath (but not after episiotomy repair because repair was done after KC ended) and continued for 25-120 minutes. Then all infants were swaddled or dressed and taken to maternity ward for rooming in. Grp 1 KMC immediately after delivery with rooming in maternity ward, Grp 2: dressed and placed in mom’s arm after delivery and rooming in, Grp 3: infants kept in nursery after birth and during maternity ward stay of moms, Grp 4: nursery after birth and then roomed in with moms in maternity ward. BF was measured on day 4 after birth, infant weight measured daily. More formula and less breastmilk for infants in nursery than in infants who roomed in with mom. Swaddling did not influence BF measures, but swaddled babies who were separated for 2 hours after birth before reuniting with mothers tended to have delayed recovery of birth weight loss compared to infants who were exposed to same treatment but dressed in clothes. Swaddled babies kept in nursery and who received breastmilk supplements had significantly delayed recovery of weight loss compared to infants getting only breastmilk. Day 5 of predicted weight gain in exclusively BF infants showed sig increase/100 ml of breastmilk compared to predicted weight gain on Day 5 of supplements/100 ml. Supplements have negative influence on amount of ingested milk, supplement feeding or short separation after birth when combined with swaddling negatively affected infant weight gain. No differences in number and duration of breastfeeds, amount of ingested breast milk, supplementing between the three rooming-in groups (KC, mothers arms, and reunion group). Birth KMC is considered the normal experience after birth (thus they were the controls) and swaddling and separation are being considered as the unusual treatments and trying to justify them. RCT, Fullterm, Very Early KC, swaddling, separation, weight gain, Breastfeeding duration, number of feeds, Birth KC, rooming-in, separation, episiotomy. KC is routine. Not on charts yet.

Bystrova K, Widstrom AM, Matthiesen AS, Ransjo-Arvidson AB, Welles-Nystrom B, Vorontsov I, & Uvnas-Moberg K.. (2007b). Early lactation performance in primiparous and multiparous women in relation to different maternity home practices: a randomized trial in St. Petersburg. *International Breastfeeding Journal* 2, 9-23. A randomized controlled trial of 176 mother-infant pairs randomized into 4 groups: grp 1 was KC in delivery for 25-120 mins + rooming in + feeding on demand, n=37; grp 2 was 40 infants dressed and placed in maternal arms + rooming in + feeding on demand; grp 3 (n=38) infants were kept in cot in delivery and nursery and no rooming in and fed on schedule of 7 times per day, grp 4 (n=38) infants were kept in cot in delivery and later roomed in + feeding on demand. In each group equal numbers were swaddled or clothed. On day 4, number of breastfeeds, amount of milk ingested, duration of “nearly exclusive” breastfeeding were recorded as was intensity of breast engorgement and visual analog scale of daily maternal feelings of being “low/blue.” On day 4 multips had lower milk production than primips when separated from infants and feeding on the schedule of 7 feeds/day. Data collected at 25-120 minutes postbirth and on day 4 in maternity ward and daily maternal feelings. No diff in milk production between primips and multips in other groups. Multips had higher perception of breast engorgement and lower intensity of feeling “low/blue” than primip mothers. Early suckling was shown to positively affect milk production irrespective of parity. Grps 1 and 2 infants who suckled within first two hours of birth ingested significantly more milk on Day 4 than those who had not (284 ml vs. 184 ml),
regardless of being in KC or swaddled. The biggest predictors of sufficient milk supply were suckling within 2 hours of birth, intensity of breast engagement, and number of breastfeeds on Postpartum Day 3 for primiparous women. For multiparous women, the predictors was rooming-in. Maternal feelings of being low/blue were related to milk ingestion and milk production. They make the point that previous studies have not segregated effects of KC vs effects of suckling within 2 hours of birth and this article does and it is the suckling that made the difference in milk production, not the KC because the swaddled group also had same amount of milk as KC group. RCT, FT, Birth KC of 25-120 mins, BF, milk production, maternal feelings. Not on Charts as of 6/5/09.

Bystrova K, Widstrom AM, Matthiesen AS, Ransjo-Aarvidson AB, Welles-Nystrom B, Wassberg C, Vorontsov I, & Uvnas-Moberg K. (2003). Skin-to-skin contact may reduce negative consequences of the “the stress of being born”: A study on temperature in newborn infants, subjected to different ward routines in St. Petersburg. Acta Paediatrica 92 (3), 320-326. RCT of 176 fullterm newborn mother dyads, grp A got KC for 120 mins, satarting 20-25 minutes after birth and after all infant treatments and bath!), grp B got held in arms swaddled or clothed, grp C kept in cot in nursery swaddled or clothed. Axillary, thigh, back (interscapular) and foot temperatures from 30-120 min postbirth. First temp taken at 30 minutes post-birth. All temps rose significantly in all TX grps (grp A and B) except for foot temp over the 90 minute observation period. Largest increase in temps was seen in KC group (p. 324) and the rise was more pronounced at the most peripheral sites (thigh and foot). Foot temp rose from 28.5-31.5 in KC group. Most of the change occurred during the first 30 minutes, except foot temp rise was delayed by 60minutes in the swaddled infants held in mother’s arms. Foot temp dropped in nursery grp C and drop was greatest in swaddled group C babies. Foot temp rise most in KC group and remained high in KC group. KC after birth may be a natural way of reversing stress-related effects on circulation induced during labour because KC babies were more relaxed. FULL TERM, Axillary, Thigh, Back, Foot Temps, RCT, VEKC, rate of temp rise, swaddled, relaxation.

Cadwell, Karin & Turner-Maffei, Cindy. (2009). Chapter 4. Getting breastfeeding off to a good start. The first hour after birth In Continuity of Care in Breastfeeding. Best Practices in the Maternity Setting. Boston: Jones and Bartlett Publ. Pgs. 49-56. In this chapter, which starts with “More maternitycare facilities areexperiencing the magic of skin to-skin contact in the first hour.”(p.49), the chapter goes on to convey the importance of mother-baby contact during the first hour after birth (pg. 50), expectations for care in the first hour after birth (p. 51), evidence for skin-to-skin care in the immediate postpartum period (increased infant survival, decreased stress and increased homeostasis for the baby, improved temperature regulation, improved breastfeeding outcomes and maternal attachment behavior, spontaneous breastfeeding), Common barriers to optimal practice in the first hour of life and strategies to overcome barriers (routine practice of mother baby separation, routine procedures take priority over breastfeeding and time for mother and baby to be together, lack of education about importance of early skin-to-skin contact, and the assumption that KS is reserved for only healthy babies, not those who are immature, sick, or uncoordinated or struggling with motor and state regulation (pg.55). This chapter shares many recommendations too. BOOK Birth KC, BF, implementation, guidelines, FT, PT NOT on charts 1/21/2011.


Calais E., Dalbye R, Nyqvist KH, & Berg M. (2010). Skin-to-skin contact of fullterm infants: an explorative study of promoting and hindering factors in two Nordic childbirth settings. Acta Paediatrica,99, 1080-1090 DOI: 10.1111/j.1651-2227.2010.01742x. Descriptive study of 117 postnatal mothers and 107 fathers/partners in two settings were surveyed: two settings where Birth KMC was implemented as standard of care in Sweden and one in Norway, consecutively tested, answered questionnaire at 2 week postpartum. Satisfaction with support for KC in postnatal care and being a mother in Swedish setting promoted KC during the first day postpartum; previous knowledge about KC increased practice of KC on postpartum days 2 and 3. Receiving visitors apart from partner and sib lings was a hindering factor. KC was practiced to a larger extent in Sweden. In Norway, parents received more visitors and were more satisfied with the received information and support for KC in the postnatal period. Caregivers need to give parents adequate support for practicing KC with newborn healthy term infant and it is important to develop information routines.
during the antenatal period as well as in relation to KC at birth to effectively introduce and implement KC. **Full term, Routine KC, Postpartum KC, # of visitors/visiting, implementation, antenatal information. Birth KC.**

Calume ZF, Charpak N. 1996. El programa “Madre Canguru”: Una tecnica colombiana di cuidado
ambulatorio del nino prematur o de bajo peso al nacer. Tribuna Medica 93 (4), 191-200. SPANISH. The Kangaroo Mother Program: A Colombian technique for ambulatory care of premature infants and low birth weight newborns. PT


Campbell-Yeo, M.L., Johnston, C.C., Joseph, K., Feeley, N.L., Chambers, C.T. & Barrington, K.J. (2009) Co-bedding as a comfort measure for twins undergoing painful procedures (CComForT Trial). BMC Pediatrics, 9:76. This is an abstract of a planned, NOT YET DONE, study using skin to skin contact between twins for pain reduction because skin to skin contact between infant and mother reduces pain. Because the possibility exists that pain reduction is from maternal presence OR from stabilization of regulatory processes from direct skin contact, they are trying co-bedding skin to skin contact between 128 twins. (x in co-bedding and x in standard care). It is a randomized controlled trial and pain will be measured from videotapes of facial actions using PIPP. , RCT, PAIN, PT, facial actions, PIPP


Cantrill R, Creedy D, & Cooke M. (2004). Midwives’ knowledge of newborn feeding ability and reported practice managing the first breastfeed. Breastfeeding Review, 12(1), 25-33. Continuous uninterrupted KC at birth facilitates finding nipple and effective BF, but is not consistently used. Newborn feeding Ability Questionnaire measures nurses’ knowledge and practice in supporting first breastfeed, and given to 3500 staff nurses (midwives in Australia are equivalent of staff nurses) by mail; 31.6% (N=1105) responded. Mean knowledge was 85.94 (Range was 40-110; total possible on tool is 110); practice mean score was 95.89 (range of 57-117, total possible score is 120). All respondents said that KC immediately after birth was important, but few understood the “continuous, uninterrupted” aspects of Birth KC for correct attachment and effective suckling. Practice of continuous, uninterrupted KC is poorly understood, not uniformly practiced. **Fullterm, Descriptive study of BF knowledge, BF support/practice, Birth KC, Breastfeeding, Implementaton, Knowledge of KC questionnaire.**

Cantrill RM, Creedy DK, & Cooke M. (2008). Assessing midwives’ breastfeeding knowledge: Properties of the Newborn Feeding Ability questionnaire and Breastfeeding Initiation Practices scale. International Breastfeeding Journal, 3(7)(April 30, 2008), online journal only, pages 1-12. Retrieved 8/22/08. Available from http://www.internationalbreastfeedingjournal.com/content/3/1/7. This provides two scales, one of which has many items about KC to elicit knowledge about effects of skin to skin contact on infant feeding, infant physiological stability, newborn innate abilities, and effective breastfeeding practices. Predictive ability of scales is moderate. Midwives (nurses in the british terminology) with high knowledge scores were more likely to report best practices when assisting mothers with breastfeeding; midwiveswith more personal breastfeeding experience scored higher on all scales. Individual learning needs and effectiveness of education can be evaluated with these tools. Response rate was 31.6% (n=1107)sent to 3500 nurses. **Fullterm, tool development, KC knowledge and practices,knowledge of KC questionnaire. Not on charts yet.**
Carbajal, R. (2005). Traitement non pharmacologique de la douleur du nouveau né. Non pharmacologic management of pain in neonates. Archives de Pédiatrie, 12, 110-116. Review of pain management strategies and reviews Gray and Johnson’s articles and states that skin to skin contact is a part of BF and provides the direct (by blocking nociceptive transduction or transmission or activation of descending inhibitory pathways or by activating attention and arousal systems that modulate pain (pg. 114) and indirect mechanisms (reduce total amount of noxious stimuli to which infants are exposed) of how SSC reduces pain. Review, pain, PT

Carbajal R, Gall O, & Anneckin D. (2004). Pain management in neonates. Expert Rev Neurother (May) 4(3), 491-505. A clinical review that says accurate assessment of pain is needed, evidence for pain management strategies exist, and reviews these after talking about main source of pain being procedural pain in neonate. Says skin to skin contact can reduce pain indirectly by reducing total amount of noxious stimuli to which infant is exposed and directly by blocking nociceptive transduction or transmission or by activation of descending inhibitory pathways or by activating attention and arousal systems that modulate pain. National guidelines are needed to improve pain management. He is from France. This is exactly same as previous citation. Review, pain, PT, PT

Carbajal R, Rousset A, Daanan C, Coquey S, Nolent P, Ducroq S., Saizou C, Lapillonne A, Granier M, Durand P, Lencen R, Coursol A, Hubert P, de Saint Blanquat L, Boëlle PY, Anneckin D, Cimerman P, Anand KJ, Bréart G. (2008). Epidemiology and treatment of painful procedures in neonates in intensive care units. J Amer Med Assoc 300 (1), 60-70. Doi: 10.1001/jama.300.1.60 Each infant received a median of 115 procedures over course of hospitalization and a mean of 16 (Range= 0-62) painful ones per day. 69.6% of all procedures were painful in these 33 week infants. Of 42, 413 painful procedures over course of all infants hospitalization, 2.1% were treated pharmacologically, 18.2% nonpharmacologically, 20.8% with pham and non-pharm interventions, 79.2% had no specific analgesia. In Paris, many painful procedures are experienced and very few have pain management interventions. Kangaroo Care is Listed as one type of non-pharmacologic intervention. Pain, PT, number of pain ful procedures.

Carfoot S, Williamson PR, & Dickson R. (2003). A systematic review of randomized controlled trials evaluating the effect of mother/baby skin-to-skin care on successful breast feeding. Midwifery, 19(2), June, 2003, pg. 148-155. Used same method as Cochrane reviews, reviewed 7 randomized trials and found quality questionable in 4 of 5 studies about duration of BF. No studies on success of BF. Findings “fail to support the current initiative to implement changes in clinical practice to include skin-to-skin contact. Methodological flaws within the included studies prohibit firm conclusions being reached with regard to the effect of skin-to-skin contact on the duration of BF, timing of first BF or baby physiological factors (temperature and behavior). This review highlights the need for further primary research to assess the effect of skin-to-skin contact on the BF experience” (pg. 148). Across the studies, KC was given for 15-90 minutes. Two studies in Spain, 1 Canada, 1 Austria, and 3 in Guatemala. A major weakness of this review is that she did not use the Swedish Studies, nor any of U.S. FULLTERM, Review. BF, Meta-Analysis

Carfoot,S., Williamson, PR, & Dickson, R. (2004). The value of a pilot study in breastfeeding research. Midwifery 20(2), June 2004. RCT pilot with fullterm infants who got 45 minutes of KC starting after weighing after birth, or 45 minutes of regular swaddled holding after weighing, drying, dressing. More than 75% of KC infants had success of 1st breastfeed using IBFAT (BAT) score of 8 and that was more than controls (62%) Fullterm, RCT, BF success, VEKC

Carfoot, S., Williamson, P., & Dickson, R. (2005). A randomized controlled trial in the north of England examining the effects of skin-to-skin care on breastfeeding. Midwifery 21(1), 80-83. RCT of 102 VEKC dyads (quickly dried, and weighed and then given to mother and removed from mother for dressing, measuring and perineal suturing - got minimum of 45 minutes of KC and then breastfeeding for about 45 minutes), 102 routine care (dried and wrapped in towel and then given briefly to mother, and interrupted for weighing, measuring, dressing –then given back to mother for swaddled holding for 45 minutes). In the KC dyads 89/98 (91%) babies had successful 1st feed vs. 82/89 (83%) controls (Non significant difference) Success of first BF was measured by IBFAT with latch added so that a score of 8 or more was called “success”). 42/97 Kcers and 40/100 controls EXCLUSIVELY BF @ 4 months.(Non Significant difference).
Infant temp 1 hour postbirth higher in KCers (p = 0.02), more moms 87/97 (90%) Kcers were very satisfied with their care (KC) vs. 60/102 (59%), 83/97 (86%) of kcers and 31/102 (30%) controls said they prefer to receive same care in future. Limitation of study was that mothers changed groups and were retained in original group for statistics (p = .76). In summary, no benefits to BF success or exclusively BF, and only temp was higher and maternal satisfaction with care higher in KC group. RCT, Fullterm, BF Success, BF Success Tool, maternal satisfaction, maternal preference, Temp, BF Exclusivity at 4 months, Episiotomy KC, VEKC (not birth KC because taken to warmer to be dried and weighed before KC began).

Gundewall C. (1979). Effects of various amounts of contact between mother and child on the mother’s nursing behavior during the following four days. Developmental Psychobiology, 11, 143-151. 50 fullterm dyads in 3 groups: extended contact (KC in BF position for 1-2 hours immediately after birth and for 2-4 hrs between meals – n=17), extended contact in KCBF position for 1-2 hrs immediately after delivery but not between meals after that (n=17), routine care (hold baby for max of 5 minutes after birth- no KC after that as placed in crib at side of mother after washing, Iding,etc. N=16). Watched when baby took nipple in mouth & recorded q 15 sec. Til 2 mins. after baby let go of nipple. Moms showed more smiling, talking, and other contact behaviors than routine care moms during feeding interactions. KC for 1-2 hrs immed.after birth influenced feeding behavior during the following four days. Fullterm, RCT, KCBF position, Maternal behaviors, Birth KC

Carlsson SG., Fagerberg G., Horneman G., Hwang C-P., Larsson K., Rodholm M., Schaller J., Danielsson B., & Gundewall C. (1979). Effects of various amounts of contact between mother and child on the mother’s nursing behavior: A follow-up study. Infant Behavior and Development, 2, 209-214.17 Naked babies put in mothers bed for 1-2 hrs immediately after delivery, baby placed on the mother’s body in nursing position or at her side with its face touching the mother’s breast. After 2 hrs, baby taken away, washed and put in crib at mom’s side. (mom held infant for up to 5 min after birth, then taken away, washed and put in crib). Observations began when infant took nipple and continued for two minutes after letting go of nipple. This was six week Postpartum assessment of feeding in the home.No group differences at 6 weeks as seen in 1978 study because feeding at 6 wks is so routinized that it has lost its significance as a means of communication. Fullterm, KCBF position

Caruana E. (2008). Review summaries: evidence for nursing practice: Early skin-to-skin contact for mothers and their healthy newborn infants. J. Advanced Nursing, 62(4), 439-440. This is a review of Moore’s Cochrane analysis of 2007. Relates no adverse effects of early KC were reported; implications for nursing are: 1. early KC improves maternal and infant outcomes, with no reported short term or long term adverse effects. 2) the timing of KC is important: in first two hour post birth infants are alert and if they receive KC then and remain undisturbed and unmedicated, they will often self-latch at about 1 hour post-birth.3) to ensure that the infant’s temperature remains within safe range, KC should be uninterrupted and infant should be dried well and covered with warm blanket and head needs to be covered with dry cap that is replaced if it gets damp. More trials are needed. No independent from Moore’s article commentary or review is presented. Review. Full term, breastfeeding, temperature


Castral TC, Warnock F, Leite AM, Haas VJ, & Scochi CG. (2008). The effects of skin-to-skin contact during acute pain in preterm newborns. European J. of Pain, 12(4): 464-471. Doi: 10.1016/j.ejpain.2007.07.012 Randomized clinical trial of 59 stable (GA =30 weeks) given heel stick got either 15 minutes of KC before, during and after stick (n=31), or 28 got routine lance in incubator. Neonatal Facial Coding Scale was significantly lower in KC throughout whole procedure. Both groups of infants cried and showed increased heart rate during puncture and heel squeeze and these changes were less for KC infants. KC promoted reduction in behavioral state measures and less physiologic increase during procedure. It is recommended that KC be used as a nonpharmacologic intervention to relieve acute pain in stable premature infants born 30 weeks gestation or older. available now from doi:10.1016/j.ejpain.2007.07.012. PT, RCT, pain, crying, heart rate, facial, behavioral state. Not on charts yet.


Cattaneo A., Davanzo R, Uxa F, & Tamburlini G. (1998). Recommendations for the implementation of Kangaroo Mother Care for low birthweight infants. Acta Paediatrica, 87(4): 440-445. This is report of the 1996 INK meeting recommendations and includes 4 research goals: 1) work on effectivenes and safety of KMC as a means of stabilizing premature and LBWs just after birth 2) further health systems research on its application in different settings, KMC at birth for VLBW in 1st and 2nd level maternities units with very limited resources, 3) conduct research on developmental (long term and short term) outcomes, and 4) KMC for home deliveries not assisted by trained personnel PT, Guidelines, Implementation, research goals, development

Cattaneo A, Davanzo R., Worku B, Surjono A., Echeveria N, Bedri A, Huksari, E., Osorno L, Gudetta B, Setyowireni D, Quintero S, & Tamburlini G. (1998). Kangaroo mother care for low birthweight infants: A randomized controlled trial in different settings. Acta Paediatr 87: 976-985.Multicenter study, median entry age was 10 days (R=1-74) KMC produced breastfeeding/breastmilk feeding rates at discharge of 83%, 98%, and 80%. Mexican KMC infants with early discharge had more common overall BF (88 vs 70%) and BF exclusivity (80 vs. 16%) than controls. Length of stay shorter for KMC. Transfer back to conventional care was 13.4%. 91% of moms were happy with KMC and 83% comfortable with KMC. No episodes of hypothermia nor apnea. PT, Randomized Controlled Trial (RCT), Mortality, BF, Length of Stay, transfer back rate, 3rd world, apnea, hypothermia, maternal feelings
CBS Evening News. (2009). Mother’s Milk a lifesaver for Preemies? San Diego, April 10, 2009. This is a transcript of the presentation made on CBS Evening news about the benefits and need for mothers milk by preemies highlighting a program at UC San Diego. When I accessed this article, a four page print out came which included two pages of posted comments. One comment on page 3 was “I hope more follow-up is done on this topic (other benefits of human milk on preemies, i.e. ROP, weight gain, etc. obstacles that mom face when trying to breastfeed , etc). Also, I urge the CBS staff to uncover how ‘development care’ and ‘kangaroo care’ help preemies’ physiologic stability and neurological development. These are fascinating wonders that unfortunately not all the NICUs are practicing.” I accessed this report on 6/15/2009 and it is available from http://www.cbsnews.com/stories/2009/04/10/eveningnews/main4935867.shtml PT


Centers for Disease Control and Prevention. (2005). This is a report related to breastfeeding that says on page 1 that KC should be encouraged to promote breastfeeding. See reference under Shealy for full citation. On page 1 of the book it states “maintaining skin-to-skin contact between mother and baby after birth has been demonstrated to have a positive effect on breastfeeding.” “Breastfeeding is an extremely time-sensitive relationship” (pg. 2). Policy, BF. Full term, guidelines, Birth KC, breastfeeding

CDC has three areas of involvement: 1) the National Survey of Maternity Practices in Infant Nutrition and Care (mPINC) surveys which occur every two years, 2) Breastfeeding report cards which are conducted every two years (2007, 2009, 2011) (BF report card shows how BF is being protected, promoted and supported in each state using 5 outcomes from Healthy People 2010 [Ever breastfed, BF at 6 months, BF at 12 months, Exclusive BF at 3 months, and Exclusive BF at 6 months]and 9 process [ Average mPINC score, %live births in BFHI facilities, % BF infants receiving formula before 2 days of age, # of IBCLC/1000 live birth, # of LLL groups/1000 live births, # of State Dept. FTEs dedicated to BF, State legislation about BF in public places, State legislation mandating employer lactation support, and BF coalition with public website] indicators), and 3) the National Immunization Survey which asks questions about BF, birth, and many factors related to immunity. The last national Immunization Survey was conducted in 2007 and the results from 1999-2007 are reported as CDCP 2010 below. Be sure to see Dept. of Health and Human Services and CDCP citation below, too.

Centers for Disease Control and Prevention (CDCP). (2007). The CDC National Survey of Maternity Practices in Infant Nutrition and Care (mPINC). Hospital Survey. OMB # 0920-0743, Expires 07/31/2009. Available from http://www.cdc.gov/breastfeeding/pdf/mpinc_hospital_survey.pdf. Survey conducted by Diane Manninen, Ph.D., Task Leader, Battelle, 1-866-826-4176. This is a national (USA) CDC survey of hospitals to assess their promotion of breastfeeding. Among the infant nutrition and infant care questions are these that pertain to Kangaroo Care: “A4: Approximately, how many mothers are encouraged to hold their healthy full-term infants skin-to-skin for at least 30 minutes within an hour of birth for uncomplicated vaginal births?” Few=0-9%, Some = 10-49%; Many = 50-89%, Most = 90%+. Not sure. Question A5 is “Are routine newborn procedures (e.g. APGAR, cord clamping, foot printing) after uncomplicated vaginal birth done while the mother is holding the healthy full-term infant skin-to-skin?” Rarely=0-9%, Sometimes = 10-49%, Often 50-89%, Almost always= 90%+ and Not sure. Question A9 is “Approximately how many mothers (regardless of feeding method) are encouraged to hold their healthy full-term infants skin-to-skin for at least 30 minutes within two hours after delivery for uncomplicated cesarean births?” With few, some, many, most, and not sure being possible answers. The survey, generally considered precursors to development of JCAHO mandated care requirements, is being performed for the Centers
for Disease Control and Prevention, the National Center for Chronic Disease Prevention and Health Promotion, the Division of Nutrition and Physical Activity, and the Maternal and Child Nutrition Branch of CDCP. All from Atlanta, GA. Full term, breastfeeding, Birth KC, guidelines, implementation. See results of study that follow as CDC 2008 reference. BE sure to SEE CDC 2011 to see how the questions have changed from 2007 to 2009

Centers for Disease Control and Prevention. (2008). Breastfeeding-related maternity care practices at hospitals and birth centers – United States, 2007. Morbidity and Mortality Weekly Report, 57(23), June 13, 2008, 621-625. The CDC survey was conducted on 2700 birth facilities in 2007 and found that many birth facilities in US are not fully supportive of breastfeeding. Birth facilities reported their practices and policies in caring for women who chose to breastfeeding and responses were scored 0-100 points. The least supportive states (scores 48-58) were Alabama, Arkansas, Kentucky, Louisianna, Mississippi, Oklahoma, West Virginia. Scores of 75-81 were highest and were in states Vermont, New Hampshire, Maine, and Oregon. Laurence Grummer-Strawn, chief of nutritional branch of CDC’s Division of Nutrition, Physical Activity, and Obesity, said “These findings underscore the importance of improving the way hospitals and birth centers provide assistance, encouragement, and support of breastfeeding. We have a great deal of work to do to accomplish our national objectives related to breastfeeding, and birth facilities can make a huge contribution to this effort.” Full term, birth KC, guidelines, breastfeeding. SEE DEPT Health and Human Services and CDCP for report on OHIO.


Centers for Disease Control and Prevention, Division of Nutrition, Physical Activity, and Obesity. (2009b and 2011). Improving hospitals’ support for breastfeeding. Retrieved from www.cdc.gov/mpinc 7/5/2010 or www.cdc.gov/mpinc and we retrieved it on Sept. 11, 2011. This document was updated March 2011. www.cdc.gov/breastfeeding/pdf/mpinc/maternity_care_practices.pdf to get the specific document that lists 6 strategies to improve hospital support of breastfeeding. STSC is the very first strategy and says “Doctors and midwives place newborns skin-to-skin with their mothers immediately after birth, with no bedding or clothing allowing enough uninterrupted time (at least 30 minutes) for mother and baby to start breastfeeding well.” FT, Guideline, duration of 30 mins of KC is important.


Centers for Disease Control and Prevention. (2011). Maternity Care Practices. Available from www.CDC.gov/breastfeeding/Maternitycarepractices. Poster August 4,2011 a nd accessed 9/15/2011. This sheet starts w ith a definition section that says “maternity care practices related to breastfeeding take place during the intrapartum hospital stay. Some maternity care practices of interest are developing a written policy on breastfeeding, providing all staff with education and training….Other maternity care practices differ in their effect on breastfeeding. Both the use of medications during labor and cesarean birth have been shown to have a negative effect on breastfeeding; however, providing continuous support during labor and maintaining skin-to-skin contact between mother and baby after birth have been demonstrated to have a positive effect on breastfeeding” pg. 1. FT, PT, BF, Birth KC Not on Charts 9/18/2011.


Chambers, M.B., Morrison, B., Ludington-Hoe, S.M. (2011). Maternal perception of birthing center nurses support of first breastfeeding. *Presentation at 7th Annual Cleveland Clinic Nursing Research Conference Journey Forward in Nursing Research. May 6, 2011 Cleveland Clinic Lyndhurst Campus.* A fullterm birth KC study conducted at Fairview Hospital in Cleveland in which nurses have for 4 years been starting birth KC within 1-2 minutes of birth and continuing until the first feeding at breast has been accomplished. Nurses were asked their perceptions of this practice. *GET RESULTS FROM BARB*

Chantry  C.J. (2005). What should the lactation consultant know about the Academy of Breastfeeding Medicine breastfeeding management protocols? *Journal Human Lactation* 21(1), 39-41. Review of clinical scenario about taking fullterm infant from breastfeeding mom because dextrostick showed 37 mg/dl. “Separation of mother and infant at birth to treat hypoglycemia with breast milk substitutes was less than optimal management. Chemstrip of 37 mg/DL in an asymptomatic infant within the first 3 hours of birth is normal and does not require treatment per se” pg. 39. Serum glucose is 10-15% higher than whole blood glucose on which the heel stick screening is performed. If serum glucose is <35 serum, not whole blood or infant is symptomatic is to offer breastfeeding and providing formula only if the infant will not breastfeed” (pg. 39). The separation of mother and baby is inappropriate because skin-to-skin contact immediately after birth in a stable infant is the recommended routine in part because it actually is more likely to result in euglycemia! Skin to skin contact assists with maintenance of normal body temperature and reducing energy expenditure, concomitantly stimulating suckling and milk production. Breastfed term infants have lower concentrations of blood glucose but higher concentrations of ketone bodies than formula-fed infants. Increased ketone bodies appear to be a normal adaptation to the low nutrient intake that occurs during the establishment of breastfeeding. Suggested thresholds for glucose levels at which to intervene may not apply to breastfed infants who may tolerate lower plasma glucose levels without any significant clinical manifestations or sequelae. These recommendations are grade A recommendations based on standards of US Preventive Services Task Force and those of the Academy of Breastfeeding Medicine. *Fullterm, birth KC, breastfeeding, guidelines, evidence-based practice, hypoglycemia*

Chaparro, C.M. & Lutter, C.K. (2007). *Beyond survival: Integrated delivery care practices for long term maternal and infant nutrition, health, and development*. Washington, DC: Pan American Health Organization, 2007. This is a review and guideline that says that it is absolutely essential that delayed cord clamping, immediate KC, and initiation of breastfeeding within first hour of birth be integrated with one another and included as standard delivery care practices. This is same as Lutter and Chaparro publication that follows under Lutter. *Guideline, review, Birth KC, BF and delayed cord clamping. Not on charts yet*

Chaparro, C.M. & Lutter, C.K. (2009). Incorporating nutrition into delivery care: delivery care practices that affect child nutrition and maternal health. *Maternal and Child Nutrition, 5*, 322-333. Delayed umbilical cord clamping, early skin-to-skin contact and early initiation of exclusive breastfeeding are three simple and inexpensive delivery care practices which have the potential to improve short-term and long-term nutrition and health outcomes in mothers and infants. Delayed cord clamping has benefits to preterms (prevents IVH and hematological status, and in full terms improves iron status through 6 months of age. Early skin-to-skin contact, in addition to regulating temperature, improves breastfeeding behaviors, which has important implications for long-term infants nutrition and health. But these three practices are not common in many delivery settings, so the manuscript presents discussion of immediate and long-term health and nutrition benefits and identifies policy and programme changes needed for integration and implementation of these practices into standard delivery care. *Review, FT, delayed cord clamping, Birth KC, Breastfeeding. Not on charts 10/29/2011.*


intense BF instruction before discharge. Samples of hindmilk and foremilk upon entry into KMC and weekly thereafter until term. Protein concentration varied inversely with postconceptual age and postnatal age. Fat concentration was higher in hind milk than forearm milk in samples of the same feed. Lactose increased steadily with PCA. Calcium/phosphorus ratios were stable, approximate 2:1 and similar in samples of different PCA and postnatal age. Mineral concentration is inadequate for preterm infants. Protein concentration decreases steadily to mature milk levels by 3rd week postnatal age, regardless of birth gestational age. Thus, for 3rd week onward, infants 32 weeks and less need protein fortifier. Feeding hind milk increases caloric density and fat intake (see Ann Johnson’s study of 20 mins of KC holding brings hind milk up first for the feeding). Preterm, descriptive, Breastfeeding, milk composition.


Charpak N, Ruiz JG, Zupan J, Cattaneo A, Figueroa Z, Tessier R, Christo M, Anderson G, Ludington S, Mendoza S., Mokhachane M, & Worku B. (2005). Kangaroo Mother Care: 25 years later. Acta Paediatrica 94(5), 514-522. This contains summary reviews of outcomes and emphasizes practice guidelines and outcomes for implementing KMC in a variety of levels of neonatal care and in low-middle- and high income countries. Defines KMC as continuous skin to skin contact between mother and infant, exclusive breastfeeding, and early home discharge in the Kangaroo position (514). Pg. 515 says KMC is not “alternative medicine”, but a scientifically sound intervention. Clinical dilemma of asking mom to hold in KMC her dying infant has to be resolved, and we should avoid emergence of suboptimal quality (what does this mean? Duration, frequency? Without monitoring? With a stressed vs relaxed mom?), and KMC should not be taken to community level before introduced properly for care of stable infants in hospital (what is proper introduction? And why not?) Paper reviews the KMC position, KMC nutrition, and discharge/follow-up policies and outcomes of KMC research. KC position is strictly upright, start at birth and ASAP in NICU, avoid separation (515). Continuous KC is for minimal care incubator infants; intermittent KC (ideally 2 hr or more) should begin before feeding, Review, community, continuous KC, end-of-life KC, position, birth KC, alternative medicine, guidelines, temperature, implementation. PT

Charpak N, & Ruiz-Pelaez JG. (2006). Resistance to kangaroo mother care implementation in developing countries: proposed solutions. Acta Paediatrica 95(5), 529-534. Between 1994 and 2004, 44 teams were sent to 25 developing countries to initiate KMC and some were not successful. 17 open-ended questions were answered by 15 coordinators at successful sites and by 15 coordinators at unsuccessful sites. The early discharge component with ambulatory follow-up was the most difficult component to implement and other barriers were difficulties arising from health professionals, mothers and families that reflected local cultural practices. Solutions are active surveillance for sources of resistance and identification of obstacles and practice solutions. Descriptive, qualitative comparison, barriers, resistance to KMC, BF, early discharge, PT implementation, third world, 24hr/day KC. NOT ON CHARTS YET

Charpak, N., Ruiz-Pelaez, J.G., & Charpak, Y. (1994). Rey-Martinez Kangaroo mother program: An alternative way of caring for low birth weight infants? One year mortality in a two cohort study. Pediatrics 94(6 Pt1), 804-810. Infants < 2000 grm birthweight observed in two hospitals, one that gave KMC 24/7 once stable (about 32-34 wk and until 37-38 wks when KC not tolerated) and the other did not, got incubator care only,. Enrolled when ready for minimal care. KMC infants (n=162) were 24/7 KMC until not tolerated any more (about 37 weeks postmenstrual age), and discharged early. Controls (n=170) were in incubators and had later discharge. Both followed up to one year. KMC infants had higher relative risk of death, grew less in first 3 months, and had higher proportion of developmental delay at 1 year, survival was similar between groups, but weight gain and neurodevelopmental questions remain. PT, descriptive


Charpak N, Ruiz-Pelaez JG, Figueroa de Calume Z, & Charpak, Y. (2001). A randomized, controlled trial of kangaroo mother care: results of follow-up at 1 year of corrected age. Pediatrics 108(5), 1072-1079. A randomized trial of 382 KMC and 364 traditional care preemies <2000 gm who were randomized when off of O2 support and getting only minimal care. 24/7 KMC, nearly exclusive BF, and early discharge were KMC conditions. Evaluation at term age, 3, 6, 9, and 12 months corrected age. Risk of death lower but not significantly lower in KMC, head circumference greater in KMC, developmental indices (Griffith psychomotor at 6 and 12 months; and more cerebral palsy in incubator group) not different between groups. Shorter hospital stay for <1500 gramers (up to 50% shorter). Number of infections the same between groups but severity less in KMCers. Many KMCers were breastfed til 3 months age. KMC humanizes neonatology, promotes BF, shortens hospital stay without compromising survival, growth, or development. PT, RCT, mortality, infection, length of stay, head circumference, BF, humane care. Psychomotor development, cerebral palsy, 3rd world Not on charts yet.

Charpak, N., Ruiz-Pelaez, J.G., Figueroa de Calume, Z. & Charpak, Y. (1997). Kangaroo mother versus traditional care for newborn infants ≤2000 grams: A randomized, controlled trial. Pediatrics, 100 #4, Oct. 1997, 682-688. 382KMC and 364 traditional care newborns were followed in this RCT. 24 hour/day 7 days a week KMC given in upright position at different hospital than traditional infants and moms taught KMC and ambulatory KMC + early discharge. Early discharge criteria are: have overcome major adaptation to extrauterine life, have received treatment for infection or other problems, suck and swallow properly, achieve 20 g/day weight gain (p. 683). Traditional care stayed in hospital until usual discharge criteria met (wgt of 1700 grams or more, regulates temp, gains weight). Term age results reported here. No differences in: # and proportion of deaths; # & proportion of infections (14% in each) (infection was one that required antibiotic), weight, height, head circumference, # of infants total or partially (some formula) breastfeeding, no diff in readmission rate. Differences were: KMC had earlier discharge (1.1 days sooner), lower # of severe infections (nosocomial infections requiring rehospitalization – KMC 3.8%, controls 7.8%), proportion of subjects getting only formula was lower in KMC. KMC is not associated with increased risk of dying, there’s no reduction in early physical growth in KMC, early discharge did not increase admissions, and 50% shorter stay can mean less crowding. KMC is safe. She differentiates intermittent skin-to-skin contact from KMC and says skin-to-skin contact is only one component of KMC. RCT. PT Mortality, Wgt, height, head circumference, infections, Fortified breastmilk, length of stay, skin-to-skin contact is not KMC, readmissions, 3rd world

Charpak, N., Ruiz-Pelaez J.G., Figueroa Z., & Kangaroo Research Team. (2005). Influence of feeding patterns and other factors on early somatic growth of healthy, preterm infants in home-based kangaroo mother care: a cohort study. Journal Pediatric Gastroenterology and Nutrition, 41(4) Oct., 430-437. Prospective descriptive study of 129 healthy preterm infants sent home on ambulatory KC and exclusive BF. In hospital, formula given to infants who did not gain 15 g/day for 3 consecutive days. At term age (at home by then?) 60/126 infants gained wgt adequately with exclusive BF. In 14 who need supplements, adequate wgt gain achieved before term age and supplements were stopped. More immature infants need supplementation more frequently, infants with lower weight for GA at birth were less likely to achieve adequate weight by term age. Growth indices at term age in KMC group were between 10-25th percentile, similar to non KMC preterms. PT, weight, home KC, exclusive BF.

Charpak N, Ruiz-Pelaez JG, & Motta, S. (2006). One year follow-up of a cohort of preterm infants (≤ 34 weeks GA) discharged with ambulatory oxygen in Bogota, Colombia. GET CITATION. 206 newborns were followed-up from 7 KMC programs. 4 infants died, 21 (35%) lost to follow-up at term age and 99 (48%) at 12 months. At term age
exclusive BF = 54 (26.2%), growth at 12 months was normal, 16% still had supplemental home oxygen at 3 months and oxygen continued until infants were 106 days old maximum, 73% were readmitted at least once and 67% of readmissions were due to respiratory problems. 50% had ophthalmology screening and ROP = 35% of those. 19% had neurodevelopmental tests at 1 year that showed no differences in mental and motor development. (IS THIS CORRECT?)

**Descriptive, PT, follow-up, mortality, home KC, home oxygen, exclusive BF, mental development, motor development, readmissions, weight and length, ROP, third world, 24 hr/day KC**


Chermont, A.G., Falcao, L.F., de Souza Silva, E.H., de Cassia Xavier Balda.R, & Guinsburg, R. (2009). Skin-to-skin contact and/or oral 25% dextrose for procedural pain relief for term newborn infants. *Pediatrics, 124*(6): e1101-e1107. Doi: 10/1542/peds.2009-0993. An RCT of 640 healthy term infants assigned at 12-72 hours of life to get IM of hepatitis B vaccine in right thigh according to 4 groups: no analgesia (routine care group), oral 25% dextrose 2 min before injection, KC for 2 mins before injection and persisting throughout the injection, and oral dextrose + KC. Neonatal Facial Coding System and Neonatal Infant Pain Scale and Premature Infant Pain Profile scores before, during thigh cleansing, during injection, and 2 minutes after injection were scored. Oral dextrose reduced duration of pain, KC decreased level and duration of pain, dextrose + KC was more effective than either treatment separately for term newborns and acts synergistically to decrease pain. **FT, RCT, Pain, injection, sucrose water, PIPP, duration of KC was 2 minutes.**

Chia P, Sellick K, & Gan S. (2006). The attitudes and practices of neonatal nurses in the use of kangaroo care. *Australian Journal of Advanced Nursing, 23*(4), 20-27. NO DOI. Descriptive survey and interview of 34 nurses to survey their attitudes and practices of KC in a Melbourne NICU and their concerns with promoting KC. There are 2 tables that convey the survey that was used: Opinions on the benefits of KC (KC promotes bonding, has a positive effect on physical well being of infant, enhances parental confidence, results in more effective breastfeeding, benefits of KC have been overstated, should not be done with intubated infant, should be done with infants weighing 1000 grams or more, should begin within a few hour of birth, all parents should be encouraged to do KC, all parents should be given relevant information on KC, nurses should remain with parents for support and assistance during KC, facilitating KC is professionally satisfying, nursing should facilitate KC when the NICU is quiet, facilitating KC is an added burden to NICU nurses), and then KC practices and activities (encouraged mothers in participation of KC; assisted mothers in KC participation, encouraged fathers to participate in KC, assisted fathers in participation in KC with different weight infants, provided information on KC, participating in a continuing education program about KC, been supervised in technique of KC). All nurses had assisted and encourage parents to participate in KC and the majority agreed on the benefits of KC for infants and mothers. There was general acceptance that KC could be used with low birth weight infants requiring intubation and all but 2 nurses found facilitating KC to be satisfying. There was uncertainty about KC’s role in promoting breastfeeding. Barriers to KC were heavy workforce requirements, insufficient education, lack of organizational support and absence of clear protocols, especially for low birth weight infants. Nursing STRONGLY supports KC, but have educational and practical concerns that need to be addressed. Nurses need educational programs, skill development, physiologic monitoring of infant, transfer technique skills, and supervised practice. **PT, Implementation, knowledge of nurses, BF, satisfaction of nursing, ventilated KC. Not on charts 2/1/2011.**
This is a hospital protocol for KC with preterm infants. Infants must not have chest tubes or intracardia lines (RA, LA). Family must be willing to participate and spend at least one hour. Outcomes are that infant will maintain neurobehavioral organization, physiologic stability in oxygenation, heart rate and thermoregulation during transfers and holding, that there will not be any adverse effects associated with transfer or KC such as extubation and thermal instability, and that a bonding process is begun. Documentation of the KC session should include treatment interventions, and then duration of KC, infant’s tolerance of KC, vital signs and pain score for intubated infant during KC on the Flow Sheet. On the progress note, problems encountered during KC and action taken as well as interdisciplinary patient-family education flowsheet of the teaching that was completed should be recorded. **Guidelines, protocols, VentKC possible, preterms**

Hospital protocol and step by step procedure to conduct the transfer of ventilated infants into and out of KC. Equipment, procedure, transfers (parent-assisted and nurse-assisted), after transfer, and documentation (on flow sheet write duration and tolerance of KC and in Progress Notes write problems encountered and actions taken and on Patient-Family Education flowsheet write the KC teaching that has been completed) are all covered. **Preterm, vent KC, guidelines**

Chiu, Y.B., & Blume-Peytavi, U. (2004). Stratum Corneum Maturation. A review of neonatal skin function. Skin Pharmacology and Physiology, 17:57-66. This is NOT an article about KC, but on pg. 63 the statement is made that “evaporative heat loss in infants <30 weeks GA could exceed resting heat production in these infants, meaning if an infant cannot increase his/her heat production to maintain his/her body temperature, then his/her body temperature will fall. The clinical importance of these findings is obvious, and strategies, i.e. emollient application, skin-to-skin contact kangaroo care), plastic heat shield, plastic blankets to minimize TEWL in preterm infants are being developed.”

**Preterm, temperature**

Chisa, R. (2009). Skin-to-skin in the delivery room of a Level 3 maternity ward: Practical aspects and safety. Descriptive and semi-experimental study of 50 midwives and 58 mother-infant couples in the Besancon Teaching Hospital Maternity Ward. Revue Sage –Femme, 8(3), 138-144. Activity did not impede Birth KC and all moms said would renew the skin to skin experience if give birth again and patients were satisfied. Birth KC is compatible with level 3 maternity ward. This harmonization of midwifery practices will enable infant safety in the DR while responding to the desires of the mothers. Birth KC is a first step in a care protocol favoring establishment of the mother infant relations. **Birth KC, Full term,**

Chiu, S-H, & Anderson GC. (2009). Effect of early skin-to-skin contact on mother-preterm infant interaction through 18 months: randomized controlled trial. International J. of Nursing Studies, 46(9), 1168-1180. RCT of 100 infants who started KC early after birth and then intermittently throughout the next five days (Amt of KC was very little – see Anderson, Chiu et al., 2003) vs. those preterms put in regular NICU without early KC. AT 6 (N= 69 infants) and 12 months (N=70 infants) NCAST feeding was videotaped and scored. No difference in feeding between groups. At 6,12, and 18 months (N=76) the NCAST teaching was videotaped. KC infants scored lower on the teaching at 6 months (negative outcome, more controlling mother). Authors conclude that the data is inconclusive due to low dose of KC, small sample size (but this is a good sample size in general, but I do not know what their a priori or actual power was for these outcomes), and insensitive measures of interaction (they suggest Parent-Child Early Relational Assessment and/or behavioral coding during play). **PT, RCT, interaction, teaching, feeding, negative effect**

Chiu, S-H, Anderson, G.C., & Burkhammer M.D. (2005). Newborn infant temperature during skin-to-skin breastfeeding in dyads having breastfeeding difficulties. Birth,32, 115-121. 48 fullterms having Breastfeeding difficulty at 12-18 hours postbirth had temporal artery temperature taken before, once during, and after each of 3 consecutive breastfeeding in KC on postpartum Day 1. Temp reached and remained in neutral thermal range (36.5 and
37.6) during KCBF. BF sessions differed in length from 30 minutes to 50 minutes before a feeding. Found that temps increased to neutral thermal zone when infants were cool and decreased to neutral thermal zone when infant was too warm (pg. 119). In two infants temp went from 36.2 before KC to 36.4 and 36.6 at 30 mins of Kc and stayed at that level. An infant’s temp of 37.5 dropped to 36.8 and another’s from 37.4 to 37.2 during KC. “Data suggest mother has ability to modulate infant’s temperature during KC, if given the opportunity” (pg. 119). A need for a wrap is inferred from the statement “training sessions on KC may need to be provided for hospital staff. It is possible that with incorrect KC position, infant temperature may decrease.” (pg. 120). KCBF guidelines are: infant should wear diaper small enough to maximize ventral surface, mom should wear clothing that can open down the front, wear hospital BF gown backwards as opening is too small for BF, put head cap on infant if birth kc is given, if ambient temp is cool place blanket (maybe warmed blanket) over infant’s back. **Descriptive, temporal artery temp, KCBF, Fullterm, thermal synchrony, KC wrap/education needed, guidelines for KCBF, Early KC**

Chumba E, McClure EM, Wright LL, Carlo WA, Chakraborty H., & Harris H. (2008). Effect of WHO newborn training on neonatal mortality by education. *Ambul Pediatr* 8(5): 300-304. The WHO’s Essential Newborn Care course sets the minimum accepted standard for training midwives and physicians on aspects of infant care (resuscitation, breastfeeding, kangaroo care, small baby care, and thermoregulation) many of which are provided by the mother. This descriptive study evaluated effect of the Essential Newborn Care course on all causes of infant mortality within 7 days of birth (early mortality) in Zambia in moms who had completed 7 years of education and moms with 8 or more years of education. ENC is associated with decreases in early mortality – rate dropped from 11.2/1000 live births pre-ENC to 6.2/1000 with ENC. Mortality decreased in moms with 7 yrs education, but no change in moms with 8 or more years education. **PT, FT, 3rd world, descriptive, mortality, essential newborn care. Not on charts 4/29/09**

Christensson, K. (1996). Fathers can effectively achieve heat conservation in healthy newborn infants. *Acta Paediatrica*, 85, 1354-1360. Paternal KC with FULL TERM newborns from C/S deliveries. 44 infants studied and glucose levels were higher in KC than cot babies at 90 minutes postbirth and at 24 hrs. postbirth, mean axillary temp was higher in KC group. Father is as good as incubator. **RCT, FULLTERM, FATHERS, temp, Blood glucose, C/S, Birth KC/VEKC**


call in the human infant in the absence of maternal body contact. Acta Paediatrica, 84, 468-473. Conducted in Spain. Primiparous and multiparous women of NSVD given 90 minutes of KC postdelivery (Grp A, n= 15) or left in cot for 90 minutes (Grp B, n= 14) or placed first in cot and then given KC later (Grp C, n=15). Temperature increased (Grp A KC axillary temp at 90 minutes post birth = 36.9 and control = 36.4) and crying was significantly less in the KC group A. Thermoregulation by KC persists for 2-3 days and is mediated by increased cutaneous circulation due to sympatholytic activity. Examined if the comfort provided by KC was associated with changes in peripheral blood levels of CCK and oxytocin. No such effects could be documented, but possibility still exists that maternal body contact causes a central release of the peptides CCK and oxytocin, mediating the comfort response in infants. RCT, FULL TERM, separation, temperature, comfort response, CCK, oxytocin, crying, sympathetic activity., Birth KC/VEKC, RELAXATION


Christidis I, Zotter H, Rosegger H, Engele H, Kurz R, Kerbl R. (2003). Infrared thermography in newborns: the first hour after birth. Gynakol Geburtshilfliche Rundsch, 43 (1), 31-35. Surface temp within 1 hr of birth was examined in 42 fullterms (AGA) with infrared thermography. Immed. after birth, surface temp is uniform picture, skin temp is significantly cooler than core. Soon, peripheral sites become cooler but trunk has constant temp; bathing in warm water leads to more even temp profile, radiant heaters and KC provided within the first hour of birth with mother prevents heat loss and produce uniformly warm thermogram of infant. Descriptive, Full Terms, temperature profile. Get full article.

Chwo, M-J., Anderson, G.C., Good, M., Dowling, D.A., Shiau, S-H H., & Chu, D.-M. (2002). Randomized controlled trial of early Kangaroo care for preterm infants: Effects on temperature, weight, behavior, and acuity. J Nursing Research (Taiwan), 10 (2), 129-142. 34 healthy LATE preterm infants in TAIWAN were randomly assigned before first feed on day following birth. KC was done first at a mean of 21 hours and was done during BF, controls were clothed and wrapped and held that way for one hour, three times a day during feedings. KC vs. controls showed KC had higher TYPANIC temps (37.3 vs 37.0), more quiet sleep (62 vs 22%), more inactive awake, less drowsiness, less crying (2 vs 6%). No diff in weight loss or acuity (LOS). PT, RCT, tympanic temp, sleep, inactive awake, drowsy,cry, wgt, length of stay, late preterms

Chwo, Miao-Ju, & Huang, Li-Hung. (2002). Effects of very early kangaroo care on infant’s extraterine adaptation and maternal birth-related fatigue. Presentation at International Conference on Tradition, Evidence, and Innovations in Nursing, March 21-23, 2002, Phuket, Thailand. 49 fullterm dyads randomly assigned to KC (n=24)60 minutes of KC after newborn care) or control (n=25) (routine newborn care, no skin-to-skin contact). Temp, HR, SaO2 and Beh. State and maternal fatigue measured at beginning and every 15 minutes. KC had sig. Higher Temp (37.30 vs. 37.00 at 60 min), no sig diff in HR, or SaO2 at any time, no Bradycardia in either grp and KC had more quiet sleep (41% vs. 13.5%) and alert inactivity (27.6% vs. 2.8%) than controls. Controls had more drowsy and crying (38.5 vs. 15.1%) than KC.. KC moms had less fatigue @ 60 min (37.67 vs. 42.36). RCT. Fullterm, temp, HR, SaO2, Brady, State, Fatigue. Delivery KC

Cignacco E., Denhaervnck K, Nelle M, Buhrer C, & Engberg S (2009). Variability in pain response to a non-
pharmacologic intervention across repeated routine pain exposure in preterm infants: a feasibility study. Acta Paediatr. 98(5): 842-846. doi: 10.1111/j.1651-2227.2008.01203.x Not a KC study, but SUCROSE. Two hospitals were used to study one group of 9 infants (28 2/7-31 4/7 GA who received sucrose 2-3 minutes before stick for repeated heel sticks occurring between 2-14 days of life as part of routine clinical care. Pain assessed by Bernese pain scale, PIPP, and visual analog scales and salivary cortisol 20-30 min after stick. 72-94% of variability was within subjects, indicating inconsistency in pain response across 5 repeated heel sticks. No sig differences in salivary cortisol before and after heel sticks, indicating no stress-induced peak after painful stimulus. However, a general decrease in cortisol occurred over the heel sticks (did he consider maturation of cortisol? Over hospitalization period, cortisol levels decrease according to this finding and that of Grunau RE, Holsti L, Daley DW, Oberlander T, Weinberg J, Solimano A et al., 2005. Neonatal procedural pain exposure predicts lower cortisol and behavioral reactivity in preterm infants in the NICU. Pain 2005, 113: 293-300. Circadian rhythm of cortisol? Pulsatile release of cortisol that has half life of one hour?) Pain, Preterm, repeated pain, cortisol, sucrose, but not KC


Clarke, A. (2009). International Child Health. Paediatric Nursing. 21(7); 32-33. Health care professionals in economically strong nations are in a good position to support and learn from their colleagues in low-income countries. This is a review of a meeting of the International Child Health Group, a specialty group of the Royal College of Paediatrics and Child Health. David Southall, medical director of Childhealth Advocacy International, reported that “improving outcomes with limited resources was the background to the development of Kangaroo Mother Care (KMC) in Bogota in 1978. This comprehensive care for babies involves skin-to-skin contact with mother or father 24 hours aday in the upright position – bringing benefits in thermoregulation, reduced infection, breastfeeding, and emotional comfort. Initially an alternative to hospital care for stable low-birthweight babies in countries where access to technology was poor, the evidence for its many benefits means that KMC is no longer regarded as ‘poor man’s’ care, and it is now practiced in many countries, rich and poor.” (pg. 33). Has lovely picture of KC on page 32 with a caption saying “Kangaroo care: continuous skin-to-skin contact between mother and child.” Review, PT, temp, infection, BF, comfort, guideline

Clarke LL & Deutsch MJ. (1997). Becoming baby-friendly. One hospital’s journey to total quality care. Lifelines, Dec. 1997, pg. 30-37. The story of how one Kaiser hospital became baby-friendly. On page 35 it says “Kangaroo care, originally encouraged to support the development and enhance the well-being of the premature infant, is practiced in our unit as a first step in encouraging suckling and latch-on for infants separated from their mothers. These tiny, fragile babies teach us what nature has always known—nurturing is a reciprocal process and mothers and babies do it best.”. The step 4 in this article is the USA Baby Friendly step 4 that deletes KC at birth and only says help mothers
initiate breastfeeding within one hour of birth. **FT, PT, implementation, breastfeeding BF, Baby friendly. Late KC. Not on charts yet (4/29/09).**

Cleary GM, Spinner SS, Gibson E., & Greenspan JS. (1997). Skin-to-skin parental contact with fragile preterm infants. J. American Osteopathic Association, 97(8): 457-460. Case study of 29 wk GA twins given maternal and **PATERNAL KC** for 2 hrs on 19th day of life when on nasal cannula. All physiologic patterns were more stable, NO bradycardia, no central or obstructive apnea, no periodic breathing or desats during KC and this pattern persisted more than 2 hrs after KC ended. **Case study, PT FATHERS (all data collapsed and reported as Parental KC; PROTOCOLS included), HR, Bradycardia, Apnea, PB, Desats, Residual KC, twins, nasal cannula**

Clifford, PA, & Barnsteiner J. (2001). Kangaroo care and the very low birthweight infant: Is it an appropriate practice for all premature babies? J Neon Nurs, 7(1): 14-18. 7 infants at CHOP (Children’s Hospital of Philadelphia)(6 vented) who started KC from 4-32 days of birth showed physical safety could be maintained during KC. Physiol. variables remained WNL during KC, KC enables interactive relationship, promotes bonding. No exclusion criteria for KC’s use. All wore hats, covered by blanket and parent’s shirt. Smallest was 25 wks who did KC at 10 days of age at 680 grams. Minimum KC was 30 minutes, range was 58-84 mins of KC. 2 infants had UA lines, 6 with PICC lines. Stability of baseline HR, No brady, no HR drift, no apnea, no cold stress and temp stability was maintained. **Vent KC, bonding, HR, Brady, Apnea, temp, stability, micropreemie, PT**

Clifford PA, Stringer M, Christensen H, & Mountain D. (2004). Pain assessment and intervention for term newborns. J Midwifery Womens Health 49 (6), 514-519. She begins with review that infants perceive pain even previable fetuses. Review of NIPS, CRIES, PAIN, and OPS scales. On pag 516 she says “skin-to-skin contact is an effective intervention during heel lance procedures for blood assays. The physiologic mechanisms supporting tactile-induced pain reduction are not known, but it is theorized not to be opioid-mediated”( cites Gray et al. 2002 as source). “Prior to a painful procedure, implementation of one of the nonpharmacologic interventions should be used.”(517). Interventions available to reduce or eliminate pain, such as KC, are discussed in this review article on term infant pain. KC effectively manages newborn infant pain. **Review, Fullterm, pain**


CNN (Cable News Network), (2010). Mother brings miracle baby back to life after 2 hours! August 28, 2010. This is the report of a twin 27 weeker who the obstetrician tried to resuscitate for twenty minutes, could not do so, and gave the “dead” baby to the mother, saying “Your son did not make it.” The report came from a newspaper in the United Kingdom and was picked up by CNN. The report shows pictures of the parents grieving when given the baby, and the mother put the baby in skin to skin contact and the gasping that had occurred occasionally (and which was viewed as reflex, death throes gasping) became more regular and then the baby started gasping regularly and moved and grabbed the mother’s finger, licked breastmilk off her finger and then looked at her. Baby is presented 5 months after birth and is doing well. **PT, miracle baby, end-of-life care/compassionate KC. See also Today Show , 2010. Nils Bergman suggested that the infant was so stressed by preterm birth that his HPA axis just put him in disassociated mode and systems shut down and the best survival program he could mount was occasional gasps and that heart beat must have been very rare and barely audible and that is why they could not pick it up, and then when given to mother, vagal nerve parasympathetic drive took effect, helped medulla oblongata regulate heart beat and respirations, and infant recovered enough to survive. There is a story of one infant saved by KC in Ludington & Golant 1993 book. I checked with a pediatric neurologist who believes the baby may have had a pdp that was open and as soon as it closed (usually do so within 20-30 mins of birth if they will spontaneously close) he recovered, but the pediatric neurologist said that he knows babies who have been “barely alive” for many minutes and then revive. Dr. Christine Smilie also wrote to me and stated**
that as a resident 25 years ago she was the pediatrician at a delivery of a 24 weeker who was 425 grams and was told that they don’t do anything to save babies under one pound except support the family. So she gave the baby to the parents and stayed with them to support them and the baby made gasping breathing movements irregularly and parents held the swaddled infants for many hours because the baby stayed like that for many hours before succumbing. Today, Dr. Smilie wonders if they should have done KC for that baby, because he lived a long time after birth and might have been helped by KC. **PT, End-of-life KC** To comment on CNN news briefs about Kangaroo Care as occurred with the miracle baby brought back to life August 328, 30, 31 and Sept. 3, 4, 2010, write to vcm@cnn.com (VCM stands for viewer communications management. See also Daily Mail 2010 and Today Show 2010 on bib.

Cohain, J.S. (2010-2011). Waterbirth and GBS. *Midwifery Today, International Midwife, Winter*, 96: 9-10. No DOI. A report of one case of Group B Strep among 4432 water births, a rate of GBS that is significantly less than when infants are born out of the water (called DRY birth). One of the reasons given for the low rate of GBS infection is that skin to skin contact at birth promotes health and in waterbirth, the infant is immediately placed on the mother’s chest skin to skin even before cord is cut. She cites the Miracle baby report that BIRth KC even helped bring back a dead baby in Australia (see CNN, Today Show, Daily Mail citations for this too).


Collados-Gomez, L., Aragones-Corral, B., Contreras-Olivares, L., Garcia-Feced, E. & Vila-Piqueras, M.E. (2011). Assessing the impact of kangaroo care on preterm infant stress. *Enfermeria Clinical*, 21(2), 69-74. NO DOI. Quasi-experimental, one group pretest-posttest study in Spain to determine if 51 29-34 weeks postmenstrual age preterm infants in an incubator has less physiologic stress symptoms (HR, irregular breathing, apnea, oxygen saturation drop) and lower behavioral stress response(trunk arching, hyperextension, very open fingers, contraction of facial muscles, irritability and exaggerated/sustained extension of arms and legs). Basal stress (in incubator), during KC, and after KC were measured. No loss of subjects. Statistically different variables after KC were irregular breathing, trunk arching, hyperextension, very open fingers, contraction of face muscles, apnea, irritability, and exaggerated /or sustained extension of arms and legs. Oxygen saturation was 94.73% +/-3.05% before KC, 95.92 +/-2.97% after KC. HR ranged from 158.14 +/-17.48 bpm before KC and 151.47 +/-4.47 bpm after KC. KC is related to a decrease in occurrence of neonatal stress variables, helping to organize motor and physiologic systems to achieve state of tranquility. **PT, pretest-posttest, ventilated KC, HR, Sao2, apnea, crying, STRESS** Not on charts 5.19.2011


Colonna F, Robieux I., Santin E., Camper M, & Nadalin, G. (2009). Fathers in the operating room and early skin-to-skin contact during cesarean section: it can be done! Quader ni ACP, 16(1): 10-14. This relates information about fathers in the operating room and having skin to skin contact during cesarean section, saying it can be done. **PT, Cesarean section, Paternal KC, BirthKC/VEKC. NEED TO GET THIS. CAN’T FIND IN US 8/15/09.**


Colson, S. (2008). Bring nature to the fore: The nature-nurture debate and breastfeeding competencies. *The Practising Midwife*, 8(11), 14-19, “Taken together with known physiological benefits associated with skin to skin contact during the first ostnatal hour, the importance of supporting a hormone-enhancing postnatal environment conductive to breastfeeding initiation may be an urgent midwifery priority” (pg.14 ) and in Table 1 on page 14 it states, “Midwifery breastfeeding competencies . The overall aim is to provide a hormone-enhancing environment that supports the initiation of exclusive breastfeeding. 1. Biological nurturing, 2. Skin to skin contact, 3 hospital acquired infection,
mother baby nurturing diary, oxytocin, breast-bottle feeding reflex assessment, “ The rest of the article addresses in a very small way that skin to skin is part of a midwife’s knowledge and practice competencies. **Review, PT, FT, BF, Birth KC** NOT ON CHARTS AS OF 10/29/09.

Colson S.D., Meek, J.H., & Hawdon, J.M. (2008). Optimal positions for triggering primitive neonatal reflexes stimulating breastfeeding. *Early Human Development*, 84(7): 441-449. Qualitative and descriptive quantitative study of Biological Nurturing position and regular breastfeeding position on number of Primitive Neonatal Feeding Reflexes seen. This is not a KC study, but she talks about the KC position (prone, chest to chest while mother is at 15-25 degree incline rather than vertical) as being BIOLOGICAL NURTURING because in this position the 17 Primitive Neonatal Reflexes (sucking, swallowing, rooting, hand to mouth, swiping breast, head turn, head bobbing) are expressed more often than when mom is upright and holds infant at side. **FT, Descriptive, Prefeeding behaviors, position.** NOT A KC STUDY

Conde-Agudelo, A., Belizan, J.M., & Diaz-Rosello, J. (2011). Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Systematic Review, (3): CD002771 (Update of Cochrane Database Systematic Review 2003 (2): CD002771) 3rd one below. 16 studies, 2518 infants filled inclusion criteria. 14 RCTS tested KMC in LBW infants AFTER stabilization, one evaluated KMC in LBW before stabilization, and one compared early onset KMC with late onset KMC in relatively stable LBW infants. 11 studies used intermittent KMC and 5 evaluated continuous KMC. At discharge or 40-41 weeks postmenstrual age, KMC was associated with reduction in risk of MORTALITY, (RR=0.600 in 7 trials of 1614 infants; risk of **nosocomial infection** (RR=0.42) at discharge, 6 months(266,384),(309,399), and latest follow-up and decreased risk of respiratory tract infection at 6 months – pg. 15 – all finding in intermittent KC groups but not in continuous KC groups). No differences in **diarrhea or readmission** to Hospitals (pg. 16), **hypothermia** (RR=0.23) at discharge, **length of stay** (mean difference 2.4 days). At latest follow-up, KMC was associated with a decreased risk of MORTALITY (RR=0.68; 9 trials, 1952 infants) and severe infection/sepsis (RR=0.57). KMC was found to increase some measures of infant **growth** (weight gain) per day mean difference of 3.9 grams; and **head circumference gain** per week-mean difference of 0.18 cm – but no differences in weight gain, head circumference and length at discharge or term age - pg. 16, **Breastfeeding** (increased likelihood of BF and **exclusivity of BF** at discharge, 1-3 months, and results same for intermittent as continuous KMC), and **mother-infant attachment and satisfaction** with birth experience (pg17). “Data support the use of KMC in LBW INFANTS as an alternative to conventional neonatal care mainly in resource-limited settings. Further info is required concerning effectiveness and safety of early onset continuous KMC in unstabilized LBW infants, long term neurodevelopmental outcomes, and costs of care” (pg.2). “Although current evidence is mainly limited to the use of KMC in low/middle income countries, there is emerging evidence that use of KMC could improve breastfeeding rates in high income countries. Subgroup analyses suggest that both continuous and intermittent KMC are beneficial for stabilized LBW infants.” (pg. 20). “There is a clear need for randomized trials with an adequate sample size that evaluate the use of continuous or intermittent KMC in high income settings and report results mainly on infant mortality.” (pg. 20). Only 5 randomized controlled trials (256 infants; study were Bier 1996; Neu 2000, Roberts 2000, Rojas 2003, Whitelaw 1998) met inclusion criteria. “Although some data are available on long term neurodevelopmental outcomes, continuing follow-up and additional data of randomized children are justified as more subtle difference in later childhood may become apparent (and cites Roberts C, Anderson PJ, Doyle LW, & Victorian Infant Collaborative Study Group. 2010. The stability of the diagnosis of developmental disability between the ages of 2 and 8 in a geographic cohort of very preterm children born in 1997. Arch Dis Childhood 95(10), 786-790). “ pg 20 for quote. “Further well-designed economic evaluations are needed to assess the cost effectiveness of KMC in low, middle, and high income seings. (pg. 18 says Cattaneo 1998 said cost of care was 50% less for KMC (US $19,289 vs. $39,764 and Sloan 1994 found it cheaper for KMC too). Further exploration of mother-infant attachment should be included in future trials as this element is inconsistently evaluated across studies.” (pg. 20). **PT, meta-analysis, Mortality, Infections, hypothermia, length of stay, growth (weight gain, head circumference) breastfeeding and exclusivity of BF, maternal-infant attachment and satisfaction, developmental outcome, cost of KMC, research needs.** NOT ON CHARTS 5/2/2011

Conde-Agudelo A, Diaz-Rosello JL, Belizan JM. (2000a). Kangaroo mother care to reduce morbidity and

Conde-Agudelo A., Diaz-Rossello JL, Belizan JM. (2000b). Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Review. In: The Cochrane Library, Issue 4,2000. Oxford: Update Software. Available from www.nichd.nih.gov/cochrane/neonatal. Analyzed 3 24/7 KMC studies (Sloan 94; Charpak 97, Cattaneo 98) and concluded “all studies were of moderate to poor methodology. No evidence of difference on infant mortality, Decreased severity of illness, decreased respiratory distress, decreased maternal dissatisfaction with care, decreased perception of social support in NICU, increased exclusivity BF, increased weight gain, increased maternal competence (p.3), but says that methodological quality of trials weaken credibility of findings and that “there is still insufficient evidence to recommend its routine use in LBW infants. Well designed RCTs are needed.”(pg. 3). Only one outcome of the meta-analysis was KMC reduced likelihood of NOT EXCLUSIVELY BF at discharge.META-ANALYSIS.

Infection, WGT, BF., LOS, mortality, severity of illness, respiratory distress, maternal satisfaction, social support, mat.competence, PT.

Conde-Agudelo A., Diaz-Rossello JL, Belizan JM. (2003). Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Systematic Reviews, (2): CD002771. This is the Feb. 11, 2003 update. They reviewed 5 new studies out through Dec. 2002 (Tessier et al., 1998 was one). ALL STUDIES HAVE TO BE 24/7 KMC, not intermittent KC). No RCT met criteria for review (weaknesses were blinding procedures for those who collected outcomes, handling of drop outs, completeness of follow-up) so recommendations are not changed. Results of new studies (but not meta-analysis) for Mortality (no difference), Infection (decreased in KC), BF (More exclusive BF in KC), Readmissions (no differences), Weight gain (significantly more in KC), psychomotor development (no differences at 12 months), maternal competence (sig. better in KC), hypo & hyperthermia (sig. less in KC), cost (50% less for KC), and length of stay (KC= 4.5 days, control – 5.6 days)are reported on pages 8-10 and based on three studies of 1362 infants, all tested in developing countries. Available through www.nichd.nih.gov/cochrane/conde-agudelo/conde-agudelo.htm PT, Meta-analysis – no new results, but reviews several individual studies WGT, Infection, Temp, LOS, mortality, severity of illness, respiratory distress, maternal satisfaction, social support, mat.competence.

Conde-Agudelo A., Diaz-Rossello J.L. & Belizan, J.M. (2007). Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database of Systematic Reviews, Issue 4, Art No: CD002771. DOI: 10.1002/14651858. CD 00271. Purpose was to determine if there is evidence to support the use of KMC in LBW infants as an alternative to conventional incubator-based care after the initial period of stabilization with conventional care. Three studies, 1362 infants were reviewed. All trials were in developing countries, were of moderate to poor methodological quality, particularly in blinding procedures, handling drop outs, completeness of follow-up. Most are results of a single trial. KMC (24/7 KC) associated with reduced risk for nosocomial infection at 41 wks corrected age, lower respiratory tract disease at 6 months, severe illness, not exclusively BF at discharge, and maternal dissatisfaction with method of care. KMC infants gained more weight/day (3.6 gm difference) by discharge, improved maternal competence scores, maternal perception of social support during NICU were worse for KC group. Psychomotor development at 12 months was same for both groups and no difference in mortality. KMC appears to reduce infant morbidity without any serious deleterious effects, but there is still insufficient evidence to recommend its routine use in LBW infants. Well designed RCT of this intervention are needed.” (pg. 2) PT, Meta-analysis, SINGLE TRIAL of KC, not repeated KC, Infection, Weight gain, morbidity, maternal satisfaction, maternal competence, social support, development, mortality, need good RCTs.

Cong X, Cusson RM, Hussain N, Zhang D, & Kelly SP (in press). Kangaroo care and behavioral and physiologic pain responses in very low birth weight twins: A case study. Pain Management Nursing, in press. Crying, heart rate variability, and PIPP responses in 28 week GA twins receiving 30 mins of KC, 15 mins of KC, and incubator care before, during and throughout heel sticks conducted over three consecutive days (one procedure per day) showed that the twins cried more and had higher PIPP pain score by two or more points and tachycardia during heel stick in the incubator than in KC. Infant B had a desat (SaO2 <80%) and tachycardia (HR>180) event by the end of the heel stick squeezing and a bradycardic (HR<100) event during recovery in the incubator. HR rise was higher in incubator than...
in KC 15 and KC30. LF/HF ratio was lower in the long and short KC conditions compared to incubator. Both longer and shorter KC helped reduce infant pain. More behavioral state quiet sleep in KC than incubator and more active sleep and awake time in incubator than KC during the baseline period. More crying in incubator (424 secs in one baby and 190 sec in other) than in KC (52for one baby and 72 seconds for other). PIPP was more than 2 points higher for both infants in incubator than KC during heel stick and recovery phases. No diff in PIPP between KC 30 and KC 15 mins. HRV ratio returned to baseline within 5 minutes after heelstick in KC, but increased more in the incubator group. Higher HF and LF values in KC15 than KC30 across all phases. Data suggest that KC30 is best duration, differences between the twins were not explored, and offered no explanation why KC30 data differed from KC15 data. PT, Case study, HR, Tachycardia, bradycardia, PIPP, crying, HRV, desat, pain Not on charts 2/4/2011

Cong X, Cusson, R.M., Hussain, N., Ludington-Hoe, S.M., Walsh, S., & Zhang, D. (2012). Effects of Kangaroo Care on autonomic responses in preterm infants undergoing heel stick pain. Under review at Pain. A randomized cross over trial to determine effects of longer (30 mins) vs. shorter (15 mins) of KC or incubator before and throughout a heelstick. Heart rate variability (Low frequency, high frequency and LF:HF ratio) were measured throughout baseline, heel warming, heelstick and recovery in 26 stable infants <32 weeks GA and 4-27 postnatal days old. HR changes from baseline to heel stick were significantly higher in incubator care than in either KC (more stable HR), and more infants experienced decreased HR in incubator than in either KC condition, LF and HF increased from baseline to heel stick and then decreased from heel stick to recover with incubator care; no significant changes in LF and HF were seen in either KC condition across all periods (more stable LF and HF). LF and HF were higher in heel stick phase in incubator than in KC 30 minute infants. LF/HF ratio decreased from baseline to heel stick and recovered during the recovery period in all groups and no differences between the groups in any period for the ratio were found. Infants had more quiet sleep in the two KC conditions than in incubator. Both longer and shorter periods of KC stabilize autonomic control during painful procedure in preterm infants. PT, randomized cross over, stability of HR, and HRV, sleep. Not on charts as of 5/2/2011.

Cong X, Ludington-Hoe SM, McCain G, & Fu, P (2009). Kangaroo care modifies preterm infant heart rate variability in response to heel stick. Early Human Development, 85(9), 561-567. Doi: 10.1016/j.earlhumdev.2009.05.012 Randomized cross over trial of 14 preterms 30-32 weeks GA and less than 9 days old had behavioral state(Anderson Behavioral State Scoring System), Heart rate, heart rate variability indices taken over 20 minute baseline, heel warming(5 minutes), heel stick (15 seconds) and squeezes 0.5-10.0 minutes) and recovery (20 minutes) in KC after 60 minutes of KC or undisturbed incubator care. In baseline KC infants had 65% QS (incubator had 60 %), in heel warming both groups had 65% time in QS and 22% time in AS, during heel stick 65%KC and 64% incubator infants cried. During recovery in KC 57% time in QS and in incubator 48% time. NO differences in behavioral state. HR was significantly lower in KC (146±9) than incubator (152±13 bpm) during baseline and during heel stick (KC=159±14; incubator = 165±14). Low and high frequency and increased with heel stick and dropped in recovery in both conditions. LF/HF ratio was lower during heel stick than all other phases in both conditions. LF was higher in KC at baseline and heel stick than in incubator, and HF was higher in KC than incubator at baseline. LF/HF ratio was lower during recovery in KC than incubator and KC had medium effect size on HRV (.35=.40). Infants experience better balance in response to KC than Incubator condition as shown by more autonomic stability during heel stick. KC may be helpful in mediating physiologic response to painful procedures in preterm infants. Randomized cross-over, PT, pain, HR, behavioral state, heart rate variability.

Cong X, Ludington-Hoe SM, & Walsh S. (2011). Randomized cross over trial of kangaroo care to reduce biobehavioral pain responses in preterm infants: a pilot study. Biological Research for Nursing, 13(2), 204-216. DOI: 10.1177/1099800410385839 or http://brn.sagepub.com. Published online at http://brn.sagepub.com/. 2 Randomized cross over trials (one of 80 mins of KC before heelstick[n=18] and the other of 30 minutes of KC before heelstick[n=10]) of 14 preterms 30-32 weeks GA and 2-9 days old who had Premature Infant Pain Profile (measured every 30 sec), serum and salivary cortisol. Salivary cortisol measured at end of baseline and recovery; serum taken with heel stick. Phases were baseline(20 mins), heel warming (5 mins), heel stick (0.5-10.0 mins) and 20 minutes recovery for kangaroo care heel stick one day and incubator heel stick the next (or vice versa). 3 covariates were previous KC experience, # of previous painful procedures, and severity of illness. Length of KC heelstick was longer in 80 min study because
phlebotomist had difficulty getting blood in KC position; no differences in heelstick time in 30 minute study because different phlebotomist was used. Outcomes: no differences in PIPP scores between KC heelstick and Incubator heelstick with 80 min KC and no other outcome differences; 30 mins of KC showed lower PIPP at 4 points during Recovery (KC = 4.9, 4.8, 4.5; IH = 5.7, 6.2, 6.0 respectively) and lower PIPP (more than 2 points) during KC heelstick than during incubator heel stick and returned to no pain 3 minutes earlier than incubator heelstick; lower salivary cortisol at end of Recovery(KC=0.21 ug/dl; IH= 0.57 ug/dl), and lower serum cortisol during KC heelstick (5.63 ug/dl) than incubator heel stick(9.15 ug/dl). Better pain reduction with 30 minutes of KC than 80 minutes of KC before starting the heel stick procedure. No carry over effects of KC were found. Randomized cross over trial, PT, pain, PIPP, salivary and serum cortisol, residual effects

Conn, N., & Discensa, D. (2009). *The Preemie Parent’s Survival Guide to the NICU – How to Maintain Your Sanity and Create a New Normal*. Burke, VA: PreemieWorld, LLC. This is a great book about surviving the NICU and , of course, it relates doing Kangaroo Care in many places throughout the book. Available for $24.95, has 191 pages, and go to [www.preemieworld.com](http://www.preemieworld.com) or see review under Snyder, 2012.

Constantinou JC, Adamson-Macedo EN, Stevenson DK, Mirmiran, M, Fleisher BE. (1999). Effects of skin-to-skin holding on general movements in premature infants. *Clin Peds, 38*(8), 467-471. Videotaped infants at Stanford Hospital for 60 min. preKC and 115 min.postKC to count gross movements using CION1 scale. KC by mothers and fathers lasted mean 72 min. and took axillary temps preKC, kc and postkc. Axillary temps did not change significantly across all 3 periods; infants spent 20.37% preKC and 21.47% postKC time in gross movements. Rest/activity of preterm infants is unaltered FOLLOWING KC (Did not look at movements during KC). Says results are similar to de Leeuw. PT pretest-posttest, own control. Activity (gross movements), Axillary temps. Paternal KC, Residual effects, motor devel


Cosimano, A. & Sandhurst, H. (2011). Strategies for successful breastfeeding in the NICU. Neonatal Network, 30(5), 340-343. In this review of interventions to promote BF of preterm infants, on page 340 under “Feeding Cues” it is written “If the baby is overly agitated, it is recommended that attempts be made to comfort the baby. This can be done by placing the premature infant skin-to-skin on mother’s or father’s chest, otherwise referred to as kangaroo care, which also aids in the bonding process.” That is all there is folks, about KC, in the whole article and there are no pictures of kangaroo care either. PT, Review, breastfeeding, agitation. Not on Charts 9/7/2011.

Council of International Neonatal Nurses. (2010). *Clinical Practice Guideline: Late Preterm Infant*. Available on the website [www.coinnurses.org](http://www.coinnurses.org) under documents/Guidelines. Accessed 8/29/2011. On Page 2, it has a category of Thermoregulation, and the first bullet under the subheading Thermoregulation is: “Initiate skin-to-skin contact with mother to facilitate temperature regulation of the infant.” (2nd bullet): “Maintain skin-to-skin as much as possible,” (3rd bullet) “Place in an isoloette or a radiant warmer when not skin-to-skin until infant able to thermoregulate. IF an isoloette or warming device is not available, then swaddle and warm as possible. Use of skin warmer is another option.” All quotes are on page 2. PT, temperature, guidelines. Not on charts 8/29/2011

Council of International Neonatal Nurses. (2011). *Position Statement on Care of the Well Term Infant.* Available on the website [www.coinnurses.org](http://www.coinnurses.org) under documents/Position Statements. Accessed 8/29/2011. On page 1 of the document, it is written: “…COINN supports and recommends the following basic care of well term babies: and item #4 is “during this time (transition to extraterine life) and throughout hospital stay on-going contact with mother is encouraged for breastfeeding and bonding.” “#5: Maintain thermal environment to prevent hypothermia. Actions to be taken are immediate drying after birth, provision of warmth, positioning and clothing and skin-to-skin care.” *FT, Birth KC, guideline.* Not on Charts s8/29/2011


Craig S, Tyson JE, Samson J, Lasky RE. (1982). The effect of early contact on maternal perception of infant behavior. *Early Human Dev.* 6, 197-204. Healthy term infants randomly assigned to KC or routine care. 23 KC placed in KC on chest covered by blanket and then wrapped for move to recovery room and then returned to KC on mother for approx 1 hr. 26 routine care infants(infant wrapped, given to mom for 10 minutes then taken to nursery). Home visits made one month after delivery and mothers interviewed regarding experience of pregnancy, delivery, and first pp months and Broussard Maternal Perception of Infant and Infant Behav Record. Moms in both groups perceived infants as less difficult than average infant and no differences between groups seen with one hour of contact, in either male or female infants. *FULLTERM, perception of infant, maternal feelings about birth experience*

Creedy DK, Cantrill RM, & Cooke M. (2008). Assessing midwives’ breastfeeding knowledge: Properties of the Newborn Feeding Ability questionnaires and Breastfeeding Initiation Practices Scale. *International Breastfeeding J.* 3(7), 1-12 (on line journal only so pages are 1-12) Retrieved 8/22/08. Available from [http://www.internationalbreastfeedingjournal.com/content/3/1/7](http://www.internationalbreastfeedingjournal.com/content/3/1/7). This is development of a healthy term newborn feeding ability tool which is a questionnaire for health professionals to determine what they know about newborn infant breastfeeding and how to help it. One of the five factors that really relate to breastfeeding is congruent with knowledge about skin-to-skin contact. Has many questions about KC too. *Full term, feeding ability tool, BF. Not on charts yet.*

Crenshaw J. (2007). Care practice #6: No separation of mother and baby, with unlimited opportunities for breastfeeding. *J. Perinatal Edu.* 16(3), 39-43. This is an update of the Jeanette,Klaus & Klaus 2004 statement of Rule #6 of the Six Care Practices that Support Normal Birth by the Lamaze Institute for Normal Birth. This one reviews the evidence for non-separation after birth and reviews influence of early and frequent skin-to-skin contact and rooming in on breastfeeding and early attachment. “Women are encouraged to choose a birth setting that does not routinely separate mothers and babies and to plan for early and frequent skin-to-skin contact and rooming-in.”(pg. 39). “Lamaze International joins with the many organizations that recommend keeping mothers and babies together after birth. Lamaze International recommends that you give birth in a place where you and your baby can be together without unnecessary interruptions. If you are having a baby, tell your caregiver that you plan to hold your baby skin-to-skin after birth and keep your baby with you throughout your stay.” (pg 41-42). *FT, BF, separation, Birth KC, Guideline*

Crenshaw, J.T., Cadwell, K., Brimdyr, K, Widstrom, A.M., Svensson, K., Champion, J.D., Gilder, R.E. & Winslow, E.H. (2012). Use of a video-ethnographic intervention (PRECESS Immersion Method) to Improve skin-to-skin care and breastfeeding rates. *Breastfeeding Medicine, FE b7* epub ahead of print. Descriptive study of 11 mothers who were observed during the PRECESS 5-day training period, called Part 1 of the study.. Part 1 was the part in which the first stage was teaching skin-toskin contact to nurses in a US hospital by having them dobirth KC while being filmed and then reviewing their performance on the film (called reflection) and completing some educational content over a 5-day period (she calls this 5 day education/training program PRECESS Immersion Method (P=Practice, R=reflection, E=education, C = combined with E=ethnography [using video in situ], for S= sustainable, S = Success) and then the second part was review of medical records for three months starting the day after PRECESS ended. During part 1, 10(91%) of the mothers received Birth KC, 8(73%) also got uninterrupted KC until end of first breastfeed, 9 moms
intended to BF and 6 of them were exclusively BF at discharge, and five of the six babies (83%) who completed all nine instinctive stages during Birth KC were exclusively BF at discharge. Over the three month observation a significant improvement (25% greater than baseline) in number of moms getting birth KC occurred (p<0.000), predominantly by increasing the number of cesarean birth mothers who got KC. FT, Cesarean, Birth KC, BF at discharge, exclusive BF, maternal stress and maternal satisfaction.

Crenshaw J, Klaus PH, & Klaus MH. (2004). #6: No separation of mother and baby with unlimited opportunity for breastfeeding. J. Perinatal Education 13(2), 35-41. See Crenshaw. A position paper providing the evidence for Lamaze International’s guidelines for normal birth. #6 has to do with non-separation and provides the evidence for skin to skin care immediately after birth (cry less, stay warmer, breathe easier, instinctively attach and start to breastfeed usually within an hour of birth). They recommend Birth KC on page 41 and say do not dry the infant’s hands and have good review of the hormonal cascade begun by KC. Birth KC, Full term, separation, breast search, latch, guidelines, infection (says same thing as WHO 1998). This is same as Jeanette Crenshaw citation which is how it appears in Pubmed.


Cristo M, (2002). Get this from Rejean Tessier. I don’t have it. Has to do with maternal feelings of competence and adaptation to mothering role PT.

Curry, MAH. (1979). Contact during the first hour with the wrapped or naked newborn: Effect on maternal attachment behaviors at 36 hours and three months. Birth and Family J. 6(4), 227-235. 20 women randomly assigned to wrapped (11) or naked baby (9)during 1st hour after birth- started after 5 min APGAR and continued for 17-49 minutes. Blanket across the infant’s back. Behav observed for 15 sec each minute x 15 minutes at 36 hrs postbirth and at 3 months of moms at play. NO diff in attachment behaviors at either time. Temps taken q 15 minutes to be sure it was ok. FULLTERM, Temp, Maternal Behavior, RCT, swaddled, Birth KC/VEKC

Curry, M.A.,(1982). Maternal attachment behavior and mother's self-concept: The effect of early skin-to-skin contact. Nursing Research, 31(2), 73-78. 11 Controls (wrapped infant) vs. 9 KC infants. Maternal attachmentat 36 hours and 3 months postbirth, FULL TERM. Attachment behaviors, Self concepts. VEKC??When did KC begin?

Dabrowski, G. A. (2007) . Skin-to-skin contact. Giving birth back to mothers and babies. Nursing for Women’s Health, 11(1): 64-67. This is a clinical report that starts with national recommendations for KC and then proceeds to relate how intrapartum community hospital nurses proceeded to implement birth KC. Starts with review of KC benefits to mother-infant interaction, thermoregulation, analgesia, breastfeeding and transition to extrauterine life. The next section is implications for practice (i.e. put under radiant warmer or in KC ? Maintaining flexibility is important, start telling moms about practice before labor, etc.) and then relates their “one hospital experience” which cites that parents had read of KC on web and wanted it when they came to deliver, so hospital initiated change and this is report of change to incorporating KC immediately after birth (but common practices limit birth KC). Speaks to continuing resistance from neonatologists and others (pg. 70) and concludes with websites for further information. KC is the most helpful way a mother can provide healthy care for her infant. FT, Birth KC, implementation. Not on charts yet.


Dageville, C., Casagrande, F., De Smet, S., & Boutte’, P. (2011). The mother-infant encounter at birth must be protected. *Archives de Pediatrie, 18*, 994-1000 DOI: 10.1016/j.arcped.2011.06.007 NOT a KC Study. This is a review of literature of mammals and humans and epigenetic research showing life-course changes due to separation. The medical decision to separate newborn from his mother is frequent and is not a BENIGN decision and should be evaluated. (Dr. Barbara Morrison’s comment: Is this a real decision or just a blanket practice that is no longer thought about nor questioned). There is physiology related to maternal-infant interactions and negative consequences of disrupting their interactions around birth. Mother infant bonding is common in all mammals and attachment is the result of 4 mechanisms: behavioral programming, secretion of neuroendocrine substrates, activation of sensory cues, and breastfeeding. BF plays a crucial role. Research has shown that early-life maternal separation can alter biological responses to stress, disturb learning behaviors, and impair social skills throughout the life span. Neonatal maternal deprivation at birth can lead to biological and behavioral disorders in adulthood. Recent advances in epigenetic research may partly explain how neonatal maternal deprivation at birth can lead to biological and behavioral disorders in adulthood. Separating a newborn from his mother is NOT harmless and must be carefully considered. Organization of perinatal care should be revised in France to take into consideration these results of separation. Full term infants should be allowed to be with mother at birth. PT, FT, Review. *Birth KC, separation, stress, interactions, environment, NICU separation, hormones, attachment, BF, Not on charts 8/19/2011.*

Dageville C, Pignol J, & De Smet S. (2008). Very early neonatal apparent life threatening events and sudden unexpected death: Incidence and risk factors. *Acta Pediatrica 97*(7), 866-869. *Prospective* study. Purpose was to determine risk factors for neonatal death within 2 hours of birth. Over one year at 22 hospitals, 62,968 live births, 2 neonatal life threatening events, no deaths. *First baby* (Apgar 9-10, NSVD,39 wks, 3080 g) had complete recovery and the *second infant* (Apgars 9-10, 38 wks, 3180 gsm, NSVD) had cerebral palsy. Rate for life threatening events and deaths was 0.032/1000 live births. Very slight. Less than usual for live births. Infants had to be 36 wkGA or more and ALTE had to occur in first two hours of life. ALTE criteria were marked palor/cyanosis, major hypotonia or stiffness with no apparent movement, requires at least vigorous stimulation and cardiopulmonary resuscitation. Transfer to NICU if previous measures are successful, lack of evidence of any underlying condition following appropriate investigations. Also reviewed 23 previous reports if they met the following criteria: were full term healthy neonates, had occurred in first two hours after birth, was characterized as ALTE, sudden death, near death, or sudden unexpected death. Risk factors were being left alone in Delivery room while mom gave KC, primiparous mother, infant was prone, and mother and baby alone in delivery room. Life threatening event in first 2 hours post birth is very uncommon. The common feature in 23 published cases of healthy full term infants during the first 2 hours of life revealed that all were primips, in skin-to-skin contact, and mother and baby were left on their own in the DR. During this critical adaptation period, ALTEs could be due to undetected perinatal events, congenital disease or malformation. The 23 cases of babies who were in KC at time of event were reported by Kuhn (2 cases), Gatti (6 cases), Espagne (2 cases), and Hays (11 cases). Of these 23 cases, 12 died and 8 had autopsies. When in Birth KC the healthy term infant has 5 of the known risk factors for conventional sudden infant death: bed-sharing, prone sleeping position, face down, head covered, soft bedding (on mom’s abdomen, chest, or breast) (AAP Task Force on Infant Sleep Position and SIDS. Changing concepts of SIDS: Implications for infant sleeping environment and sleep position. Pediatrics 2000, 105, 650-656.). Add to this a drowsy mother who is left alone with her neonate, and surveillance may be lacking on part of the staff - all can lead to fatal episode. KC between mom and infant left alone in delivery room may constitute the main risk situation. “neonatal ALTE or sudden unexpected deaths during the first 2 hr after birth are possible albeit very rare. Skin-to-skin contact between the mother and infant left alone in the delivery room could be the main risk situation. This must not lead to reconsider skin-to-skin contact that has been proven beneficial and seems per se almost safe, but must induce maternity staff to pay particular attention to a skin-to-skin infant when left alone with its mother.” (pg. 866 and 868). Autopsy confirmed findings. No hospital had any written procedure describing the conditions of surveillance of skin-to-skin neonates. *Fullterm, Birth KC, life threatening event, bradycardia, apnea, autopsy to confirm birth or prebirth damage, guidelines. See also Foran, 2009 for autopsy confirming prebirth damage from birth damage, but*
Foran is not a KC study. So it is on the life threatening chart only, and not in this BIB) NO POLICY.


Dalbye, R., Calais, E. & Berg, M. (2011). Mother’s experiences of skin-to-skin care of healthy full-term newborns – a phenomenology study. Sexual and Reproductive Healthcare, 2(3), 107-111. 20 women gave KC starting at birth and continuing until end of first breastfeeding or at 2 hours of life and were interviewed one-to-two weeks later. Mothers related that babies liked KC, it stopped crying and irritability, and that maternal-infant affinity was increased. Moms wanted to give infant the BEST CARE (p. 109), and KC started a positive spiral. A mutual interaction developed which acted as a generator releasing energy to the mothers who wanted to continue the practice which increased mother-infant affinity, and increased naturalness and well-being. Happiness, peace and satisfaction were expressed by newborns, and crying/troUBLEsome infants responded positively to KC. KC “is unlike anything else” (pg. 109), is “wonderful, cozy, intimate, creates security, harmony, joy and tranquility.” Some mothers expressed worry about falling asleep and dropping the baby or losing their grip when doing KC. Article states “Perhaps this fear could be reduced or even eliminated if togetherness of mother and child became an established routine” (pg. 110, but I think this must mean that if it is routine, moms will talk and support and educate each other so this is not longer a concern, PERHAPS!!). Big barrier to doing KC at home is inadequate support from relatives and negative attitude in a male dominant culture (pg. 110). This stresses the importance of family members and partners and relatives and friends to have good knowledge about the method and its benefits. Descriptive, qualitative. Full term. Birth KC, maternal feelings, crying, home KC, post-discharge KC, barriers. NOT On charts 7/22/2011.

D’Apolito KC (2006). State of the science: procedural pain management in the neonate. J Perinat Neon Nurs 20(1): 56-61. A review of non-pharmacologic approaches to pain reduction. Page 58-61 has section on KC that page 59 says “5 studies have examined efficacy of KC versus placement in a bed, warmer, or incubator during a heel stick in preterm newborns”. “the average newborn gestational age was 31-33.6 weeks and all received 20-30 minutes of KC prior to heel stick. In 3 studies, HR, cry time, facial grimace, and pain scale criteria were reduced in neonates receiving a heel stick while in KC vs time spent in a bed, warmer, or incubator. (pg 60-62). “Cortisol and beta-endorphin levels were also significantly reduced for newborns receiving KC (pg. 58-59)”. “Pain reduction may relate to possible deactivation of the hypothalamic-pituitary-adrenal axis which may alter pain responses by decreasing the production of stress hormones (i.e. beta-endorphin)” (pg. 65). PAIN, PT< FT mechanisms, stress, cortisol, beta endorphin Review Cites Tsigas C, Chrousos G. 2002. Hypothalamic-pituitary-adrenal axis: Neuroendocrine factors and stress. J Psychosomatic Res 53: 865-871. NOT on CHARTS YET as of 5-20-09.


Darmstadt G, Black R, & Santosham M. (2000). Research priorities and postpartum care strategies for the prevention and treatment of neonatal infections in less developed countries. Pediatric Infectious Disease J. 19, 739-750. This article speaks to the importance of adapting KMC for use in the community and to prevent infection. Infection, community KMC, 3rd world PT, FT GET THIS ARTICLE AND PUT IN FILES.

postbirth) in the home where community-based KMC was introduced in India. Globally 2/3 of women deliver at home. 733 LBW, 971 fullterm were studied. 77% of moms gave KMC usually or almost always, 855 of moms with LBW gave KMC. Hypothermia (<36.5) was high in LBW (49.2% 361/733) and normal birthweight (43% or 418/971). If ambient temp was <20 mean infant body temp was lower than when in ambient temps>20C. Among hypothermic newborns, 42% (331/78) of their moms had lower temperatures (R=-34-37) and were 6.7 to 0.1C different from oral temperature. Acceptance of KMC was nearly universal at one month postpartum, No adverse events during KMC, KMC prevented hypothermia and protected baby from evil spirits and made babies more content. 


da Silva, L.J., da Silva, L.R., & Christoffel, M.M. (2009). Technology and humanization of the neonatal intensive care unit: reflections in the context of the health-illness process. Rev Esc Enferm USP (Portugese), 43(3), 684-689. The theoretical article reflects on technology and humanization in neonatal care. Several conceptions of health and illness are presented and how the conceptualizations influence the way we behave and think about infants in neonatal care. KMC is presented as a relational technology that provides shelter for family-baby unity in the NICU, valuing experiences and major needs of affection and comprehension.


Davanzo, R., Cattaneo, A. (1995). The kangaroo mother method. The Kangaroo, 4(1)July: p. 6-9. This is a review of Sloan (Lancet, 1994) and Charpak (Pediatrics 1994) articles with a commentary related to the recommending Kangaroo Care for implementation on a global basis. The Kangaroo is a journal published by the Bureau for International Cooperation in Maternal and Child Health and is available by writing to the address listed in Davanzo 1993. Implementation, Review, PT< FT

Davanzo, R., Travani, L, & Brovedani, P. (2010), Practical strategies for promoting breastfeeding in neonatal intensive care. Minerva Pediatrics, 62(3Suppl), 205-206. (No DOI). Current literature lists the following strategies to promote breastfeeding on LBW infants, of whom usually only 30-50% are getting mother’s milk at discharge from NICU and only 10% suckle at the breast: access at anytime for both parents to the NICU, knowledge of science of lactation and multidisciplinary training as provided by Baby Friendly, peer support in hospital, KMC, breastfeeding expression using simultaneous pumping with an electric pump especially in the first two weeks. Galactogogues and cup feeding have little benefit. Cites a Davanzo R et al, in Pediatric and Perintatal Epidemiology, 2009 study of BF practices in Italy in NICUs. KMC helps BF. PT, Review, BF. Not on charts 2.1.2011

income mothers of preterm infants who completed the Portuguese version of the Postpartum Depression Screening Scale upon admission to NICU and at KMC discharge. 66 moms were depressed upon admission (37.3%), and upon discharge from KMC unit only 30 (16.9%) were depressed. No one developed depression during KMC stay. KMC may lessen maternal depression. PT, quasi-experimental, maternal feelings, depression, KMC, 3rd world

de Almeida H, Venancio SI, Sanches MT C, & Onuki D. (2010). The impact of kangaroo care on exclusive breastfeeding in low birth weight newborns. J Pediatrics (Rio Journal), 86(3), 250-253. DOI: 10.2223/JPED.1974. Prospective comparative study of infants before and after KMC was implemented. 43 Brazilian newborns (23 = KMC, 23= controls) <2000 gm and staying for at least 7 days in NICU. KMC group infants started sucking three days before controls (infants before KMC started). Exclusive BF (even if only got expressed breast milk) rates were higher in KMC group at discharge (82.6% v 0%, p=0.00), at 40 wks pma (73.9% vs 31.6%, p=0.01), at 3 months (43.5 vs 5.0%, p =0.005), and at 6 months (22.7 vs 5.9%, p=0.20 NOT SIGNIFICANT at 6 months). KMC is facilitator of exclusive BF. PT, BF, Exclusivity, 3rd World Not on charts 2/1/2011

de Aquino RR & Osorio MM. (2009). Relactation, translation, and Breast-orogastric tube as transition methods in feeding preterm babies. J Human Lactation, 25(4), 420-426. Descriptive study of 432 prematures using retrospective chart review from IMIP Kangaroo Mother Care Unit in Northeast Brazil. AT discharge, # of exclusive BF infants was 85% (relactation program), 100% translactation program, 100% breast-OG tube program.. There were 1.6% of the cases that had feeding related problems. All three programs were efficient methods in the feeding transition of preterm infants in a 24/7 KMC unit. PT, Descriptive, BF, 24/7 KMC, exclusivity of BF. Not on charts as of 9/12/09.

de Araujo, C.L., Rios, C.T., dos Santos, M.H., & Goncalves, A.P. (2010). Mother Kangaroo Method: An investigation about the domestic practice. Cien Saude Colet, 15(1): 301-307. A descriptive study of mothers who got KMC training in the hospital to determine how Stage 3 (Home KMC) was being implemented. 100% of families got education and training in hospital, and of those, 53.3% of the mothers actually got hands-on guidance about KMC. In the home setting, 93.3% of moms positioned the babies accurately in KC, and during KC 86.7% of infants were actually ‘slightly’ dressed, 86.7% of moms were breastfeeding correctly and 86.7% of moms were exclusively breastfeeding (inferred from “not using any other devices like bottles, nipples, tubes, cups”. 46.7% of moms were giving KC for 5-6 hours/day, and 66.7% of moms identified home tasks as principal obstacle to more KC. Follow-up is less than desirable and 63.3% of moms cited lack of funds for transportation to clinic and back as reason for poor follow-up. Education in hospital facilitated practice. PT, descriptive, home-based/Community KC, BF, duration, education, follow-up, implementation.

De Chateau P. (1979). Effect of hospital practices on synchrony and the development of the infant-parent relationship. Seminars in Perinatology, III(1), 45-60. I think this is a report of practices, not a study or report of KC. We will check this out. Fullterm, synchrony, interaction


De Chateau P, & Wiberg B. (1977b) Long-term effect on mother-infant behaviour of extra contact during the first hour post partum. II. A follow-up at three months. Acta Paediatrica Scand 66,145-151.Fullterm primip moms given 15-20 min suckling and KC during 1st hr. after delivery vs control (infant taken to nursery) had sig. diff bev at 36 hrs and 3 months postbirth during free play. KC moms kissed,looked en face more and babies smiled more and cried less frequently. A greater proportion of KC moms were still BF at 3 months. Influence of KC was more pronounced in boy-mom than girl-mom pairs. Interviews revealed no diff in maternal perception of 1st week at home,infant sleeping at 3 months was same,same # had had colic and meds for colic. KC infants given night feeds twice as long, fewer reported problems with night feeding in KCs. Control moms reported more difficult adaptation to infant and needed home help longer (14.5 vs 7.6 days).FULLTERM, KCBF, BF at 3 months, maternal behavior, maternal perception, infant smile/criing, RCT, EARLY KC
De Chateau P, & Wierberg, B. (1984). Long-term effect on mother-infant behavior of extra contact during the first hour postpartum. Part III: Follow-up at one year. Scand J Soc Med, 12: 91-103. 15-20 minutes of KC during BF was given to moms and FULL TERM babies and compared to crib held infants. At 1 year, KC moms held and touched infants more frequently, talked more often positively to infant, returned to employment to a lesser extent, and had a greater proportion of infants who were sleeping in room of their own. In 4/5 parts of Gessell Development Schedule, KC babies were ahead of controls. No differences between groups on Vineland Social Maturity Scale and the Cesarec Marked Personality Scheme. KC moms breast fed 2.5mos. more. Fullterm, RCT, Early KC, KCBF, Development


de Hollanda Parisi TC, Coelho ERB, & Melleiro MM. (2008). Implantation of the kangaroo mother method in the perception of nurswswes in a university hospital. Acta Paul Enfermeria (Brazil) 21(4), 575-580. Qualitative study with purpose to understand nurses’ perception of KMC in the NICU by 5 nurses who were interviewed. The 3 themes were the decision making and awareness processes of the health care team, the intervening factors, and beliefs and feelings associated with KMC. Study showed importance of involvement of the collaborator at the institution during the processes of change and the need to provide adequate human and physical resources for effective implementation. PT, 3rd world, implementation.


de Leeuw R (1987). The kangaroo method. Ned Tijdschr Geneeskd, 131(34), 1484-1487. (DUTCH). KC was started at Academic Hospital of the Univ. of Amsterdam for a small preterm infant having intractable apneic attacks. Apneic attacks diminished due to improved breathing pattern while KC. Descriptive, preterm, apnea, breathing patterns.


de Leeuw, R., Collin, E.M., Dunnebier, E.A., & Mirmiran, M. (1991). Physiologic effects of kangaroo care in very small preterm infants. Biology of the Neonate, 59(3), 149-155. Clinical observation study using pretest-test-posttest (each period = 1 hour) design of 8 preterms (27-29wks GA, M=28 wks; bw 770-1465 M=1104g) given one hour of maternal or paternal KC when clinical condition allowed (after days of ventilation and O2 support by CPAP or hood for irreg breathing with apneic attacks). Infants wore hat and blanket, parents sat in upright chair. Some had CPAP or O2 by mask during KC. KMC done randomly in am or pm. Mean entry age = 18.1 days, HR, RR, TcpO2 (between scorign of regular/irregular breathing, % of time of reg/irreg breathing, # of apnea >10 seconds and % total time of apnea >10 secs. power spectrum of breathing, rectal temp (B4 & after KC), bradycardia (<100 bpm). No diff between periods in HR, # of brady increased slightly during KC but not significantly (two infants had increase from 0 to 13 or 8 during KC), RR (during KC some had increased RR, some had decreased RR), % time in reg vs irreg breathing, # of apnea and total apnea time, tcpO2 (but 8 of the data points infants were still on O2 suport), % time in state 1,2, and transitional state (crying was not seen at all in any period), and in rectal temp (rectal temp increased somewhat in all but 2 very small infants who had a decrease of 0.3C from 36.8 to 36.5 and other from 37.1 to 36.2 (0.9C change). Need to prevent
hypoesthesia in very LBW infants. Power spectrum of breathing clearly showed 3 infants had increased regularity of respiration and others had no change in regularity of breathing). Parental questionnaires show edKC increased parental
self confidence and confidence in the baby. Some infants improved, others had no change. No clinical deterioration during KC. KMC has no lasting effect on sleep in infants. Quasi-Experiment: PreKC-KC-PostKC infants as own control. Sleep. Micropreemies who were unstable and VLBW, Paternal KC, CPAP KC, State, Breathing pattern, rectal temp, apnea >10 sec # and % time, bradycardia, crying, parent confidence, TcpO2. Check weight outcomes as Tallandini says KCer gained 14.5 g/kg of birthweight per day and controls gained 10 gram/kg of birthweight/day. Stability in Breathing, Spectral analysis (Power) of breathing done. Not an RCT. Micropreemie (ELB W)

de Leon-Mendoza, S., & Mokhachane, M. (2011). “Early” or timely discharge in Kangaroo Mother Care: Evidence and experience. Current Women’s Health Reviews, 7(3), 270-277 doi:10.2174/157340411796355135. The benefits, risks, and safety of early discharge of LBW infants weighing <2000 grams into KMC at home with frequent follow-up visits are presented. Safety and risks post-discharge are the same in both settings, but breastfeeding outcomes at 3 months and maternal-infant bonding, family involvement benefits are evident in KMC settings. A practical guide for implementation of early discharge policy is outlined. Early discharge policy is contingent upon a systematic, operational outpatient follow-up program. A low care/KMC ward/Half-way house have been used as alternatives to home discharge in areas where follow-up cannot be assured. PT, Review, 3rd world, early discharge, BF, bonding, family involvement. Not on Charts 10/2/2011.


ITALIAN, Review, preterm.

De Macedo EC, Cruvinel F., Lukasova K, & D’Antino ME. (2007). The mood variation in mothers of preterm infants in kangaroo mother care and conventional incubator care. J. Tropical Pediatrics, 53(5), 344-346. 90 mothers were divided into 3 groups: 30 moms of term newborns, 30 moms of preterms with KC, and 30 moms of preterms in incubators. The visual analogue MOOD SCALE by Guimares, 1999 was used. Preterm moms were evaluated before and after either KC and incubator visit; fullterm moms were evaluated once. NO depressed moms or malformed babies. Ancova (with hospitalization time, birthweight, and birth age as covariates) determined differences in maternal mood between groups. Term moms differed from preterm moms (p<0.05) but no differences between preterm moms who visited incubator and preterm moms who did KC. Pretest-posttest paired t-tests showed significant improvement in 13/16 items of mood variation in KC moms (in calm vs excited; strong vs feeble, muzzy vs clear-headed, well coordinated vs clumsy, lethargic vs energetic, contented vs discontented, troubled vs tranquil, quick-witted vs. mentally slow, tense vs relaxed, attentive vs dreamy, incompetent vs. proficient, happy vs sad, antagonistic vs amicable) (but no difference in alert vs. drowsy, interested vs bored, and withdrawn vs. gregarious); incubator moms showed improvement in only one item (being well coordinated versus clumsy). Before visit mothers did not differ in mood state, so mood state was not determined by type of care. After visit, incubator mothers reported feeling more awkward than before. A benefit of KC to mothers is increased feelings of well being, intense connectedness with the infant, and high self-confidence in ability to care for infant. Differences in KC mom’s moods were attributed to prolonged contact with baby, pleasant feelings from skin to skin contact, help of professional during baby’s placement and removal, and knowledge of on-going benefits to the baby. These elements need to be provided to moms when they visit the infant in an incubator. PT, descriptive, 3rd world, Maternal feelings. Not on charts yet (Reference for tool is Guimares FS. 1999. Escalas analogicas visuais na avaliacao de estados subjetivos. In: Gorenstein C, Andrade L, Zuardi A (eds). Escalas de Avaliacao Clinica em Psiquiatria e Psicofarmacologia. Sao Paulo: Lemos Editorial, pp. 29-34).

Demott, K., Bick, D., Norman R., Ritchie,G., Turnbull, N., Adams, C. Barry C., Byrom, S., Elliman, D., Marchant S., Mccandish, R., Mellows, H, Neale, C., Parker M., Tait, P., & Taylor, C. (2006). Clinical guidelines and evidence review for post natal care: Routine post natal care of recently delivered women and their babies. London: National Collaborating Centre for Primary Care and Royal College of General Practitioners. 1-489. In this guideline for the United Kingdom, the Baby Friendly Initiative is considered the minimum standard of care. In the section on Infant Feeding, (Section 6, 6.1 has the rated recommendations. Recommendation 15 is “Women should be encouraged to have
skin-to-skin contact with their babies as soon as possible after birth” and this is rated “A”. #16 is “It is not recommended that women are asked about their proposed method of feeding until after the first skin-to-skin contact” (rated D). (page 192). Also included are signs of good attachment (mouth wide open, less areola visible underneath the chin than above the nipple, chin touching the breast, lower lip rolled down, and nose free, and no pain) and signs of successful feeding (audible and visible swallowing, sustained rhythmic suck, relaxed arms and hands, moist mouth, regular soaked/heavy diapers) and how to deal with many breastfeeding and infant feeding problems. Under section 6.2 Evidence statement for Infant Feeding, there is the question “What factors immediately after the birth contribute to successful breastfeeding?” And then it lists several CORE CARE items, of which recommendation #50 is “early separation of mother and baby may disrupt pre-feeding behaviors (a level 3+ recommendation) [pre-feeding behaviors were first documented by Jansson 1995], #51 is “early skin-to-skin contact appears to have some clinical benefit especially regarding breastfeeding outcomes and infant crying and had no apparent short or long-term negative effects [Level 1++]”, and #52 is “Early skin-to-skin contact with suckling is associated with increased duration of breastfeeding ‘Level 1+’.” (pg. 200) and this is followed by a section on peer support of breastfeeding (pg. 202) and on page 209 a report of Taylor et al., 1985 appears, and on page 212-214 there is a full section #6.3.1.3 Does Skin-to-skin contact Contribute to Successful Breastfeeding? And the answer is based on Anderson et al.’s 2003 Cochrane review and Carfoot’s 2005 review. also includes treatments for problems like sore nipples, insufficient milk supply, engorgement, sleep babies (pg. 248)—should feed within 3-5 hours of last feed, and use gentle stimulation, unwrap the baby, change the diaper, rock and massage to awaken the infant and if he does not awaken, then assess for hypoglycemia, sepsis and dehydration (Glover J [1995]. Supplementation of breastfeeding newborns: a flow chart for decision making. J Hum Lactation 11(2), 127-131), and has big cost analysis of breastfeeding (p. 225) sections. Guidelines, Full term, breastfeeding, Birth KC, separation, crying, separation

De Oliveira Azevedo, V.M., Xavier, C.C., & de Oliveira Gontijo, F. (2011). Safety of Kangaroo Mother Care in intubated neonates under 1500 g. Journal of Tropical Pediatrics. DOI: 10.1093/tropej/fmr033. Quasi-experimental, one group, prekc-KC–postKC study of 43 preterms (GA=29.1 +/-1.6 wks), BW = 1.1334 +/-2318g) were assessed for 90 minutes (15 min before, 60 mins during KC and 15 mins after KC) for HR, saO2, axillary temp, and mean arterial Blood Pressure of ventilated infants. No significant differences between the three periods. Thus, KC is a safe method for ventilated infants. PT, Quasi-exp, Pretest-test-posttest, HR, SaO2, axillay temp, BP, vent KC. Not on Charts 5/2/2011.

De Rooy, L. & Johns, A. (2010). Management of the vulnerable baby on the postnatal ward and transitional care unit. Early Human Development, 86, 281-285. This is a physiologic review encouraging safe management of vulnerable infants (late preterm/near term; SGA, IUGR, infant of diabetic mom) on the postnatal ward as long as you know how to handle thermoregulation, blood glucose and feeding problems. Thermoreg problem: Blood glucose problems: hypoglycemic response to insulin is blunted, instead insulin promotes fetal growth with increase in activity of β pancreatic cells in 3rd trimester (when dramatic increase in adipose and glycogen stores occurs). Fetus adapts from continuous supply of glucose, amino acids, and others to cycle of fasting followed by feeds and diet based on fat from adipose tissue stores and milk. At birth, abrupt cessation of transplacental glucose, so BG falls and catecholamines (epinephrine, norepi) surge to restore BG levels. In term infant BG may fall to <2mmol/l in first few postnatal hours without adverse outcomes (pg. 282). Newborn brain is protected from hypoglycemia by 1)astrocyte glycogen stores, 2) decreased cerebral glucose utilization in neonatal period (first month of life) (cerebral utilization is 4-16mmol/100g/min and is lower than at any other time in infant’s or child’s life. 3) Ketone bodies are taken up and used by the neonatal brain as an alternative cerebral fuel and the ketogenic response peaks in newborn at 24-48 hrs postbirth. Average intake of colostrums is approx. 7ml/ feed in 1st 24 hours so energy expenditure exceeds intake for 24 hours and neonate relies on lipolysis of stored fat and β oxidation of fatty acids to produce ketone bodies. This production of ketone bodies is enhanced with EXCLUSIVE Breastfeeding such that SGA infant has ketone body reponse similar to fullterm AGA infant, and does not occur with EXCLUSIVELY FORMULA fed infants (pg. 282). KC is enormously important for the vulnerable infant and the health benefits are considerable. “Early skin to skin contact should begin straight after birth///Such skin to skin contact may help in the expulsion of the placenta and should take precedence over other non-essential but well established labor ward routines which may follow birth, such as washing mother and baby, or measuring and weighing the baby” “Skin to skin contact for the vulnerable infant has the dual purpose of maintaining the
baby’s temperature, and in facilitating breastfeeding." (pg. 282). “Preterm or small babies may well prefer smaller feeds at shorter intervals, and hence allowing such infants frequent skin to skin contact with unlimited access to the breast is crucial in the establishment of breastfeeding” (pg. 283). Recommends Kc for Nearterm, Late Preterm, Infant of Diabetic Mother, SGA/LBW infants. In regards to monitoring Blood glucose it says in the well infant who is stable the first BG measurement can be taken just before the second feed (about 4-6 hrs postbirth)(pg. 284.). On page 284 is a box entitled “CARING for the vulnerable BABY ON THE POSTNATAL WARD” and #1 is “Immediate skin to skin contact (or as soon as mother and baby’s condition allow), 4. Frequent breastfeeds and maintaining skin to skin contact.”. Review, Late preterm, near term, BF, colostrum, ketones for brain, energy supply, hypoglycemia and hyperthermia, neuointensive care.

de Santana Mda C, de Goulart BN, & Chiari BM (2010). Characterization of parturients assisted by the Speech Therapy Care Service of a school maternity. Pro Fono 22(3), 293-298. (No DOI). Retrospective descriptive study of 204 medical records of women who were participating in the second phase of the Kangaroo Mother Method in Brazil (2nd phase is continuous 24/7 KMC in step down unit of premature care before discharge). Mean age was 24.61 yrs, 61.27% from countryside, 50% were single moms who had been to school for 4-5 yrs(35.29%) or high school (the rest). Cesarean was prevalent birth method (48%) and 43.62% reported some prenatal care counseling. Most had low income and no remunerated job (were housewives) and no previous experience with breastfeeding (53.43%).

DESCRIPTIVE of characteristics of women in Step 2 of KMC in Brazil. Implementation, cesarean, PT. Not on charts 2/1/2011

de Sousa Freire NB, Garcia JBS, & Lamy ZC. (2008) Evaluation of analgesic effect of skin-to-skin contact compared to oral glucose in preterm neonates. Pain, 139(1), 28-33. Doi: 10.1016/j.pain.2008.02.031 Ninety-five (95) Brazilian infants of 28-36 weeks postmenstrual age randomly assigned to 3 groups: grp 1 was incubator (n=22) prone and no analgesia during heel stick; grp 2 KC n=31. held in KC for 10 minutes before and during heel stick, grp 3 glucose, n=31, prone in incubator, given 1 ml of 25% glucose 2 min before heel stick. KC group had smaller variation in HR and oxygen saturation, shorter duration of facial activity, and lower PIPP scores than infants being given sucrose. KC produced analgesic effect in preterm newborns. PT, RCT, HR, SaO2, facial action, pain, PIPP, stability. THIS IS SAME AS FREIRE REF IN THIS BIB, but article has de Sousa in front of Freire and the Pubmed citation just has Freire NB, etc.

de Vonderweid, U., & Leonessa, M. (2009). Family centered neonatal care. Early Human Development, 85(10 Suppl), S37-S38. A survey of all Italian NICUs on parental access, environmental and individualized neonatal care, breastmilk feedings, and KMC. Mothers are allowed unrestricted access in 29% NICUs, most NICUs reduce lights and noises, nesting in incubator and regular change of postures are frequently reports, and NIDCAP is uncommon as is breast milk feeding at discharge. KMC is performed in 67% of NICUs. Descriptive, developmental care practices, KMC, breast milk, implementation, PT


Diaz-Rosello, J.L. (1996). Caring for the mother and preterm infant: Kangaroo care. Birth, 23(2): 108-111. This is a review article with 17 references. LITERATURE REVIEW, PT


Infants discharged in KC and exclusive BF do not gain enough weight in first year. Later work showed that infant’s need fortification of the breastmilk.

DiFrisco, E., Goodman, K.E., Budin, W.C., Lilienthal, M.W., Kleinmna, A. & Holmes, B. (2011). Factors associated with exclusive breastfeeding 2 to 4 weeks following discharge from a large, urban, academic medical center striving for Baby-Friendly designation. The Journal of Perinatal Education, 20(1), 28-35. NOT a KC study, but attributes exclusivity of BF to KC. This is a descriptive study of 113 mothers who answered a 28 item questionnaire 2-4 weeks postdischarge about their breastfeeding behaviors at that time and what had happened in the hospital. The C/S rate was 33% and the reasons for not exclusively BF at 2-4 weeks post-birth were (in order of incidence) perceptions of not enough milk supply (82.8%), feeling very tired (20.7%), difficulty latching on (17.2%), and allowing woman’s partner to feed the baby (10.3%). 87.5% of moms were breastfeeding at 2-4 wks post discharge and 59.2% were EXCLUSIVELY BF. Mothers who reported BF within the first hour of birth were significantly more likely to be exclusively BF at 2-4 weeks after discharge than moms who did not BGF within the first hour of birth – true for all moms, even those with cesarean section. No other tested variables were significantly associated with exclusive BF 2-4 weeks after discharge. On page 33 it says ‘This finding is also consistent with previous research that indicates promoting early BF by placing the baby skin to skin (no hyphens) with the mother immediately after birth has a positive effect on exclusive BF and duration of BF (cites Richard & Allade, 1990). Another study also demonstrated that when newborns are placed skin to skin (no hyphens) with their mothers, BF is easier, bonding is enhanced, and babies cry less and stay warmer (cites Mikel-Kostyra, Mazur & Bolstruszko, 2002)”[This article speaks only to breastfeeding outcomes and does not mention bonding, crying and staying warm at all!] (pg. 33 for quoted material). Supports skin-to-skin contact in first hour of birth and says in abstract that “incorporating care practices …as recommended by the Baby-Friendly-Hospital Initiative, may increase the duration of exclusive BF after discharge.” (p. 28), but even here the article does not say anything about measuring skin-to-skin contact, or that skin-to-skin contact is one of the care practices of BFHI. FT, Descriptive, NoT kc, exclusive BF.


DiMenna, L. (2006). Considerations for implementation of a neonatal kangaroo care protocol. Neonatal Network, 25(6), 405-412. Many health professionals are not aware of KC, its benefits, or how to perform it. Article reviews the literature on KC and its benefits, and then develops a list of evidence-based KC guidelines for use with all infants and their parents. There is an evidence-based protocol to assist with implementation of KC. There is a good chart in which the aspect of implementation is on the left (i.e. use of head cap, upright position) and rationale with citation is on the right and the citations have been evaluated using a proprietary evaluation system. Increased knowledge of and education on KC for healthcare providers should lead to increased, routine use of KC. Summarizes that KC improves infant physiologic stability, thermal regulation, and state organization. Review, implementation, guidelines, stability, Preterm, .state, temperature.

Discenza, D. (2011). Nurturing touch helps mothers with postpartum depression and their infants. Neonatal Network, 30(1), 71-72. In this clinical report, mostly about massage, it says on pg 71 “Nurturing touch can begin in the NICU as soon as the infant is stabilized. A perfect way to begin- one that is beneficial to both parent and infant- is kangaroo care (cites Bergman and March of Dimes). Just place the infant (tubes and all) on the mother’s chest skin to skin. Kangaroo care provides the infant with all the physiologic benefits of bonding with the mothers. An added benefit is that the mother’s body warmth keeps her infant at the perfect temperature, so the infant has to use fewer calories to keep himself warm. The mother can enjoy this time with her infant and see how calming it is for her child “ PT, clinical report, depression. Not on charts 11/1/2011

Dodd, VL. (2005). Implications of kangaroo care for growth and development in preterm infants. *J Obstet Gynecol Neonat Nurs* 34(2), 218-232. A review article. Temperature studies revealed for infants greater than 28 weeks that temperature is stable or increases (pg. 225); heart rate data was of concern in only one of 17 studies reviewed (and that was Bohnhorst, 2001 – she did not review Bohnhorst et al., 2004); respiratory rate is not negatively affected by KC except for some tachypnea in Bohnhorst 2001 study (pg. 225), oxygenation is stable or improved except for Bohnhorst 2001 study with 8 infants; nurturing and sensitivity to infant needs occurs in KC group and is not disputed by any study; and that KC contributes to increased weight gain. Concludes that KC has nurturing advantages to both infant and parent.

Review, PT, HR, RR, Wgt, maternal feelings, oxygenation, temp

Dodd, VL (unpublished dissertation). Effect of Kangaroo care on preterm infant weight gain and vagal tone. This is available from S. Ludington at Susan.ludington@case.edu. Randomized controlled trial of 31 preterm infants born at 25-31 wks GA who were randomly assigned at 32 wks postmenstrual age to traditional swaddled holding control (n=17) or to KC for one hour daily for 3 weeks (n=14). Daily weights and calorie ingestion were recorded. Vagal tone was measured at 32, and 35 days while sleeping in bed. A one-way MANCOVA tested for KC effects after controlling for resting vagal tone at 32 weeks, calories ingested, and birth weight. The overall multivariate effect was NOT significant (p=0.055, Wilks Lambda = 0.793, F (2,25) = 3.26. Weight gain was higher in KC (F=6.49; p=0.017) and daily weight gain for KCers was 30.73 (+/- 1.36 grams) and for controls was 25.8 (+/- 1.22). Weight contributed 20% of the variance associate with treatment, at a moderate power (0.69) to detect type II error. No effect on vagal tone and author says 35 weeks may be too young to detect vagal tone differences. PT, RCT, weight, vagal tone.

Dodds, E. (2003). Neonatal procedural pain: a survey of nursing staff.. *Paediatric Nursing* 15(5): 18-21. Survey of nurses and found that nurses don’t use pharmacologic interventions because they think they are harmful to the infant. I don’t know if it says anything about nurses’s beliefs about KC and other non-pharmacologic interventions for pain. GET THIS. PT, FT, pain

Dombrowski MAS, Anderson GC, Santori C, Roller CG, Pagliotti F, & Dowling DA. (2000). Kangaroo (skin-to-skin) care for premature twins and their adolescent parents. *MCN, The American J. of Maternal/Child Nursing*, 25(2): 92-94. 32 wk twins Kced by teen parents and showed attachment behaviors and self-confidence when interacting with infants. Ample milk supply, no engorge (actually # of sanitary napkins as <3 (KC = 66 or 30.5%; C 34.5 or 15.7%), 3-4 napkins (KC = 117 or 54.2%; C = 102 or 47.2%) or >4 (KC = 33 or 15.3%; C = 80 or 37.1%), and shorter length of stay as <3 days (KC = 79 or 36.6%; C = 54 or 25%), 4-6 days (KC=94 or 43.5%; C = 99 or 45.8%), or ≥7 days (KC = 43 or 19.9%; C = 63 or 29.2%). Mean length of stay was 4.5±0.71 for KC; 5.2± 0.92 days for Controls). Authors concluded that results were due to oxytocin in mother and that mothers benefit from early birth Kctime with infants. RCT, FT, involution, maternal Hgb, maternal erythrocytes, lochial discharge, length of stay (0.6 or 49.1%) Not on charts 5/15/09 See Marin’s study for placental
expulsion

Doughterty D, Luther M. (2008). Birth to breast - a feeding care map for the NICU: helping the extremely low birth weight infant navigate the course. Neonatal Network 27(6): 371-377. This is a clinical article that includes a reference to KC, saying “limited frequency and duration of kangaroo care between mother and infant... is a significant factor influencing non-successful breastfeeding of the preterm infant” (pg. 371). **PT, Clinical, breastfeeding, success.**

Not on charts yet 4/29/09


Not on charts


Dunbar, C.N. (2007). Quiet time. Finding peace and privacy on a busy postpartum unit. Nursing Spectrum, April 23, 2007 NY/New Jersey Edition, page 10-11. The is a clinical article reviewing Morrison’s 2006 work on interruptions during postpartum day 1. But on page 10 there are quotes from Morrison related to KC: “Multiple studies since the early 1970s have shown skin-to-skin contact starting immediately after delivery has a significant impact on not only attachment behaviors but also successful breastfeeding. When mothers do not get the chance to hold their infants in skin-to-skin or to breastfeed immediately, the higher levels of oxytocin that were stimulated by the birth will begin to decrease.”(pg. 10). **FT, Clinical report, breastfeeding, Birth KC.**

Durand, R., Hodges, S., LaRock, S., Lund, L., Schmid, S., Swick, D., Yates, T., & Perez, A. (1997). The effect of skin-to-skin breastfeeding in the immediate recovery period on newborn thermoregulation and blood glucose values. Neonatal Intensive Care, March/April, 1997, p. 23-27. Infants started either KC or radiant warmer care 30 minutes after birth and continued for 120 minutes. Temperature at 120 minutes postbirth was higher in KC than swaddled and cot infant’s temperature. No differences in blood glucose levels was present. KC assists with maintenance of normal body temperature and reduces energy expenditure and concomitantly stimulated suckling and milk production. Maintenance of body temperature is needed to prevent lowered blood glucose levels. **Fullterm, BF, Temperature, Blood glucose, Birth KC/VEKC. Is this an RCT?**

Dzukou T, De La Pintiere A, Betremieux P, Vittu G, Roussey M, & Tietche F. (2004). Kangaroo mother care: Bibliographical review on the current attitudes, their interests, and their limits. Archives de Pediatrie 11 (9), 1095-1100. In developing countries KMC regulates body temp and metabolic adaptation of the newborn. SAYS IT IS DIFFICULT TO RECOMMEND USE OF KMC in CURRENT PRACTICE (just like Conde-Agudelo et al, 2003 and repeated also in Venancio 2004 article). Rigorous randomized controlled trials are needed to establish full safety and know kmc’s impact on neuropsychological development and the real somatic growth and economic cost. **Review, maternal attitude, transfer, maternal feelings, metabolic rate, temperature, growth, cost. Preterm, PT, developmental care, development, FRENCH**

Dzukou, T. (2005). Response to Mazurier. Archives de Pediatrie, 12: 473. This is a response to Mazurier and Picaud’s comments about the study published in the same journal in 2004. **WE NEED TO GET THIS and TRANSLATE**

daily pg. 248), 4) nonnutritive sucking at the breast, and 5) transitioning to breast feeding. 80 infants enrolled and results were: mother’s average milk supply was 603 mL/d, 71% (57/80) of infants received mouth care with human milk, 48% (38/80) mother-infant dyads did KC and had a mean # of 6 days of KC and a median of 4 days with range from 1-55 days (pg. 251), 60% (35/58) performed nonnutritive sucking at breast, and 100% (58/58) transitioned to feedings at breast. Has big section on mouth care with human milk on pg. 249, and then KC begins on 249 too, reviewing physiologic and breastfeeding benefits, and they state that they have a policy, a nursing standard, and a DVD of transferring a ventilated patient into KC. Says it could be days or weeks for surgical infant to be held due to hemodynamic instability, use of ECMO, high freq ventilation or an abdominal wall defects requiring a slow progression of abdominal contents into the abdominal cavity. So gave KC once infant was stable and could tolerate transfer, gave KC at least one hour per day. The surgical conditions she is referring to are: gastroschisis, omphalocele, congenital diaphragmatic hernia, and tracheoesophageal fistula/esophageal atresia. PT, FT, surgical kids, BF, KC when stable, duration of KC 1 hr/day, quality improvement project/ implementation. Congenital heart defect. Check chart

status 1/21/2011 See Spatz 2012 too and Spatz 2004


Ellett, M.L., Bleah D.A., & Parris S. (2004) Feasibility of using kangaroo (skin-to-skin) care with colicky infants. Gastroenterology Nursing, 27 (1), 9-15. 75 parents agreed to participate in an internet-based study of KC’s effects on colic, but only 5 actually did participate and only 2 completed data collection (a 3-day diary of infant baseline state or arousal; a diary to complete for 2 weeks while doing KC; then stop KC and complete a post-KC diary of infant state of arousal for next 2 days). Data based on 2 data sets shows KC is promising intervention for colic and no other treatments are out there. She recommends a larger clinical trial. One infant spent 605 minutes crying and the other 1470 minutes during the two weeks of KC. Difficult to do experimental study over the internet. Fullterm,Case Study,Cry, Colic, Behav. States

Ellett MLC, Lane L, & Keffer J. (2004). Ethical and legal issues of conducting nursing research via the internet. J Professional Nursing 20(1), 68-74. This is a report of how she conducted a qualitative study of what it was like to live with a colicky infant (successfully completed on line) and then a randomized controlled trial of KC to decrease crying time of infants (not successfully completed as only two subjects completed data collection (see Ellett, Bleah & Parris, 2004 listed immediately above. On page 69 of the Ellett,Lane, & Keffer article, Ellett relates the following details about the RCT of KC to reduce crying in colicky babies: KC was to be initiated at first sign that an episode of colic was beginning (usually at 2-3 weeks old). This article relates that a nursing colleague voiced ethical concerns about doing intervention research over the internet but the IRB approval covered all concerns and in particular one must be sure that subjects know they can withdraw at any time, that internet contact is not substitute for health professional’s advice, and that researcher is available by email and phone to answer concerns. Fullterm, ethics, not really a KC study. Not on charts yet.


Endyar ni, B., Roeslani, R.D., Rohsiswatmo, R., & Soedjatmiko. (2009). Mothers’ response on Kangaroo Mother Care intervention for preterm infants. Paediatrica Indonesiana, 49(4), 224-228. Mothers reported that they loved Kc and it reduced their stress. PT, Descriptive, maternal feelings, maternal stress. TRY TO GET THIS FOR FULL ANNOTATION Not on Chart 11/2011
Engler, A.E. (2005). Maternal stress and the white coat syndrome: a case study. *Pediatric Nursing 31*(6), 470-473. One mother was doing KC when the infant’s surgeon approached her and the “white coat” syndrome caused her fingertip temperature to increase. **GET THIS.** Case study, PT, maternal stress, fingertip temperature.

Engler, A.E., Ludington-Hoe, S.M., Cusson, R.M., Adams, R., Bahnsen, M.A., Brumbaugh, E.J., Coates, P., Grieb, J.K., McHargue, L.K., Ryan, D., Settle, M., & Williams, D.M. (2002) Kangaroo care: National survey of practice, knowledge, barriers, and perceptions. *MCN, Amer. J. Maternal Child Nursing 27*(3): 146-153. 537 (59%) of all NICUS in America returned surveys. Over 82% report practicing KC, but mostly only upon request of mother. Nurses are knowledgeable. Barriers are infant safety concerns and reluctance by RN, NNP, MD and families. Units that practice KC have more positive perception than units that do not practice KC. >60% report that low GA or low weight are not contraindications. Lack of consistent KC guidelines in the NICU contributes to most of the barriers to its use. **SURVEY. Barriers, practice, knowledge, perceptions, implementation, PT**

Engler, A.E. (in progress), but not printed yet in 2012. Kangaroo Care to Reduce Maternal and Infant Stress. Available from Arthur Engler, Assoc. Professor, Univ. of Connecticut at Storrs. Randomized trial of Kangaroo to reduce maternal stress. RCT, pretest-test-posttest of 25 (13 KC, 12 control) who gave 2 hours of KC or sat beside incubator for talk/touch but not holding for two hours on ONE Day only. Postnatal age was 17 days and GA was 32.8 wks. And mean BW of 1986 gms. Maternal fingertip temp pretest KC 93.1, midway thru KC 92.13, post was 91.07 & was sig higher in KC (higher fingertip temp = less stress) than controls at the mid point. PSS: NICU scales taken before and after the 2 hours. Sights and sounds both groups went up, control grp had significant rise and Kcers did not; Appearance & behavior of baby” only sig decrease in controls eventho Kcers decreased too, Parental Role Alteration had no significant change in either group tho trend was for both groups to decrease stress in their scale. MAACL was sig. lower in KC group after TX. No diff in skin conductance, galvanic skin response, salivary cortisol. **PT, Maternal Stress, Fingertip temp, skin conductance, galvanic skin resistance, salivary cortisol, MAACL for dysphoria**


Erlandsson, K., Christensson, K., & Fagerberg, I. (2008). Fathers’ lived experiences of getting to know their baby while acting as primary caregivers immediately following birth. *Journal of Perinatal Education, 17*(2), 28-36. Qualitative study of 15 fathers who were interviewed between 8 days and 6 weeks after taking care of infant as primary caregiver during the first hours after birth when separated from post-ceasarean section at 37-42 weeks mother. Immediately after cesarean section infants were given in KC to mother for 30 seconds to 40 minutes, then transferred to father for KC, wrapped in cloths or dressed in clothes on the father’s chest or in his arms or cot. Care by father was for 1-7 hours after birth. Father-child togetherness (experienced sympathy with child, experienced concern with child and mother, experienced roller coaster feelings, experienced trust and vulnerability, and experienced thoughts about life and future) and increasing responsibility while getting to know his newborn were common themes. **Fullterm, qualitative, paternal KC, paternal feelings, cesarean section. NOT ON CHARTS YET.**

Erlandsson, K., Christensson K., Dsilna A, & Jonsson B. (2008). Do caregiving models after cesarean birth influence infants’ breathing adaptation and crying? A pilot study. *Journal of Childrens’ and Young People’s Nursing, 2*(1), 7-12. RCT of 13 fullterm infants after cesarean section who were held in KC or in cot for several hours postbirth. KC infants had larger breath volumes, larger minute ventilation and cried less than cot infants. **Full term, RCT, breathing, crying, cesarean section, paternal kc. NOT ON Charts yet.**

Erlandsson K, Dsilna A, Fagerberg I, & Christensson K. (2007). Skin-to-skin care with the father after cesarean birth and its effect on newborn crying and prefeeding behavior. *Birth, 34*(2), 105-114. Randomized Controlled trial of paternal KC during first 2 hours after elective c/s (due to breech, small pelvis, previous c/s) 37-41 week gestation c/s birth with spinal analgesia in 30 moms (KC=15 immediate KC after c/s; 14 placed immediately in cot). One cot infant was transferred to NICU at 82 mins postbirth for tachycardia, one KC infant transferred at 60 mins postbirth for another reason.
hypoxia – resultant med diagnoses was “prolonged pulmonary adaptation” and were reunited with moms in postpartum 1 and 4 days later (pg. 107). Measured tape-recorded separation distress crying (when there is absence of maternal body contact [Christensson, Cabrera et al., 1995]), prefeeding behaviors (rooting, mouth movements, sucking (from NBAS), and behavioral state (from NBAS, recording predominant behaviors in first minute of every 15 minute observations but two sleep states were collapsed into one so they measured sleep, drowsy, away, and crying). Immediately after delivery, cord was cut, infant wrapped in two towels, shown to mom, taken to open incubator, wiped off, suctioned pm, then returned to mom in surgery room and put on her chest still wrapped in towels, stayed on moms chest for 5-10 mins, then went to nursery with father. Father sat on chair and gave KC with 2 blankets covering infant, father interacted with awake child, consoled crying child (pg. 108). Control infants in cot in nursery, wrapped in 2 blankets and father present in same room but not able to pick up child. First recording was at 30 minutes postbirth and continued until 120th min postbirth recording was complete, using mean values for every five minutes for crying and feed behaviors and every 15 minutes for state. There were 221 5-min periods for KCers and 162 5-min periods for controls. KCers cried less (p<0.001; KC Mean=13.4 second SD=3.60; control Mean=33.4 SD=6.61 seconds). Mean crying time for 35-40 mins postbirth =30.4 sec KC & 57.8 c ot; for 55-60 mins postbirth =17.6 secs KC & 53.3 cot; for 85-90 mins postbirth = 10.8 secs KC & 22.5 cot). Crying of KCers decreased rapidly (in first 15 mins) and cot group took longer. KCers had lower level of wakefulness than cots (p<0.01), and dropped from crying to drowsy state by 60 mins postbirth (cot babies dropped to drowsy at 110 mins post birth). Rooting patterns not different between groups. KCers showed less rooting than cots (p<0.01), lowest level of rooting was at 75 mins postbirth, cot infants showed steady medium level of sucking at 105 mins postbirth while KCers declined in sucking at 60 mins postbirth (p<0.001), which was when drowsiness began. Because sleep is important for infant’s recovery from being born, earlier drowsiness and sleep is a positive outcome. Within 15 minutes of onset of paternal KC, crying stopped. KC facilitated coordination of prefeeding behavior. All pat KC infants rooted, put fingers/hands on father’s skin, and sucked on fathers nipple (pg. 113). Infants in KC relaxed and appeared to have reduced stress KC after c/s is often limited and it cites Baby Friendly sources (Rowe-Murray, H, & Fisher, J. 2003 on KC bib). Fullterm, RCT, cesarean, paternal KC, HR, crying, drowsy, behav state, sleep, Early KC, relaxation, stress. Put on Charts.

Espagne, S., Hamon, I., Thiebaugeorges, O., & Hascoet, J.M. (2004). Sudden infant death of neonates in the delivery room. [in French]. Archives de Pediatrie, 11(5), 438-439. Sudden infant death at birth is rare. This article states that skin to skin contact is a risk factor for ALTE. SIDS is not a term used for neonatal deaths. FT, BirthKC, negative effects, life threatening event, mortality. Susie, GET FULL ARTICLE FROM FRANCE.

European Commission Directorate of Public Health and Risk Assessment, Karolinska Institutet Dept of Biosciences at Novum Unit for Preventive Nutrition, Institute for Child Health IRCCS Burlo Garofolo, & Unit for Health Services Research and International Health WHO Collaborating Centre for Maternal and Child Health. (2006) Infant and Young Child Feeding: Standard Recommendations for the European Union. (Retrieval from http://www.burlo.trieste.it/old_site/Burlo%20English%20version/Acti vities/research_develop.htm). This paper reports the state of breastfeeding in the European Union as late as June 2006, predominantly for breastfeeding. Guidelines for prenatal and early postnatal BF support that includes doing KC immediately at birth for two hours until first breastfeeding is complete (when baby stops sucking and releases nipple) are included. The standard practice guideline for Pregnancy states “2.1.3. If expectant parents do not indicate their infant feeding choice during pregnancy, health workers should ask the other how she intends to feed her baby only after she has given birth, when the baby is placed skin-to-skin on her chest. The first skin-to-skin contact between mother and newborn infant offers a golden opportunity to actively encourage breastfeeding.”(pg. 8). The guideline for Childbirth states: 3.1. “To facilitate the initiation of breastfeeding, the newborn should be dried and placed skin-to-skin on the mother’s chest and abdomen immediately after birth or as soon as possible thereafter and covered with a dry warm blanket or towel. This initial skin-to-skin contact should last as long as possible, ideally for at least two hours after birth or until after the first breastfeed. All the routine neonatal procedures that are not life saving (e.g. washing, weighing and non-urgent medical procedures) should be postponed until after the first breastfeed (WHO, Care in normal birth: a practical guide. WHO, Geneva, 1996; Anderson, Moore, Hepworth & Bergman, 2003; Mikiel-Kostyn, Mazur & Boltruszk0, 2002). If the baby or the mother need urgent medical care, skin-to-skin contact should be offered as soon as they are stable.” 3.2. “During the initial skin-to-skin contact, the baby will find and explore (i.e. nuzzle and lick) the breast, and will eventually find the nipple and
latch on for the first breastfeed. Use a hands off technique (Renfrew MJ, Dyson,L., Wallace L, D'Souza L, McCormick F, Spiby H. The effectiveness of public helath intervention to promote the duration of breastfeeding. National Institute for Health and Clinical Excellence, London, 2005).” Do not force or accelerate the occurrence of the infant finding the nipple and latching on (pg. 10). Then on page 11 it has wonderful list of signs of going well and signs of difficulty for positioning, sucking, and transfer of milk. The guidelines for the first few days of life do NOT include KC even in the section about unsatisfactory breastfeeding by 12 and 24 hours post-birth. But on page 12 it says that crying is a late sign of hunger. Guidelines for preterm babies begin on page 13 and on page 14 it says “5.6. Kangaroo Mother Care (KMC) or skin-to-skin contact should be started immediately or as soon as possible after birth, depending on the infant’s medical condition and on the mother’s willingness and ability to be present in the hospital, and continued for long periods of time, at least one hour at a time or as often as possible. Exended KMC, up to full-time, is of benefit (Mikiel-Kostyra, Mazur & Bolstruszko, 2002; Hurst, Valentine, Renfro, Burns & Ferlic, 1997; WHO, Kangaroo mother care: a practical guide. 2003.) “5.11. After about 35 weeks gestational age, breastfeeding on demand can be started while continuing and facilitating rooming-in and skin-to-skin contact or KMC.”(pg. 14). First month of life guidelines and From one to six months guidelines and after six months guidelines do not include skin-to-skin at all but provide wonderful guidelines for feeding and introducing foods with great rationale for everything. On page 25 it states “Because there is no evidence for the superiority or equivalence of formula feeding when compared to breastfeeding, competent health workers will not recommend it as an alternative or a complement to breastfeeding, unless there are legitimate medical reasons for doing so.” (p. 25). On page 28 is RISKS of a Decision not to breastfeed and the Disadvantages of formula feeding with risks for child and mother and their families segregated. At the bottom on the page it is written: “Mothers who formula feed should be supported to maximize bonding opportunities (e.g. using feeding times for close skin-to-skin contact with the baby and not delegating feeding to anyone other than a parent where possible.”. Guidelines, birth KC, FT. breastfeeding, hand’s off policy, signs of good BF, disadvantages of formula feeding.


Fairbank, L., O’Meara S, Renfrew MJ, Woolridge M & Sowden AJ. (2000). A systematic review to evaluate the effectiveness of interventions to promote initiation of breastfeeding. Health Technology Assessment 4(25): 1-169. This was a systematic evaluation of 59 studies (14 RCTs, 16 non-RCTs, and 29 pretest-posttest studies. “Stand alone interventions such as rooming-in or a package of interventions such as rooming-in, early contact, and health education may be effective in increasing both the initiation and duration of breastfeeding. But also stated that there is insufficient evidence on KC effects on BF initiation and duration at this time. Fullterm, BF, Comprehensive review.

Fardig, J.A. (1980). A comparison of skin-to-skin contact and radiant heaters in promoting neonatal thermoregulation. Journal of Nurse-Midwifery, 25(1), 19-27. 17 Kcers got KC after initial nursing care under radiant warmer (Grp A), 17 got immediately KC (never under radiant warmer – Grp B) & 17 controls had no skin contact at all (Grp C). Skin temps taken every 3 minutes for 45 minutes; Rectal temps at 21 and 45 min postbirth. More controls had skin and rectal temps below NTZ at 21 and 45 min postbirth than either of KC grps. Kcers (Grp B) had temps that were same as those under radiant warmer (Grp A). FULLTERM, skin temp, rectal temp, Birth KC/VEKC, IS THIS RCT?

Fegran L, Helseth S, & Fagermoen MS. (2008). A comparison of mother’s and fathers’ experiences of the attachment process in a neonatal intensive care unit. J Clinical Nursing, 17(6), 810-816. Descriptive qualitative study of 6 mothers and 6 fathers had interviews upon discharge from Norwegian NICU. Hermeneutic analysis revealed two main categories of experience: 1. “taken by surprise”- moms felt powerless and period was surreal and strange. Fathers experienced the birth as a shock, but were immediately ready to be involved. 2. Building a relationship. Moms needed to regain the temporarily lost relationship with their child and fathers experienced the beginning of a new relationship. Fathers were encouraged to have KC with the child from the very beginning (pg.813 and commented that the KC experience initiated an exchange of power which made both father and child relax (pg. 814) and one dad who could not sleep went to NICU to KC in the middle of the night and it made him feel
more confident, have better self esteem and better coping abilities. Doing KC made fathers feel like important contributors to baby’s care. Paternal relationship changed from an impersonal one to one characterized by “belonging” and “protecting the child.” (p.814). Mothers wanted to do KC but were afraid to touch the preterm infant at first. Despite the need to be close, 3 mothers expressed ambivalent feelings and cried the whole time they KCed, or expressed a need to do KC but did not dare to do KC, confronting mothers with the realization that they could not take on the burden of taking care of their child. Being involved in KC also confronted the mother with the burden of not being able to take care of her child. Parents of preterm infants have different starting points and these should be noted as professionals encourage parents to have early KC. PT, descriptive, attachment process, maternal feelings, paternal KC.  **NOT ON CHARTS YET**


**NEED TO GET THIS CITATION.** *Preterm Development, review*

Feldman, R. (2007). Maternal-infant contact and child development: Insights from the kangaroo intervention. In L’Abate, L. (Editor), *Low Cost Approaches to Promote Physical and Mental Health, Theory, Research, and Practice*, Springer Publishing Co.: New York, NY. pp. 323-351. This is Chapter 16 in the book and it is a review of all KC research centered around four themes: maternal touch and contact in human and animal models showing that postpartum touch is a positive experience, mechanisms mediating the effects of early physical contact on infant’s later development (including centrality of maternal proximity), specific improvements following early contact intervention for preterms, and the basis for emphasizing the sensitive period are presented. This is a wonderful scholarly review.  **Preterm, sensitive period, Development, review. Separation**

Feldman, R. (2009). Long-term effects of skin-to-skin contact in the neonatal period: a ten-year follow-up. Paper submitted for publication. This follow up study reports that the positive effects of skin-to-skin contact on childrens’ cortisol responses and autonomic reactivity that are seen in the neonatal period are still present at 10 years of life.  **PT, Quasi-Experiment, development, 10 years, autonomic system, cortisol, stress. Not on charts**

Feldman, R., & Eidelman Al. (2003). Skin-to-skin contact accelerates autonomic and neurobehavioral maturation in preterm infants. *Developmental Medicine and Child Neurology, 45*(4), 274-281. 35 infants got 24.31 days of KC for a total of 29.76 hours and 35 infants did not get KC. 19 males, 6 females in each group. GA was 30.28 wks, bw = 1229.95 gm and medical risk. KC is standard option in care, so no randomization of subjects, but they were matched. Vagal tone is a physiologic index of infant ability to orient to the environment and adapt to changing inputs (Porges Sw, Doussard-Roosevelt JA, Portales AL, Greenspan SL. (1996). Infant regulation of the vagal ‘brake’ predicts child behavior problems: a psychobiological model of social behavior. *Dev Psychobiol 29*, 697-712). Vagal tone for 10 min B4 KC at 32 weeks and 10 min at 37 wks - KCers had more rapid maturation of vagal tone and higher level of vagal tone. Behavioral state measured in 10 sec epochs x 4 hrs on 4 consecutive evenings at 32 (B4 KC) and same procedure at 37 wks using an unnamed 6 state scale – more rapid improvement in state organization (longer periods of quiet sleep, longer period of alert wakefulness and shorter periods of active sleep & better sleep cycling at 37 weeks than at 32 weeks in KC group and more mature state regulation at 37 weeks than controls. ) NBAS at 37 weeks showed more mature neurodevelopmental profile (especially habituation and orientation)in KCers. State regulation is sign of maturation and is delayed in preterms. State scoring system was modeled after Brazelton and Holditch-Davis, a 6 state system without established psychometric properties. Neurodevelopmental profile was more mature for KC infants. And early skin to skin contact improves maturation of the autonomic and circadian systems in preterm infants – KC works on physiologic as well as behavioral-regulatory mechanisms of emotion regulation.  **PT, Matched TX and Controls, but not RCT, Vagal tone, Quiet & Active sleep, Alert Inactivity, NBAS for development, Sleep Cycling, state, circadian rhythms, separation, parasympathetic**

Care: Parenting Outcomes and Preterm Infant Development. *Pediatrics*, 110(1 Part 1), 16-26. Quasi-Experimental study with N= 146 in two groups: 73 LBW infants who got KC in the NICU from 31-34 weeks for 2 weeks 1 hour/day with mothers (M duration of KC=24.31 days and M= 29.76 hours)0 and 73 matched controls at other hospital. Ten minutes of video tape of mother infant interactions were coded. At 37 weeks postmenstrual age, mother infant interaction, maternal depression, maternal perceptions measured. At 3 months infant temperament, mat-paternal sensitivity, etc.KCers had more positive interactions, and moms showed more positive affect, touch, adaptation to infant cues and infants were more alert, less gaze aversion. Kc moms had less depression. At 3 months, KC moms and pops were more sensitive and provided a better HOME environment. At 6 months, KCers had higher Bayley Mental (96.39 vs 91.81 for controls) and psychomotor (KC= 85.47; control 80.53). Also followed-up at 2 years. “Mothers who provided KC report more positive feelings towards the infant and a better sense of the parenting role. The physical bonding may reduce maternal depression and increase familiarity with the infant and his or her interactive signals. The effects of state organization may improve infant alertness during mother child interaction resulting in increased maternal involvement.”

PT, Matched TX and Control, used TWO Hospitals, not RCT. Development, Bayley Mental/Motor, Temperament, Mat Behavior, maternal-infant interaction, infant state was alert, Mat. depression. SLEEP?? HOME KC and follow-up for 2 years.


Feldman, R., Singer, M., & Zagoory, O. (2010). Touch attenuates infants’ physiologic reactivity to stress. *Developmental Science, 13*, 271-278. Not a KC study, but mentions KC. Fifty-three mother-infant dyads were tested in two conditions: still face and still face with maternal touch to determine how gentle human touch reduces hormonal stress, vagal tone, and stress behaviors that are demonstrated during the STILL FACE paradigm. Good review of the physiologic process of how that occurs. Maternal and infant cortisol and infant vagal tone were measured at baseline (free play), during still face and upon reunion with mother. On page 776 it states “Studies assessing the effects of skin-to-skin contact on the development of premature infants demonstrated that both stress hormones (Weller et al., 2002) and autonomic reactivity (Feldman & Eidelman, 2003a, Gray WAatt and Blass, 2000) were more optimal in the treated infants as compared to matched controls.” “the positive effects of skin-to-skin contact on children’s cortisol response and autonomic reactivity were found to persist across the first 10 years of life” (Feldman, 2009). Cortisol were lower in the still face + touch group during the still face procedure and also during reunion, indicating that without touch, infants still had high levels of stress cortisol during reunion. No group differences between maternal cortisol levels – neither having touch with infant or not having touch with infant was sufficiently stressful to elicit maternal stress response (pg. 274). Infant cortisols were individually stable between the 2nd and 3rd assessments (during still face and during reunion with mother). Mother and infants’ baseline cortisols were interrelated and infant baseline cortisol correlated with mother cortisol recovery, pointing to a cross generation mechanism in the development of the stress response. Vagal tone was suppressed in still face without maternal touch condition. Touch synchrony during free play was associated with higher infant vagal tone (better parasympathetic control). Maternal touch myssynchroy (touching the infant while infant’s gaze is turned away) correlated with higher maternal and infant cortisol. The provision of maternal touch during moments of maternal unavailability reduces infant’s physiological reactivity to stress. Touch, especially KMC touch, reduces stress responses in infants. FT??Quasi-experimental, stress, maternal and infant cortisols, touch types, development, 10 years, still face Not on charts 5/24/2011.

Feldman R, Weller A, Leckman JF, Kuint J, & Eidelman AI (1999). The nature of the mother’s tie to her infant: Maternal bonding under conditions of proximity, separation, and potential loss. *J Child Psychiat* 40 (6),929-939. Measured attachment in fullterm mothers, healthy preterm infant moms, and VLBW infant moms. Pg. 937 says “Intervention efforts that aim to enhance proximity and touch in VLBW infants, such as skin-to-skin contact (kangaroo care), may be crucial for these mothers in order to initiate the bonding process.” FT, PT, maternal attachment, maternal depression

contribution of mother-infant skin-to-skin contact (Kangaroo Care) to family interaction, proximity, and touch. J. Family Psychology 17(1), 94-107. 146 three-month old preterms were tested. 73 had received KC in the NICU. Micropatterns of proximity and touch were coded. Following KC, moms and dads were less intrusive, infants showed less negative affect, and family style was more cohesive. Maternal and paternal affectionate touch of infant and spouse was more frequent, spouses remained in closer proximity, and infant proximity position was conducive to mutual gaze and touch during triadic play in the KC group. KC is beneficial for development of family processes. PT, Not an RCT, interactions, development, proximity

Feldman, R, Weller A, Sirotal L, Eidelman A. (2002). Skin-to-skin contact (Kangaroo care) promotes self-regulation in premature infants: Sleep wake cyclicity, arousal modulation, and sustained exploration. Developmental Psych, 38(2), 194-205. 73 pretermers got KC, 73 controls. KCers got at least 1 hr of KC per day x 14 consecutive days in NICU (Mean 26.62 hrs of KC+ 12.14 hrs). Tested 1-2 days B4 KC at 32 weeks and at 37 weeks GA, and at 3 and 6 mos. Corrected age. Control gp tested at 32 weeks and all other times were same. State measured in 10 sec epochs over 4 hrs before KC and at 37 weeks. KC infants spent SIG more of the 4 hr time in QS and Alert Wakefulness and less time in Active Sleep than controls. At term, KC more had mature state distribution, more organized sleep-wake cyclicity (but not B4 KC at 32 weeks), @ 3mos KC had higher threshold to negative emotionality and more efficient arousal modulation with complex stimuli. At 6 mos KC infants had longer duration and shorter latencies to shared attention and sustained exploration in toy session. Behavioral state scoring system was modeled after Brazelton and Holditch-Davis but is not anesthetized psychometric tool. Infants were tested them at 3 months corrected age using a modified version of the Behavioral Response Paradigm in which increasingly aversive stimuli are presented to the infants. There are predetermined periods of presentation and rest for each stimulus. KC infants showed higher thresholds for negative emotionality as shown by latency to first cry being longer in KC than controls. Infants who got KC were able to tolerate more aversive environmental stimulation that infants who did not get KC. Thus, KC infant’s stress-reactivity skills were more optimal, as they were more resilient or less sensitive than controls, over 3 months after receiving KC. KC infants also had more optimal reactivity (mid range reactivity) during the aversive stimulus and were more adept at using the “off” periods (rest periods) for rest (no reactivity). During face-to-face interactions, KC infants showed less negative emotionality and mothers were more synchronous and less intrusive (a sign of the bi-directional effects of early co-regulation on mother and child) PT, Quasi-experiment, Maternal benefit, stress, emotion regulation, 3 month face-to-face interaction, social dev. Not an RCT, State, Development, sleep cycles, Quiet Sleep, arousal, Infant emotion, PT. Used same stats as Engler

Ferber S.G., & Makhoul I.R. (2004). The effect of skin-to-skin contact (kangaroo care) shortly after birth on the neurobehavioral responses of the term newborn: a randomized, controlled trial. Pediatrics, 113 (4), 858-865. 47 healthy mom-infant dyads (22 KC) began KC 15-20 mins after delivery for 60 min, 25 controls got no KC, standard wrapped care after being taken out of delivery room to be weighed and dressed and then returned to mom (kc only, control group babies went to nursery for 2 hours). At 4 hours postbirth they observed infant for every two minutes over one hour. KC group slept longer, were mostly in quiet sleep state, had less time in transitional, fussy, crying, and alert states (using 6 state Brazelton scoring), showed more flexor movements and postures, less extensor movements. KC influences state organization and motor system modulation shortly after delivery, this kind of care should be offered shortly after birth. KC reduces infant stress (pg. 861). Fullterm, RCT, development, sleep, quiet sleep, crying, alert state, flexed posture and flexed movements, motor development, stress.

Ferber SG, & Makhoul IR. (2008). Neurobehavioural assessment of skin-to-skin effects on reaction to pain in preterm infants: a randomized controlled within-subject trial Acta Paediatr. 2008;97(2):171-176. Neurobehavioural assessment of skin-to-skin effects on reaction to pain in preterm infants: a randomized controlled within-subject trial (all subjects got heel stick with KC, KC alone without a blood stick, blood stick in incubator, and time alone in incubator without blood stick). 30 preterm infants had baseline (10 minutes), intervention (blood test or no blood test heel stick for 2 minutes), posttest (10 minutes) and follow-up (20 minutes in a crib starting 1 hour after treatment) measurement of NIDCAP naturalistic observation of infant neurobehaviour in all four conditions. During blood stick with KC, a decrease in motor disorganization and extension movements was found, as were an increase in both positive and
negative attention signs. Significant neurobehavioral changes were sustained into follow-up one hour later with KC but not without KC. PT, RCT, Pain, residual effects, decreased stressful neurobehavioral signs of pain (Specific NIDCAP movements are associated with acute pain in preterm infants in the NICU- Pediatrics 2004). Not on Charts Yet, Stress,

Ferreira, C., & Ludington, S. (1994). Does frequent skin contact improve respiratory pattern in preemies? Respiratory Care, 39(11): 1061. RCT, KC = 23; Incubator = 21; 5 day study. pretest, test-postest design of 3 hours of KC/day for five days, SaO2 improved during KC compared to incubator period. PT, RCT, HR, RR, Sao2,

Fidler H.L. (2010). Report brief on a maternal massage therapy intervention and neurodevelopmental outcomes at 2 years corrected age. Advances in Neonatal Care, 10(2). 98-99. This is review of the Mendes & Prociainoy, 2008 and the Prociainoy et al., 2009 results of an RCT of VLW infants, all of whom got 24/7 KC in Brazil and then one group got Kc + massage. In the Mendes report, massage + KC group got discharged 7 days earlier and had fewer infections. In this report, the KC+ massage group did better in neurodevelopment (significantly higher MDI and higher, but not significantly so, PDI up to 2 years postbirth). Massage was by mothers, 4 times/day beginning at 48 hours of life until discharge from NICU and massage was on external aspects of limbs and specific facial regions and kinesthetic stimulation (passive exercise of limbs). Micropreemie, VLWB, RCT, massage, development.

Field, T., Hernandez-Reif, M., Feijo, L., & Freedman, J. (2006). Prenatal, perinatal, and neonatal supplemental stimulation: A survey of neonatal nurseries. Infant Behavior & Development, 29(1), 24-31. 82 US NICU neonatal staff members in 25 NICUs around the southern US states responded to questionnaire. 1) skin-to-skin following birth in the delivery room (83%), containment (swaddling and surrounded by blanket rolls occurred in 86% of NICUs), music is in 72% of NICUs, rocking in 85%, KC (98% of NICU), nonnutritive sucking during tube feedings in 96% NICUs, and breastfeeding in 100% NICUs. Pregnancy massage (19%), labor massage (30%), Doula (30%), NICU waterbeds (23%), preterm infant massage (38%). These are physicians’ perceptions, not staff nursing and I, SML, think that they are inaccurate as 100% of NICU infants do not get breastfed!! PT, FT, Survey, KC, BF, rocking, NNS, swaddling, massage, Birth KC, VEKC, alternative therapies

Filho reference is officially LAMY FILHO, so go there

Finigan, V., & Davies, S.(2004). “I just wanted to love, hold him forever.” Women’s lived experience of skin-to-skin contact with their baby immediately after birth. Evidence Based Midwifery, 2(2), 59-65. Phenomenologic qualitative study of women in the UK and they comment on the ‘gaze’ they needed to establish with the baby and the natural instinct of wanting to touch and bring their babies to the breast.


Fischer, C.B., Sontheimer, D., & Linderkamp, O. (1998). Cardiorespiratory stability of premature boys and girls during Kangaroo Care. Early Human Development, 52(2), 145-153. Pretest(2 hrs)-KC (2 hrs with cap and covered across back with cotton blanket)-posttest (2 hrs) design in which stability of HR, RR, and SaO2 values was measured by a method developed by the team- amethod of counting the boxes on the graph paper of how high the values were. KC had no effect on any stability indicator; boys had significantly less stability in all three measures than girls. PT, Quasi-exp, HR, RR, Sao2, KMC only, stability, ELBW, VLWB, micropreemies

Flacking, R., Ewald, U., Nyqvist, K.H., & Starrin, B. (2006). Trustful bonds: A key to ‘becoming a mother’ and to reciprocal breastfeeding. Stories of mothers of very preterm infants in a neonatal unit. Social Science and Medicine, 62, 70-80. 25 mothers whose preterm infants had been cared for in 7 NICUs in Sweden were interviewed to
assess the process of becoming a mother of a preterm infant and the role that breastfeeding played in becoming a mother. Three themes emerged: 1) loss of the infant and the emotions of putting ‘life on hold’. 2) separation from infant was a sign of being unimportant as a person and as a mother, - separation made mothers distrustful and feeling shame/distrust rather than trust in care- and 3) there are critical aspects of becoming more than a physical mother. Kangaroo Care was a critical aspect for becoming a mother and NICU moms had to wait for weeks to hold their infant skin-to-skin. KC meant to mothers that the infant had vitality and strength and would survive because he could be held skin-to-skin. KC also meant a step toward normality.” Kangaroo holding itself was something that was approaching the normal.” And KC made them feel important because they could see the baby was in a healing state when held in KC. (pg. 74-75 for the 3 meanings of KC).

Flacking, R., Ewalt, U., & Wallin, U. (2011). Positive effect of kangaroo mother care on long-term breastfeeding in very preterm infants. *Journal Obstetric, Gynecologic, and Neonatal Nurses, 40*(2), 190-197. DOI: 10.1111/j.1552-6906.2011.01226.x. Descriptive longitudinal study of 103 very preterm infants (<32 wks GA) and 197 preterm (32-36 wks GA) infants from NICUs in 4 counties in Sweden. KMC contact/day during all hospital day from parental-self report were used and BF data obtained by phone contact. VPT dyads that were breastfed at 1,2,5, 6 months had spent more time in KMC/per day than those not BF at those times. Trend toward significance occurred at 3 and 4 months. In the Preterm dyads, no statistically significant difference were found in amount of daily KMC between those BF and those not BF. KMC during hospital stays is important for breastfeeding durations in very preterm infants. KMC has an empowering effect on the process of BF, especially in smallest and most vulnerable infants. PT, BF duration, micro-preemie, descriptive study. *GET THIS* Not on charts 5/2/2011.


Fleming, P.J. (2012) Unexpected collapse of apparently healthy newborn infants: the benefits and potential risks of skin-to-skin contact. *Archives of Disease in Childhood, Fetal and Neonatal Edition, 97*(1), F2-3. DOI: 10.1136/archdischild-2011-300786. This is a review of recent reports from Germany (Poets et al., 2011), France (DAgeville et al., 2008; Espagne et al., 2004; Andres et al., 2011), United Kingdom & Ireland (Becher et al., 2011) and Scotland (Peters et al., 2009) about ALTEs and deaths during birth kangaroo care. It relates similarities between the reports (collapse is a rare event, most commonly observed in infants of primiparous mothers, infants are unobserved by staff, infants are undergoing skin-to-skin contact with infant prone or on side of mother’s chest. Scotland study had one infant that had prenatal brain injury - so prenatal compromise may be a contributing factor. Accidental asphyxia has occurred according to Becher, Poets, and Andres. Unexpected collapse of healthy infant within a few hours of birth has existed for many years and may be first presentation of underlying previously unrecognized congenital anomaly of cardiorespiratory system or neural control systems or underlying metabolic disorder, but in most cases it is not because the most common cause is positional asphyxia. Nonetheless “The routine separation of mothers and infants after delivery…may have significant negative effects on the establishment of normal mother-baby postnatal interactions, most importantly, the establishment of breastfeeding.”(pg. 1 of article). FT, Birth KC, ALTE, life-threatening events. Not on charts 9/15/2011.’/xe’;xd

Flynn, A., & Leahy-Warren, P. (2010). Neonatal nurses’ knowledge and beliefs regarding Kangaroo Care with preterm infants in an Irish Neonatal Unit. *Journal of Neonatal Nursing, 16*(5), 221-228. KC was introduced into IRISH NICUs in 2003 (pg. 225). An evaluative study of 62 neonatal, pediatric, and midwife nurses’ (in a level III NICU) knowledge and beliefs about KC. They used the tool that Engler et al., 2002 used to test knowledge and beliefs. 56(90.3%) believed KC is a safe alternative for stable growing preterm infants, agreeing on the benefits for both infants and parents. Overall level of knowledge was good to excellent, the lowest score was 35/51. Nurses had uncertainty of doing KC with intubated infants and infants on blood pressure support, umbilical lines, and phototherapy. More education is needed to foster development of more positive beliefs and increase staff knowledge of potential adverse effects. Cites Chia study about the education, skills training, assessment of infants, transfer techniques and supervised
experience to improve use of KC. PT, descriptive study, nurse knowledge, ventilated KC, phototherapy, umbilical lines, beliefs, transfer is hardest, implementation guidelines. Check if on charts.

Fohe K, Kropf S, & Avenarius S. (2000). Skin-to-skin contact improves gas exchange in premature infants. J Perinatology, 20(5), 311-315. 53 preemies 28-32 wks GA, <1800gm, pretest incubator (60 min)-test(KMC: 90 min)-posttest(60 min) acting as own controls. HR increased 5 bpm, RR decreased 5bpm, SaO2 increased by 0.4%, tcpO2 increased by 48 mmHg, RECTAL temp increased by 0.3°C during KMC. Smallest increase in HR and highest decrease in RR is <1000 grams; SaO2 and tcpO2 increases doubled in <1000grm compared to >1800 gms. Infants remain clinically stable and have more efficient gas exchange. No risk of hypothermia in <1000 grams VLBW. Quasi-Experimental, pretest-test-posttest. HR, RR, SaO2, rectal temp, FiO2, TcPO2, TcPCO2. Very low birthweight and some micropreemies, Quasi-exp., stability

Foran, A., Cinnante, C, Groves, A., Azzopardi, D.V., Rutherford, M.A., & Cowan, F.,M. (2009). Patterns of brain injury and outcome in term neonates presenting with postnatal collapse. Archives of Childhood Disease, Fetal and Neontal Ediction, 94(1) F168-F177. Doi: 10.1136/ADC.2008.140301. NOT A KC STUDY. Study was of infants who were sent from hospitals to the referring hospital for sudden collapse and only 12 infants were found over 14years and I doubt S2S at birth occurred much before 2004, so at the most one infant could have been in KC, but they had NO DATA as to how the infant was placed in Breastfeeding, could have been swaddled. They only know that 6/12 cases they got over all these years were BREASTFEEDING babies. Sudden postnatal collapse of previously apparently healthy term infant is rare, incidence being 0.03-0.5/1000 live births. Babies with collapse fell into two outcome groups: neuronal damage (basal ganglia and brain stem injury) or respiratory illness (needed ventilation with 100% O2) and the majority were caused by asphyxia events. 12 infants were studied Mean GA=39 wk, BW Mean=3150 gm. 10 were by normal spontaneous vaginal delivery (including one in occiput posterior position, 2 breech, 2 water births, 3 ventouse/forcep deliveries) and 2 by emergency Cesarean. Median APGAR sores were 9 (Range = 3-9) and 10 (Range =8-10) at one and five minutes. Median cord pH =7.29(R=7.18-7.34). All were thought to be well after birth. Median age at postnatal collapse was 75 minutes (R=10min-55hours). All infants required extensive resuscitation. Median pH after collapse was 6.75 (R=6.39-7.05), seven infants became severely encephalopathic with severely abnormal EEG/aEEG recorded within 12 hours. MRI showed acute severe hypoxic ischemic injury. All 7 died. One infant showed rapid recovery, had mild encephalopathy and good outcomes. Four infants had severe respiratory illness, normal background aEEG and MRI showing white matter change (n=3), or a small infarction (n=1). All had a good two year outcome. In this term cohort early postnatal collapse was generally followed by severe encephalopathy, acute center gray matter injury, and poor outcomes OR severe respiratory illness/white matter change and good outcomes. THIS STUDY MADE A SIGNIFICANT CONTRIBUTION because the MRI and EEG could tell if injury occurred after birth or before. First, no metabolic (oxidative stress) or bacteriological problems were Group 1 were severely encephalopathic and had severe EEG abnormality and severe damage to the central germinal matrix and brainstem . All of these maintain respiration or a primary airway compromise postnatally. “Group 2 had a primarily respiratory abnormality. These infants had near normal brain imaging and EEG and normal outcome.” (pg. 175) These infants had Early EEG and MRI which predicted outcomes accurately. However, no antepartum, intrapartum, or other etiological factors were identified except as listed above (i.e. brain damage and one minute APGAR of 3). “None of the infants showed convincing signs of perinatal asphyxia from APGAR score, which were normal. F176). Possible explanation for collapses was interference with brainstem blood flow in course of labor and delivery gave rise to brainstem injury (Susie’s note: i.e. hard, long duration pushing?). Brain stem injury usually presents as seizures some hours after birth, but brain stem injury also has a time lag between injury and presentation (F176).” The group with severe neuronal injury seemed often to have a time relationship to feeding – collapsing during feeding or within minutes of their first breastfeeding. This may be due to infants having suffered a mild generalized asphyxia or basal ganglia and brainstem injury impairing ability to coordinate feeding and respiration” (F176). But respiratory group had “primary mechanism of inadvertent suffocation, and occurs in first time mothers (9/12 were primips) and with early skin-to-skin contact. MENTIONS KC HERE. Although the benefits of skin-to-skin contact are not disputed, some authors recommend close monitoring of parents and infants in their first postnatal hours… In our study only two were found sleeping with their mothers. The majority with poor outcome were found collapsed during or immediately after feeding.” (F176). Gestational age is a risk indicator because GA has a
profund effect on ultimate pattern of injury. If infant is less than term or on the brink of term, i.e. 37,38, 39 weeks GA rather than 40 or 41 wks GA, hypoxic ischemic injury tends to affect the lower basal ganglia and brainstem then in more mature infants.” F176 and citation is there for an unpublished work. Any white matter injury in the infant places him at risk of attention and behavioral problems after 2 yrs of age (F177). Further investigation is needed in a larger postnatal collapse cohort. FT, Birth KC, life threatening, mortality, autopsy confirmation, Risk indicators, prognostication, NO SUPPORT OF KC statement. Sleep with mom, during FEEDINGS


Franck LS, Bernal H, & Gale G. (2002). Infant holding policies and practices in neonatal units. Neonatal Network, 21(2), 13-20. National survey of policy and practice of conventional and KC holding. 215/400 responses from Level 3 and Level 2 nurseries. 40% of units have policies for KC and only 26% have policy for conventional holding: 73% offer parents KC with extubated infants, 45% offer KC with intubated ones, paternal KC permitted in 68%, sibling KC in 2%, grandparent KC in 6% of units. Many units permit KC with ventilated, CPAP, artery caths, percutaneous venous caths, and chest tubes (p. 18). Benefits are enhanced attachment and closeness. Readiness for KC determined by SaO2, HR, & RR, not wgt, GA. 25-33% of respondents identified staff RN and MD as not supportive of KC. Barriers to KC are infant stress, privacy, timing of parental visit, and getting staff help. Descriptive Survey. PT, implementation, barriers, attachment, surrogate KC, policies. Not on Charts Yet.

Franck, L.S., Oulton, K., & Bruce, E. (2012). Parental involvement in neonatal pain management: an empirical and conceptual update. Journal of Nursing Scholarship, 44(1), 45-54. NOT A KC article but it addresses maternal use in managing infant pain and provides 7 steps of maternal progress in doing this. Conceptual article saying that mothers want to know of painful procedures, be fully involved, and taught how to use specific therapies such as frequent diaper change, pacifies, sucrose, prepare environment and want health personnel to be more skilled in starting lines and IVs to reduce infant pain. Provides new theory of the levels of parental involvement in managing NICU infant pain and clearly states that parents see their” role as a VITAL ROLE in which they want full involvement” (pg. 48) and to help with infant pain as much as possible, want to be informed of painful procedure before it occurs and then help baby through painful procedure and even use specific treatments like change diaper frequently, give sucrose, pacifier, proper rest opportunities, more skill in health workers for putting lines in, create calm surroundings etc (pg 49 chart). They don’t want to be told that they should wait outside. Page 48 relates the stages of parental involvement: 1. None (views infant comfort as nurse or doctor’s role only), 2. Be Informed, 3. Be present, 4. Provide comfort by touch, voice, specific comforting techniques, 5 Informant for NICU staff (tells staff what works for baby), 6. Active decision maker, 7. Advocate for infant – primary responsibility in partnership with clinical team. Theory, pain, maternal/paternal/patient involvement.

Fransson, A-L., Karlsson, H., & Nilsson, K. (2005). Temperature variation in newborn babies: Importance of physical contact with the mother. Archives of Diseases of Childhood Fetal Neonatal Edition, 90(6), F500-F504. Descriptive study of abdominal, foot, and rectal temperatures over the first two days of life in 27 healthy fullterm newborns when held in close contact with their mother (babies wore diaper, cotton vest and romper pg.F500) and when in cot were covered by blanket) versus when in a cot beside the mother. 48 hours of recording beginning 4-8 hours postbirth, so this is Early KC. There is no mention of KC as a condition, but the conclusion says “During periods of skin to skin care, peripheral and abdominal skin temperature increased, indicating a heat gain”. (pg. F503) but the article does not describe any skin to skin period, and since when is dressed in vest, diaper, and romper called skin to-skin care? Foot temps rose quickly, all temps were higher when baby was with mom than when in cot. In KC mean difference between rectal and abdominal temp was 0.2C vs 0.7 in cot babies; difference between rectal and foot in KC was 1.5C vs. 7.5C in cot babies – temp difference between rectal and foot of 7-8 degrees C indicates a HEAT LOSS close to the maximum heat loss for which a neonate can compensate. Difference between rectal and foot temp in KC showed positive heat balance, no heat loss. Article emphasizes importance of close physical contact with mothers for temp regulation during the first few postnatal days. Fullterm, descriptive, abdominal Temp, foot temp, rectal temp, swaddled KC?, Early KC.
Freire NB, Garcia JB, & Lamy ZC. (2008). Evaluation of analgesic effect of skin-to-skin contact compared to oral glucose in preterm neonates. Pain 139(1): 28-33. RCT of 95 preterms 28-36 weeks randomly assigned to 3 groups: incubator (n=33) prone in incubator during heel stick and got no analgesia; KC group (n=31) 10 minutes of KC before and during heel stick; glucose group (n=31) prone in incubator and got 1 ml of 25% glucose 2 minutes before heel lancings. KC group had smaller variation in heart rate, smaller variation in oxygen saturation, shorter duration of facial activity (brow bulge, eye squeeze, nasolabial furrowing), and lower PIPP score. KC produced analgesic effect in preterm newborns during heel lancings. Pain, Preterm. HR, stability, SaO2, PIPP, facial signs. Full citation under de Sousa Freier earlier in this bib.

Furlan C.E., Scochi C.G., & Futado, M.C. (2003). Perception of parents in experiencing the kangaroo mother method. Review Latin-American Enfermagem, 11 (4), 444-452. 10 parents completed interview within 60 days after preterm infant discharge from charity hospital inside Brazil. Four themes were: KC should be flexible, KC improves mother-child and family relationship, KC helps complete infant’s growth & development, and KC helps mother develop caregiving skills. Preterm, qualitative descriptive study, Parental report of KC’s meaning to them, attachment, development, caregiving skills, weight


Furman, L., Minich N., & Hack, M. (2002). Correlates of lactation in mothers of very low birth weight infants. Pediatrics, 109(4), 695-696. Significant correlates of lactation beyond 40 wks Conceptional age included beginning milk expression before 6 hs post-delivery, expressing milk ≥5 times per day, and Kangaroo Care. Increased maternal support specifically directed toward behavioral factors, including early and more frequent milk expression and kangaroo care, may improve the rates of successful lactation among mothers of VLBW infants who choose to breastfeed. KC is associated with increased milk production. Regression analysis. BF, PT, milk product

Gale, G, Franck, L., & Lund, C. (1993). Skin-to-skin (kangaroo) holding of the intubated premature infant. Neonatal Network, 12(6), 49-57. 25 intubated (>10 breaths/min) infants of any weight or gestation with axillary temp 36-37.2 given adlib KC. Axillary temp measured after 10 mins of KC. Did standing transfer. Transfer was most stressful. No infant dropped temp and it more commonly rose and had to have hat removed. Infants <1.2 kilos needed 15-20 minutes of adaptation to get good SaO2s, some became wiggly, less comfortable, and desaturated after 20-30 minutes. Bigger infants tolerated KC better and >30 week PCA did better in KC than <30 weeks. Infants slept for 10-15 min and then aroused in response to parent’s voice. One accidental extubation. Parent statements reflected stronger identity and knowledge of infant, greater confidence in infant need for them and ability to meet needs. Parent liked to watch infant’s SaO2 improve during KC. No negative reactions from parents. PT, descriptive study of temp only, VENT KC, SaO2, Sleep, transfer, axillary temp, parent response, maternal confidence, confidencestaff responses, desats


Gallagher KJ. (2000). Continuous skin-to-skin contact in the NICU: Kangaroo or “Possum” care? J. Perinatology, 5, 318-319. In SML’s opinion this is a silly article saying KC should be called possum care because KC did not originate in Australia. How do people get this stuff published? Commentary, PT.

defined as mild: 36.0-36.4; moderate as 32.0-35.9, severe as less than 32.0, normal rectal or axillary temp is between 36.5 and 37.5 according to WHO 1997; AAP and ACOG 1997. In first 20 hours of life 17% of all temps are in hypothermic range (Takayama et al., 2000); and 51.8% of 200 term infants studied over first 72 hours postbirth had one or more hypothermic episodes and episodes peaked between 15 hr and 2nd day of life postbirth (Li et al., 2004). Christensson et al., 1998, Fransson et al., 2005 and Karlsson 1996 are reviewed. The guidelines are: no symptoms of distress, normal HR and RR, and having mild hypothermia, have mom empty bladder and be willing, medicate mom for pain, room temp should be at least 25C, mom wears hospital gown, no bra, and sits at any angle at which shes comfortable, put hat on infant’s head, allow as much of infant skin as possible in contact, use receiving blanket in fourths, monitor infant temp with axillary probe 15 minutes after start of KC, if temp is same or improved, check at 30 mins and then 1 hour post KC beginning. If infant axillary temp at any time is 36. or less or if temp is dropping after 30 minutes of KC or rectal temp less than 30 or infant not normothermic after 1 hour of KC or infant has signs of distress, stop KC. Fathers are an acceptable alternative, and KC may be beneficial for adoptive parents. She has an evidence-based scoring system that is unusual: A1 = at least one randomized controlled trial involving this population; A2 = at least one RCT involving related populations, B = well designed RCT, or empirical data from published research reports, or widely accepted scientific principles, C = official recommendations of established advisory panels, D = expert opinions or consensus among clinicians. Guidelines, Full term, review, hypothermia rewarming, evidence-based practice rating system, paternal KC, temp.

Ganatra HA, Stoll BJ, & Zaidi AKM (2010) International perspective on early-onset neonatal sepsis. *Clinics in Perinatology* 37, 501-523. Review of early onset sepsis and on page 510-511 it says that KC can decrease EONS in full term and preterm infants. Says KC remains to be assessed in community settings, but Conde-Agudelo’s Cochrane review of 2003 shows significant reduction in infection in LBW in hospitals. Says that “increase in body temp and weight gain and reduced stress in conjunction with increased BF might be responsible for the lower rates of infection in neonates receiving KC” (pg. 511) and KC is listed in Box 2 (pg. 509). As a postnatal care intervention to prevent EONS and its associated mortality. Review, infection, mortality, stress, temp, weight gain, PT, FT.

Gangal, P. (Ed.) (2007). Breast Crawl. Initiation of breastfeeding by breast crawl. For Unicef India, UNICEF Mahashtra, 19, Harish Enterprises, Parsee Panchayat Road, Andheri (E), Mumbai, India 400069, unicef.org/India. Email is rmail@unicef.org. Telephone is +91-22-28269727. If you create a quiet, calm, unobtrusive environment, the breast crawl will happen and infants will latch on and suckle on their own. Chapter one has the 10 steps to Successful BF, then a copy of the script for the Breast crawl video, frequently asked questions about breast crawl, scientific overview, India’s vision of this early skin-to-skin experience, and appendices. The Scientific Overview is very well done. And the 10 steps lists step 4 as “help mothers initiate BF within half hour of birth” and does not mention KC as original #4 did. (pg. 10). A birth KC procedure is outlined on page 12 starting “soon after delivery and after the baby has cried and started breathing well” (pg. 12) and involves drying baby (BUT NOT THE HANDS), putting baby cheek-to-cheek with mother (for a holy prayer whispered in baby’s ear), and then placed between maternal breasts and baby and mother are covered with a cloth. One step mentions “The baby’s risk of infection is reduced because safe germs (bacteria) from the mother start to colonize her skin and intestines, and prevent harmful germs from growing” (pg. 12). Says baby starts salivating when baby realizes food is near, and odor of substance from nipple that is similar to amniotic fluid smell drives baby to nipple (pg. 12). One step includes putting baby cheek-to-cheek with mother so she can see baby and reports that some mothers start to cry, get extremely emotional, and some even lick their babies (like cows do) (pg. 16) when given cheek-to-cheek experience. Indian doctors learned about breast crawl from Klaus and Fanaroff’s 2005 *Care of the High Risk Neonate* text which said the breast crawl was originally described in 1987 by Widstrom, Ransjo-Arvidson, Christensson, Matthiesen, Winberg and Uvnas-Moberg. Page 15-16 identifies several advantages of this NON-SEPARATION approach: keeps baby warm, leads to faster and effective achievement of feeding skills by the baby, baby starts getting colonosrum as first feed (colostrum is high in antibodies), baby starts getting colonized by safe germs from the mother (pg. 15), helps uterine contractions, faster expulsion of placenta, reduces maternal blood loss, prevents infant anemia (pg. 16), leads to better sugar levels if first few hours post-birth, earlier passage of meconium and thus decreased intensity of normal newborn jaundice, early and long term breastfeeding success, better maternal-infant bonding, may boost development of baby’s nervous system, permits expression of natural instinctive mammalian process (16). Page 17 states “Frequency of feeding and skin to skin contact is the key to breastfeeding success.” They mention that they have
let preterm and Low Birth weight infants crawl to breast if the infant does not have respiratory distress or need transfer to NICU (pg. 17). For cesarean they place baby cheek to cheek first and then near a breast (pg. 17) and assist with first breastfeed while in operating room. Most babies complete the crawl within 30-60 minutes postbirth. Fullterm, Birth KC, infection, breast crawl, non-separation, breastfeeding, preterm reference too., attachment, 3 rd world, cesarean.


Gardner MR & Deatrick JA. (2006). Understanding interventions and outcomes in mothers of infants. Issues in Comprehensive Pediatric Nursing 29 (1): 25-44. Review of literature of interventions designed to improve effective mothering outcomes. On page 27 the chart of intervention strategies to promote mothering processes lists Feldman et al., 2002, 2003 and Tessier et al., 1998 as the KC references reviewed on maternal-infant contact. On page 34 is a one paragraph review of the findings of the three studies identified above. The authors conclude that home visiting, KC, education, counseling, and group intervention all promote effective mothering during the first years of an infant’s life. Nurses should use these interventions to promote effective mothering during the first year of life. Integrative review, maternal behaviors (Grading criteria for the review were Level I=systematic review or meta-analysis of randomized trials, Level II = randomized controlled trials, Level III=Quasi experimental method, Level IV= Case-control/cohort study, Level V= Systematic reviw of descriptive and qualitative studies, Level VI = Descriptive or qualitative study or case study, Weakest = Level VII = Expert opinion/report., FT, PT

Gardner, S. (1979). The mother as incubator – After delivery. Journal Obstetric, Gynecologic and Neonatal Nursing. May/June 1979, 174-176. Infants delivered and dried, and given routine care, eye instillation, ID bands, and weighing and footprinting - then given to mom for KC and covered with warm blanket. 9 were wrapped in one cotton and one plastic blanket, held briefly by parent and put under radiant warmer. Rectal temps taken 2 and 15 minutes after birth. KC infants had less drop in temp (1.1degree C) from 2-15 minutes than control (1.5 degrees C).FULLTERM, Birth KC/VEKC, rectal temp, swaddled care


Gartner LM, Morton J, Lawrence RA, Naylror AJ, O’Hare D, Schanler RJ, et al., (2005). Breastfeeding and the use of human milk. Pediatrics 115(2), 496-506. THIS IS THE SAME AS AAP above, and I am not sure which is the correct citation as I have seen the same manuscript reported both ways. So look at AAP 2005 for the annotation. Guideline, policy, fullterm, preterm, breastfeeding. This is also the same as Gartner & Eidelman, 2005

of 35 weeks in both groups) who got at least 6 hours/day starting at 1.72 days of age until discharge (wearing head cap and diaper only) and at home or infants who got incubator care or open cot care (n=50). All KMC was for at least one hour at a time. First month KMC duration was 10.21 hrs, in second month 10.03 hours, and in 3rd month 8.97 hours. Length of stay sig shorter for KMCers (3.56 vs.6.80 days) At 3 month follow up, mother were interviewed and attachment score (authors own 5 questions) was significantly higher in KMCers (24.46 vs. 18.22. In KMC group mother was more often primary caregiver, were more involved in care of baby, spent more time beyond usual caretaking with baby, went out without baby less often, and derived greater pleasure from baby than controls. Did not report how measured home KC, may have been by recall at interview. KMC facilitates mother baby attachment. PT, RCT, home kc, length of stay, attachment, maternal feelings, 1hour sessions of KMC, length of KC at home 3 months of KC LATE PRETERM.

Gathwala, G., Singh, B., & Singh, J. (2010). Effect of Kangaroo Mother Care on physical growth, breastfeeding, and its acceptability. Tropical Doctor, 40, 199-202 A RCT of 110 (KMC group got KC for at least 6 hrs/day, including after they moved from NICU and went home; control group got incubator care). Weight,length and occipitofrontal circumference were measured weekly X 3 months. Acceptability of KC by mothers and staff was measured on Day 7 of KMC by Likert scale questionnaire. Breastfeeding rates were measured at end of 3 months. Mean GA was 35.48 ±1.20 wks in KC group and 35.04±1.09 wks in control. KMC was initiated at mean age of 1.72±0.45 days and the duration of KC was 9.74±1.48 hr/day. Mean birth weight was 1.69 ±kg in the KMC group compared to 1.60±0.12 kg in controls. Mean length gain in cm/wk was 1.03±0.5 in KMC group compared to 0.74±0.05 in controls. Mean occipitofrontal circumference change was -.59±0.04 KC vs. 0.47±0.03 controls (p<.01), and at 3 months 88% of KC were EXCLUSIVELY breastfeeding and 72% of controls were (p<.05). Maternal acceptance was good. KC improves physical growth, breastfeeding rates and was well accepted by mothers and nursing staff. PT, Late PT, RCT, 3rd world, Duration, Home KC for 3 months, BF, weight, length, occipitofrontal circumference, maternal acceptance, staff acceptance Not on Charts as of 11/2010.

Gatti. This article is in related literature on the Life Threatening Chart. It is not here because it is not a KC study.

Gazzolo D, Masetti P, & Meli M. (2000). Kangaroo care improves post-extubation cardiorespiratory parameters in infants after open heart surgery. Acta Paediatrica, 89(6), 728-729. 5 male infants (X age=5 months) who had repeatedly failed extubation attempts earlier after cardiac surgery were observed every two minutes through two two-hour KC periods (each with a preKC measurement 2 hrs before KC). All 3 KC sessions occurred within first 12 hours of extubation (KC was diaper only, covered with blanket) in Modena, Italy. SaO2 and tcpO2 sig. increased and TcpCO2, HR, and CVP sig. decreased during the 3 different KC periods. “Despite restricted study pop, findings suggest prolonged periods of KC during postop care might have impact on quality, therapy, and length of stay of postop pedi pers, with possible influences on management and costs”p. 729. Descriptive. HR, RR, SaO2, TePO2, TePCO2, CVP, pH, Na, Ca, K, BP, Fullterm, length of stay, costs, congenital heart disease

Gentilucci, M., & Dalla Volta, R. (2008). Spoken language and arm gestures are controlled by the same motor systems. Quarterly Journal of Experimental Psychology (Hove), 61(6), 944-957. This is a review article of the mechanisms of speech and arm movements and discusses how maternal touch of the infant and skin-to-skin contact helps accelerate development of motor areas. Review, physiology, Speech motor development, full term. Not on Charts 3/26/2012

Geva, R. & Feldman, R. (2008). A neurobiological model for the effects of early brainstem functioning on the development of behavior and emotion regulation in infants: implications for prenatal and perinatal risk. J Child Psychology and Psychiatry, 49(10), 1031-1041. Vertical Integration Theory (pg. 1033, simply put that functioning of brainstem predicts later development in the limbic and cortical cores of development (there are three brain levels: brainstem, limbic, and cortical) and review that states that the infant brainstem needs maternal skin contact in post-birth period for its own development and infant physiological regulation (pg. 1037). They propose 3 integrated levels of observations for the study of early risk: a) brainstem-related physiological regulation of cyclic processes and sensory integration e.g. vagal regulation, circadian rhythms; b) emotion and attention regulation capacities that draw on the
integration of brainstem and limbic systems; and c) higher-level outcomes that draw on intactness of brainstem and limbic networks, including socio-emotional self-regulation, inhibitory control, and cognitive processing. They underscore the importance of assessing sub-cortical and brainstem systems and the longitudinal effects of transitory brainstem dysfunction on physiologic homeostasis, motivation, arousal-modulated attention, stress reactivity, and mother-infant co-regulation. **Has content on cholecystokinin, too. Theory, Review, stress, physiologic stability, development, limbic brain. Not on Charts as of 9/10/09. FT, PT**

Gewirtz JL, Hollenbeck AR, Sebris SL, & Manniello RL. (1989). Maternal-infant behavior at 2-days and at 28-days postpartum following maternal-infant contact in the recovery room. Presentation at the Annual Meeting of the American Psychological Society, June 10-12, 1989 in Arlington, VA. Retrievable through ERIC. NEED URL 62 white, married, middle class mother/infant (full term, APGARS of 9 or more at 5 minutes; 52/62 had epidurals,) dyads were assigned to one of two groups: KC (naked ventral-ventral with blanket covering both) in the recovery room or holding swaddled infant in her arms in recovery room. White middle class mothers were chosen to add to the literature of Klaus et al. 1972 who sampled low income Black mothers in Cleveland. Each group received either 15 (KC = 16; swaddled = 17) or 60 minutes (KC = 15; swaddled = 14) of the treatment starting in the recovery room within one hour of birth (at least 20 minutes after birth) and then were observed at 2 and 28 days postpartum. 11 maternal (smiling, looking, talking, rocking, touching with palms, etc) and 11 infant behaviors (grimace, smile, resist, en face, eyes open, non-vocal sound, vocalizing, fuss/cry, mouthing, motor acts, feed) were observed every 10-seconds during and between feedings (one hour before scheduled feed) and scored. At 2 and 28 days postpartum the Brazelton Maternal behaviors were relatively stable from 2-28 days; infant behaviors were less stable but indicated developmental changes: more eyes open, more en-face, less fuss/crying at 28 days compared to 2 days. Longer contact (60 mins vs. 15 mins) overpowered the mode of contact (higher frequencies of maternal behavior in 60 min than 15 min group; and the same for 7 infant behaviors). There was no difference between KC and swaddled groups; only longer time made a difference. A unique bonding experience occurs in the recovery room and the expression of maternal and infant behaviors is more dependent upon the state of the infant (whether feeding or between feeds) than whether KC or swaddled holding occurred. Behaviors must be examined only in the CONTEXT of FEEDING/NOT FEEDING. Fullterm, quasiexperimental, maternal behaviors, swaddling, self regulation, state NOT ON CHARTS YET.


Gibbins S., Hoath SB, Coughlin M, Gibbins A., & Franck L. (2008). The universe of developmental care. A new conceptual model for application in the neonatal intensive care unit. *Adv Neonatal Care* 8(3), 141-147. This is a theoretical article proposing a new conceptual model for developmental care. The infant’s skin is the “shared surface” with his/her environment and as a result of the skin being a shared surface, changes occur in each of the “care planets” (or dimensions of care, arenas of care) which are monitoring/assessment, feeding, positioning, infection control, safety, comfort, thermoregulation, skin care, respiratory care, family, staff, and environment. KC is listed as a component of the “comfort care planet” because of its pain reduction outcomes, but not in thermoregulation, infection control, or feeding areas, which is where it also belongs. Theory, preterm, developmental care., pain

Gitau R, Modi N, Gianakoulopoulos X, Bond C,Glover V, & Stevenson J. (2002). Acute effects of maternal skin-to-skin contact and massage on saliva cortisol in preterm babies. *J Reprod Infant Psychol* 20(2), 83-88. An RCT showing that a single session of 20 minutes of KC reduced salivary cortisol acutely. The other groups were massage and control condition. Authors suggest that repeated KC session may produce sustained reduction in salivary cortisol. PT, RCT, salivary cortisol, stress. GET THIS ASAP Not on charts

Gizzo, S., Di Gangi, S., Saccardi, C., Patrelli, T.S., Paccagnella, G. Sansone, L., Barbara, F., D’Antona, D. & Nardelli, G.B. (2011).Epidural analgesia during labor: Impact on delivery outcome, neonatal well-being, and early breastfeeding. *Breastfeeding Medicine* Epub ahead of print. All newborns received skin-to-skin contact right after birth in this two group (64 primips who got epidural in labor; 64 primips who got no analgesia) study. All had NSVD, No...
significant differences between groups in maternal age, GA, type of delivery, neonatal birthweight and length, APGARs, type of crying, neonatal reactivity, and time between birth and exposure to breast, and length of active labor. Length of labor for epidural group 363.58 mins and in no analgesia group it was 292.30 mins (p=0.001). Length of ACTIVE labor showed no difference. Number of women having a short Length of first breastfeeding was also significantly different (<30 mins in 62.2% of epidural group and <30 minute in 29.3% of no analgesia group)(p=0.001). Conclusion was that Epidural has little effect on trend of labor and duration of first breastfeed and none on neonatal outcomes. Dr. Morrison suggests a shorter first breastfeeding may not be a positive outcome, nor might be a longer breastfeeding. Until we know how the length of breastfeeding was measured (i.e. were bouts of non-nutritive sucking at the breast included or excluded?) we will not be able to answer this. Also, Dr. Morrison says the epidural babies may have been a bit sleepier, thus falling asleep sooner and resulting in more breastfeeds of short duration than in the non-epidural group – short feeding may have nothing to do with BF but may be related to epidural. Also, Dr. Morrison says that oxytocin is released early in a feeding and only when the oxytocin begins to drop off is prolactin released, indicating that a short feeding may NOT be beneficial because prolactin is needed for new milk production. Prolactinating receptors are laid down when progesterone is down and when oxytocin drops, so stopping the feed early may not allow sufficient drops to produce prolactinating receptors. We will watch for these data when the full manuscript is available.

Glasser S, Lerner-Geva L, Levitski O, & Reichman B. (2009). Parent support activities in neonatal intensive care units: a national survey in Israel. Harefuah 148(4): 238-242, 276-277. Descriptive study of social workers responses to questionnaire about services, programs, and facilities in 23 Israeli NICUS to support parents during and after hospitalization of preterm infants because parents experience stress. 20 units employ the KMC; three units used Al’s Developmental Care. Most strategies (many are listed) are practiced in few units so national guidelines need to be developed with would integrate families, staff and economic constraints. PT, Descriptive, policies/guidelines needed, Maternal stress, KMC. Not on charts As of 8/12/09.


Gloppestad, K. (1995). Initial separation time between fathers and their premature infants: A comparison between two periods of time. Vard I Norden, 15(2): 10-17. When KC was introduced, waiting time was significantly reduced by 66.8%.FATHERS, visiting times, separation, PT

Gloppestad, K., (1996). Parents’ Skin-to-Skin Holding of small premature infants: Differences between fathers and mothers. Vard Nord Utveckl Forsk, 16(1): 22-27. The time from birth til fathers held their preemie in KC was significantly later compared to mothers- about 120% difference of the median in time. FATHERS, PT, separation

Gloppestad, K. (1998). Experiences of maternal love and paternal love when preterm infants were held skin-to-skin and wrapped in blankets: Differences between the two types of holding. Vard I Norden, 18(1): 23-30. 103 mothers and 82 fathers held infants in both KC and swaddled and rated their love significantly higher when holding KC than when holding wrapped infants. No differences between fathers and mothers love ratings during KC. KMC and FATHERS. Attachment, PT


Golianu B, Krane E, Seybold J, Almgren C, & Anand KJ. (2007). Non-pharmacologic techniques for pain management in neonates. Seminars in Perinatology 31(5), 318-322. Discussion of KC begins on page 319. Recommends KC for acute pain but says that KC cannot provide analgesia for moderate or severe pain in neonate. KC needs to be considered in a graduated multidisciplinary algorithm for neonatal pain management: identify stress and pain triggers (noise, crowded environment, frequent medical handling, frequent painful procedures, lack of soothing touch) and remove or mitigate them. Mildly painful triggers or procedures may benefit from nonpharmacologic intervention. More painful procedures may benefit from combination of nonpharmacologic therapies and pharmacological interventions…” (pg. 321). Review, pain, FT


Gonzalo Papi, A., Baiges Nogues, M.T., Batiste Fernandez, M.T., Marca Gutierrez, M.M., Nieto Jurado, A., & Closa Monasterolo, R. (1998). Metodo canguro en sala de partos en recien nacidos a termino (Spanish). An Esp Pediatr 1998 June;48(6):631-633. English is: Kangaroo method in delivery room for fullterm babies. 533 normal fullterms were given KC as soon as dried and for next two hours (mean was 49+/−23 minutes). Temperature of infant was related to duration of KC; 96% had axillary temp >36. 98.5% of infants stayed awake with KC, and KC infants who breastfed during KC stayed longer in KC. If infant had more than 50 min. of KC he had 8 times more probability of breastfeeding spontaneously. Moms tolerated it well though 21% were tired. Almost all infants (98.5%) stayed awake. They “recommend KC in the delivery room as a safe and well tolerated method for mothers and newborn infants which contributes to their well-being. In order to improve breastfeeding and the newborn’s temperature, we recommend that the infant remains more than 50 minutes in Kangaroo Care.” pg. 631. FULLTERM, DELIVERY ROOM, Birth KC. Descriptive study, Axillary temp, Awake state, BF, Maternal fatigue with KC, state. BF better with 50 mins KC. NOT on charts yet.

Gontijo, T.L., Meireles, A.L., Malta, D.C., Proietti, F.A., & Xavier, C.C. (2010). Evaluation of implementation of humanized care to low weight newborns – the Kangaroo Method. Jornal de Pediatria (Rio J), 86(1), 33-39. 176/293 hospitals trained in KMC were evaluated by questionnaire (sent to 293) first and then visits to 29 units. Three dimensions of implementation were addressed: structure, process, and results. First stage of KMC (care in NICU) was implemented in 84.9% of hospital, but only 47.3% implemented all three stages according to Brazilian norm. Stage 1 is identification of early labor, with the infant <2500 grams who goes to NICU and mother must be oriented to KMC’s importance. Stage 2: Infants in stable clinical condition is moved to the KMC nursery, where he or she will be accompanied by the mother and will actually assume the Kangaroo position for long as it is possible, being stimulated to remain 24 hours/day in that position, functioning as an adaptation period for mother and child to be discharged from hospital. Stage 3 consists of ambulatory attendance until the infant reaches 2500 grams, being moved, afterwards, to attendance in primary healthcare units. This is early discharge with infant in KMC at home. PT, Evaluative survey, implementation. 3 stages of KMC.

Gordon, I., Zagoory-Sharon, O., Leckman, J.F., & Feldman, R. (2010). Oxytocin and the Development of Parenting in Humans. Biological Psychiatry, 68,377-382. doi:10.1016/j.biopsych.2010.02-005. NOT A KC study per se, but mentions KC. This a descriptive study of 160 cohabitating mothers and fathers and measurements of peripheral oxytocin in both at 2 months and 6 months postbirth and correlated to affectionate behaviors in moms and stimulating parental behaviors, tactile stimulation and object presentation in fathers. Moms and fathers had synchronized levels of oxytocin from 2-6 months (as they do in cortisol, vasopressin, epinephrine, adrenocorticotropic hormone, growth hormones, and prolactin (pg. 380) and peripheral oxytocin correlates well with CENTRAL oxytocin (pg. 380). Positive interactions increase brain oxytocin, and oxytocin can increase to help mediate the effects of stress in the first few months of life (p.380). Central oxytocin is main determinant of maternal behaviors. KC has been shown to increase...

Descriptive FT, oxytocin, attachment, stress.

Gottesman, N. (2009). Kangaroo Care. In Parents magazine. The manuscript says “Skin-to-skin contact is good for all babies, but it is especially helpful for infants born prematurely. That’s why most neonatal intensive care units encourage what’s called “Kangaroo Care,” where a mom places her preemie on her bare chest, holding him tummy-to-tummy, much like a mama kangaroo. “This kind of contact relaxes a preterm infant and can help him grow,” says Susan Ludington, Ph.D., a professor of pediatrician nursing at Case Western Reserve University in Cleveland, what has extensively studied kangaroo care. The practice began in South America in the late 1970s as a way to care for preemies in poor areas with limited neonatal care. Studies there showed that it helped reduce infant mortality rates. Kangaroo care subsequently became popular worldwide. ‘We know that this kind of skin-to-skin contact can encourage sleep and weight gain and can reduce infections and breathing problems in pre-term infants,’ Dr. Ludington says.” PT, FT, review, recommendation, mortality, infections, respiratory patterns, weight, relaxation.

Gouchon, S., Gregori, D., Picotto, A., Patrucco, G., Nangeroni, M, & Di Giulio, P. (2010). Skin-to-skin contact after cesarean delivery: An experimental study. Nursing Research, 59(2), 78-84. A RCT (called experimental non-inferiority adaptive trial) of 17 days randomly assigned to 2 hours of SSC beginning when elective cesarean mom was returned to postpartum room (51±10 mins post delivery) vs routine care (17 mins, dressed infant in bassinet or in mom’s bed for the two hours). All infants were bathed and dried and then KC babies were dressed in diaper and head cap, wrapped in warm cloth, held by relative or placed in warmer until mom returned to her postpartum room about an hour (M=51 mins) after infant was delivered. This was EARLY KC, not Birth KC and not Very Early KC. When mom came to room, infant was placed in SSC (diapered only, covered by cloth, sheet, or blanket, prone on chest for 2 hours at most). Control group was bathed, dried, dressed, held by family member or placed in warmer until mom returned to room when mom could place baby in her bed, in a crib next to bed, or on the neonatal unit. Temporal artery temperatures taken every 30 minutes, at 30, 60, 90, and 120 minutes of KC. SSC infants were not at risk of hypothermia at all and temps were the same between groups at all times (30 min temp in SSC was 36.1C(±0.4). No differences in temp upon arrival from OR, after being bathed, after mom returned to her room, and not at any observation time. SSC infants latched on sooner and more were BF at discharge. Maternal satisfaction with KC was high. FT, RCT, C/S, Early KC at Birth, Temp, BF, Latch, Maternal Satisfaction. Duration = up to 2 hours

Gray L, Watt L, & Blass E. (2000). Skin-to-skin contact is analgesic in healthy newborns. Pediatrics, 105(1):e14-e24. RCT of 30 newborns held in KC or left in crib for heel stick, for PKU?!. Crying and grimace reduced by 82% & 65% from control levels. HR also reduced, increase was 8-10 bpm with KC heelstick vs .36-38 bpm without KC. Acceleration of HR was reduced. Moms given 15 minutes to relax and were then tested. Says effect of KC is not opioid mediated but instead, in combination with taste and suckle of BF appears to form a pain blockade. KC meets the American Academy of Pediatric’s recommendation to use nonpharmacologic and environmental interventions to reduce or eliminate newborn stress or pain during circumcision (AAP, Circumcision Policy Statement. (#RE9850), Elk Grove, Ill: AAP. Fullterm, HR, RCT, pain, cry, grimace, maternal relaxation, HR stability. Cortisol level significantly decreased 20 minutes after KC began. Cortisol?? Not on cortisol chart, check cortisol data because I had not written cortisol as an outcome measure but Nolan & Lawrence, 2009 on page 440 of their article say that Gray Watt Blass had this outcome. Needs to go on RCT list for pain. Circumcision policy.

Gray L, Miller LW, Philip BL, & Blass EM. (2002). Breastfeeding is analgesic in healthy newborns. Pediatr 109 (4), 590-593. RCT of 15 infants who were breastfeeding in KC position during heelstick, 15 swaddled in bassinet during heel stick, 198 minutes after previous feed. Taste, suckling and KC were the elements that reduced crying by 91% and grimacing by 84% from control infant levels and HR was substantially reduced. In KC, infants cried 4% or 8.77 seconds and grimaced for 8%, 17.25 seconds during lance compared with 43% (72.07 seconds) crying and 50% (80.31 seconds) grimacing in controls. 11/15 Kcers did not cry or grimace at all during heel lance, and these effects extended well in recovery phase (1/15 Kcers cried during recovery, for a total of 10 seconds and controls cried for 28 seconds). Kc HR rose 6 bpm and control HR rose 29 bpm. FullTerm, BF, pain, Breastfeeding in the KC position.CRYING, HR, Grimacing, RESIDUAL EFFECTS, RCT.
Gray’s Anatomy, Television show on ABC, Thursday, Nov. 5, 2009. (2009). A fellow takes a resident into the NICU and saw a mother holding her swaddled infant and the mother said to the fellow “My baby loves to be held.” The resident replied, “You should hold your baby skin-to-skin because that is even better for your baby. Right between your breasts.” Next scene is mother with baby in KC and the fellow says to the resident, “This is kangarooring. The baby will be better Kangarooring than in swaddled holding.” The mother then contributes: “Oh, yes, my baby really likes this. Her heart rate is much better now.” Fellow and resident walk out.


Groleau D, & Cabral NE. (2009). Reconfiguring insufficient breastmilk as a sociosomatic problem: mothers of premature babies using the kangaroo method in Brazil. Maternal-Child Nutrition, 5(1-January), 10-24. Qualitative study of mothers of preterm infants who used KMC in the hospital and were all breastfeeding upon infant discharge, but once home they soon abandoned breastfeeding because of insufficient breastmilk. Interviews in homes of mothers revealed that sources of stress (lack of outpatient clinical support, conflicting local norms of care and feeding preterm infants) generated anxiety, and anxiety coupled with economic constraints and discontinuity in models of health care led mothers to lose confidence in their breastfeeding capacity. Insufficient breast milk is a result of sociosomatic process. **Preterm, qualitative, breastfeeding, maternal anxiety.**

Gromada, K. (2010). Paternal Kangaroo Care after cesarean section. This appeared in Amy Spangler’s “baby gooroo” web site and here is the story. Karen Gromada (IBCLC) had twin sons. In 2010 when one of those twins became a daddy, he conducted Kangaroo Care right after the cesarean section and continued until his wife could take over. All went very well. Then Karen had a good friend whose daughter had a cesarean at Cincinnati Good Samaritan Hospital also had the father KC right after cesarean birth until Mother could do it and it went well and mom and daddy were ecstatic. **Case Study from the person, informal, Cesarean KC, paternal KC.**


Grossman K, Thane K, & Grossman KE. (1981). Maternal tactual contact of the newborn after various postpartum conditions of mother-infant contact. Developmental Psychology, 17, 158-169. 54 mixed parity middle income West German fullterm infants. Grp 1: 12 controls – mom saw infant and may have touched briefly, then baby dressed and moved to mothers bedside in bassinet; saw infants 5 times each day for about 30 minutes at feeding times. Grp 2: early contact infants - may have received 30 min of KC in delivery room (nude infant placed in maternal arms on delivery bed with heater overhead; n = 12), then routine feeding every 4-5 hours same as control. Grp 3 (n =17) extended contract, had infants beside their beds for 4 hours in am and 1 hour in pm and could change their diapers. Grp 4 (n=13)-possible KC same as group 2 and rooming-in same as grp 3. AT 2,5,8 days: Summed score for tender touches, duration and frequency increased for extra contact group. **Fullterm, Quasi exp as assigned sequentially (successively) in grp 1 then grp 2 etc. maternal behavior May not be KC –does not specify if mom wore gown. Check with Gene if this is KC or not – did she clarify for the Cochrane?**

Guimaraes GP, & Monticelli, M. (2007). [(Lack of) motivation of the pregnant mother to practice the Kangaroo Mother Method]. Portuguese article. Review Gaucha Enfermeria, 28(1), 11-20. A clinical report of the implementation of KMC in the NICU of a public hospital. Nurses realized there was a problem when some mothers did...
not want to do KMC, then went to the literature, and conducted systematic reflection to solve the problem. Rather than move mothers to do KMC, they decided that the neonatal team needed to change its ideas of what the maternal-infant bond is and realize that often mothers’ reactions are different from those expected by health professionals. Some moms don’t want to do KMC. **Preterm, implementation, bonding, barrier to KMC, maternal feelings (don’t want to do KC).**

Gupta M, Jora R, & Bhatia R. (2007). Kangaroo Mother Care (KMC) in LBW infants—a western Rajasthani experience. *Indian Journal of Pediatrics, 74*(8), 747-749. Descriptive study of 50 LBW (Birth weight >2 kilograms, M=1.487+/-.0.175 kg; M ga= 28.2. range 28-32 weeks) were given KMC (under father’s shirt with head cap) 4-6 hours/day in 3-4 sessions once thermally stable, no o2 support, and tolerating enteral feeds (mean age when KC started = 4+/-1.78 days, and until discharge at >1.8kg, >34 weeks pma, and mother ready to go home. 8 weeks postdischarge they followed up infants to see if KC was being done at home & if baby was gaining weight. No mother refused to participate. Weighing done once per day on electronic scale. Mean birthweight was 1.487 gm and age when KC started was 4.0 (+/-1.738 days). Mean weight gain during KC was 29+/-3.52 grams, mean discharge age = 23.6 +/-.3.52 days, mean duration of hospital stay was 15.5+/11.3 days. AT 8 weeks postdischarge, 20/50 moms had continued KC in their homes, average weight gain was 1.135+/-.0.121 kg, the number of infants exclusively breastfeeding was 16/50. Moms reported that KC helped increase milk production (pg. 48). No discomfort in moms about doing KC. At home, fathers, grandmothers, and sister-in-law did KC with good weight gain and thermal results. Also, no evidence of infection once on KC. Main problems prior to KC were respiratory distress and icterus (pg. 48) Greater weight gain, shorter stay with KC. KMC is effective & safe in stable preterms . Because of its simplicity, KMC may have place in home care. **Preterm, implementation descriptives study, weight gain, length of stay, 3rd world, infection, community-based, breastfeeding, milk production, paternal KC, surrogate KC, home KC.**


Hadeed, A.J., Ludington, S.M., & Siegal, C. (1995). Skin-to-skin contact (SSC) between mother and infant reduces idiopathic apnea of prematurity. Pediatric Research, 37(4), Part 2, p. 280A, #1233. Pilot RCT of 3 hours of incubator prior to 3 hours of KC (n = 1) and then back for 3 hours in incubator; control group (n = 1) remained in incubator all the time. Within the KC group apnea frequencydropped by 79-83% ; KC group had fewer apneas than control group. **GET THIS. Preterm, apnea**


Hake-Brooks, S.J., & Anderson, G.C. (2008). Randomized controlled trial: Kangaroo care and breastfeeding in mother-preterm infant dyads 0-18 months. *Neonatal Network, 27*(3), 151-159. 66 moms and preterm 32-36 wks GA, 1300-300 gm BW, 5 minute APGAR ≥6 were randomized into KC (n=36) and controls (n=30) with data collected at Rainbow Babies and Children’s Hospital (3rd level, University hospital in Cleveland) and in Kadlec Med Ctr (2nd level, community based hospital in Richland, WA). KC dyads (n= 36; mean KC = 4.47 hrs/day) BF longer (5.08 months vs. 2.05 months, and more exclusively (100% breastmilk, IBS level 1 & 2) at discharge & 6 months postdischarge than controls(n= 30, defined as wrapped in blankets whenever they were held). Clinically significant differences (but not statistically significant differences) occurred in exclusive BF at each measurement. Follow up was by phone at 6 wks & 3 months and in clinic at 6,12, 18 months . IBS = Index of Breastfeeding Status by Labbok &! Krasovec, 1990). RCT, PT, BF, BF exclusivity


delivery room and then to nursery til 12 hrs old vs 10 primip moms who were separated from babies after delivery for first 12 hrs. At 12 hrs, babies brought to moms and observed for behaviors for 15 second every minute x 15 mins.KC moms had sig increased attachment behaviors(fondling, kissing, en facing, gazing at, holding baby close) but no caretaking differences. FT. Does not specify randomization.Quasi-Experiment. Maternal attachment behaviors, episiotomy

Hales D, Kennell J, & Sosa R. (1976). How early is early contact? Defining the limits of the maternal sensitive period. Pediatric Res, 10, 259. Randomized study of 3 grps in Guatemala. Grp 1 (n=20) got 45 min of KC in recovery room under heat lamp and then to nursery until 12 hours old– called early contact group; grp 2 (n= 20) got 45 min of KC starting at 12 hours postbirth (called delayed contact), grp 3 (n=20) first saw swaddled baby at 12 hrs postbirth. At 36 hours: Sig. More affectionate behaviors (en face, looking at baby, talking, fondling,kissing, smiling) than delayed or control moms. No difference between groups in proximity maintaining behavior(keeping baby in bed, holding it close) or in care taking (wiping mouth, burping) of infant. RCT, Fullterm. Maternal behaviors. (Same as 3rd study reported by Sosa et al., 1976), episiotomy

Hales D, Lozoff B, Sosa R, & Kennel JH. (1977). Defining the maternal sensitive period. Dev Med Child Neurol 19 (4), 454-461. Randomized study of 3 grps in Guatemala. Grp 1 (n=20) got 45 min of KC in recovery room under heat lamp and then to nursery until 12 hours old– called early contact group; grp 2 (n= 20) got 45 min of KC starting at 12 hours postbirth(called delayed contact), grp 3 (n =20) first saw swaddled baby at 12 hrs postbirth. At 36 hours: Sig. More affectionate behaviors (en face, looking at baby, talking, fondling,kissing, smiling) than delayed or control moms. No difference between groups in proximity maintaining behavior(keeping baby in bed, holding it close) or in care taking (wiping mouth, burping) of infant. RCT, Fullterm. Maternal behaviors. (Same as 3rd study reported by Sosa et al., 1976), episiotomy

Hall, R.W. (2012). Anesthesia and analgesia in the NICU. Clinics in Perintalogy. 39(1), 239-254. Review article of pain treatments. Pain in the NICU is common, undertreated and has adverse evetns. Most common. Most common non-pharmacologic treatments are non nutritive sucking with or without sucrose, kangaroo care, swaddling, and massage. PT, Review – but not a KC review so not on Review chart, Pain


Hall D & Kirsten G. (2008). Kangaroo Mother Care – a review. Transfusion Medicine 18, 77-82. A review article that states the 3 components of KMC: continuous 24/7 KC, exclusive breastfeeding, early home discharge in KC position (and cites Charpak et al., 2005 for all this). On page 77 says “KMC was developed …in response to high morbidity and mortality associated with overcrowding and sepsis. In its original form and to limit nosocomial sepsis infants were discharged, regardless of weight, as soon as they were stable..” Home KC is to continue until infant rejects KC, usually at 37 weeks postmenstrual age with the baby becoming restless as a result of feeling crowded.”(pg. 78). Because KC is associated with reduced rates of infection (cites Kirsten & Kirsten, 2000), Kirsten and Weyer studied # of blood transfusions in infants with KMC (13%) vs incubator care (23%, p<.001) and there were fewer transfusions in the KMC infants with mild or no respiratory distress syndrome. When transfusion was needed KMC group got lower mean number of packed red cell transfusions (especially in infants >800 g and gestational age >28 weeks). The reduced need for red cell transfusion probably due to improved health of KMC infants, but benefit did not extend to smallest <800 g, most immature <28 weeks infants. Fewer infants in KMC received FFP(1% vs. 4.5%, p<.001), and no difference in platelet transfusions. Decreased rate of transfusions led to significant cost savings with KMC group costs being 55% lower than control group’s. Article continues with lit reviews related to breastfeeding, provision of humane care, empowerment of parents, increasing bonding, reducing maternal and infant stress, physiologic effects, less hypothermia and increased weight gain, infection reduction, calming, quiet sleep, cognitive development, pain reduction, earlier discharge, etc. Authors conclude that KMC offers a wide range of benefits and there are no apparent short or long term negative effects to parent and infant. “Indeed, KMC is a method that every parent may experience whatever the gestation, whether the infant is sick or healthy, big or small.”(pg. 81). PT, bradys, Review so transfusion specialists
are aware of KMC. Infection, stress, Blood transfusions Everyone should experience KC.


Hamilton KE & Redshaw ME. (2009). Developmental Care in the UK: a developing initiative. Acta Paediatri ca, 98(11), 1738-1743. Longitudinal study of two observational studies of use of developmental care from 2005 to 2007. In 2008, rates of KC increased from 50-80%, but aggregate scores indicating 8 basic indices of developmental care did not change. Variable approaches still exist, with limited improvements over time; the UK culture is ambivalent towards developmental care. Descriptive, preterm, developmental care use, implementation, KC not supported (See Vasquez & Berg, 2012 where KC was not supported at San Francisco General Hospital). Not on charts as of 8/12.09.


Handlin, L., Jonas, W., Petersson, M., Eideback, M., Ransjo-Arvidson, A.B., Nissen, E. & Uvnas-Moberg, K. (2009). Effects of sucking and skin-to-skin contact on maternal ACTH and cortisol levels during the second day postpartum - influence of epidural analgesia and oxytocin in the perinatal period. Breastfeeding Medicine 4(4), 207-220. 63 primiparae were in four groups (could not randomize to groups due to medical situation) (gp 1=14 got oxytocin intramuscularly postpartum; gp 2= 9 got oxytocin infusion; gp3=14 got epidural analgesia + oxytocin infusion; gp 4=6 who got epidural analgesia alone; gp 5= 20 moms who did not get epidural nor oxytocin. 24-48 hours after birth this experiment was begun and KC was given and infants were placed skin to skin and allowed to initiate sucking and were encouraged to stay there for 60 minutes irrespective of duration of sucking. During Breastfeeding session, ACTH and cortisol levels dropped. Significant negative relationship between ACTH and oxytocin. No relationship between oxytocin and cortisol. Duration of KC before sucking was negatively related to lower cortisol (as KC increased, cortisol decreased). Duration of KC was NOT related to ACTH. Cortisol levels differed significantly between moms who got epidural with and without oxytocin. BF is associated with decreased ACTH and cortisol and KC contributes to this effect. Mechanisms regulating ACTH and cortisol are partially dissociated because one was related and the other not. Medical interventions in connection with birth influence the activity of the hypothalamic-pituitary-adrenal axis 2 days after birth. Quasi-experimental (not an RCT), FT, Late KC, postpartum day II, BF, cortisol, stress, ACTH, epidural, oxytocin

Handlin, L., Jonas, W., Ransjo-Arvidson, A.B., Petersson, M., Uvnas-Moberg, K. & Nissen, E. (2012). Influence of common birth interventions on maternal blood pressure patterns during breastfeeding two days after birth. Breastfeeding Medicine epub Feb. 7, 2012. Examined influences of medical interventions during labor on Blood Pressure during breastfeeding at two days postbirth. 66 NSVD, BP measured at -5, 10,30 and 60 minutes during a morning BF at two days PostPartum. There were five treatment groups: 1)control, no meds n=21, 2) epidural with oxytocin stimulation, n=14; 3) epidural without oxytocin, n=7; 4) oxytocin stimulation only, n=9; 5) moms got 10 unit of oxytocin IM, n=15. Significantly lower diastolic in epidural non-oxytocin group compared with controls, oxytocin IV group and epidural + oxytocin group, (all comparisons significant). Both systolic and diastolic BP fell significantly during BF in control, oxytocin IM, and epidural + oxytocin groups; the falls in diastolic BP were lower in the oxytocin IV (p=0.05). Duration of KC contact before BF correlated positively with decrease in systolic BP in oxytocin IM group only. Conclusion: administration of epidural during labor lowers baseline diastolic BP and abolishes the fall in BP in response to BF at two days. FT, Postpartum, day 2 KC (late KC), BP, epidural


Hanson et al., (2005). Kangaroo Care for Ventilated Infants. Presentation at the 18th Annual Physical and
Developmental Environment of the HighRisk Newborn conference, Sand Key, Florida. Randomized controlled trial of ventilated KC conducted at Sarasota Memorial Hospital. Contact Cindy Martin. Preterm, RCT, Ventilated KC

Hardy, W. (2011). Integration of Kangaroo Care into routine caregiving in the NICU. What is stopping you? Advance in Neonatal Care, 11(2), 119-121. DOI:10.1097/ANC.Ob013e3182120b04 This is a review that starts with “it has been found that its (KC) benefits outweigh the risks and include so much more than just thermoregulation (pg. 119). The review is based on reading Nyqvist et al. 2010 State of the Art article, Ludington’s KC is Developmental Care chapter in the 2nd edition of Developmental Care text, and the WHO 2003 Practical Guide book. The advantages of KC are thermoregulation, physiologic stability, breastfeeding, growth, reduced infection, maternal-infant bonding, reduced biobehavioral response to pain, better sleep and state management (pages 119-120). The disadvantages of KC are infant instability – predominantly with transfer, inadequate or unavailable protocols, and professional and parental education are needed. She concludes the article with “KC should be provided daily as long as infant remains stable and duration should be at least one hour. For more analysis and information related to the evidence and implementation of KC, please take the time to refer to the chapter titled” Kangaroo Care is Developmental Care” in the latest edition of the NANN publication: Developmental Care of Newborns and Infants: Handbook for Health Professionals (2nd ed)” (pg. 120-121). PT, review, temp, stability, BF, wgt gain, infection, pain, duration, apnea, cortisol, stress, implementation, barriers to implementation, bonding, state/sleep, relaxation, protocols, prof. education, transfer instability. NOT ON CHARTS 8/29/2011

Hardy, W. (2011) Facilitating Pain Management. Advances in Neonatal Care, 11(4), 279-281. No doi available 10/8/2011. There is a whole section on Kangaroo care’s role in reducing pain symptoms saying “KCIs provided by placing a diaper-clad infant skin-to-skin with either the mother or the father. Not only does KC promote thermoregulation, physiologic stability, breastfeeding, growth, behavioral state management, infection prevention, and bonding, but it has also been found to promote pain management. When infants are held skin-to-skin, acombination of enzymes and hormones is chemically released that has been found to raise the pain threshold. During KC, infants are better able to manage painful procedures and show a decreased cry response. They are also able to achieve deep sleep state and are more difficult to arouse even when experiencing a painful stimuli. For this practice to become more routine, caregivers need to become more comfortable with doing procedures while the infant is held skin-to-skin. FT, PT, pain, KC mechanism. Not on charts 8/31/2011.

Hargboel, A. (1987). Luna- A child who has tried the Kangaroo Method. Foraldre og Fodsel, #1. No page numbers listed. Need to get this manuscript. PT

Harris H. (1994). Remedial co-bathing for breastfeeding difficulties. Breastfeeding Review 2(10), 465-467. This is a remarkable picture story of doing KC in a warm bath in the “immediate postpartum period” (really within one hour of birth) to get infant to crawl spontaneously to the breast. Author states that infant needs UNINTERRUPTED time to do this and will go to breast if given time. She says pouring water over infant will keep him warm, crying stops, infants occasionally go to sleep, so stroke him down his back and his journey to the breast continues. Descriptive, crying, temperature, BF, sleep FT


Harrison D, Yamada J, & Stevens B. (2010). Strategies for the prevention and management of neonatal and infant pain. *Curr Pain Headache Rep* 14, 113-123. This is a review of pain relief strategies, focusing heavily on sucrose and its effectiveness over repeated use over 4 weeks in NICU and 3 months, but then goes into KC on page 118-119 and says “there are increasing #s of RCTS evaluating the efficacy of KC in reducing minor procedural pain. In all studies, reduced pain responses during heel lance or intramuscular injections were found. Two studies compared KC to sweet solutions (sucrose and glucose) during heel lance. Both studies reported greater reduction effect in the KC group, and if sweet solution given concomitantly with KC may provide additional analgesia (Johnston et al., 2009). Site differences occur too (Johnston et al.,2009) and enhanced KC (rocking, singing, talking, finger or pacifier) did not result in enhanced pain reducing effects (Johnston et al. 2009). Integrating KC into the unit is challenging: need setting and policy that supports KC during all nonemergency procedures (blood test, IV line placements, injections) which dictates that such non emergency procedures are only performed when mothers are available for KC, would enhance this technique’s use.O. Other factors to be considered are physiologic state of infant, staffing, maternal readiness, support from unit management for use of this method of pain management (Johnson 2007). Research needed is: more studies on the feasibility of KC during painful procedures, rates of utilization of KC during procedures, effectiveness in sick full term newborns and older infants. KC for pain was graded HIGH (“further research is very unlikely to change our confidence in the estimate of effect.pg. 115). FT, PT, review, pain

Harrison, T. (2010). Case study of skin-to-skin intervention in infant with a congenital heart defect. Presentation at the 2010 “Nursing Research: Bench to Bedside”, Midwest Nursing Research Society Annual Research Conference, April 10, 2010, Kansas City, Missouri, USA. A 40yo mother and her full term white male infant with hypoplastic left heart syndrome who had undergone the first stage palliative hybrid procedure to improve blood flow, gave 14 days of KC for one hour each day. Personal communication from Dr. Harrison related the following: Mom wanted to breastfeed but protocol is first feed is bottle. So bottle it was and the baby choked, sputtered, gasped for breath, spit, etc. Following the feed they place the baby in KC, but he did not settle down. He was bobbing his head all over the mother’s chest. Dr. Harrison said to mom” I think he is looking for something!” The staff nurse said mom could breastfeed, so the infant was slid down to a nursing position, he latched without assistance and breastfed beautifully without any respiratory difficulties. He was 12 days old and this was his first breast experience. The contrast between the two feedings was incredible and beautiful. After he was finished, he was moved back into the KC position and he fell into wonderful deep sleep that mom said he had never experienced before. He stayed in KC for close to 2 hours without any problems. This was first subject in Harrison’s study and the mom still does KC whenever she can. She feels it is her special time with her baby. “The presentation related the following: “High frequency power heart rate variability detected continuously in real time using ECG was analyzed with MARS 5000 Ambulatory ECG Analysis and Editing System. Moms recorded thoughts, feelings, concerns daily and completed survey for further thoughts, feelings, and suggestions about KC. KC began post-operatively when stable and started on oral feedings. After feeding, infant was placed in KC up to 129 minutes after beginning observations, and then was transferred back to bed from 129-137 minutes. HR and SpO2 taken continuously and showed HR was relatively stable around 140 bpm until bottle feeding began, then increased up to 178, and then SSC was given for 10 minutes (minute 45-55) and HR was predominantly 160-182, then breastfed and HR dropped from 82 back to 145. Then KC was given minutes 60-129 and HR was stable around baseline of 140 similar to the pretest period. SpO2 values were stable from 90-100 at all times, only slightly higher occasionally during KC than seen in pretest. Design for high frequency power testing was pretest (30 min before feeding while in open air cot), test (during feeding), and posttest (60 minutes after feeding). HF values varied between 2.00-3.50 across all feeding periods. Number of minutes of KC over the 14 days showed Day 1=78 mins, Day 2=100 mins, Day 3=127 mins, Day 4=85 mins, Day 5=87 mins, Day 6 = 102 mins, Day 7= 91 mins, Day 8= 87 mins, Day 9=93,94 mins, Day 10=70 mins, Day 11= 20 mins, Day 12=62 mins, Day 13= 90 mins, Day 14= 57 mins. Mom was very satisfied and would recommend KC to others, would like to begin KC the sooner the better, one hour was enough, however, holding longer is good, and other comments were “a great experience for me and it helped me feel better”, “holding him makes me feel relaxed, and was very comforting,” “this makes me feel like I’m doing something to help him heal”, “it’s very therapeutic. You get to enjoy your baby. Gives you a chance to feel like you are being a mom by holding and cuddling baby. It also helps with the stress.” Conclusions were that infant was safe and stable during SSC, mother adhered to intervention rather well, HRV improved over time, mother was satisfied with SSC. SSC deserves further investigation as an intervention to enhance autonomic function in infants with congenital heart defects.
Congenital heart defect, BF, Sleep, respiratory difficulty, FT, duration of KC, HR, SaO2, maternal feelings, satisfaction, maternal stress responses.

Harrison, T., & Ludington-Hoe, S.M. (under review 2012). The responses of a newborn with congenital heart defect to Kangaroo Care. _ Coronary Pathology, _ Case study of an infant who got KC for 90 minutes in the days before having corrective heart surgery for a congenital heart defect. The infant tolerated KC well and the authors suggested that use of KC may reduce preparation time for surgery by improving infant physiology. SEE ALSO Ludington-Hoe, & Harrison. FT.

Hays, S., Feit, P., Barré, P., Cottin, X., Huin, N., Fichtner, C., & Putet, G. (2006). Respiratory arrest in the delivery room during skin-to-skin care in 11 full term healthy neonates. _ Archives de Pediatrie, 13(7), 1067-1068_. Says that 3 recent articles have reported that KC is a risk factor for respiratory arrest in the delivery room. So, the authors contacted doctors in their region and exhaustively reviewed perinatal charts and found 11 cases of respiratory arrest during birth KC since 2000. In each case the term newborn was prone on mother’s chest and all experience respiratory arrest (and five had cardiac arrest too) at some time between 5-120 minutes postbirth In two infants, stimulation and ventilation by mask was sufficient; in the other, external cardiac massage, intubation and ventilator assistance were needed. One infant died after 20 minutes of ineffective resuscitation; the others were transferred to NICU Four infants died and autopsy showed hypoxic ischemic pathology. So Birth KC is risk factor for death. Infants need to be vigilant watched, especially if the mother is a PRIMIP. This incidence is grave and other reports show an elevated incidence of death with birth KC. So conduct rigorous evaluation of the newborn, vigilantly watch the couplet during the first hours of life, but continue KC. Birth KC, Full Term, life threatening events.

Heinmann, K., Vaessen, P., Peschgens, T., Stanzel, S., Wenzl, T.G. & Orlikowsky T. (2010). Impact of skin-to-skin care, prone and supine positioning on cardiorespiratory parameters and thermoregulation in premature infants. _ Neonatology, 97(4), 311-317_. DOI: 10.1159/000255163 Skin-to-skin care and supine position are standard positions. Influence on cardiorespiratory parameters and thermal regulation are discussed controversially. Compared KC with prone and supine position and tested H1: KC has no impact on cardiovascular parameters and thermoregulation. 18 spontaneously breathing PT infants (Median GA= 28 weeks, 24-32; chronologic age 36 days (7-64 days) and weight 1543 gm (R=750-2100 gm). HR, RR, breathing pattern, desat episodes (<85 &>80; <80), oxygen saturation, rectal temperature in Germany in a 6 hour measuring cycle of three subsequent series. 120 mins each in SSC and prone position and supine position, then compared by Wilcoxon. During KC no increase in apnea nor bradycardiac episodes and no difference in respiratory rate, breathing pattern, oxygen saturation episodes and duration of desat compared to supine or prone. Episodes of desat <85 and >80 and <80 were more frequent in supine than prone. HR increased in KC and prone compared to supine, and temp was not sig higher during KC and prone compared to supine except a rise between the start and end of the 6 hour measuring cycle. No sign that KC mediated changes in quality or quantity of desats and in body temps compared to prone in preterm infants. Supine was worst position for preterm infant. PT, HR, RR, SaO2, desats, temperature, prone, supine very low birth weight, micropreemie NOT on Charts 2/17/2011 GET THIS Costs 26.50 for the article VERY IMPORTANT ARTICLE for argument that KC position is as safe as supine positioning and being prone does not harm infant.

Henderson, A. (2011). Understanding the breast crawl: Implications for nursing practice. _ Nursing for Women’s Health, 15(4), 296-307_. This is a clinical review article that states that Klaus in 1998 called the process of initiation of BF at birth THE BREAST CRAWL and that UNICEF recommends the breast crawl as the “preferred method for initiating breastfeeding.” The breast crawl is a process that is more than just a way of providing breast milk, it is a behavioral process that brings mothers and babies together. The breast crawl is defined as “the newborn, undisturbed and skin to skin on mother’s chest for the purpose of locating and self-attaching for the first feeding” (p.297). The breast crawl is a five part process: 1. infant rests on mom’s abdomen and intermittently looks at her, 2. Infant salivates and mouth her fingers, 3. Leg and arm movements propel her toward the breast. 4. Upon reaching sternum, her head bounces up and down and side to side. 5. She approaches nipple, mouth open, and after several attempts self-latches and suckles. (Others call this inborn INNATE process prefeeding and feeding behaviors with 1) the
birth cry, 2) relaxation, 3) awakening, 4) crawling, 5) breast preparation, 6) at breast, 7)sucking (This is Nyqvist et al, 2010 Towards Universal KC…). KC facilitates the breast crawl. Maternal body is the habitat for newborn stabilization and supports innate behaviors. She says that skin to skin contact immediately after birth is recommended by AAP, and that the Kangaroo position (chest to chest) facilitates the breast crawl. The Kangaroo position should be frog like, head to one side, wear hat and diaper and blanket. KC is now the standard of care for all newborns, healthy and vulnerable.

GOAL of KMC is to “empower parents as they practice the skills and responsibilities of caregiving while meeting all of their newborn’s physical and emotional needs (quote from Nyqvist et al, 2010 Towards Universal KC). Neonatal reflexes also facilitate BF. The reflexes are Sucking, Swallowing, Rooting, hand-to-mouth, arm and leg movements, finger flexing/extension, mouth gape, tongue dart/licking, head turning to right/left, head bobbing/nodding, placing, palmar gasp, plantar gasp, and Babinski toe fan (pg. 298). When on the semi-reclined mother (her body is foundation of support and arms contain infant), gravity holds baby on the chest, pressure on top of feet elicit placing, brushing foot sole against body elicits stepping, instincting stroking from mother elicits babinski which in turn directly stimulate lip and tongue reflexes. Hand to mouth movements stimulate the mouth gape reflex, gravity assists head and arm movements to stimulate the breast and position at the nipple. Newborn has all senses and olfactory is acute and infant responds to chemical cues secreted from Montgomery Tubercles on areola and surrounding glands as well as milk scent. These cues stimulate search, mouthing, grasping and rooting (pg. 298 and citation of Brown 2008 and Schaaf et al., 2009).

Olfaction is part of social learning and behavior and the olfactory bulb is part of the olfactory cortex within the limbic lobe (site of emotional memory, emotions and visceral responses to emotions in brain). Oxytocin release is stimulated by uterine pressure (from infant in Kangaroo position), nipple stimulation, food intake, warmth, light massage/stroking, stimulation of anterior chest, abdomen and urogenital organs. Increased levels of oxytocin simulate increased trust, sociability, decreased fear and anxiety, vasodilation (vasodilation of maternal chest causes it to heat up and the chest and breast are then a warm and safe environment [Kimura & Matsuoka, 2007]), lower HR, lower BP, enhanced healing, improved nutrient storage, increased social memory and curiosity, social bonding, relaxation, and elevated endorphin levels, by directly countering the effects of cortisol. Oxytocin also stimulates the amygdala so that the mother is imprinted with details of her newborn and begins bonding. (pg. 300). The breast crawl promotes physical stabilization, temp regulation, HR, RR, and blood glucose are improved and quickly stabilized, and the multisensory stim of KC lower circulating levels of cortisol. Mother and baby are relaxed and have sense of well being and then infants go into deep quiet sleep. Nurses can facilitate the breast crawl by providing patient education prenatally as well as intrapartally, opportunities for the breast crawl and don’t rush him to do feeding within one hour, navigate barriers, Cesarean is one barrier and baby should be given to father and then to mother when fully alert. She says there are two risks: bed-sharing and falls. Observation should be vigilant at all times, and bed-sharing which is encouraged because it increases duration of breastfeeding and UNICEF/BABY FRIENDLY says when baby is in bed with mother and mother is sleeping, “it’s only necessary to provide intermittent observation to monitor for any immediate environmental dangers and promote a safe sleep environment (Unicef UK BFHI 2004). Do not permit sleeping on couch or recliner, only on firm mattress with light blankets, well-fitting sheet and no bulky objects around baby. No smoking, no ETOH use, no substance use (alters response or sensitivity to newborn). She gives guidance for prevention of falls, i.e. low bed., head of bed <45 degrees, tucking in linens, no sleeping between parents, mother sleeping on side to enclose baby and let baby roll onto back after feeding. (pg. 305). Hospitals can promote the breast crawl by educating nurses, get help gaining experience, adequate staffing, encouragement from management. Full term, birth KC, cesarean, KC goal, Newborn reflexes, prefeeding behaviors, oxytocin, bed sharing, barriers, educate nurses, BF difficulties, c/s, paternal KC, guidelines from USBC and AAP, safety, falls, implementation. Not on Charts 10/1/2011.


Hendricks-Munoz, K. (2002). Karen Hendricks-Munoz, MD, discusses Kangaroo Care at NYU Medical Center. Msnyuhealth.org. Posted July 16, 2002. available at www.msnyuhealth.org/articles/kangaroo_care.html. Describes KC, they permit it as long as mom likes, says moms breast warms up and cools down with infant. Cites HR, RR from other studies and states “We are continuing to find that KC helps babies grow stronger and leave hospital sooner—up to 20 days sooner— with no evidence of increased infection. Also quotes a study of less maternal depression. PT, clinical report, infection, growth, LOS, Mat depression, Mat-Neonatal Thermal Synchrony.
Hendricks-Munoz KD, Louie M, Li Y, Chun N, Prendergast CC, & Ankola P. (2009). Factors that influence neonatal nursing perceptions of family-centered care and developmental care practices. American J. Perinatalology, Epub ahead of print. Correlational study of relationship between developmental care education and nursing perceptions and beliefs about KMC, developmental care, and family centered care using 24 item likert scale survey. 59 NICU nurses from 3 different Level 2 NICUS in NY completed Likert scale survey of their perceptions and beliefs about KMC. Neonatal nurses who were supported by an on-sight developmental specialist were more likely to have strong beliefs related to the technique of KMC. Clinical care approaches that have a high level of parental participation such as KMC in the NICU are likely to be facilitated as are all development care approaches when a dedicated, trained infant developmental specialist is in the unit too. PT, dev care, KMC beliefs, implementation

Herald Sun Newspaper. (2009). Miracle premature baby Warwick still alive after dying 18 times. August 13, 2009. Available from http://www.news.com.au/heraldsun/. Story of 2 lb preterm born 11 weeks early who had bad heart infection and brain bleed and parents decided to not resuscitate. Baby given nothing but 24/7KMC for 8 days and kept coming back from cyanotic-producing apneas (18 of them) and has survived without deafness, blindness, heart is fine, and has some motor delay but is not a quadriplegic as the parents were told he’d be. KMC did it for this miracle baby. End-of-life KC, compassionate KC, resuscitation KC. PT, case study.

Herald Sun. (2009). Miracle Baby Warwick Still Alive after Dying 18 Times. Herald Sun Newspaper, Australia. August 13, 2009. Available from http://www.news.com.au/heraldsun/. Case study of a Birmingham UK preterm born 11 wks premature who had bad infection. Parents made do not resuscitate decision and took him out of incubator to hold without all the wires and machines. They KCed him for 8 weeks and 18 times he stopped breathing and then started himself back up again. Mom says “he slept with me in abed in that room for those 8 days, hearing my heart beating as he lay beside me, his skin on mine. What happened to Warwick is a pure miracle, its as simple as that.” Baby has cerebral palsy now, and is over one year old, but heart problems no longer exist. PT, Compassionate KC, End of life. HAS BEEN LISTED IN PUBLICATIONS AS MIRACLE BABY WARWICK without the newspaper name.

Heyns L, Gie RP, Goussard P, Beyers N, Warren RM, & Marais BJ. (2006). Nosocomial transmission of Mycobacterium tuberculosis in kangaroo mother care units: a risk in tuberculosis-endemic areas. Acta Paediatr, 95(5), 535-539. Case-study of one case in which Mycobacterium tuberculosis was passed to a source within the KMC unit in which 8-10 mothers/infants resided. Infant was born at 29 weeks and spent 23 days between 2 KMC units. The chance for nosocomial transmission of infection was due to untreated active TB positive pregnant women, a TB-endemic environment, and confined, poorly ventilated area, and multiple mothers in one room. Mother of infant was not TB positive, nor were any contacts at home. Only possible source was another mother in the KMC unit who had chronic cough and illness (she was TB positive). Actually 4 of the 6 neonates who shared the environment with this TB+ mother got TB. All parents, visitors, and healthcare workers should be screened to decrease nosocomial transmission. Preterm, Descriptive, nosocomial infections, 3rd world? (Not yet on charts)

Hickson A., Rutherford M,Glover V, Stevenson J, Dore C, Cowan F, & Modi, N. (2006). Neurological outcome of premature infants following a controlled trial of skin-to-skin contact. Early Human Development, 82(9), 631-632. Randomized controlled trial of 78 (KC=40; incubator = 38) preterm infants less than 32 weeks Gestation started KC or incubator within first week of life. Moms were encouraged to give KC once daily for 4 weeks, but mean number of minutes of KC over 4 weeks was 507.36 (approximately 8.5 hours or 2.17 hours/week). Infants were assessed at 12 months using Griffiths’ Developmental Scale to give developmental quotient, and Hammersmith Infant Neurological Examination to get Optimality Score. Cranial ultrasounds from neonatal period were available in 74 infants and magnetic resonance imaging (MRI) at 12 months was available in 30 infants) were considered for effect on development. Imaging scores were normal, mildly abnormal, severely abnormal. Seven children died and 13 were lost to follow-up. 1 control and 4 KC infants had severely abnormal imaging. Overall developmental quotient and personal-social, hearing-language, eye-hand coordination and performance, but not motor, sub scales were higher in KC group and controls but differences were NOT significant. There was significant interaction between group and image abnormality. When imaging severity accounted for, over all developmental quotient was significantly higher in the
**KC group** (mean difference 13.2, 95%CI 3.1 to 23.4, p =0.01). NO difference in neurological status as measured using cranial ultrasounds. KC is associated with improved overall developmental quotient when evidence of brain injury is taken into account. Findings supports use and continued evaluation of SSC for improving neurological outcomes in infants. **Preterm, RCT, longitudinal, developmental, brain injury, Cranial ultrasounds, MRI**


**Milk production**

Hill PD, Aldag JC, & Chatterton RT. (1999a). Breastfeeding experience and milk weight in lactating mothers pumping for preterm infants. *Birth, 26*(4), 233-238. Average frequency of KC/wk was used as covariant in comparison of single vs double pumping on milk yield from2-5 weeks PP. No infants were breastfed during wks 2-5 PP.. KC was significantly related to 2=5 wk PP milk yield (p=.017). **PT, BF**


Hill & Schronk is later in the bib

Hill Z, Tawiah-Agyemang C, Manu A, Okyere E, & Kirkwood BR. (2010). Keeping newborns warm: beliefs, practices, and potential for behaviour change in rural Ghana. *Tropical Medicine and International Health 15*(10), 1118-1124 DOI: 10.1111/j.1365-3156.2010.02593.x. Descriptive study of 635 women in rural Ghana who delivered were interviewed about immediate newborn care. Respondents knew that keeping baby warm was essential for health but 71% still had delayed drying, 79% delayed wrapping, 93% early bathing, 10% placed in KC. Birth attendants were in charge and usually left baby alone until placenta was delivered. Early bathing is to reduce body odour in later life, shaping baby’s head, helping baby sleep and feel clearn. KC was easily understod and mostsaid they would try it but changing bathing practices will be difficult. **FT, community-based KC, Birth KC, hypothermia. Not on chart 12/28/2011.**


Houston, S. (2009). Financial impact of Kangaroo Care. (not published yet, available from Sylvia Houston at [www.preciousimagecreations.com](http://www.preciousimagecreations.com). Based on stats from March of Dimes that 12.8% of all babies born each year in 2006 were preterm (128 of every 1000 babies born, or 543,000 in 2006), the approximate cost per day of preterm care is $10,000 and the approximate weekly cost of preterm care is $70,000. Because KC babies have an average of 7 days shorter length of stay,(Charpak et al., 1997, Pediatrics), the savings with KC is $8,960,000.00 for every 128 preterms, the savings for lower re-admission rate is $1,152,000.00; and from fewer NEC cases $1,168,000.00, yielding a grant total of $11,280,000.00 and a per baby savings of $88,125.00! Article explains how these figures were derived. **PT, Cost, length of stay, readmissions, NEC.**
During PKC and MKC sessions infant had no desaturations, FiO2 requirement reduced from 43% to 38%.


Huang, Y.Y., Huang, C.Y., Lin, S.M., & Wu, S.C. (2006). Effect of very early Kangaroo Care on extraterine temperature adaptation in newborns with hypothermia problems. Hu Li Za Zhi, 53(4), 41-48. Randomized controlled trial of early KC vs. radiant warmer. 78 consecutive cesarean newborn infants with hypothermia were randomized. KC group got KC with their moms in the post-op room (KC started >30 minutes postbirth); controls got routine care under radiant warmers. Mean temp of Kcers was higher (36.29 vs. 36.22, p=.04) than those under radiant warmers. Extraterine adaptation in hypothermic infants is best treated with KC. “KC could be incorporated into standard care regimen to improve hypothermia care.” After 4 hours, 97.43% of KC group infants had reached normal body temp vs.82.05% of controls. KC should be incorporated into standard care to improve hypothermia care. Full Term, RCT, very early KC, cesarean section, warming, hypothermia. Check charts

Hung, K.J., & Berg., Q. (2011). Early skin-to-skin after cesarean to improve breastfeeding. MCN, American Journal of Maternal Child Nursing, 36(5), 318-326. Quality improvement project using the PDSA (Plan, Do, Study, Act) approach promoted as a Rapid Cycle Improvement Process for quality improvement from the Health Care Quality Strategies, Inc. group (reference is at end of this citation) to do KC in operating room and during recovery to increase breastfeeding. Tried KC in OR (duration of KC in OR ranged from 3-30 minutes pg. 322) and in recovery for first 3 months of the project and found that when KC was given in the OR there was higher LATCH score in infants who got KC in OR (8.0) vs. no KC within 90 minutes of birth (LATCH =7.7) or within four hours of delivery (LATCH=7.6). Only 33% of the KC OR moms fed formula compared to 42% of moms who got KC in recovery in the first 90 minutes postbirth. NO KC Group within 90 minutes of birth had 74% supplementing with formula. Skin-to-skin contact within the first 90 minutes of birth increased from 20% (before intervention) to 68% (after intervention) and the number of infants who did NOT get KC within the first four hours postbirth decreased from 40% to 9%. Conclusion was that Birth KC was feasible and can be provided “IMMEDIATELY after cesarean birth”. And there is greater likelihood of breastmilk feeding than formula when KC begins in the OR rather than in recovery (lower rates of supplementation too).

“Perinatal and neonatal nurses should be leaders in changing practice to incorporate early Skin-to-skin contact into routine care after cesarean birth.”(pg. 1 of article). One mother was quoted as saying “I felt some pain at the end of the surgery because the effects of the anesthesia were wearing off, but when they put the baby in my arms, I forgot about the pain because I was so happy to have him with me”(pg. 323). “With my last child, they took her to the nurse to do KC in operating room during recovery to increase breastfeeding. Tried KC in OR (duration of KC in OR ranged from 3-30 minutes) and in recovery for first 3 months of the project and found that when KC was given in the OR there was higher LATCH score in infants who got KC in OR (8.0) vs. no KC within 90 minutes of birth (LATCH =7.7) or within four hours of delivery (LATCH=7.6). Only 33% of the KC OR moms fed formula compared to 42% of moms who got KC in recovery in the first 90 minutes postbirth. NO KC Group within 90 minutes of birth had 74% supplementing with formula. Skin-to-skin contact within the first 90 minutes of birth increased from 20% (before intervention) to 68% (after intervention) and the number of infants who did NOT get KC within the first four hours postbirth decreased from 40% to 9%. Conclusion was that Birth KC was feasible and can be provided “IMMEDIATELY after cesarean birth”. And there is greater likelihood of breastmilk feeding than formula when KC begins in the OR rather than in recovery (lower rates of supplementation too).


Hunt F. (2008). The importance of kangaroo care on infant oxygen saturation levels and bonding. J Neonatal Nursing 14(2), 47-51. After an extensive review of the literature, they present a case study of a 24 week GA infant who was 28 days old when held by dad for 30 min of Paternal KC and then given to mom for 90 minutes of Maternal KC. During PKC and MKC sessions infant had no desaturations, FiO2 requirement reduced from 43% to 38%, and vital...
signs improved. Mother showed signs of obvious confidence with handling and caring for infant once she commenced KC. Baby got off CPAP relatively soon and mom was confidence in transfer and holding. Then they go into issues related to implementation, and recommendations for practice saying all pediatric nurses would benefit from learning more about benefits of KC, literature needs to be produced for families to understand importance of KC, and wider society awareness of KC will facilitate its implementation. Development of evidence-based guidelines is essential because no protocol inhibits KC use according to Wallin et al., 2004. PT, Case study, CPAP, FiO2, vent KC, stability, desats, SaO2, implementation, staff education, guidelines, need pamphlets NOT ON CHARTS YET.

Hurst NM, & Meier P. (2001). Managing breastfeeding for preterm infants and their mothers. Central Lines, 17(4), 1, 3-7. Refers to use of KC on pg 3 with pictures and how helpful it is to promote breastfeeding. Differentiates starting with KC and progressing to KC + nonnutritive sucking to BF. BF, PT

Hurst, N.M., Valentine, C.J., Renfro, L., Burns, P. & Ferlic, L. (1997). Skin-to-skin holding in the neonatal intensive care unit influences maternal milk volume. J. Perinatology, 17(3): 213-217. 8 mothers started KC during the first 4 weeks postdelivery and 8 others in the following 4 weeks. All babies had been ventilated. Mean 24-hour milk volumes at 2, 3, 4 weeks after delivery showed strong linear increase in KMC infants, and no change in control infants’ mothers’ milk volumes. PT, milk volume, BF, milk production

Hussey-Gardner B & Famuyide M. (2009). Developmental interventions in the nicu: What are the developmental benefits. NeoReviews 10(3), e113-e119. Review of NIDCAP, massage, positioning, KC, music, visual stimuli, light, multimodal stimuli on development. Positive review for NIDCAP, and for KC it says on page e117 “Infants receiving KC (intermittent KC during hospitalization) have exhibited more alertness and less gaze aversion (Feldman et al., 2002), more rapid maturation of vagal tone and state organization, more quiet sleep, more alert wakefulness, less active sleep, better habituation and orientation skills on the NBAS (Feldman et al., 2003), and higher MDI and PDI scores on the BAyley (Feldman et al., 2002). When compared to standard NICU care, preterm infants receiving KMC (continuous KC skin to skin home care with daily outpt. Monitoring) demonstrated similar developmental outcomes, with no difference in development as measured by the Griffiths Mental Dev Scales at 6 and 12 months corrected age, and no differences in the incidence of cerebral palsy, visual deficits, and hearing impairments at 12 months of age (Charpak et al., 2001). The developmental benefits of KMC may be better for low birthweight preterm infants (Tessier et al., 2003). When compared with standard NICU care, treated infants had higher IQ scores on the Griffiths Mental Dev. Scales at 12 months corrected age, and the difference was most significant for preterm infants born earlier (30-32 wks GA) (Tessier et al., 2003)”. Review, developmental care, dev., PT

Hutton and Hassan


Ibe OE, Austin T, Sullivan K, Fabanwo O, Disu E, & Costello AM. (2004). A comparison of kangaroo mother care and conventional incubator care for thermal regulation of infants <2000 g in Nigeria using continuing ambulatory temperature monitoring. Ann Trop Paediatr 24 (3), 245-251. Cross-over quasi-experimental study of ambulatory KC alternating with incubator care in Lagos, Nigeria. Each KMC/incubator session was 4 hours, 38 KMC sessions compared to 38 incubator sessions in 13 stable 1200-1999 g infants who were 24 hrs-30 days old who wore cotton vests and caps (pg. 246) during KMC (IS this REALLY KMC?) and only diaper in incubator. KMC done by mother or by surrogate female. Infant forehead and axillary temp and maternal chest temp every 5 min x 4 hrs for each session. Each day had 3 KMC and 3 incubator periods. Mean axillary temp in KMC = 37.6 (0.5), incubator = 37.1 (0.8); mean microambient temp in KMC = 34.3 (0.12) and incubator = 33.6 (3.5). Core (axilla)-periphery (forehead skin) diff in KMC = 1.5 (0.6) and in incubator = 1.0 (0.7). Risk of hypothermia reduced by >90% in KMC vs. incubator, and more cases of hyperthermia (>37.5) in KMC, core-periphery temp differences widen but risk of hyperthermia >37.9 was not
significant. Microambient temp (next to infant, under bra top of mom) higher in KMC than incubator (tho room temp
was same). 88% of Moms thought KMC safe, 100% preferred KMC to incubator because no separation, 63% had probs
adjusting to KMC, 53% that KMC was convenient for mom, 75% thought KMC was comfortable for mom, 100%
thought KMC comfortable for baby. KMC is preferred method for managing stable LBW infants. Quasi-Exp, 3rd
world, PT, Axillary temp, forehead temp, core-periphery gradient, Micro-ambient temp(breast temp) Maternal
feelings, surrogate KC. Swaddled KC (dressed), SEPARATION

INJOY VIDEOS (2010). Web-Enhanced Parent Guides. There are two that are of interest to us: Mother and New Baby Care and Better Breastfeeding. In Mother and New Baby Care chapter 2 is Feeding Your Baby from page 19-33, and on page 20 there is a section called “Ways to Keep Your Baby Close” and the first one says “Hold her skin-
to-skin whenever possible (now and in the weeks to come).” And under the picture of KC on the same page it says
“Skin-to-skin contact keeps your baby calm and helps you learn her hunger cues.” In Better Breastfeeding, chapter 2
Latching On and Positioning, section 1 called “Getting off to a good start” it says on page 10 under “ways to prepare for
breastfeeding: “Talk with your hospital staff and healthcare provider to make sure that you will have a long period of
holding your baby skin-to-skin right after birth.” In the section entitled “Rooming-in at the Hospital” it says “Rooming-
in allows you to hold your baby skin-to-skin and breastfeeding from the beginning, giving you both a good start.” And in
the right hand column there is a whole section entitled “Skin-to-skin contact” and it says “Hold your baby skin-to-skin
right after delivery for at least an hour, with no clothing or bedding between the two of your. The hospital staff can
usually do everything they need to while you hold her. If she is alert, she may latch on and breastfeed. If you have a
cesarean birth, hold your baby skin-to-skin as soon as you can.1 If you are both doing well, you can ask for your baby to
be brought to you. Hold her skin-to-skin as much as you can in her first days and weeks – it helps breastfeeding and puts
her right where she needs to be!” This is followed by a picture of mother breastfeeding in KC an d the picture is labeled
“Skin-to-skin contact” and the caption says “See How you cn hold your baby skin-to-skin right after birth.” Below the
picture there is box called “TAKE NOTE. Skin-to-skin Contact. Studies show positive effects on babies who have
immediate skin-to-skin contact and who are held close to the breast after birth. The benefits of skin-to-skin contact: It
keeps babies warm and comfortable, they latch on better, which helps your milk production, they breastfeed exclusively
for a longer period of time, they cry less.”(all on page 10) On page 11 it says in the “Your Baby’s Position” section:
Hold your baby so he is facing you, tummy-to-tummy (and skin-to-skin if possible.)” FT, BF, PP KC, home KC, Birth
KC. Not on charts as of 10/14/2010.

management during the first 14 days. Raleigh, NC: Author. Recommends non-separation from birth and Birth KC to
promote breastfeeding. Full term, breastfeeding, Birth KC, Guideline, separation.

Especially for Healthcare Professionals. Available from www.ilca.org. This trifold contains a summary about the value
of early breastfeeding, what skin-to-skin contact is, what is known about skin-to-skin care, how babies use their senses in
the first hour of life, how to welcome babies softly, and how IBCLCs can help. It concludes with references and is an
excellent resource for lactation consultants to use. Guidelines, Breastfeeding, Birth KC, FT

for the World Health Organization’s Commission on the Social Determinants of Health Vancouver, BC: Human Early
Learning Partnership (HELP). 440-2206 East Mall, Vancouver, B.D. V6T 1Z3, phone: 604-827-5395, FAX: 604-822-
0640 or email lori.irwin@ubc.ca or get from web site: www.earlylearning.ubc.ca/WHO. This is a full treatise on the
types of nurturing environments needed for optimal gender equity and early child development (early childhood is
prenatal through 8 years). Manuscript states the the early years are critical for brain development and KC is discussed on
page 31 and 32 under the heading of linkages between health care systems and early child development programmes
because health care workers may be the only professionals parents come into contact with during these early years. “We
suggest linking early child development programs and services with health care systems will improve child survival
rates. The example of Kangaroo Care from Bogota, Colombia is instructive here. KC is based on mothers, fathers, and
caregivers providing skin-to-skin contact for low birth weight infants as part of early stimulation, which has been shown

1.
to improve survival rates of the most vulnerable infants. Through skin-to-skin contact, **infants gain the early stimulation that matters for their survival** – costs of this intervention are minimal, but **benefits are immeasurable.** While the case of KC is a unique hands-on early stimulation programme, developed in hospitals and carried out within and beyond the walls of institutions, health care providers can facilitate early child development in various other ways as well.” (pg. 31-32). A box on page 32 relates: “Kangaroo Care: Beginnings in Bogota, Colombia. Each year about 20 million infants of low birth weight are born worldwide, which imposes a heavy burden on health care and social systems in developing countries (Ruiz-Pelaez, Charpak, & Cuervo, 2004). Premature babies (under 2000 grams) born in poorly resourced settings may not have access to incubators and those that do are separated from their mothers. KC was first developed in 1978 to help preterm babies with temperature regulation and bonding in Bogota. Mothers, father or caregivers carry/sleep with newborn babies skin to skin in upright positions 24 hours a day. KC has been shown to be at least as effective as traditional care in incubators at a fraction of the costs. It is a practice with roots in local traditional child rearing that has been taken up in many industrialized nations (e.g. France, Sweden, USA, Canada and more). KC has been shown to deliver ideal conditions for premature infants, reduce costs of caring for premature infants, improve breastfeeding rates, improve bonding, and in some settings reduce morbidity and hospital stay.” (pg. 32). **PROVIDES THE BEST CARE** Separate, BF, bonding, morbidity, length of stay, costs, PT Not on Charts 3/20/2010

Isaacson LJ. (2006). Steps to successfully breastfeed the premature infant. Neonatal Network, 25(2), 77-86. On page 81 begin two sections entitled Kangaroo Care and then Kangaroo Care Plus Gavage Feeding. It generally recommends KC because KC familiarizes the infant with mother’s scent and feel of breast, moms experience let down during KC, and report largest let down when holding in KC (Meier et al., 1998). Under gavage feedings it says gavage feedings can be given during KC and allows infant to associate full stomach feelings with being at breast. At 30 wks pma infants want to suck and can go to breast in KC and “for the most part, infants on CPAP, nasal cannula, or, of course, room air, are stable enough to participate in this (sucking at breast and gavage feeds in KC) step.” (pg. 82). Clinical Review, PT, BF, CPAP, Cannula, gavage feed, let down. Not on Charts yet.

Issah, K., Nang-Beifubah, A., & Opoku, C.F. (2011). Maternal and neonatal survival and mortality in Upper West Region of Ghana. International Journal of Gynaecology and Obstetrics. March 31 Epub ahead of print. NO DOI. A 6 month evaluation in 2009 of 24/7 KMC that was instituted in 5 hospitals to reduce neonatal mortality is reported. 47 maternal deaths were reported, 46.5% occurred within 24 hours of admission. 23 were linked to delays in receiving care and non-adherence to treatments. KMC resulted in 622 (89.5%) OF 695 targeted infants surviving. At the end of 2009, only 30 of the recommendations had been implemented. KMC improved neonatal survival. PT/FT, descriptive study of implementation of 24/7 KMC, neonatal mortality. Not on charts as of 5/2/2011.

Ith, P., Dawson, A., & Homer, C. (2012)a. Quality of maternity care practices of skilled birth attendants in Cambodia. International Journal of Evidence-based Healthcare. 10, 60-67. DOI: 10.1111/j.1744-1609.2012.00254.x. Report of how birth attendants are doing in providing good health care andon page 63 it says “The majority of babies (87%) were not put skin-to-skin contact with their mother and only one baby was given to his mother within half an hour of birth. Babies were left alone on a nearby table or given to family members outside the delivery room.” 3rd world, BKC, practice. NOT on Charts.

Jablonski, L. (2011). Listening to newborns: What babies have to say about transitions to life. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 40*(Suppl 1), S24-S25. DOI: 10.1111/j.1552-6909.2011.01242.x FT study of nurses who chose four areas in which they wanted to know the evidence: delayed cord clamping

Jackson, P.C. (2010). Complementary and alternative methods of increasing breast milk supply for lactating mothers of infants in the NICU. *Neonatal Network, 29*(4), 225-230. On page 228 of this REVIEW of interventions to increase milk production it talks about Kangaroo Mothering. It says that recently (cites Tunnell, R, 2004) that KC had been adopted from fullterm use to NICU use. It provides a definition of KC then a bit of history with hypothermia studies and then goes into breastfeeding studies (moms BF longer at 3,6, and 9 months PMA (Charpak et al.,2001 in Pediatrics), more likely to be EXCLUSIVELY BF, then cites Rao, Cattaneo, Sloan and Roller’s studies, saying that in addition to breastfeeding benefits, KC helps bonding. The review concludes with “Because risks to the infant are
minimal with kangaroo mothering, it should be practiced universally with premature infants in the NICU” (pg. 228). On Page 229 it says “KC is an alternative therapy. Alternative therapies may be effective in maintaining and /or increasing breast milk supply for NICIU mothers. They should be considered on their own or as complementary therapies at the first sign of lactation difficulties. Kangaroo mothering and relaxation therapies may be attempted without risk of adverse side effects.” Review, BF, PT and FT review.


Jarrell JR, Ludington-Hoe SM, & Abouelfettah A. (2009). Kangaroo care with twins: a case study in which one infant did not respond as expected. Neonatal Netw 28(3): 157-163. This is a case study of one twin who consistently dropped his oxygen saturation level when moved from incubator to KC. He had been on a ventilator for 34 days and had been extubated for 4 days when first tested. KC was stopped early and his vital signs immediately started returning to normal once back in the incubator. This infant with chronic lung disease had difficulty in KC and vital signs that exceeded normal limits, similar to Smith S. work in early 2000s. Maternal breast temperatures did not differ between breasts. PT, Case study, HR, RR, SaO2, temperature, BPD, maternal breast, negative outcome, twin.

Javorski M, Caetano LC, Vasconcelos MG, Leite AM, & Scochi CG. (2004). Social representations on breastfeeding according to preterm infants’ mothers in Kangaroo Care. Rev Lat Am Enfermagem 12(6), 890-898. A qualitative study of meanings assigned to breastfeeding in KC mothers. Mothers identified the following meanings: healthy babies are breastfed, mother’s milk provides protection and preserves premature’s life, BF is the complement of motherhood, BF a premature infant is hard and exhausting. Babies have problem of late sucking. 3rd world, BF, PT. Not on Charts Yet.

Jeanette C, Klaus PH, & Klaus MH. (2004). #6: No separation of mother and baby with unlimited opportunity for breastfeeding. J. Perinatal Education 13(2), 35-41. Actually Jeanette Crenshaw is the author. See Crenshaw. A position paper providing the evidence for Lamaze International’s guidelines for normal birth. #6 has to do with non-separation and provides the evidence for skin to skin care immediately after birth (cry less, stay warmer, breathe easier, instinctively attach and start to breastfeed usually within an hour of birth). They recommend Birth KC on page 41 and say do not dry the infant’s hands and has good review of the hormonal cascade begun by KC. Birth KC, Full term, separation, breast search, latch, guidelines, infection (says same thing as WHO 1998).

Johanson, R.B., Spencer, S.A., Rolfe, P., Jones, P., & Malla, D.S. (1992). Effect of post-delivery care on neonatal body temperature. Acta Paediatrica. 81(11), 859-863. 300 infants (KC beginning immediately after birth when infant put to breast under mom’s clothing or possibly under swaddling and kept against mother’s breast) was as effective as oil massage or plastic swaddling in keeping babies warm. Fullterm and Preemies were analyzed as one group, and there are many methodological omissions in the report. Kangaroo Care may or may not have been given. RCT, Birth KC/VEKC, swaddling, temperature, Preterm and fullterm.

Johnson, A.N. (2005). Kangaroo holding beyond the NICU. Pediatric Nursing 31 (1), 53-56. A review article that cites many studies as well as International Network for Kangaroo Mother Care. Article relates origins of KC, the effects of KC on infant physiology, maternal feelings, pain outcomes, maternal attachment (and quotes general adult attachment literature in relation to touch effects), infant development (called long-term study of community KC), and has a simple and useful table of effects on page 54 and she outlines the role of all nurses in KC on page 55. Implications for nursing are that KC should be expanded to the pediatric units (because “no studies in Pediatric Intensive Care unit” pg. 55), prenatal classes to parents and into the community. Visual aids and reading materials are important tools,(pg. 55). And “the use of IVs and oxygen does not preclude the practice of kangaroo holding” (pg. 55). “Advance practice nurse need to be included in the plan for KC” (55) Also effects on maternal pain should be considered. Review, FT, PT Community KC, Maternal Pain, Maternal Stress, Pediatric PICU KC, INK, guidelines, need pamphlets for implementation, advanced practice nurses, FT. postpartum KC, home KC (Not on Charts yet).
Johnson, A.N. (2007). Skin-to-skin holding effects on breastmilk caloric composition. Presentation at 7th National Neonatal Nurses Meeting of the Academy of Neonatal Nurses, Sept. 6, 2007, Las Vegas, NV. Based on the premise that more than one hour of KC is believed to promote breastmilk production, she undertook a pilot repeated measures cross-over (I imagine the sequence of KC and non-holding was randomized but I do not know) study of 12 moms who gave a 1 hour/session of KC for at least two sessions over a four day period and then were also measured when they did not hold their infant. After the KC and non-holding sessions moms used pump to express milk. All expressed milk over 4 days was measured and weighed. A one milliliter aliquot of milk was centrifuged for fat and calories. Moms were M=26.8 yrs old, had M=14 yrs education, lived M=7.5 miles from hospital, and gave birth to 66.7% males at M=30.1 wks gestation and Mean birthweight = 1428.8 gm and Mean entry weight was 1365.6gm. Mean birthweight loss = 63.2 gms. Use ccrematcrct plus for fat and caloric intake. Expressed milk right after KC all had values of 23 cal/ml or more (R=23-33 cal/ml) and standard error was very small (0.003), milk after no-holding had <25 cal.ml (R=22-25cal/ml)(standard error was 0.124 – more variability). Caloric composition increased right after KC in every mother. KC affects caloric composition of mother’s milk. All readings taken at same time of day. PT, Quasi-Exp, BF, milk composition

Johnson, AN. (2007). The maternal experience of kangaroo holding. J Obstetric, Gynecologic, and Neonatal Nursing. 36(6), 568-573. Qualitative study of 18 moms who gave KC for one hour in tertiary NICU and were interviewed with several questions (on page 570). Moms interviewed over 5 months following a 60-minute KC session in NICU. Observations of mom’s KC holding were made too. Triangulation of maternal interviews, demographic data, and observation data support use of KC to improve maternal confidence of caring for preterm infant. Three themes emerged about their experience: 1. They needed to feel needed in the NICU because they felt isolated in the chaos of the NICU. “I needed to be a mother and couldn’t have it in the NICU until I did this.” One mother told her infant “I will make you feel so much better in my arms”(pg. 570). After holding mothers felt important and “being needed by the nurses” and “being important in caring for (their) infants”(p. 571).Mothers reported that KC was “a way to express my love”, “gave a warm feeling of joy,” “Happiness I have never felt before” “heart warming in many ways.” Many moms felt nervous or scared with 1st KC but only confidence by 3rd KC session and that “each holding is better than the last”(pg. 571). Many reported that KC helped them understand their baby’s needs better and giving KC made them feel important in their infant’s care. 2. They need support to do KC (encouragement, teaching, planning for KC by nurse, control over environmental activity, noise, visitation; maternal articulation of the KC plan.. Mothers want to know when they can do KC and they want to know the schedule in advance, but they “try not to ask if they can Kangaroo hold”. When nurses placed privacy screens the mothers had a sense that it gave her time alone with her baby and another said it was more like home, and another said “despite the loud noises the rest of the time, we can escape to be alone for an hour” (p. 571), and 3.Mothers were satisfied with their interactions with their babies during KC regardless of the infants physical health status, Gestationalage or ability to respond to the mother. All mothers described connectedness to infant that differed from other holding experiences (p.571). One mother said KC was an intense experience for her and another said “she is telling me that everything is fine when she moves her hands near mine”(p.572). Mothers also said that KC taught them how to be a mother and KC moms were more active in providing care for their infants than non-KC moms during a shift. KC is important for maternal role attainment, and KC is not as spontaneous as one might think (p. 572). Nursing Assessment of Infant needs to be done each time. Supports Messmer’s work on increased confidence. Nurses play essential role by offering KC to mothers to help guide them in their confidence with the infant. In summary, moms reported feelings of “being needed” and “feeling comfortable” with KC regardless of infant’s health status. There are multifaceted advantages of KC on maternal attachment behaviors.

Johnson, A.N. (2007). Factors influencing implementation of kangaroo holding in a special care nursery. MCN: The American J of Maternal Child Nursing, 32(71), 25-29. Descriptive study of 67 RNs who completed a survey to identify factors that supported implementation of KC in level III nursery. Primary factor for implementing was the assessment of infant physiologic stability, then adequate nursing staff patterns, maternal readiness, encouragement from management. Nurses with 5 or more years of practice were more likely to implement KC than less experienced nurses. Support included educational programs, adequate staffing, and encouragement. Says KC is usually done with stable,
older preemies. **Descriptive, PT, Implementation, barriers to practice. Name is Amy Nagorski Johnson, RN, Ph.D., University of Delaware**


Johnston CC, Aita M, Campbell-Yeo M, Duhn LJ, Latimer MA, & McNaughton KJ. (2007). The social and environmental context of pain in neonates. Chapter 12 in Anand KJS, Stevens BJ, and McGrath PJ (Eds.) Pain in Neonates and Infants. (3rd Ed.) N.Y.: Elsevier, Pp, 177-189. On page 180, a discussion of KC begins, first citing Dodd 2005 saying that her work showed that KC facilitates parents’ recognition and understanding of infant cues, allowing them to respond as needed – meaning respond to pain cues. Then she reviews three paternal KC studies (LH et al 1992; Christensson et al., 1996; Bauer et al., 1996). She concludes that “the studies provide beginning evidence that early paternal involvement in care of infant is necessary, meaningful, and even critical. What has not been explored is the full contribution fathers can make….specifically in the area of providing comfort against pain.” (pg. 181). **PT, FT, Review, pain, research with fathers in pain is needed.**

Johnston, C.C., Campbell-Yeo, M., Fernandes, A., Inglis, D., Streiner, D., & Zee, R. (2010). Skin-to-skin care for procedural pain in neonates [Protocol]. Cochrane Database of Systematic Reviews, Issue 3. No doi available. This article relates their plans to run a Cochrane analysis with various pain outcomes to determine how KC **performs in randomized trials and randomized cross over trials. No comparisons to other measures are being made. Meta-analysis, Pain, FT, PT,**


Johnston, C.C., Campbell-Yeo, M., & Filion, F. (2011). Paternal vs Maternal Kangaroo Care for procedural pain in preterm neonates: A randomized controlled trial. Archives of Pediatric and Adolescent Medicine, 165(9), 792-796. Doi: 10.1001/archpediatrics.2011.130 A randomized cross-over study of 62 preterms from 28-36 weeks gestational age who were in NICU for at least 2 blood sampling procedures. Heel lances were at least 24 hours apart, infants were held in KC for 30 minutes before and during lance with the mother or the father, and with the other parent in the subsequent session. Which parent came first was randomized. KC is supposed to be helpful because oxytocin is released during KC and oxytocin has antinociceptive effects by potentiating endogenous opiate release (Lund I, Ge Y, Yu, LC et al., 2002. Repeated massage-like stimulation-induced long-term effects on nociception contribution of oxtocinergic mechanisms. Eur J Neuroscience 2002, 16(2), 330-338; Uvnas-Moberg K. 1998. Oxytocin may mediate the benefits of positive social interaction and emotions. Psychoneuroendocrinology, 23(8), 819-835). The endogenous opiate release is then released into breast milk[citations 1, 45, 46 below] and is one mechanism for the analgesic effect of breastfeeding (47,48 below). Premature Infant Pain Profile and time for heart rate to return to baseline were outcomes and parents were asked four questions: 1) how many times they had provided KC before the study? 2) how did they feel when they provided KC during the heel lance? 3) would they do it again? And 4) Would they recommend it to other parents? (pg 794) and all 69 moms and 36 fathers responded positively to all questions. The refusal rate was 22% mostly because one parent or the other did not want to do KC or did not want to be videotaped (only infant’s face was videotaped). Males recovered HR more quickly to baseline level; receiving sucrose lengthened time to recovery (pg. 794) so sex and sucrose were included in recovery analysis. At 30 and 60 seconds after heel lance, Maternal KC infant had significantly lower scores on the PIPP than when in paternal KC (30 second mean difference was 1.435 (95% CI = 0.232-2.632); 60 seconds mean difference was 1.548 (95% CI = 0.069-3.027); at 90 and 120 second, no differences were seen. The difference in time to return to KC baseline HR was significant, with the time in maternal KC being 204 seconds and in paternal KC 246 seconds (mean difference, 42 second (95% CI = 5.16-81.06 seconds). Both parents blunted the pain response compared to incubator scores in previous studies. Mothers are marginally more effective than fathers in decreasing pain response- “there is something unique about the comfort of a mother’s contact over and above...
that of another caring adult. Number of previous KC sessions was NOT a significant factor in the analysis (pg. 795).

Future research should address feasibility issues and nonparent providers of KC during painful procedures. **PT, R X-over, Maternal KC, Paternal KC, pain, HR, PIPP, REFUSAL RATE, Not on Charts 9/10/2011** (Ref 1, 45, 46, 47, 48 1:Acolet, Sleath, Whitelaw, 1989 on KC bib; 45:


Johnston CC, Filion F, Campbell-Yeo M, Goulet C, Bell L, McNaughton K, Byron J, Aita M, Finley GA, & Walker CD. (2008a). Kangaroo mother care diminishes pain from heel lance in very preterm neonates: A crossover trial. *BMC Pediatrics 8*(1), 13. Doi: 10.1186/1471-2431-8-13 online pub of 15 pages (Published 24 April, 2008) Available from [http://www.biomedcentral.com/1471-2431/8/13](http://www.biomedcentral.com/1471-2431/8/13). Randomized controlled (infant as own control) trial of 61 preterm between 28.0/7-31 6/7 weeks gestation in 3 level III NICUs in Canada. Infants got KC for 15 min before and during heel lance. In incubator prone, swaddled in blanket. Used PIPP, videotaped and assessed every 30 seconds. Noticed that infants had physiologic stability and deep sleep within a minute of onset of KC (pg 7). PIPP scores 90 second post-lance significantly lower in KC than incubator (8.871 vs 10.677) and at 30, 60, 120 second in favor of KC but nonsignificant. Time to recovery was significantly shorter by one minute for KC (123 sec vs. 193 secs). Facial actions were highly significantly lower in KC at all times, reaching a two-fold difference by 120 second post-lance. HR was significantly lower across the first 90 seconds in the KC condition. Mean SaO2 levels were sig. higher at 60 and 90 second post-heel lance. “Very preterm infants appear to have endogenous mechanisms elicited through skin-to-skin maternal contact that decrease pain response, but not as powerfully as in older preterm neonates. The shorter recovery time in KMC is clinically important in helping maintain homeostasis” Had 32% refusal rate by moms (felt too stressed, did not want anything extra done to baby, did not want to see infant in pain)(pg. 4 of 9)PT, RCT, VLBW, LBW, pain, PIPP, HR, SaO2, facial actions, stability, sleep, micropreemie, maternal stress from being in unit

Johnston CC, Filion F, Campbell-Yeo M, Goulet C, Bell L, McNaughton K, & Byron J. (2008b). Enhanced kangaroo mother care for heel lance in preterm neonates: a crossover trial. _J. Perinatology 29_(1), 51-56. 90 preterms between 32-36 weeks gestational age put in randomized cross-over design (1st condition was KC + singing, rocking, sucking; 2nd condition was KC alone). No sig differences in any of the 30 sec time periods over the 2 min of bood sampling nor in time to return to baseline. Pains scores were lower and comparable to other studies of KMC. KC alone is sufficient to decrease pain response to heel stick. **PT, R cross-over, PIPP, HR, SAO2 Pain HOW MANY MINUTES OF KC?**

Johnston, CC, Filion F, & Nuyt AM. (2007). Recorded maternal voice for preterm neonates undergoing heel lance. *Advances in Neonatal Care 7*(5), 258-266. Descriptive cross over study (hearing recorded filtered maternal voice or no voice during heel stick) of 20 infants who from 32-36 weeks pma who heard filtered maternal voice recording for 10 minutes at 60-70 decibels 3 times/day for 48 hours after feedings. At end of 48 hours, randomization determined which half of infants got heel stick hearing maternal voice first and the second condition (no voice) was within 10 days of first. Premature Infant Pain Profile score was outcome. Maternal voice recording made no differences at all. Order did not affect PIPP scores either, nor facial recordings. Different modalities of maternal presence appear to be necessary to blunt pain response. Skin-to-skin contact has been proven efficacious for diminishing procedural pain in both fullterm and preterm neonates, but mothers often are not able to be present during a painful procedure, so Johnston tried voice alone and it did not work. Kangaroo Care does. **Preterm, descriptive cross –over, pain, PIPP**

Johnston, C.C., Stevens, B., Pinelli, J., Gibbins, S., Filion, F., Jack, A., Steele, S., Boyer, K., & Veilleux, A. (2003). Kangaroo Care is effective in diminishing pain response in preterm neonates. (2003) *Arch Pediatric and Adolescent Medicine 157* (11), 1084-1088. 74 preterms 32-36 wks postconceptual age and within 10 days of birth were in cross-over (served as own controls) study of 30 minutes of KC and then heelstick in KC versus being prone in incubator and getting heelstick in incubator. Premature Infant Pain Profile scores over first 90 seconds of heel lance procedure were significantly lower by 2 points in KC. KC effectively decreases pain of heelstick. **PT, Quasi-Experimental, Pain, crying**
Despite the duration of the breastfeeding episode, all mothers complied with this instruction. The duration of skin-to-skin contact and breast massage by the newborn in the perinatal period enhances breastfeeding duration and maternal oxytocin release. This study measured effects of oxytocin administration during labor by IV or immediately after birth on intramuscular injection of oxytocin and prolactin secretion during breastfeeding on postpartum day 2. On page 72, it states “skin to skin contact between mother and infant after birth during the early sensitive period enhances breastfeeding duration and maternal-infant interaction in a more long-term perspective.” Large amounts of oxytocin are released during labor. In addition, maternal oxytocin is released by skin to skin contact and breast massage by the newborn in the perinatal period. The study was conducted in Sweden where “mothers and infants should have been in skin to skin contact for the first 2 hours after birth” (pg. 72). And “mother were encouraged to maintain frequent skin to skin contact with their newborn” (pg. 73), and “When the baby had started to suckle the breast, mothers were asked to stay in skin to skin position with their baby for 60 minutes, regardless of the duration of the breastfeeding episode.” All mothers complied with this instruction. The duration of skin-to-skin contact is defined as a newborn receiving only breastmilk and no other liquid or solid except for drops of syrup consisting of vitamins, minerals or medicine. The mother’s refusal to feed the newborn breast milk does not constitute exclusive breast milk feeding. The requirements now are that this ruling does not apply to preterm infants, and does not apply to healthy term mothers for whom an MD, CNM, or PA have written a medical reason in the medical record. “Reasons for not exclusively feeding breast milk during the entire hospitalization are clearly documented in the medical record.” These reasons are due to a maternal medical condition for which feeding breast milk should be avoided. Exclusive breast milk feeding is defined as a newborn receiving only breastmilk and no other liquid or solid except for drops of syrup containing of vitamins, minerals or medicine. The mother’s refusal to feed the newborn breast milk does NOT constitute exclusive breastfeeding. They are looking at the process and they are looking for an increase in the rate of infants exclusively breast milk fed. Exclusive breastfeeding, FT NOT on CHARTS as of 10/29/09.
to skin contact between mother and infant before start of breastfeeding and the duration of breastfeeding were recorded.”

Pg. 73. Then on page 74, in Table 2, it reports the “duration of skin to skin contact before breastfeeding in minutes and seconds. For all participants, (n=61) the median was 2.0 and range was 1.00-7min 30 seconds). For the oxytocin IV (before birth) group (n=8), median was 3.0 (R=1.7-00 mins); for oxytocin IM (n= 13), median was 2.0 mins (R=1-7 mins); for epidural analgesia group(n=20) with (n=14) or without (n= 6) intrapartum oxytocin infusion median was 3 mins (R =1-6 mins.30 second ) and for the women who received none of the interventions (n=20), median was 2 mins (R=1-9 mins). No significant differences in amount of KC before breastfeeding session was seen. Results: All mothers showed pulsatile oxytocin release during first 10 minutes of breastfeeding. Giving oxytocin with epidural lowered pulsatile oxytocin release. Prolactin was released during breastfeeding too on PP2. Oxytocin infusion facilitated release of prolactin but decreased endogenous oxytocin levels dose-dependently. Epidural analgesia in combination with oxytocin infusion influenced endogenous oxytocin levels negatively. **Descriptive comparative study, Full Term, birth KC, postpartum KC, oxytocin, prolactin, epidural. NOT ON Charts as of Augu 25, 2009.**

Jonas W., Wiklund I, Nissen E, Ransjo-Arvidson A-B, & Uvnas-Moberg K. (2007). Newborn skin temperature two days postpartum during breastfeeding related to different labour ward practices. *Early Human Development* 83, 55-62. Purpose was to determine if epidural and oxytocin during labor affect newborn temperature during breastfeeding on postpartum day 2. 47 mother infant pairs, 9 got oxytocin stimulation during labor, 20 got epidural and oxytocin during labor, 18 moms got neither epidural nor oxytocin during labor. 27 mother- infant fullterm pairs who were all lying dressed on mom’s bed, awake, hungry, calm, and no crying on Day 2 of life. All were then undressed and weighed with diaper. Then immediately placed in KMC and covered with light blanket. This is standard practice and all moms continued KC for at least 30 minutes and all moms were Breastfeeding. Measurements taken on morning of Day 2 of life. Treatment groups were based on oxytocin and epidural: 9 moms had received oxytocin during labor, 20 moms had epidural + oxytocin, 18 moms had neither oxytocin nor epidural and served as control. Skin temp on back (between shoulder blades, put in KC and covered with blanket), Skin temp taken immediately after placement in KCand 5, 10, 20, and 30 minutes after placement. Skin temperature immediately after placement in kc was higher in epidural infants (37.07) compared to control (34.19). Skin temp rose significantly over first 10 minutes and then were stable in control and oxytocin stimulation by IV in labor group. **No such skin temp rise occurred in infants who mom had epidural during labor.** First skin temp higher in epidural than controls, skin temp increased sig during the experimental period in the control infants, same response in moms who got oxytocin (p=.008), no such rise in infants whose mom’s had epidural during labor (infant skin temp did not rise in epidural moms). In summary, novel finding of rise in newborn skin temperature during breast feeding on postpartum day 2 and KMC two days postbirth is similar to findings immediately after birth. But if mom got oxytocin or epidural in labor, her babies skin temp did not rise during KC as well as infant temp of moms who did not have oxytocin or epidural. Interventions during birth prevent infant from responding naturally to KC. Epidural hampers infant skin temperature during KC breastfeeding on postpartum day 2 Watch birth interventions as they have long term effects. **Quasi experimental because could not randomize,** Fullterm, temp ↑, interscapular temp, epidural-related temp, analgesia KMC = normal behavior, oxytocin.

**Epidural, temperature rise pattern was same as seen by Ludington 2000. (See also Bystrova 2007 in which KMC was considered normal and other treatments were evaluated for their effect). Routine KC, Intermediate KC, back temp, Postpartum Day 2, negative effect of epidural. (NOT ON CHARTS YET).**

Jonas W., Nissen E, Ransjo Arvidson AB, Wiklund I, Henriksson, P, & Uvnas-Moberg, K (2008). The short and long term decrease of blood pressure in women during breastfeeding. *Breastfeeding medicine* 3(2), 103-109. DOI: 10.1089/bfm.2007.0031. **Not a KC study per se,** but reports that Blood Pressure drops during breastfeeding. On PP day 2, 8.8 systolic +/-11.0 and diastolic drops 7.7 +9.3. At a 25 week follow-up period, asignificant fall is vagal blood pressure with systolic falls were 15+/10 and 10 +=9.7 for diastolic fall. BP falls significantly in response to individual BF periods during the entire observation period. **FT, BF, BP**

Jonas J, & Ellen E. (2002). Kangaroo Care. Indian Journal of Continuing Nursing Education. 3(2), 10-13. Measured HR and temperature increased during KC and then dropped after KC I think KC was an hour or so long. **PT, pretest-test-posttest design, HR, Temp, DO NOT HAVE< GET THIS**

Jones, E., & Spencer SA. (2007). Optimising the provision of human milk for preterm infants. Archives of Disease in Childhood, Fetal & Neonatal Edition 92(4), F236-F238. Clinical review of techniques to improve breastfeeding of preterm infants, which is far less than optimal. Makes the point that expression of milk must begin early after preterm's birth because mean amount of milk production on Day 7 post-birth is strong predictor of adequate milk volume at 6 weeks postpartum (p. F236). She says we should encourage mothers to produce milk, express as soon as possible after birth, express at least 8 times each 24 hours, provide support & breast pump, use shield, and reduce stress of NICU and preterm birth by doing KC. "The early instigation of KMC is thought to be beneficial in this respect, with mothers experiencing feelings of milk ejection during KMC (and it shows a picture of KC with a ventilated infant). It has been shown that mothers of VLBW who practiced KMC lactated on average four weeks longer than controls, with less chance of discontinuing lactation before discharge. In contrast, the use of nasal oxytocin spray does not markedly improve the milk yield during the first five days postpartum." (pg. F237). Preterm, clinical report, breastfeeding, ventilated KC, milk ejection, maternal stress Not yet on charts.


Jonson B.H., Abraham, M.A., & Parrish, R.N. (2004). Designing the neonatal intensive care unit for optimal family involvement. Clinics in Perinatology, 31(1), 353-382. This is a review of how to design a single bedded nicu for optimal family involvement. Optimal family involvement is described as having practices that reflect family-centered care, such as breastfeeding, skin-to-skin care, and developmental care (p. 354). In relation to skin-to-skin care, it says on page 355: "Skin to skin care. This type of care has been used in neonatal intensive care for over 25 years. Mothers and fathers consistently report positive emotional effects of providing this type of care for their infant (cites Kirsten, Bergann & Hann, 2001 and Tessier et al., 1998). For mothers, skin-to-skin contact has been shown to increase breast milk production (cites Furman, Minick, & Hack, 2002 and Hurst et al., 1997). Research also suggests that skin-to-skin care has beneficial effects for infants, including enhancing growth, reducing pain response to procedures, and promoting neurobehavioral development into the first year of life (cites Kirsten et al., 2001; Johnston et al., 2003; and Oghi et al., 2002)." (pg. 355). Review, PT, cites KC as one strategy for optimal family involvement, pain, milk production, development. NOT ON CHARTS YET as of 9/14/09


Kadam S, Binoy S, Kanbur W, Mondkar JA, & Fernandez A. (2005). Feasibility of Kangaroo mother care in Mumbai. Indian J Pediatrics 72(1), 35-38. 89 low birth weight infants (<1800 grm, stable cardiopulmonary in air, APGAR of 7 at 5 mins and on feeds (breast or breastmilk feeds by spoon), Mean age = 3.2 days (1-8 days range) randomized (44 KC, 45 conventional care (CMC)) in tertiary care unit. Moms sat semi reclined holding upright baby beneath cloth dupatta for at least one hour each session and continuing for as long as comfortable (Mean =9.8 hrs/day SD =3.7 hrs) and until discharge (wgt gain for 3 days, maintaining temp, feeding well, and mom confident of caring for baby at home). CMC under radiant warmer until dish. HR and SaO2 continuous, RR each hour when in quiet state, Axillary temp for 3 minutes each hour and when hypothermic (<36C) & hyperthermic (>38C). KC group had significantly: less hypothermia (10/44 vs. 21/45), higher SaO2 (95.7 vs. 94.8%), and decreased respiratory rate (36.2 vs
No differences in # of hyperthermia episodes, sepsis (KMC=6; CMC=8), apnea (KMC=6, CMC =8), BF onset (KMC 4.7 days(+3.3); CMC 5.6 days(+3.9), hospital stay (KMC=8.5 ± 4.4; CMC=9.3 ± 4.5 days), weight gain (KMC = 1494±211g; CMC = 1462±205g). 15 KMC babies transferred back to conventional care (for sepsis = 6; for apnea = 6, for jaundice = 7 – which equals transfer back to CMC rate of 34.1%). Klebsiella pneumoniae was predominant organism. One baby died in each group (due to sepsis for KMC and NEC for CMC). Moms asked 3 questions: Do you feel comfortable when giving KMC? Will you continue giving KC at home? Does your husband agree with this care? 86% moms happy with KMC, 14% felt CMC was better; 79% of moms felt comfortable during KMC and 73% felt they would be able to give KMC at home; 64% fathers agreed with KMC. For jaundice = 7

Kaffashi, F., Scher, M.S., Ludington-Hoe, S.M., & Loparo, K. (in press) Complexity analysis of neonatal EEG and skin-to-skin contact (Kangaroo Care) effects. American Journal of Physiologic Regulation and Integrated Computerized Physiology, 291 (2011). Three groups of infants were compared; one group (n=10) of preterm infants who received 1.5 hours of KC/day for 4 days/week from 32-40 weeks postmenstrual age at Rainbow Babies and Children’s Hospital; one group of similarly aged and healthy preterm infants at Rainbow Babies and Children’s Hospital (RBC) who did not receive any KC and were studied by Holditch-Davis before KC began at RBC (n=3), and one group of full-term (40 weeks gestational age) infants studied at Univ of Pittsburg with EEG within 24 hours of birth in a sleep lab (n=1). Comparisons of brain complexity as measured from EEG were made. Brain complexity was highest in the KC treated preterm infants and was better than in full term infant too. Infants cared for in incubator had the lowest brain complexity at 40 weeks postmenstrual age. PT, Quasi-experimental (no randomization to groups, just comparison between three groups), brain complexity, separation

Kambarami, R. (2002). Kangaroo care and multiple births. Annals of Tropical Paediatrics, 22(1), 107-108. States that there is a global paucity of data on use of KC in twins or triplets (pg. 107). Retrospective chart review cross sectional (twins and triplets) survey of 68 twins & 4 triplet mothers, but 26 twins and 2 triplet mothers had only one surviving infant for the study in Zimbabwe. Infants had been admitted to the KC unit where 24/7 KC was given. Admitted on day 4 of life and stayed a median of 3 days. Six were sent to NICU for sepsis, 2 for poor weight gain, one for pallor after admission to KC unit. But, all were discharged from the KC unit, discharged well and exclusively BF. Twins and triplets who received KC in first week of life tolerated it well, managed to breastfeed well in a very short time and left the hospital early. Author concluded that “KC is feasible and safe for twins and triplets.” PT, FT retrospective survey and chart review, sepsis, exclusive BF, LOS, Shared KC, wgt.

Kambarami RA, Chidede O, & Kowo DT. (1998). Kangaroo care versus incubator care in the management of well preterm infants – a pilot study. Annals of Tropical Paediatrics, 18(2), 81-86. 37 KC group getting 24/7 KC in a KC unit in Zimbabwe gained twice as much weight per day as the 37 controls (20.8 g vs. 10.2 g, p =0.0001), had shorter hospital stay (16.6 vs 20.7 days, p=0.04), and better survival rate (0% vs. 9%) and were ill less frequently, but not significantly when age and birth weight were adjusted for. “KC has major advantages over incubator care of preterm infants…”(p. 81) RCT. PT, Weight, LOS, mortality, sepsis?(illness, general morbidity), incubator

Kambarami RA, Chidede O & Kowo DT (1999). Kangaroo care for well low birth weight infants at Harare Central Hospital Maternity Unit—Zimbabwe. Central African J. of Medicine, 45(3), 56-59. 613 mother-infant pairs, got KC in tertiary level hospital whenh preterms were “well.” Median KCU admission age =12 days; 72% discharged home from KMC Unit and 28% referred to NICU. More likely to go back to NICU if male, BS<1500g. KCU admission weight <1500 grams, and KCU admission age 14 days or more. 27% sent to NICU for apnea, 27% for respiratory distress, 18% for aspiration pneumonia, 8% for jaundice, 7% for poor feeding, 5% for maternal illness, 4% for sepsis, 3% diarrhea. Birth weight was strongest predictor of being sent back to NICU. Establishment of KMCU in tertiary hospital is feasible, KC for well preterms is suitable for most mothers and infants, and infants are most likely to go back to NICU if male, very low birth weight, and greater than two weeks old when admitted to KMC Unit. Preterm, Implementation, regression, tertiary level hospital, feeding, jaundice, sepsis, maternal illness, guidelines for

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admission to KC unit, birth weight.

Kambarami R, Chidede O, & Pereira N. (2003). Long term outcome of preterm infants discharged home on kangaroo care in a developing country. Annals Tropical Paediatrics, 23 (1), 55-59. 297 preterm infants born at Harare, Zimbabwe were discharged home on KC. 26.6% died (median age=66 days), 47.5% survived, 25.9% lost. Hospital readmit rate = 22.9% with 8.8% mortality. Maternal mortality = 4.7%, chronic infant morbidity was 7.4%. Infant mortality was related to young age of mom, birth weight <1500, and maternal mortality, not to discharge weight or birth weight. Descriptive, PT, Home follow-up, Morbidity, Mortality, hospital readmit rate, birth weight

Kambarami R, Mutambirwa J, & Maramba PP. (2002). Caregivers’ perceptions and experiences of ‘kangaroo care’ in a developing country. Trop Doct 32 (3), 131-133. Focus group showed that nurses preferred KC to conventional methods, but still it’s use is not widespread. Knowledge & awareness of method need to be improved. Qualitative, focus group, staff perception, implementation, PT

Karas, D.J., Mullany, L.C., Katz,J., Khatry, S.K., Leclerq, S.C., Darmstadt, G.L., & Tielsch, J.M. (2011). Home care practices for newborns in Rural Southern Nepal during the first 2 weeks of life. Journal of Tropical Pediatrics, Epub ahead of Print. Descriptive study of characteristics (feeding hygienic care, skin/cord care, thermal care) of 23,356 and 22,768 infants on Days 1 and 14 of life in Nepal who participated in a community-based trial of Essentials of Newborn Care practices. 56.6% were breastfed within 24 h and 80.4% received prelacteal feeds within the first 2 weeks of life. Only 13.3% of caretakers always washed their hands before caring for their infants. Massage with mustard oil was hear universal, 82.2% slept in a warmed room, and KC was rare (4.5%). Many behaviors were detrimental to health and key areas for community-based training were identified. 3rd world, FT, PT, Community-based KC, Essential Care, massage

Karl, D.J., Beal, J.A., O’Hare, C.M., & Rissmiller, P.N (2006). Reconceptualizing the nurse’s role in the newborn period as the “attacher”. MCN, American Journal of Maternal Child Nursing, 31(4), 257-261 NOT A KC STUDY. This is a clinical report of attachment theory and how the postpartum nurse should take on the role of “Attacher” so that the mother bonds to her, the nurse, so the nurse can mother the mother as she is supposed to mother the child, and then help the mother attach to the infant. On page 259 there is Table 1: The Nurses Role in Facilitating Mother-Infant Attachment and under the second box of major tenets of attachment theory is “Proximity-seeking and contact-maintaining” and the supportive nursing interventions to help accomplish this are “Maximaze contact between mothers and their babies by encouraging: rooming in, skin-to-skin contact, breastfeeding and infant massage.” On page 260, the text relates” Several ways in which nurses can promote proximity and contact-maintaining behaviors include continuous rooming-in, breastfeeding, skin-to-skin contact (kangaroo care) and infant massage. Each of these is associated with facilitating attachment and contributes to the attachment process. For example, research from the past few decades shows that skin-to-skin contact decreases maternal stress and increases parent-infant reciprocity (Feldman, W.S, & Eidelman, 2003).” FT, clinical article, attachment, postpartum KC

Karlsson H. (1996). Skin-to-skin care: heat balance. Archives of Disease in Childhood 75: F130-F132. Nine healthy neonates, FULLTERM, were given 60 minutes of KC on Mom’s chest and rectal temps increased by 0.7°C, going up to 37°C, during KC. Heat was gained from areas in contact with mother’s skin; heat loss from un-protected heads was high, but dry heat loss during KC was similar to dry heat loss in an incubator. Overall, there was reduced heat loss in infants during KC, allowing heat to be conserved. KCs attained and maintained rectal temps. Fullterm, Rectal temp, descriptive, Temperature


responses to pain of an intramuscular injection in neonates. J. for Specialists in Pediatric Nurses (JSPN) 13(4), 275-280. No Doi Available. Randomized controlled trial of 100 healthy term infants (KC= 50; 22 males, 28 females and KC was in mother’s postpartum bed at 45 degrees with 2 receiving blankets over infant’s back and maternal fingers exerted slight pressure over infant’s back and no rubbing, speaking, jiggling, or other touch before, during, after injection and for 10 minutes before shot; control (put in quiet room, left for 10 minutes ) in Bandar Abbas, Iran was conducted. Infants were 2500-4000 gram birth weight, 2 hours old, unfed, APGARS of ≥7 at 1min, ≥ 37 weeks GA, Sao2≥ 95%, NSVD, no birth trauma, no congenital anomalies, no drug use by Mom. After placement in KC, researchers left mom and baby alone for 10 minutes to acclimate and then attached pulse oximeter, brought to quiet-alert state, vastus laeralis grasped, swabbed, and injected with 30 guage needle with 0.5 ml of vitamin K, and then gauze pad pressure for remaining two minutes of procedure. The face was videotaped only for duration of crying measurement. The Neonatal and Infant Pain Score (NIPS) was used (facial grimace as relaxed or grimaced; cry as no cry, whimper, or vigorous cry; breathing patterns as relaxed as changed; leg movement as relaxed or extended/flexed; state of arousal – sleeping/awake =0, irritable = 1; arm movements as relaxed or extended/flexed). Score is 0-2=mild/no pain, 3-4=mild to mod pain; >4=severe pain. Range of NIPS was 0-7; KC group had significantly fewer infants getting higher scores in each of the NIPS categories than controls. NIPS was significantly more severe (KC= 31 (62%) had score <2; 16 had score 3-4; 3 had score of >4 , control = 1 has score of 0-2; 19 had score of 3-4, 30 (60%) has score >4 ) in controls (p<0.001); cry duration longer in control (KC=14.55 seconds, control =24.61 seconds), and 30 KCers and 6 controls did not cry at all with the shot. KC is context dependent because the person giving KC must be relaxed and sucrose/taste induced analgesics have rapid onset; KC has gradual onset so be sure to give 10 minutes of KC before pain stimulus (pg. 279). [SML has 4 issues with this study: first, why were infants brought to quiet alert state rather than being left relaxed and in quiet state as found after 10 minute adaptation period (pg. 276), and second, on page 277 it states that one researcher did all the vit K shots and that she “was not aware of either the purpose of the study nor that different groups” – but how can one give a shot in KC without being aware that some babies are in KC and others were in a crib? Third, a table of random numbers was used to randomized to get equal #s of male and females. Table of random numbers has to have all of the sampling frame (all 100 babies) present and assigned a number at the same time, and when data was collected over two months, this condition was not met, and is not able to control for sex unless separate tables are used (one for each sex) and then why would they end up with exactly the same number of males/females in each group and an uneven number of males/females in each group? No rationale for this uneven representation was given.] Fullterm, pain, crying, NIPS, randomized controlled trial, RCT, Early KC. Not on charts yet. See also Sajedi 2007 article

Kattwinkel, J., Perlman, J.M., Aziz, K., Colby, C., Fairchild, K, Gallagher, J. & Zaichkin, J. (2010). Special report-Part 15: Neonatal Resuscitation: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation, 122, S909-S919. Doi: 10:1542/peds.2010-2972E. This article presents the latest guidelines for neonatal resuscitation. Although fewer than 1% require extensive resuscitation efforts, about 10% of newborns require some assistance at birth to begin breathing. Identify infants who do NOT require resuscitation by assessing three variables: term gestation, spontaneous crying or breathing, and good muscle tone. Infants who do not meet one or more of these criteria may need: provision of warmth, clearing the airway if indicated, drying, stimulation, ventilation, chest compressions, and administration of epinephrine and/or volume expansion. Assess infant during the GOLDEN MINUTE – the first minute of life. Guidelines recommend that at every birth, at least one person be designated as primarily responsible for the newborn, that this person is capable of initiating newborn resuscitation, environment should include person capable of complete resuscitation including intubation. The guidelines states that term infants who have good muscle tone and cry or breathe spontaneously should nto be separated from the mother, but should be dried and placed in skin-to-skin contact with the mother, with both of them covered with dry linen. These infants may continue to be observed for breathing, activity, and color while in contact with the mother. FT, Guidelines, BIRTH KC, NRP, separation, life threatening events (See Lewis’s 2012 review too)

stable, all neonates are given at least 4 hours/day of KMC until discharge. Mothers, fathers, grandparents and siblings provide KMC. Because they don’t have lycra bands to hold the infants in place, they use sport bras and veils to do the job. Infants wear a diaper, head cap and booties. Then report relates the statistics of their practice: 62 low birthweight infants have received KMC. 19(31%) were <1000 grams, 32 (52%) were 1001-1500 grams, and the rest were between 1501 and 2500 grams. Smallest baby was 548 grams. No significant variations in heart and respiratory rates have been noted. Temperatures remained 36.5-37.4C even in very low birth weight babies under incubator care. No hypothermia, no hyperthermia. Oxygen saturation shows improvement of 2-3%. Nurses reported that manpower needs, close supervision of infant, and use of heat convectors decreased considerably, KMC babies had fewer complications, and survival was better. Mothers reported increased expressed breastmilk and acceptance of KMC, more confident in handling infants, and feel as though they are contributing positively to the care of the infant. Authors concluded that KMC is good, safe, economical alternative in developing countries having constraints on manpower and equipment. It is well accepted by mothers, families, and nurses. 

Descriptive, Preterm, 3rd world, implementation report, Micropreemie, temperature, heart rate, HR, respiratory rate, RR, SaO2, sibling KC, grandparent KC, surrogate KC, paternal KC, duration is 4 hrs/day, breast milk production, nursing time, complications, mortality, maternal feelings. (Not yet on charts). See also Parmar et al., 2009 for a report of 135 infants.

Keegan, L. (2010). Stork Story. This a blog about her experience of having KC at her cesarean birth when baby was already dried and diapered and then handed to her for KC (without any head cap for a few minutes, though). Available at www.@MothersUtopia@Laura_Keegan. FT, Lay report, cesarean section., OR KC,

Keegan, L. (2008) Breastfeeding with Comfort and Joy: A photographic guide for mom and those who help her breastfeed. Available from www.BreastfeedingwithComfortandJoy.com. This book includes the importance of skin to skin with mom and dad. There is an accompanying youtube show about breastfeeding but it does not have any pictures of KC. BLOG, FT, BF.

Keister D, Roberts KT, & Werner SL. (2008). Strategies for breastfeeding success. Am Fam Physician 78(2), 225-232, 233-234. This review reports the American Academy of Family Physicians, AAP and ACOG policy statements supporting breastfeeding. On page 225 it states: “In addition, immediate skin-to-skin contact between mother and infant and early initiation of breastfeeding are shown to improve breastfeeding outcomes” Has chart on benefits of breastfeeding on pge 226 (disease prevention, nutritional, immunologic, developmental, psychologic, maternal health, economic, and environmental) and on page 226 there is a box entitled KEY RECOMMENDATIONS FOR PRACTICE, and the second item is “Unless contraindicted by a medical condition, mothers should have immediately skin-to-skin contact with their infants throughot the first feeding to increase the likelihood of breastfeeding success, and should be encouraged to room-in, feed on demand, and avoid supplements and pacifiers in their infants.” And this is rated as A level evidence based on AAFP policy, Gartner et al., 2005 (the AAP guidelines), Anderson, Moore, Hepworth & Bergman, 2003; Phillip & Merewood, 2004; and WHO Evidence for the Ten Step to Successful Breastfeeding. 1998.) . Says on page 227 that breastfeeding education should begin as soon as antenatal visits commence. And then “A 2003 Cochrane review found that immediate skin-to-skin contact between mother and newborn improves breastfeeding outcomes. Postpartum breastfeeding should occur within the first hour of life, even if weighing, bathing or administering medications are delayed.” (Pg. 227). Clinical guidelines for breastfeeding, birth KC, FT. Not on charts yet as of 6/20/090.

Kempe A, Alwazer FAN-A, & Theorell, T. (2010). Women’s authority during childbirth and Safe Motherhood in Yemen. Sexual and Reproductive Healthcare, 1(4), 129-134. DOI: 10.1016/j.srhc.2010.07.001. 220 women who gave birth were interviewed. If woman had her questions answered and requests met had 83% higher probability of perceiving own authority. Women who had KC ahd 28% higher and women with distant contact had lower probability of perceived own authority. Women’s social and demographic background played no role in perceived own authority at birth. Supporting women to exercise their own authority during childbirth would significantly facilitate their ability to give birth successfully andwith personal satisfaction. In a country were women are routinely disempowered at birth, empowerment is important. Disempowerment occurs at hands of skilled birth attendants, most especially MDs and also midwives who work against the mother’s personal power and authority. KC
Kennedy, J.H. (2006). Randomized controlled trial of skin-to-skin contact from birth versus conventional incubator for physiological stabilization in 1200 to 2199 g newborns. *Acta Paediatrica, 95*(1), 15-16. This is a commentary on Bergman’s RCT. Ten infants <2000g had axillary and rectal temps measured 2x/day x 5 days. KC was done for hypothermia. KC was cost-free and effective method of rewarming. Kennell asks why Bergman would even think of trying this study and did not cite the previous studies done by Ludington-Hoe and another by Anderson et al and their published reports as reasons, but was glad that Bergman did this trial. He also makes laudatory comments about the breast biosynchrony study of Ludington-Hoe et al., that was published in *Journal of Obstetric, Gynecologic, and Neonatal Nursing* in 2006. 

Kennell, J.H., & Klaus, M.J. (2005). Foreword. In Lawrence RA and Lawrence RM. *Breastfeeding. A Guide for the Medical Profession. 6th Edition.* Philadelphia, PA: Elsevier Mosby. Pp. vii-viii. This forward states on page vii “The same researchers (referring to Swedes) found that, when infants are skin-to-skin with their mothers for the first 90 minutes after birth, they hardly cry at all compared with infants who are dried, wrapped in a towel and placed in a bassinet. In addition, the researchers demonstrated that if a newborn is left quietly on the mother’s abdomen after birth he or she will, after about 90 minutes, crawl gradually up to the mother’s breast, find the nipple, self-attach, and start to suckle on his or her own. It would appear that each of these features - the crawling ability of the infant, the absence of crying when skin to skin with the mother, and the warming capability of the mother’s chest – evolved genetically more than 400,000 years ago to help preserve the infant’s life.” Pg. vii. Birth KC, BF, crawl, cry, Not on CHART's 12/28/2011.

Kennell, J.H. & Klaus et al., 1974


NOT A KC study per se but recommends KC. First week of life is important for establishing adequate milk supply. This is a clinical article about normal breastfeeding behaviors (at 1st breastfeed within 2 hrs of birth, colostrum intake is 0-5 ml; for first 2 days postbirth before secretory activation, colostrum intake is 37-169mL/d (Kent JC 2007 How breastfeeding works. J Midwifery & Women’s Health 52(6),564-570), infant should pass meconium within 2 days of birth, infant may lose up to 7% birthweight by 3.5 days postbirth (Gartner LM, Morton J, Lawrence jRA, Naylor AJ, O’Hare D, Schanler RJ & Eidelman, AI 2005 Breastfeeding and the use of human milk. Pediatrics 115(2), 496-506). By 6 days postbirth infants are taking 556-705 ml/d and weight gain in first week should be 15-30g/day (Lawrence & Lawrence 2011. Milk production is fully established by one month (Kent 2007) and normal milk production between 1-6 months post birth is 750-800 ml/day (R=440-1220 for infants growing normally). Over first six months the normal infant’s daily energy requirement, expressed as kilojoules per kilogram of body weight) decreases from 430 to 330 kilojoules/ke (1 kilocalorie [kcal]-4.184 kilojoules (kJ) and the energy required for growth decreases from 1 to 3 months, equaling 35% and between 3 & 6 months equaling 17.5% (Food & Agriculture Organization, n.d., Energy requirements of infants from birth to 12 months.www.fao.org/docrep/007/y5686e/y5686e05.htm#bmt05.3) Moms should feed 8-12 times/day and exclusively BF infants average 8/day (R=4-13/day). Milk at beginning of feed is low fat; hind milk is high fat (p. 115) and has 3 times as much fat as foremilk (Bishara R, Dunn MS, Merko SE, Darling P(2008) Nutrient composition of hindmilk produced by mothers of very low birth weight infants born at less than 28 weeks gestation, J Hum Lact 24(2),159-167). Because a breast may be full at one feeding and well drained at another, daily fat intake of breastfed infant is INDEPENDENT of feeding frequency when milk production is in normal range (pg 116). Sucking time ranges from 12-67 min/feeding and no relationship exists between duration of a breastfeed and amnt of milk
consumed during that breastfeed because they spend some time in non-nutritive sucking on each breast. On page 117 it says “The following three recommendations facilitate effective drainage (of breasts). First, early frequent, unrestricted skin-to-skin contact. Laying the baby skin to skin prone between the mother’s breasts will elicit the basic “baby led” instinctive feeding behavior of searching out and attaching to the breast. This positioning can help to calm and relieve stress in a compromised dyad while they are still learning the skills of breastfeeding.” FT, PT, breast milk production, colostrum, birth weight loss, hindmilk, fat content, VEKC, EKC. not on charts 2/7/2012.

Keshavarz, M. & Haghighi MNS (2010). Effects of kangaroo mother care on duration of exclusive BF and feeding pattern in neonates of mothers who delivered by cesarean section (Farsi). *Medical Science Journal of Islamic Azad University Medical Branch*, 20(3), 182-188. Randomized controlled trial of 80 convention care vs 80 in KC (2 hrs after cesarean KC was given and then 60min/day for 2 consecutive days and then at home. In KC group, # of feeds in hospital was greater and # of infants EXCLUSIVELY breastfed up to 6 months was greater. Time between birth and first feeding did not differ between the groups. Number of infants severely crying in hospital was lower in KC group than controls (5.6 vs. 12.3). KC is recommended in delivery and cesarean section units and then continuing at home. FT, RCT, Cesarean, BF, EXCLUSIVE BF, # of crying infants. home KC, postpartum kc, separation


Kirsten G.F. & Kirsten CL (2000). The impact of an aggressive breast feeding programme for very low birth weight infants on the prevalence of nec. *Proceedings of the 7th World Iamaneh Conference*. Stellenbosch, S.A. 164-165. VLBW and LBW preterm randomized controlled trial of intermittent KC in level II NICU where being fed breastmilk during intermittent KMC significantly decreased the incidence of necrotizing enterocolitis (NEC) (10% vs 2.8%). PT, RCT, infection, NEC, LBW. GET THIS FROM AUTHOR, not on charts yet.


Kirsten GF & Weyers H. (2006). The impact of mother kangaroo care on the prevalence of blood product transfusions in infants <1800 g managed in a developing country. *ISBT Science Series*, 1. 33-36. 622 VLBW preterms <1800 were put into randomized controlled trial of two groups: one group was nursed with intermittent KC and fed mainly breastmilk; the other group got no KC and was fed formula in incubator. If hematocrit <28% transfusions given, and if infant was receiving oxygen they got transfused at higher levels of hematocrit. No erythropoietin was given. Fewer infants with mild or no respiratory distress syndrome treated with KMC and breast milk in level 2 NICU received packed red cell transfusions compared with the control group (13% vs 23%, p<.001). When transfusion was necessary, KMC infants received a lower mean number of packed red cell transfusions (1.03 vs 0.47), and 87%(n=357) got no transfusions vs 77% (n=265) of controls who got no transfusions. The reductions in red cell transfusions occurred predominantly in the KMC group of infants with birth weights >800 grams and gestational age > 28 weeks. Fewer
The mother (Ludington's emphasis) can be taken to go to know their parents. At 2 hours the baby can have vitamin K and eye ointment and all required measurements. KC interventions to be demonstrated. Newborns should not be separated from their mothers (if both are well).

Body temperature was maintained. Overall, stabilizing the infant's physiological system was one of the first benefits of spending more time in quiet sleep, the heart rate was lower and more stable, apnea became less common.

Beginning KC was found to have soothing effects on the infant, who became calmer during skin feeling affection they begin attaching to each other. Oxytocin also makes the mother's nipple in order to receive the bacterium on the mother's skin and aparticularly, to induce the flow of mother's breast milk (colostrum) which should be given at the earliest possible stage (241). Kitajima, H. (2003). Prevention of methicillin-resistant Staphylococcus Aureus infections in neonates. Pediatrics International, 45(2): 238-245. Review of Methycillin resistant staph aureus (MRSA) which gets established very early after birth. If there have been no problems at delivery of a newborn baby, it is of great importance that the mother immediately hold the newborn to establish the mother’s original bacterial flora onto the child. The common bacterial flora would work to prevent the colonization of more alien and harmful pathologic bacteria. Strict adherence to the following seven guidelines would significantly help nosocomial infections. These guidelines should generally be applied to all newborns in the NICU except guideline #2 which concerns infants no longer in the NICU. 1. Skin contact and early breastfeeding (for the mouth and intesntive tract), by the mother should be carried out immediately after delivery.” (pg. 240). “It can therefore be deduced that one of the most effective preventive methods is to thoroughly occupy the hair follicles with a non-toxic similar bacterial strain to keep the toxic strain from being established. However, regardless of whether an infant is born by c/s or natural vaginal delivery, skin-to-skin contact between a newborn and his mother should be established immediately upon birth in the delivery room so that the mother’s beneficial Staphylococcus epidermis bacteria can be transferred to the child at the earliest possible moment. This has been referred to as Kangaroo Care or Touch Care and should be begun in the delivery room. It could also be considered the first stage in infection control for a newborn baby’s skin.” (pg. 241). Staph aureus s and staph epidermis establish themselves in the hair follicle of the host and compete to survive. The carriers are medical personnel and MRSA is by horizontal infection. Early SSC has been shown to reduce the risk of serious infection by colonizing infants with their mother’s skin flora. “The embryo in the womb exists in a germ free state but becomes exposed to bacterial flora upon passing throug the mother’s birth canal. Immediately after delivery, the newborn infants mouth should be place don the mother’s nipple in order to receive the bacterium on the mother’s skin and aparthicularly, to induce the flow of mother’s breast milk (colostrum) which should be given at the earliest possible stage” (241). Fullterm, Preterm, Infection, birth KC, VEKC, BF, nosocomial infections. MRSA GET THIS< NOT on CHARTS YET, oral care of preterms.


Klaus MH. (2009). Commentary: An early, short, and useful sensitive period in the human infant. Birth 36(2): 110-112. Commentary on Bystrova, Ivanov et al. 2009 which found that KC, not swaddled holding, is very important for improved mother-infant interaction at 12 months post-birth, (even though no measurements were taken after fullterm birth hospital discharge and 12 months age). He does a good job of summarizing Bystrova data, referring to his study () and congratulating Bystrova et al. on producing definite evidence of a sensitive period (but so did de Chateau who followed up for 3 years, and all the Mikel-Kostyra work in Poland). Klaus explains the effect through oxytocin released from hypothalamus of mom and infant as soon as KC begins, which produces clam, and with decreased anxiety and falling affection they begin attaching to each other. Oxytocin also makes them sleepy and lessens pain. From the beginning KC was found to have soothing effects on the infant, who became calmer during skin-to-skin contact. Infants spent more time in quiet sleep, the heart rate was lower and more stable, apnea became less common or disappeared, and body temperature was maintained. Overall, stabilizing the infant’s physiological system was one of the first benefits of KC interventions to be demonstrated. Newborns should not be separated from their mothers (if both are well). Babies should have skin-to-skin contact with their mothers for the next 2 hours, breastfeeding they are ready and beginning to go to know their parents. AT 2 hours the baby can have vitamin K and eye ointment and all required measurements can be taken... For the past decade, WHO-Euro teaching programs have advocated that the baby should be dried BY THE MOTHER (Ludington’s emphasis) while the infant is placed skin-to-skin with her immediately after birth and that...
the newborn examination take place with the baby in this position or in the mother’s bed (Chalmer s et al., 1999). This is not a critical period but a sensitive period and many time the succeeding day and weeks parents can enjoy their baby skin-to-skin.” (pg. 111). Commentary, birth KC, FT, PT, sensitive period , separation, stability, temp, apnea, sleep, calming , routine care at 2 hours age. Not on charts yet 6/20/09

Klaus P & Klaus M. (2007). Preface. In P. Gangal (Ed.), Breast Crawl. Unicef India, 2007, pp. 7, 8. Preface to Breast Crawl book. This section reports several facts: Baby in first hour after birth is in special state, eyes wide open, quiet, listening to mother’s familiar voice (80% of infants remember father’s voice too from womb, pg. 7), warmed by mothers chest from skin-to-skin contact (pg.7), soothed by her touch and this state lasts 30-45 minutes or more. While looking he is memorizing mothers face and four hours later will pick mother’s picture over others (pg. 7), and mother is doing the same so she can distinguish her baby by smell and touch within 24 hours of birth (pg. 7). Oxytocin is secreted by mom and baby (oxytocin activates production of prolactin for letdown and aids in production of gastrin and somatostatin and cholecystokinin (GI hormones which aid absorption of food by elongating intestinal villae), raises pain threshold, creates calm in mom and baby, causes feeling of sleepiness, and creates love (it is hormone of love)(pg. 7).

When infant sucks on hand she gets taste of amniotic fluid (tastes like substance secreted by breast and she uses the smell and taste to guide to the nipple (pg. 7).Other benefits of breastcrawl are helping infant feel more secure, reducing infant mortality thru immunological properties of human milk, encouraging a longer period of breastfeeding.(pg. 8). Behaviors rehearsed in utero are used now. Baby has ability to reach at birth to touch mother’s breast (other reaching develops at 4 months post-birth), and massages and elongates the nipple for good placement. Each touch of nipple creates surge of oxytocin in mom’s and baby’s brains. Stepping movements help baby climb to breast, and stepping on abdomen over uterus helps uterus clamp down, decreasing bleeding and expelling placenta (pg. 8). Review, birth KC, scent, pre-feeding behaviors, etc. Not on charts yet, FT, metabolism, prolactin, cholecystokinin, somatostatin, gastrin, pain, comfort, calm, sleepiness.


Klaus MH, Jerauld R, Kregers NC, McAlpine W, Steffa M, & Kennell JH. (1972). Maternal attachment: Importance of first postpartum days. New England J. Medicine, 28, 460-463. Non-randomized controlled trial (moms assigned according to day of delivery) of 28 moms (14 in extra contact who got 1 hour of skin to skin during the first three hours postbirth, then 5 hours of skin to skin each afternoon for three days after delivery; and 14 in standard maternal care-glimpse of baby after birth, brief look at baby at birth and for identification at 6 -12 hours life, then 20-30 min visits every 4 hours for bottle feeding) were watched at 28-32 days postbirth during a bottle feeding for maternal behaviors. At one month post-birth mothers who had been allowed extended contact with their FT infants beginning immediately after birth showed more affectionate behavior (more soothing, more fondling and eye-to-eye contact, and than did mothers in a control group. Actually, more reluctant to leave infant with someone else, usually stood and watched during exam, had greater soothing behavior, more eye to eye contact and fondling. This was beginning evidence for sensitive period. See Klaus 2009 and Bystrova et al. 2009 for definitive study of sensitive period. Full term, Maternal affectionate Behavior, Quasi-experimental, late KC, residual effect. Sensitive period.


Kluthe C, Wauer RR, & Rudiger M. (2004). Extrasystoles: Side effect of kangaroo care? Pediatr Critical Care Medicine 5 (5), 455-456. Case report of one preterm infant who exhibited cardiac arrhythmia on the ECG monitor during KC, leading to interruption of KC. Arrhythmia disappeared after placing baby back in incubator. Most likely reasons for arrhythmia were not valid, and arrhythmia reappeared upon continuation of KC. ECG monitoring revealed...
the reason was monitoring error due to superimposed electrical activity from the parent. Oxygen saturation represents a more reliable method of monitoring during KC (N.B.: this is similar to the Sontheimer et al.’s 1995 report entitled “Pitfalls in respiratory monitoring…” which says you pick up maternal breaths and pauses if leads are not placed under the infant’s axilla where the mother’s cardiac cycle is not picked up). PT, Case study, descriptive, HR, arrhythmia, oxygen saturation, life threatening event, apnea. Barnes et al., 2005 made commentary on this report.


Korja R, Maunu J, Kirjavainen J, Savonlahti E., Haataja L, Lapinleimu H., Manninen H., Piha J., Lehtonen L., & The PIPARI Study Group. (2008). Mother-infant interaction is influenced by the amount of holding in preterm infants. Early Human Development 84: 257-267. A correlational study examining relationships between amount of holding and infant crying and mother-infant interaction. In 30 preterm infants (<1501 gand <32 weeks) who received KC during hospitalization and then had “holding” (carrying infant in caregiver’s arm or having the infant on caregiver’s lap, pg. 259) at home and 36 fullterm infant controls. Holding and infant crying were assessed by Baby Diary at 5 months corrected age & quality of mother-infant interaction was assessed at 6 and 12 months corrected age. Longer duration of holding in home environment was associated with better quality of maternal-infant interaction at 6 and 12 months in PRETERM infants, but not in fullterm infants. Preterm infants cried more & were held more than fullterm infants(suggesting that crying is a developmental tool to elicit maternal holding and caregiving and is not a negative sign pg. ). Separation impairs interaction. KC was routine practice in Finland hospital and 29 infants (96.7%) got KC in hospital by both parents (n=22,76%), and in 24% only maternal KC was given. 13.5% of infants got KC 5 times, 27.5% got KC 5-10 times; 34.5% got KC 10-20 times, 10.5% got KC 20-30 times, and 14.0% got KC >30 times during hospitalization (pg. 260). Duration of KC at each session was 30mins-4 hours. Frequency and duration are in line with routine KC practice at Turku University Hospital. A 60 minute increase in duration of holding (not KC) affected all interaction scales at 6 and 12 months (pg. 261) in Preterms but no differences or changes in fullterm infants. Maternal stress might have been less with increased holding of infant (pg. 263) as explanation because maternal stress was not measured in this study. KC during hospitalization in preterm infants is considered KC during the initial sensitive period, leading parents to gradually learn the preterm infant’s cues and to take an active role in infant care. ‘Holding by the caregiver in a natural home environment is an important protective factor for the quality of mother-infant interaction in preterm infants” (pg. 263). PT, FT, descriptive comparison study of two groups, separation, crying, holding times, interaction, diary, routine KC, duration of KC, Paternal KC, home KC. one year interaction, not about maternal infant stress at all NOT ON CHARTS as of 8/8/09.

Kostandy, R. & Anderson, GC. (2003). Kangaroo care in neonates: Effects on pain from hepatitis B vaccine injection. Abstract # 353. pg. 191 at Research ShowCASE, April 4, 2003, CWRU, Cleveland, OH. Randomized controlled trial of 68 fullterm infants who received 30 mins of KC before Hepatitis B injection, making sure mothers felt relaxed (which supposedly takes 10-15 mins). Then moms rotated infant to supine for injection in anterior thigh. Measured baseline, injection, baseline. After (5 minute) injection period, infant turned prone for more KC comforting. Standard care infants lay undisturbed in crib for 10-15 mins before injection. HR, behavioral state (Anderson Behavioral State Scale), cry time measured before, during and after injection. RESULTS were KC infants stopped cryig faster (KC = 24 mins vs 32 mins; also 16 mins vs. 72 mins), HR returned to baseline faster (p=0.07) in KC, actually within 2 min of injection and controls never did return to baseline HR. HR was increased by 13 bpm with injection in both groups. No
difference in crying by ABSS behavioral state).  **Fullterm, Pain, RCT, HR, Behav State, Cry time.**  Also available from Dissertation Abstracts, Available from rkostandy@uakron.edu. Get Dissertation Abstract reference


Kostandy R.R., Ludington-Hoe SM, Cong X, Abouelfettoh A, Bronson C, Stankus A, & Jarrell JR. (2008). Kangaroo Care reduces infant crying with heel stick.  *Pain Management Nursing, 9*(2), 55-65. Doi: 10.1016/j.pain.2007.11.004 Randomized cross over design of 10 mother-infant pairs (30-23 wk GA preterm infants 2-9 days old) who received one heelstick in KC after a 30 minute preheelstick KC period and one heelstick the next day (or vice versa) in the incubator. Randomized cross over design and measures of inaudible and audible crying were made and crying during KC heel stick and KC recovery periods were significantly less than during incubator periods. Very little inaudible crying was present so data were collapsed and reported as just crying. Crying decreased during KC heelstick and KC recovery compared to incubator.  **PT, R Cross over, pain, heelstick, crying**

**Kovach (2002).**  Need full citation. FT. Most hospitals give KMC at delivery, some do APGARS in KC.  **Birth KC, FT**


Kress, I.U., Minati, L., Ferarro, S., & Critchley, H.D. (2011). Direct skin-to-skin versus tapping touch modulates neural responses to stroking versus tapping.  *Neuroreport, 22*(13), 655-658. Direct interpersonal contact is processed differently in the brain from similar soft touch applied through inanimate objects. Healthy volunteers had an MRI of brain to assess brain response during gentle stroking or tapping by hand versus by velvet stick. Stroking by hand elicited larger responses than the other three conditions in the contralateral primary and secondary somatosensory areas and in the posterior insular cortex. These effects originate from a combination of perceptual differences and cognitive emotional correlates of CONTACT with another person. Affective touch processing is better with direct interpersonal contact than with inanimate objects. NOT A KC study, but has big relevance because you cannot get same response to KC when there is a cloth, bra, or any inanimate object across the chest surface rather than skin-to-skin. Just think of all the times parents carry babies in carriers rather than in their arms!  **Descriptive, Related KC, importance of skin-to-skin contact, MRI, massage. Brain studies, Not on Charts as of 8/19/2011.**  **DO NOT HAVE MATERIAL ON VENTRAL SURFACE!!!**


Kritzinger A & Louw B. (2003). Clinical training of undergraduate communication pathology students in neonatal assessment and neonate-caregiver interaction in South Africa.  *SAfr J Commun Disord 50*, 5-14. Development of a clinical training module in Early Communication Pathology for communication specialists to use with mothers at risk of infant neglect and abuse. Prenatal communication with mothers increased KMC and many other outcomes. Really a study about the communication module used and how the students learned neonatal assessment and how to influence mothers.  **PT, education report, increased use of KMC after early communication, implementation**

Kroeger, M. & Smith, L.J. (2004). Immediate skin-to-skin contact after birth (Chapter 10). In Kroeger &
Kuhn, K.S. & Kuhn, M.J. (2011). Kangaroo care for your premature or sick baby. Journal Human Lactation, 27(1), 66-67. This is a consumer’s summary of what KC is, who can do KC, why it is important, how the body makes milk during KC, and how to do KC for breastfeeding mothers because it is part of a series called ILCA’s INSIDE TRACK that appears in the journal. Review, PT, FT, BF Not on charts 2/17/2011


Lago P, Garetti E, Merazzi D., Pieragostin L, Ancora G., Pirelli A., Belliene CV, & Pain Study Group of the Italian Society of Neonatology. (2009). Guidelines for procedural pain in the newborn. Acta Paediatrica 98, 932-939. Review article of evidence-based guidelines for pharmacological, non-pharmacological, behavioural and environmental measures for each invasive procedure. States literature that says repeated pain in neonatal period is associated with smaller brain volume (Peterson BS, Vohr B, Staib LH et al., 2000. Regional brain volume abnormalities and long-term cognitive outcome in preterm infants. JAMA, 284: 139-1947). Used the A, B, C, D levels of evidence as defined by the Scottish Intercollegiate Guidelines Network (SIGN) and are on page 933. Says that quiet awake is the optimal behavioural state for planned invasive procedures (pg. 933) and don’t interrupt sleep for a painful procedure. Maternal and Paternal Kangaroo Care and KMC are listed in Table 2 as an intervention with B rating (“A body of evidence including good quality systematic reviews of case-control or cohort studies directly applicable to the target population, or good quality case-control or cohort studies with a very low risk of confounders or bias and a high probability of the relationship being causal. Evidence extrapolated from good-quality meta-analyses, systematic reviews of RCTS or RCTs with a very low or low risk of bias”). On page 935 under the heading “heel lancing” and environmental measures it says “Consider involving the mother in procedures whenever possible, using skin-to-skin contact or breastfeeding during non-routine sampling.” Then in the section for venipuncture, arterial puncture and percutaneous central venous catheter insertion it says to adopt all the environmental measures recommended for heel lancing. It also says on page 935 that the efficacy of BF (and other interventions) during multiple pain procedures has not been documented “and cites the Cochrane meta-analysis of Shah PS, Aliwalas LI and Shah V, 2006. PT, FT, Guidelines, Pain, Heel stick, multiple procedures.

Lagro MG & Stekelenburg J. (2006). The Millenium Project of the United Nations, focusing on adequate postpartum care to reduce maternal and neonatal mortality world-wide. Ned Tijdschr Geneeskd 150(20), 1143-1147. (Dutch). Review article. Reduction in maternal and infant mortality by 2/3 is one goal (goal #4) of Millenium Project. Neonatal mortality needs to be reduced by half. KC can reduce morbidity in premature infants. Mothers and infants should be checked closely postbirth during the following periods: the first 6 hours, the first 6 days, the first 6 weeks, and the first 6 months according to World Health Organization. Preterm, review, morbidity, millennium project. Not on charts yet.

min/section/day for 3 consecutive days. Infant HR, infant RR, infant SAO2 were within normal limits and no differences between groups. KMC + music group had more occurrence of Quiet sleep state and less crying. KMC + music resulted in lower maternal anxiety. Maternal state anxiety improved daily, indicating cumulative effect. PT, RCT, Maternal stress, maternal anxiety, cumulative effect, HR, RR, SaO2, behavioral state, crying, Quiet sleep, music + KC (See also Schlez et al., 2011 for live harp music and infant/maternal stress (KC & music only reduced maternal anxiety). Check if on all charts 8/19/2011.


Lamp J, & Zadvinski I. (2009). Hop into evidence-based practice to promote quality care. Kangaroo care in the healthy newborn. Unpublished, but it is a poster at Riverside Methodist Hospital of OhioHealth in Columbus, OH. This is a flow sheet of application of the IOWA model for integrating evidence-based practices into care. The bold prints on the poster says “Hold me, feed me, love me,” “Never separate mom & baby”, “A dyad is not separable,” and “avoid protest despair.” They have a Quick Reference Pocket Card for nurses to use in their pockets and it contains the following: “Definition: skin-to-skin (mother-baby) care, also called Kangaroo Care: Infants are placed belly-down, directly on the mother’s chest. Purpose: To provide parents with an established option of skin-to-skin mother-baby care that supports newborn physiologic balance in transition and extrauterine life. SSC is readily available, accessible to all infants, inexpensive to initiate, and cost effective to continue. Evidence supports SSC beginning at birth for all healthy full term infant and continuing until the first suckling at the breast, and thereafter as much as possible. 2005 AAP Guidelines: ‘Healthy infants should be placed and remain in direct skin-to-skin contact with their mothers immediately after delivery until the first feeding is accomplished.’ World Health Organization (WHO): a powerful, easy-to-use method to promote the health and well-being of infants. Riverside Methodist Hospital Criteria for SSC in Healthy Babies: include all stable babies who can remain with their mothers/quality for well baby care; a mother who desires SSC and is alert.” The Recommended Practices as: Do not separate mother from infant at birth-dry newborn on mother’s chest, then place a warm, dry blanket across the infant’s back. If immediate SSC is not possible, return infant to his mother within 30 minutes, if possible. Continue SSC as much as possible. Guidelines for SSC (Skin to Skin Mother-Baby Care, #6181-R): 1. Explain to mother (and significant others) the value and guidelines for SSC. Encourage SSC for at least one hour per event. 2. Assess both parent and infant for readiness prior to skin-to-skin experience. 3. Dress infant in diaper and hat (hat optional, based on policy and care provider discretion). 4. Offer a reclining chair with arms or adjust the head of bed to 45-60 degree angle. 5. Place infant upright skin-to-skin against the mother’s chest. 6. Cover infant and mother with a blanket, across infant’s back (not over neck and head). 7. All infants must have their temperature monitored after 30 minutes of SSC. 8. If infant’s temperature is >99°F (37.5°C), be sure cap is removed, and only one blanket covers infant. Monitor temperature every 30 minutes until within normal limits. 9. If infant’s temperature is < 97.5°F (36.4°C), place hat on baby, check maternal environmental temperatures, continue SSC, measure temperature every 30 minutes until WNL. 10. Document infant and parent’s responses. Document time of SSC initiation and duration. “The poster is available from Jane Lamp, MS, RN-BC, CNS, Riverside Methodist Hospital 3535 Olentangy River Road, Columbus, OH 43214-3998. Tel: 614-566-3991, pager 614-229-8874 and fax 614-566-6702 and email is jlamp@ohiohealth.com. Her pager may be 842-5932. Or you can get it from Inga M. Zadvinski, MSN, APRN, BC, Research Advanced Practice Nurse, Riverside Methodist Hospitai, same address as above and same phone numbers, but her email is izadvins@ohiohealth.com. FT, VEKC, Birth KC, duration, separation, guidelines, implementation

Lamy Filho F, Silva A.A., Lamy ZC, Gomes MAS, Moreira ME, Grupo de Avaliacao do Metodo Canguru, & Rede Brasileira de Pesquisas Neonatais. (2008). Prospective evaluation of the neonatal outcomes of the kangaroo mother method in Brazil. *Jornal de Pediatria* 84(5), 428-435. Clinical evaluation study of 16 units (8 had 2nd phase KMC [1st phase KMC is KMC upon admission to the NICU, 2nd phase is KMC in a kangaroo care unit, and 3rd phase is outpatient KMC until infant is 2500 grams], 8 did not, 985 newborns with Birthweights 500-1749g). 2nd phase KMC began when infants were >1250 g, full enteral nutrition by NG, breathing room air with no apneas needed oxygen resuscitation or positive pressure for previous 5 days. Length of stay was same between both groups of units (KMC18.8 vs 24.1 for noKMCunits, p=0.067), KMC units had lower 36-wk pma weights (KMC=13.2 kg/d vs 15.3 kg/d); length
(KMC=41.1 vs. 41.8cms noKMC), and head circumference (KMC=30.2 vs 30.7 no KMC), but more exclusive breastfeeding (69.2% vs.23.8%). No differences in ROP, hypothermia, hyperthermia, apnea, infections/sepsis, IVH, BPD, death, nec, readmissions to NICU, no difference in after discharge morbidity or mortality.  **PT, Comparative clinical evaluation, length of stay, weight gain/day, weight, length, head circumference, hypothermia /hyperthermia episodes, apnea, infection, readmissions, ROP, exclusive BF., mortality.**

Landers S. (2003). Maximizing the benefits of human milk feeding for the preterm infant. Pediatric Annals, 32(5), 298-306. This article summarizes current knowledge of short and long term benefits of human milk feedings for preterm infants and challenges in providing adequate nutrition, along with strategies to assist in providing human milk feedings. Infection risk of human milk are related too. On page 303 is a full section on Skin-to-skin holding that even talks about the enteromammary pathway for protection of preterm infants from nosocomial infection. Very positive review of KC. **Preterm, BF, enteromammary pathway, nosocomial infections, Review**

Laptook, A. & Jackson, G.L., (2006). Cold stress and hypoglycemia in the late-preterm (“near term”) infants: Impact on nursery of admission. Seminars in Perinatology, 30(1), 24-27. Doi: 10.1053/j.semperi.2006.01.014. Not a KC article, but clinical article about cold stress in late preterms and it lists KC as an intervention to prevent cold stress and maintaining temperature is a preventive measure to protect against hypoglycemia. (I got this reference from the Munson article in 2012 but I am not sure that it really mentions KC because I am unaware of it in 2012, so I will **GET THIS and CHECK for KC**. **PT, clinical review, temperature, hypoglycemia, late preterm. Not on Charts 3/25/2012**

Lau, C., Hurst, NM, Smith, EO, & Schanler, RJ. (2007). Ethnic/racial diversity, maternal stress, lactation and very low birth weight infants. J Perinatology 27(7), 399-408. Breastfeeding, frequency of milk expression, KC, and lactation performance (maternal drive to express milk and milk production) were evaluated by self-report questionnaire every 2 weeks x 10 weeks after delivery of very low birthweight infants in three groups: African American, Caucasian, and Hispanic. Birthweight, education, and milk expression differed between groups. Trait anxiety, depression, parental stress (PSS: NICU) were similar. African American moms had lowest score in state anxiety; Caucasian had lowest score in social desirability. Birthweight and KC correlated positively with maternal drive to express milk (measured by maintenance of milk expression. Milk volume correlated negatively with depression, and positively with milk expression frequency and KC. Lactation performance can best be enhanced with a multi-faceted intervention program, incorporating parent involvement in infant care, close awareness and management of maternal mental health, and encouragement of frequent milk expression and KC. **Preterm, Descriptive, breastfeeding, maternal stress, depression, maternal anxiety, BF**

Lawn, J. (2011). Kangaroo Mother Care: The Benefits for Your Full Term and Premature Baby. Washington, DC: Save the Children. Available from [www.themiracleofkangarooothercare.com](http://www.themiracleofkangarooothercare.com). This is a 2 page pamphlet sort of thing available from the SAVE THE CHILDREN organization in Washington DC. and it relates how KMC works for a premature baby (KMC will help him grow and develop faster compared to other premature babies who do not receive any KMC. But what is KMC and what’s in it that helps both full term and premature babies? Its like holding a baby in a pouch, but you position the baby on your chest near the middle of your bosoms, Holding your newborn baby in this kangaroo position makes it possible for skin to skin physical contact and breast feeding, the two essential components that make KMC work wonders for your full term or premature baby. Skin to skin physical contact and breastfeeding in KMC is beneficial for your baby as it hastens your baby’s growth and development by 1) Regulating your premature baby’s bodily temperature (With KMC, your own bodily temperature helps keep your baby warm) or will also cool them down. Your temperature adjusts to what your baby needs. Thus your temperature could drop and adjust to those of your baby’s. This is known as thermal synchronicity. With this, his/her condition will stabilize and his/her breathing and heart rate are more regular.2) Promoting the special bond between you and your newborn baby (feelings of safety and security are promoted through KMC, making him/her less stressed and promotes sleep. 3) Giving your baby the right nutrients from your breast milk. Your breast milk has all the right nutrients to meet your newborn’s needs. Your breast milk protect your baby helping them to ward off infections. Breast milk is loaded with nucleotides athat are crucial for your baby’s brain development while colostrums provides antibodies that help boost your baby’s immune system.” (page 2) Because you position your infant between your bosoms, he/she can smell your milk and this triggers an instinctive
feeding and self-latching. Feeding your baby breast milk give his/her the nourishments they need and this hastens weight gain to almost 30 grams per day as compared to preemies cared for in incubators. Remember, KMC is for every baby and every MOM and DAD no matter what your location in the world. Pamphlet, PT, FT. NOT on Charts 7.21.2011. See also pamphlets, Lawn citation.

Lawn J., Kerber, K., Enweronu-Laryea, C., & Batemane O.M. (2009). Newborn survival in low resource settings – are we delivering? British J. of Obstetrics and Gynaecology (BJOG), 116 (Suppl 1), 49-59. This is a big review and on page 54 it states “If possible, these very small babies should receive care in a referral hospital. Kangaroo Mother care involves caring for small particularly preterm babies by having them strapped skin to skin to the mother’s front. KMC is simple, effective, and empowers mothers and can be feasibly introduced in most facilities in low income settings where care for small babies is provided. Extra care of small babies at home care, is skin to skin care and additional support for breastfeeding has great potential but requires more evaluations at scale (meaning big epidemiological studies).” In panel #4 entitled WHAT TO DO TO SAVE NEWBORN LIVES, it says “Immediate opportunities to add or strengthen high impact neonatal interventions within current maternal and child health programs, (for example ensuring tetanus immunization in antenatal care; … And provision of simple immediate newborn care, resuscitation and extra care of small babies (e.g. Kangaroo mother care) linked to childbirth care, and case management of neonatal illness linked to IMCI.” (pg. 58). Review, recommends KMC. Need more research, PT. GET FROM BARB, not on charts as of 10/20/09.

Lawn J. & Kerber K. (2009). Worth a thousand words: Kangaroo Mother Care (KMC). British J.Obstetrics & Gynecology, 116 (Suppl 1), 60. The is a one page treatise on NEOnatal care written by two SAVE THE CHILDREN authors in which they show a picture of preterms, 3 in one incubator, and then another picture of one preterm in KC. There is a whole section on KC, “KC is widely considered to be equivalent to conventional neonatal care for stable preterm babies and is more parent-and baby-friendly in all settings. Mothers in over 100 facilities in South Africa are caring for their small babies using KMC.” Review, PT, KC is good care. NOT on charts AS OF 10/30/09. Get from BARB.

Lawn J., Mwansa-Kambafwile J, Horta BL, Barros FC & Cousens S. (2010). ‘Kangaroo Mother Care’ to prevent neonatal deaths due to preterm birth complications. International J. of Epidemiology 39(Supple 1), 44-54. Meta-analysis after a Cochrane review (conde-agudelo et al., 2003) failed to show that KC reduced mortality. 9 RCTs in 15 studies of mortality. This meta-analysis showing that KMCF substantially reduces mortality among preterm babies of Birthweight <2000 gram in hospital and is highly effective in reducing severe morbidity, particularly from infection. KC remains unavailable in most low income countries. Meta-analysis, KMC not KC, infection, mortality, morbidity.

Lawn, J.E., Mwansa-Kambafwile J., Barros, F.C. Horta, B.L., & Cousins, S. (2011). Author’s response. ‘Kangaroo mother care’ to prevent neonatal deaths due to pre-term birth complications. International Journal of Epidemiology, 40(2), 525-527. Nov, 2. This is Lawn’s reply to Nancy Sloan’s critique of the original article and she says her meta analysis was not an easy and quick one, many people were involved and it stated that it was not a Cochrane meta-analysis. NEED TO GET REST OF IT TO FINISH READING. PT, FT, meta-analysis, morbidity, mortality. Not on Charts.

Lazarov, M. (1994). Barriers and Solutions to the Gobal Ten Steps to Successful Breastfeeding: A Summary of in-depth interviews with hospitals participating in the WHO/UNICEF Baby-Friendly Hospital Initiative Interim Program in the United States. Committee for UNICEF. April 1994. New York: UNICEF. Interviews revealed several barriers to implementing STEP FOUR (Skin contact should begin within 30 minutes of vaginal Birth and within 30 minutes of mom being able to respond in cesarean birth). Barriers were: lack of staff time in general, need to finish newborn procedures, mother may drop the infant, need for episiotomy repair, mother must be cleaned first, need to move the mother from delivery room, delivery room is too cold, and others. Full term, qualitative, guidelines, implementation, barriers, BirthKC, VEKC, BF, cesarean, Baby Friendly

encounter. J Alternative and Complementary Medicine, 14(3), 321-327. NOT a KC article per se. Though intended to deal with “healing touch” of “touch therapists”, the article actually reviews the clinical efficacy of touch (depends on patient’s active receptivity, and touch provider’s attention, compassion, and skill). This paper explores the unique properties of touch as medium of perception, action, and expression that can render touch a healing force within the clinical encounter. Clinical Review of physiology of touch. See Olausson, Feldman and Bystrova 2009 & Uvans-Moberg, Magnusson et al. 2005 for similarly focused content.

Lee, H.C., Martin-Anderson, S. & Dudley, R.A. (2011). Clinician perspectives on barriers to and opportunities for skin-to-skin contact for premature infants in neonatal intensive care units. Breastfeeding Medicine, Oct. 19 epub ahead of print. DOI: 10.1089/btm.2011.0004. This is a qualitative study in which 10 hospitals of the California Perinatal Quality Care Collaborative/California Children’s Services Breastmilk Nutrition Quality Improvement Collaborative met to increase the proportion of very low birth weight infants (<1500g) being fed breastmilk. They taped discussions in meetings of barriers and how to get KC practiced more widely in the NICU so that breastfeeding of preemies and infant nutrition are improved. On page 1 it says “Despite these clinical benefits, KC is not uniformly practiced.” There were 128 NICUs that are in the group, and those 128 represent over 90 of the NICUs in CA. Eleven NICUs participated and all were level III NICUs with five considered Regional NICUS by Calif Children’s Services and 6 were community NICUS. # of NICU beds ranged from 16 to 104 (mean of 47 and median of 53 beds). At the fourth meeting, KC was a “best practice” (p. 2) and key component of the Collaborative’s work. 5 monthly discussions were analyzed by thematic analysis with software. Regarding PROMOTION of KC, ideas were importance of clinical stability, staff education and buy-in, and parental motivation. These ideas yielded 3 themes: 1) Patient Implementation Factors (infants need to be clinically stable for KC but clinical stable definition varied greatly by providers and institutions. Factors determining clinical stability were age, current weight, respiratory distress, blood pressure, temperature, apnea, bradycardia, oxygen desat events. One institution’s definition of stability was <3 apnea/brady events per hour that self-resolve within 15-20 seconds; another institution’s was absence of apnea or brady, but instability was decided by attending physician. Equipment was a barrier too and impacted definition of clinically stable: needing moderate amount of O2 and on high ventilator settings meant less clinically stable. Intubation, catheterization, and devices may limit eligibility. Some policies said ventilated infants not eligible, others routine allow ventilated infants, or with a certain fraction of inspired O2 or setting limits and others were less stringent in their restrictions and allowing high frequency ventilation, transfer is problematic because it needs extra assistance. These NICUs nonetheless (allow ventilated KC –SML’s input, not part of quote) reported success with their approach” (pg. 3), “Similarly the presence of umbilical catheters was a prohibiting factors for KC in some NICUs but not in others. For most NICUs that allowed KC with umbilical catheters there was an exception for those infants with hypotension requiring pressor support.”(pg. 3). Policies for implementation was last part of theme #: “Policies differed in who was authorized to permit KC. Some required an attending physician to sign a specific KC order, whereas others incorporated KC as apart of routine care and required a specific order to avoid KC if patient was unstable. Having policies in place to address eligibility and procedures may benefit NICUs in which KC is not consistently performed.” (p.3) 2) Institutional Level Factors yielded three areas: documentation (many are responsible, but no consistency in reporting and moms may forget to chart that they did KC, and electronic records may not include KC. Literacy and language are issues with parental reporting for reliable documentation. Staff want reliable documentation so they can intervene with moms who need it the most. Staff education related that there is a lack of adequate staff education about the importance of KC and techniques for KC(pg. 3). Turn over, new staff and loss of “champion” of KC may make educating staff more difficult. Staff buy-in, motivation, and interdepartmental communication are barriers (pg.3). Not all staff believe in benefits of KC nor are motivated. A push for KC may be seen as contradictory to existing structures of care, i.e.KC may interrupt clustered care. Communicating changes in standards for quality care was a barrier for these different units. Staff motivation is difficult to sustain over time and lack of manpower was key determinant of this barrier. Staff burnout may negatively impact motivation. Creative strategies to increase motivation were: a. visual presentation of progress (putting graphs up each month of # of patients getting KC, etc), making shared goals, hold meetings, have team slogans, and t-shirts to motivate. Physician support and management support and good leadership at different staff levels may help. “Have request for KC to become routine may make more impact coming from an established, respected colleague rather than from ‘above’”(pg. 4). and 3) Maternal or Familial level factors. Lack of visitation was most frequently cited issue, as is lack of transportation and incarceration and maternal illness. Parking, food costs, sleeping and lack of childcare are barriers too. Another maternal
factor was waning motivation of the mothers – they need periodic reminders of KC’s importance and follow-up by nurses. Asian moms are expected to stay home for a month after birth, so they won’t be visiting. Lack of language competency and understanding should be dealt with by having interpreters. Have physician talk with parents (he has authoritative position) and can increase parental motivation. Some suggested using mirrors so mom can see baby and others suggested paternal KC. Education should be for staff and for Parents (pg. 5). Authors mention the possibility of included KC orders in the standard admission orders, just like they do for sepsis screening. (pg. 5). PT, Qualitative, barriers, implementation, Apnea. Bradycardia, desaturations, ventiled KC, catheters, blood pressure, respiratory distress, policies, documentation, staff education, staff buy-in, staff motivation. See also Mallet et al., 2007; Johnson 2007 for eligibility criteria and also for noting LACK OF EDUCATION. Not on charts 11/12/2011. Author of record is Henry C Lee, M.D. Div. of Neonatology, Dept. Peds, UCSF, LeeHZC@peds.ucsf.edu


Legault, M. & Goulet, C. (1994) My little Amelie, in my arms at last! Infirmiere du Quebec, 2(2): 36-38. Case study of a preterm mom who finally got to hold her little daughter in skin-to-skin contact. PT GET THIS


Lehtonen L, & Martin RJ (2004). Ontogeny of sleep and awake states in relation to breathing in preterm infants. Semin Neonatol 9(3), 229-238. Not an article about KC, but it states on page 335 that “KC has been shown to improve the integrity of sleep” and that more studies of KC and sleep cyclicity are needed. States that although behavioral states are immature during preterm period, their cyclicity is clearly seen with large proportion of indeterminate sleep and small amount of wakefulness. Oxygination is stable during active and quiet sleep in ventilated preterm infants, but indeterminate sleep and arousals are associated with hypoxic episodes. Arousals have also been linked to apnea in spontaneously breathing infants. Well-defined sleep cycles are beneficial to the oxygination of preterm infants, so ways to promote natural sleep are needed. Kangaroo care and optimal positioning have been shown to improve the integrity of sleep. Optimizing sleep cycling might improve long-term outcome of preterm infants. Review. PT, sleep, cycles, arousals, apnea, Not a KC article but explains why less apnea during KC

Leonard A, & Mayers P. (2008). Parents’ lived experience of providing kangaroo care to their preterm infants. Health SA Gesondheid 13(4), 16-28. Qualitative study of interviews with 6 parents (4 mothers, 2 father) who provided KC to their infants in the NICU in Western Cape, South Africa. KC is a phased process, each phase bringing a unique set of experiences. Eight themes emerged: unforeseen, unprepared, and uncertain – the experience of birth anxiety and barriers; an intimate connection; adjustments, roles, responsibilities; measuring success (wgt gain is big measure because all mom can do is hold and feed her baby and they remember exact wgt gain each day); network of encouragement and support – just to susrvice another NICU day and to connect with other parents (not about support for KC specifically); living-in challenges (do 24/7 KC I a room with 7 other mother/infant dyads, and the challenges are back ache (sit at 45°
Leow, J.Y., & Platt, M.P. (2011). Sudden, unexpected and unexplained early neonatal deaths in the North of England. *Archives of Disease in Childhood Fetal Neonatal Edition*, 96(6), F440-F442. doi: 10.1136/adc.2010.206649. THIS ARTICLE MENTIONS SKIN-TO-SKIN DEATHS. Early neonatal sudden death is rare (they studied 828,648 live births) and maternity practices over the last 25 years haven't impacted the incidence of sudden unexpected death which is 1.2 deaths per 10,000 live births for deaths between 6 and 100 hours postbirth, and this study found 30 cases of unexplained sudden infant death (rate is 0.35/10,000 live births). Infants with good condition had APGARS of 7 or more at 5 minutes postbirth. Babies may SHOW NO WARNING SIGNS before being found dead, or they may show BRADYCARDIA, Turning pale, Apneic spells, even while witnessed by their mothers. This study found 30 infants with unexplained sudden infant death. (Pg. F2 of 3) 13 died at home; 17 died in hospital (13 in postpartum ward, 3 in delivery suite, one in NICU). Deaths in hospital were more likely to OCCUR AT EVENINGS AND NIGHT (between 6 pm. And 8 a.m. n=15; 2 infants died from 8 a.m. -6 p.m.) “Eight infants presented dead or collapsed on the breast, all born to PRIMIPS (four were found dead at breast after both mother and child fell ASLEEP after a feed”(pg. F2 of 3). Four of the deaths which occurred in the hospital on the breast occurred in the early hours of the morning. PRIMIPS are over—represented among women whose babies die at the breast, and that deaths occur in EVENING and NIGHT HOURS suggests that both maternal inexperience and reduced professional supervision and support may be factors in a proportion of the deaths (pg. F3 of 3). Others (Gatti, Toker-Mainmon) suggest that acute respiratory obstruction may have caused deaths during skin-to-skin contact with primiparous mothers with infant’s at the breast. Foran reported severe neuronal damage in six infants who suffered collapse on their mother’s breast and suggested that unrecognized asphyxia may have resulted in brainstem or basal ganglia damage which could have impaired coordination of breathing and swallowing.

Enhanced supervision has been recommended but these data (Leow & Platt’s) suggest that across the north of England around 25,000 breastfeeding women would have to receive the extra intrusive supervision, mostly at night, to possibly PREVENT ONE DEATH”(Pg.F3 of 3). When death occurs, encourage postmortem exams to ascertain the cause because three may be implications for future pregnancies, and all families deserve to have an explanation of these particularly distressing deaths if possible.

Early neonatal sudden unexpected unexplained deaths (for which we use the term ENSUD) have not been subject to detailed study. The authors investigated the incidence from 1983 to 2007 in the population of the North East of England and North Cumbria. The authors found 30 cases of unexplained ENSUD, giving an overall rate of 0.35/10,000 live births, with no significant change in incidence over this time, and they identified a further 19 deaths of abandoned babies. The authors conclude that unexplained ENSUD is even more rare than has been appreciated and its incidence has not been altered by the considerable changes in maternity care over the last 25 years.

Lepage, J.F. & Théoret, H. (2007). The mirror neuron system: grasping other’s actions from birth? *Developmental Science*, 10(5), 513-523. Not a KC article per se, but this talks about imitation that is learned at birth and how in the first hours and few days of life having the mother be seen well by the infant helps the infant imitate maternal sound. This information along with the Velandia studies of infants vocalizing more during birth KC than when not in Birth KC suggest that KC activates the mirror neuron system which is functional at birth. This review makes a strong case for early programming of the mirror neuron system and support of a birth sensitive period (something that Bystrova et al. 2009 believes exists in her article about parental interactions). Physiologic review, FT, PT, Birth KC, sensitive period, speech sounds, development. Not on Charts 3/26/2012.
Lepire E. 2000. Kangaroo mothers in Mexico. Infirm Que, 8 (2), Nov-Dec., 42-47 PT


Levin, A. (1999). Humane neonatal care initiative, Acta Paediatrica 88, 353-355. This is an 11 step program to humanize neonatal care. The eleven steps are: 1. The mother should be able to stay with her sick baby for 24 h a day, 2. every staff member should care for mother and infant and should be able to cope with psychological aspects. 3. Staff should promote breastfeeding to every mother and learn the techniques of expressing breast milk. 4. The psychological stress of the mothers should be decreased during the whole treatment period. 5. Unless medically indicated, newborns should not be given anything other than breast milk. 6. If the infant cannot suckle, breast milk should be reduced to a minimum. 7. The number of tests and examinations should be reduced to a minimum. 8. Mother-and-child skin-to-skin and air-to-air contact should be used as much as possible, and the use of technical equipment in childcare should be reduced. 9. Aggressive therapy should be reduced to a minimum.10. The mother and infant should be considered as a closed psychosomatic system. Everyday ward rounds should focus not only on the infant but also on the needs of the mothers (include a gynecologists and other specialists). 11. Healthy family members (father, grandparents, helpers) should be allowed to visit the mother and the baby during a prolonged stay at the hospital.” (pg. 354). He says that the mother is the biological incubator for the infant (p. 354). Review, policy, preterm, guidelines, humane care

Lewis, J.A. (2012). Toward Evidence-Based Practice. Review of Special Report-Part 15: Neonatal Resuscitation: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation, 122, S909-S919. Doi: 10:1542/peds.2010-2972E. This article presents the latest guidelines for neonatal resuscitation. Although fewer than 1% require extensive resuscitation efforts, about 10% of newborns require some assistance at birth to begin breathing. Identify infants who do NOT require resuscitation by assessing three variables: term gestation, spontaneous crying or breathing, and good muscle tone. Infants who do not meet one or more of these criteria may need: provision of warmth, clearing the airway if indicated, drying, stimulation, ventilation, chest compressions, and administration of epinephrine and/or volume expansion. Assess infant during the GOLDEN MINUTE – the first minute of life. Guidelines recommend that at every birth, at least one person be designated as primarily responsible for the newborn, that this person is capable of initiating newborn resuscitation, environment should include person capable of complete resuscitation including intubation. The guidelines states that term infants who have good muscle tone and cry or breath spontaneously should not be separated from the mother, but should be dried and placed in skin-to-skin contact with the mother, with both of them covered with dry linen. These infants may continue to be observed for breathing, activity, and color while in contact with the mother. FT, Guidelines, BIRTH KC, NRP, separation , life threatening events (See Kattwinkel et al., 2010 which is original article, too)

Lima G, Quintero-Romero S, & Cattaneo A (2000). Feasibility, acceptability, and cost of kangaroo mother care in Recife, Brazil. Annals Tropical Paediatrics, 20(1), 22-26. 114 LBWs got 24 hr/7 days a week KMC up to discharge. No hospital deaths, no mod/severe hypothermia but 30 episodes/100 infant days of mild hypothermia (36-36.4) occurred mainly due to maternal separation.(Babies get cold when skin separation occurs), 88% exclusively BF at discharge; daily wgt gain was 15 g during KMC. 87% BF at 1 month; 63% BF at 3 months; KMC cost $20.00/day vs $66/day conventional care. 24/7 KMC, preterm, IMPLEMENTATION, breastfeeding, weight gain, mortality, temperature, skin separation

Mat Child Nurs, 35(6): 316-323. The is a review article about bereavement with end of life newborns. On the cover of the issue is a picture from 2007 of two black parents holding their dying or dead infant almost in KC (mother has a bra on) and the father has his hand across the back of the infant and the mother is wiping away a tear. It says on pg. 318 “Gold recommends encouraging ‘parents to see and hold their infants for extended periods and at multiple settings, and offer parents who initially decline additional chances later “(p. 1162) and says that such contact could result in more intense experiences of grief later. Also on page 318 the following about HOLDING, not KC per se, is related ‘Having parents see and hold their baby before or after death is controversial. Hughes et al cite an association between seeing and holding their baby with negative psychological sequelae during the next pregnancy. Other longitudinal data differ from Hughes et al., 2009 found that mothers of still born babies >37 wks GA who did not hold their babies had an increased risk of headache and sleep disturbance. In another study bereaved mothers who had not spent as much time with their baby after stillbirth as they wished experienced a seven times greater risk of developing depressive symptoms. Cacciarelli et al., 2008 interviewed women pregnant after experiencing a stillbirth and mothers who had not seen or held their stillborn babies showed lower levels of anxiety than their pregnant counterparts. Does not really speak to KC, but has the picture of near KC and does encourage HOLDING and SEEING the baby. Review, FT, PT, end-of-life. Not on CHarts 11/6/2010.


Lindenberg CS, Cabrera-Artola R, & Jimenez V. (1990). The effect of early postpartum mother-infant contact and breastfeeding promotion on the incidence and continuation of breastfeeding. International J Nursing Studies 27 (3), 179-186. 375 urban poor Nicaraguan primip women from 3 hospitals were asked about their infant feeding practices at 1 week and 4 months postpartum. Some mothers got 45 minutes of infant contact (KC?) after birth (WHEN after birth?) and there was a significant relationship between KC and INITIATION of breastfeeding (p <0.05). Says that “infant contact practice may influence early choice to breastfeed, but the practice alone is not enough to prolong breastfeeding” (pg. 179). RCT, Fullterm, BF, BF initiation, 3rd World, VEKC? IS this a KC study?? Not on charts yet

Lindgren, L., Westling, G. Brulin, C, Lehtipalo, S., Andersson, M. & Nyberg, L. (2011). Pleasant human touch is represented in pregenual anterior cingulate cortex. Neuroimage, Nov. 10, 2011 (Epub ahead of print). A descriptive study of adults who were exposed to human touch (skin-to-skin contact) with or without movement and a rubber glove with or without movement. Functional MRI (fMRI) was conducted to determine which touch elicits a specific response in the brain areas coding for pleasant sensations. Force (2.5N) and velocity (1.5cms/sec) were held constant across all four conditions. The pleasantness of the four different stimulation was rates on a visual analog scale and human touch was rates as most pleasant, particularly in combination with movement. fMRI revealed that human touch massage stimulation most strongly activated the pregenual anterior cingulated cortex (pgACC). The pgACC is activated during various rewarding pleasant stimulations (i.e. gambling, drugs, etc). The pgACC area is also known to be activated by both opioid analgesia and placebo. Thus, human touch massage is effective as a treatment in clinical settings to improve well-being, decrease anxiety, stress, and pain. This is the mechanism underlying emotional responses to massage. NOT KC per se, but related. Descriptive, brain mechanisms, anxiety, stress, pain, well-being.

Lindroth M (1990). [the kangaroo method is a good complement to traditional incubator care]. Lakartidningen, 87(6), 368. PT

Lisle-Porter M.D. & Podruchny, A.M. (2009). The dying neonate: Family-centered end-of-life care. Neonatal Network, 28(2), 75-83. This review article of how to help parents whose infant is dying has Table 1 on page 76 entitled “Guidelines for End-of-Life Care of the Neonate” and item IVB4b3 is “kangaroo care holding” as a strategy to keep the family involved. There is no other mention of KC, even in the section on pain relief and the importance of relaxing the
infant. **Review, fullterm and preterm, compassionate KC., end of life, pain**

Liu, D. Diorio, J., Day, J.C., Frantis, D.D. & Meaney, M. (2000). Maternal care, hippocampal synaptogenesis and cognitive development in rats. Nature Neuroscience, 3(8), 799-806. Not a KC study. A direct relationship between maternal behavior and hippocampal development was present; rat pups who had high levels of licking, grooming, and nursing showed increased expression of NMDA receptor subunits and brain-derived neurotrophic factor (BDNF) mRNA for increased cholinergic innervations of the hippocampus and enhanced spatial learning and memory. RAT study, development, brain, maternal care

Long W. (2010). Combining oral 25% dextrose with skin-to-skin contact may provide better pain relief for term newborns. *J Pediatrics* 156(5), 859. This is commentary on Chermont’s 2009 study. **Fullterm, pain, sucrose water. GET THIS AND READ AND PUT ON CHARTS**


Loring, C, Gregory, K, Gargan, B., LeBlanc, V., Lundgren, D., Reilly, J, Stobo, K., Walker, C. & Zaya, C. (2012). Tub bathing improves thermoregulation of the late preterm infant. *JOGNN*, 41(20, 171-179. Doi: 10.1111/j.1552-69096.2011.01332.x NOT A KC STUDY PER SE, only mentions KC as a possible future study. In this study they found that late preterm infants lose less body heat with an immersion tub bath than with a sponge bath (Tub bath went from 98.76 ten mins before bath to 98.32 ten mins after bath and then 98.60 at 30 mins after bath; sponge bath was 98.79 to 98.16 to98.41) nd then on page 178 it says “A future study on bathing the late preterm infant could incorporate measures of maternal/infant interaction during the bathing experience. Another intervention, which is significant for temperature regulation, is skin-to-skin positioning of the infant on the mother. Because skin-to-skin care in term and preterm infant is an accepted method of providing an external heat source, a future study might also examine this practice as a variable for enhancing thermoregulation in late preterm infants following the initial bath.” **Late PT, bathing, temperature,**

Loung (2006) presentation at Cleveland KMC Workshop. **Get and add to bib.** preterm infants who received KC + daily massage during hospitalization had better growth and motor activity at 40 weeks and 6 months corrected age than KC alone. **PT, growth, motor dev.**

Lu, H., Li, H., Ma, S., Xia, L., & Christensson, K. (2011). Perceived family perceptions of breastfeeding and Chinese new mothers’ breastfeeding behaviors. *Sexual and Reproductive Healthcare*. 2(4), 143-147. This is a descriptive study of 200 Chinese mothers who returned a questionnaires about their breastfeeding perceptions and behaviors when their infants were 4 months old. **Inadequate milk supply was the most common reason given for stopping BF, and most had positive family perception and support for BF, all were first time moms with out previous BF experience because of China’s “one family, one child” rule. Moms who breastfed reported stronger family support than mothers who used mixed feedings or artificial feeding. On page146 it says “Although Baby Friendly Hospital Initiative is strongly recommended to hospitals, it is true that actual measures are not conducted probably due to lack of strict supervisions and evaluation, as well as qualified health staff. For example, midwives just told mothers to have skin-to-skin with their babies and breastfeed their babies within one hour of birth rather than strongly encouraging and helping them.” Also the high cesarean rate contributed to delay of breastfeeding initiation. Chind has highest c/s rate in Asia (46.2% because mothers like to choose a “good” day for the birth of the baby - Pg. 146). **Descriptive, not about KC, just referral to Birth KC and BF. NOT ON CHARTS**

Ludington, S.M. (1990). Energy conservation during skin-to-skin contact between preterm infants and their mothers. *Heart and Lung*, 19(5 Pt1), 445-451. Descriptive of 8 healthy, stable preterm infants given one 3 hr session of KC to compare to comparable sessions undisturbed in an incubator (pretest) and after (posttest) KC.. Reports HR
and behavioral state (ABSS) during pretest, test, and posttest periods. Quiet sleep increased, activity level decreased during KC. Longer QS in KC than in incubator. HR increased with increasing activity (increasing level of behavioral state) but stayed within clinically acceptable limits and increase was not statistically significant (148 in pretest to 156 in KC). PT, Descriptive, HR, abdominal temperature. Behav state, quiet sleep, activity.

**RESULTS**


Ludington, SM (2003). Preterm skin contact effects on electrophysiologic sleep. Abstract # 354, pg. 192 of Research ShowCASE, CWRU, April 4, 2003, Cleveland, OH. Randomized controlled trial of 1st 8 subjects, cycling of sleep during KC is evident, but not prior to KC and not for two days before KC.  **RCT, PT, sleep, sleep cycles.**

Ludington, SM. (2003). Father-infant Bonding: Susan Ludington. USA Today. Talk Today. Available from [http://www.usatoday.com/community/chat_03/2003-06-12-ludington.htm](http://www.usatoday.com/community/chat_03/2003-06-12-ludington.htm) Accessed 4/26/2011. This is a report of questions and answers related to fathering and how Kangaroo Care can help. Dr. Ludington relates that any kind of contact between infant and father benefits father-infant attachment, that daddies should hold the infant after maternal breastfeeding so infants get into a good sleep, that daddies have been kangarooing for centuries, babies sleep well on fathers (based on 1992 publication), that babies are reassured by father’s scent and that more information can be obtained from [www.jjpi.com](http://www.jjpi.com).  **MEDIA. Paternal KC, BF, development, sleep.**  **NOT ON CHARTS YET 5/2/2011.**

Ludington, S.M., Ferreira, C. & Swinth, J. (1999). Skin-to-skin contact (SSC) effects on pulmonary function tests in ventilated preterm infants.  **J. Investigative Medicine, 47**(2): 173A. 12 ventilated infants <1000 gm. Temp decreased slightly during KC but stayed WNL. FiO2 requirements tended to decrease and pulmonary function test values remained within clinically acceptable range.  **Vent KC, not an RCT, PT, temp, descriptive or quasi-experimental**

Ludington, S., Irwin S, Swinth J, Becker J, Rao S, & Hadeed A. (1994). Skin contact and breathing in preterms.  **Respiratory Care, 39**(1): 1060. Report of RCT with incubator (3 hrs), KC 3 hrs, and then incubator when we used the nasal thermistor. HR, RR and SaO2 WNL at all times, and SaO2 only WNL during KC.  **PT, RCT, HR, RR, SaO2, apnea, vent KC**


Ludington-Hoe, S.M. (2011). Evidence-based review of physiologic effects of Kangaroo Care. *Current Women’s Health Reviews, 7*(3), 243-253. A comprehensive review of the evidence documenting preterm infant physiologic responses to Kangaroo Care ( intermittent skin-to-skin contact) and Kangaroo Mother Care (24/7 skin-to-skin contact) has been conducted. Kangaroo Care’s effects on preterm infant heart rate, bradycardia, respiratory rate, apnea, oxygen saturation, cerebral oxygenation, supplemental oxygen needs, oxygen consumption, desaturation episodes, temperature, rewarming, blood glucose, serum bilirubin, cholecystokinin, gastrin, somatostatin, weight gain or change, sleep and crying, brain maturation, brain complexity, infection, stress, and pain are reviewed as are KC’s effects with congenital heart defect infants. Documented effects of Kangaroo Care on prevention and...
amelioration of maternal depression, swifter delivery of the placenta and involution, and decreased likelihood of postpartal anemia are presented. Guidelines based on dosage (duration and frequency) of KC are provided, as is a summary of actual and potential benefits of Kangaroo Care, including use at end-of-life with an explanation for the revival from death of a 27 week preterm infant that occurred August 30, 2010. Kangaroo Care’s role in moving to the new paradigms of non-separation of the infant and mother during hospitalization and parents as primary providers of neonatal care rather than health staff concludes the manuscript. Review, PT (has a few refs to full term studies), separation, pain, parents as primary providers, benefits, neonatal abstinence syndrome, congenital heart defects, compassionate care/end of life, micropreemie KC

Ludington-Hoe, S.M. (2011). Thirty years of kangaroo care science and practice. Neonatal Network, 30(5), 357-362. This review article reflects on the evolution of KC, progress made in establishing the evidence base for kangaroo care and how the practice of KC has progressed. Table 1 (pg. 359,360) provides a summary of the effects of KC on preterm and full term infants and their parents and the article concludes with 9 goals for the future which will guarantee optimal KC practice if achieved. The goals are 1) KC begins immediately after birth for healthy infants and as swiftly as possible thereafter for infants needing resuscitation. 2) All neonates experience KC, ideally 24/7 KC or as near to that as possible, 3) Swaddled holding is replaced by KCholding, 4) Infant is in KC for sleep, feedings, periods of alertness, and for procedural pain and recovery from pain experiences, 5) Education content on KC and KC at birth and beyond is in every nursing, obstetric, and pediatric (especially neonatal) text to promote routine KC in the next generation of health care providers, 6) Neonatal, newborn, obstetric orientation programs include routine KC, 7) Routine KC practice is part of the health professional’s performance review, 8) Position statements from professional associations endorse routine use of KC for all infants, and 9) KC continues throughout hospitalization and the first three months post-discharge. Review, FT, PT, pain, benefits, goals. Not on Charts as of 7/21/2011.


Ludington-Hoe, S.M., Anderson, G.C., Swinh, J.Y., Thompson, C., & Hadeed, A.J. (2004). Randomized controlled trial of Kangaroo Care: Cardiorespiratory and thermal effects on healthy preterm infants. Neonatal Network, 23(3), 39-48. 24 healthy preterms 33-35 weeks gestation given 3 hours KC in randomized pretest-test-posttest design. KC (11) vs. control (13) in open air crib. All measures were taken each minute and means remained in normal clinical range showing safety. HR approached tachy and brady in pretest and posttest period, but not in KC. HR rose 8 bpm in KC and was significantly higher in KC than in control. (More stable physiology in KC). RR no sig change. Mean SaO2 dropped 1.0% in KC (significantly dropped). Apnea, brady, and periodic breathing recorded continuously on pneumogram and no apnea/brady occurred during KC. Only one KC infant had one episode of PB during KC and many controls had lots of PB in all periods. Significantly less PB in KC and between groups. More regular breathing in KC during KC period than in control group. Abdominal temp rose significantly (almost 1.0C) in KC and then dropped .05C in postKC. PT, RCT, HR, RR, SaO2, abd.temp, apnea, brady, periodic breathing


Ludington-Hoe, S.M., & Dorsey, S.G. (1998). Meta-analysis of Kangaroo Care Effects. J Investigative Medicine. 46(1): p. 175A. Meta-analysis of pretest-test-posttest studies and randomized controlled trials with pretest-posttest data were included. HR, RR, SaO2 and Temp results showing that temperature increased across all the studies. 161 subjects and 8 randomized controlled trials were included in the meta-analysis. Effect sizes were homogenous (Q = 2.43, p >0.05). Weighted effects sizes for preKC vs KC was 0.11, Confidence interval = 0.01-0.22, and p >0.05. Weighted mean effect size for HR was 0.35 (CI = 0.33-0.38, Q = 4.03, p >0.05), showing that HR increased during KC; RR weighted mean effect size was 0.10 (CI = 0.07-0.13; Q = 0.31, p >0.05) showing a very slight increase, SaO2 weighted mean effect size was 0.21 (CI = 0.19-0.24; Q = 1.60; p >0.05), and skin temperature increased by almost as much as heart rate (weighted mean effect size was -0.13, CI = -0.33—0.28, Q = 7.02, p >0.05). The greatest increase was in temperature followed by heart rate than thenSaO2 and finally by RR. All changes remained within clinically acceptable ranges, and KC had statistically significant effect on all variable. All rose in relation to KC as compared to undisturbed in an incubator. Duration of KC was not considered. Pretest-test-posttest studies were not considered either, had to be randomized controlled trials. PT, meta-analysis, HR, RR, SaO2, SkinTemp.

Ludington-Hoe SM, & Engler A. (1999). Kangaroo Care Congress Report. Neonatal Network, 18(40), 55-56. This is a report of all the meetings at the First US Congress of Kangaroo Care held in October 1998 in Baltimore, WA. A lady who cares for baby kangaroos when their mothers have been killed came to give the dinner speech and there are many similarities between real kangaroos and premature infants who are kangarooed. Dr. Humberto Rey presented the data on infants having transient respiratory distress and cared for in KC for the first six hours post-birth. Dr.Dieter Sontheimer reported the use of KC to prevent intubation in Germany and how the doctors there care for these babies in KC as they make rounds if mothers are not available. PT, review of presentations, respiratory distress, Birth KC for preterms.


Ludington-Hoe, S.M., Hadeed, A.J., & Anderson, G.C. (1991). Physiologic responses to skin-to-skin contact in hospitalized premature infants. Journal of Perinatology, 11(1), 19-24. 12 infants from 34-36 weeks studied. HR increased by 9 bpm (145 in pretest, 155 in KC, 148.9 in posttest), RR did not change significantly, nor did SaO2 from pretest to test. Skin temp went from 36.1 to 36.9 to 36.5 and rectal temps went from 36.6 to 37.2 to 36.7. Skin and rectal temps showed statistically significant increase during KC as compared to pretest and to posttest values but remained within clinicall acceptable limits. Quasi-Exp, Pretest-test-posttest, PT, HR, RR, temperature, oxygenation, SaO2, Apnea. Not an RCT.
Ludington-Hoe, S.M., Hashemi, M.S., Argote, L.A., Medellin, G., & Rey, H. (1992). Selected physiologic measures and behavior during paternal skin contact with Colombian preterm infants. Journal of Developmental Physiology, 18(5), 223-232. Descriptive study of 11 preterms who got 2 hours of PKC immediately after breastfeeding by mom. All three temps continuously rose in PKC and 5/11 subjects became hyperthermic during 2 hours of PKC. Infants predominantly slept in quiet sleep during PKC, and fathers demonstrated good fathering behaviors during PKC. Several fathers got tired of KC after 1.5 hours. Tympanic temp is difficult to take during KC. Warming all the way down to the toe occurred. Behavioral thermoregulation was demonstrated by 4/11 infants.

Descriptive, Preterm, FATHERS, Abdominal temp, toe temp, tympanic temp, fathering behavior, sleep

Ludington-Hoe, S.M., Hosseini, R.B. & Torowicz D.L. (2005). Skin-to-skin contact (Kangaroo Care) analgesia for preterm infant heel stick. AACN Clinical Issues, 16(3) 373-387. 23 preterms about 32 weeks PCA received 3 hrs of KC and heelstick in KC and 3 hours in incubator with heel stick in incubator – all on one day. Heel stick was for dextrostick. HR rose significantly less in KC heelstick than in incubator heelstick. Crying length was significantly less in KC heelstick (5.0 sec vs. 45 seconds) and three infants did not cry at all! 15 minutes of KC baseline state and post-heel stick state showed significantly more time in deep sleep than when in incubator. No differences in RR, oxygen saturation between groups and periods. Experimental cross-over, PT, HR, RR, SaO2, crying time, behavioral state, pain., sleep

Ludington-Hoe SM, Johnson M, Morgan K, Lewis T, Gutman J, Wilson D., & Scher MS. (2006). Neurophysiologic assessment of neonatal sleep organization: preliminary results of a randomized controlled trial of skin contact with preterm infants. Pediatrics, 112, e909-e923. 28 preterms (at32 wks +/- 1 7 days) were tested for sleep in pretest (in hooded incubator, undisturbed, from one feeding to next –2-3 hrs duration) and then in test (for KC group this was in KC at bedside in lounge chair; controls remained in incubator for interferring interval). Sleep, sound, and light measured by EEG. Arousals from Active sleep and quiet sleep were lower in KC over entire study period and during test-pretest matched segments of quiet and active sleep. Rapid eye movements, and indeterminate sleep were lower in SSC and active sleep segments. When high lighting was removed from regression analysis, quiet sleep increased during SSC Sleep patterns during SSC are analogous to more mature sleep organization. RCT, PT, Sleep, arousals, transitions

Ludington-Hoe, S.M., Johnson, M.W., Morgan, K., Lewis, T., Gutman, J., Wilson, D., & Scher, M.S. (2011) Randomized controlled trial of Skin-to-skin contact (Kangaroo Care) effects on infant sleep. Early Human Dev in press. 90 complete data sets of pretest(incubator) and test (KC or in incubator if in control group) EEG/polysomonograhic data of 2-3 hours interfearing intervals of sleep. Sig. Fewer arousals in SSC than incubator and in quiet sleep and active sleep segments in SSC than in controls, and fewer REMS in active sleep in SSC, increase (4.5 beats) HR and increased RR (5 breaths per minute) in SSC than controls. NO diff in quantity of sleep, but in quality. No diff in # of state transitions, % time in indeterminate sleep, active and quiet sleep, SAO2, but respiratory and cardiac stability (sig. Decreased standard deviation) was present in SSC group. All SSC changes were sameas seen in better sleep organization and suggest brain maturation is occurring during SSC. SSC sleep is better than incubator sleep. RCT, PT, Sleep, arousals, HR, RR, SaO2, stability


Infant A (M=176.59+/-.768, R=154-202 based on n=111; Infant B (M=160.82+/-.761; R =143-178 based on n=102).
Maternal-neonatal synchrony exists. Preterm, case study, HR, SaO2, Maternal breast temp, incubator temp, abdominal temp.

Ludington-Hoe, S.M., McDonald, P.E. & Satyshur, R. (2002). Breastfeeding in African-American women. Journal of the National Black Nurses Association, 13(1), 56-64. Review of interventions to improve breastfeeding in African American women and states that Kangaroo Care is one strategy and cites Meier’s work in that AA mothers provide KC every day to breastfeeding preterm infant and she has 98.9% BF rate at discharge of inner city, low-income, AA infants in Chicago. Review, BF, African-Americans, cereal feedings

Ludington-Hoe SM, Morgan K, & Abouelfettoh A. (2008). National evidence-based guidelines for Kangaroo Care with preterm infants ≥ 30 weeks postmenstrual age. Advances in Neonatal Care 8 (3 Suppl): S3-S23. A review article of the evidence of KC on physiologic (cardiovascular – HR, blood pressure, bradycardia–, respiratory -RR, apnea, tachypnea, periodic breathing, desaturation events, SAO2 – temperature –hypo & hyper thermia, rewarming – pain and brain maturation), behavioral (crying, state, breastfeeding), and psychosocial (maternal feelings, maternal-infant interaction, parental attachment, recovery from maternal stress) effects of KC. A sample protocol is included as is a Readiness for Kangaroo Care assessment guide that assesses infant, parent, staff, and institutional readiness for KC. Guidelines for monitoring and documenting the KC sessions are provided. Review, PT, guidelines, protocol, readiness for KC, pain, sleep


Ludington-Hoe, S.M, Nguyen, N, Swinth, J, & Satyshur, R. (2000). Kangaroo Care compared to incubators in maintaining body warmth in preterm infants. Biologic Research for Nursing, 2(1), 60-73. RCT, 16 KC and 13 control infants in a pretest (in incubator)-test (in KC or incubator)-posttest (in incubator) design of three consecutive 3-hour interfeding intervals were given 3 hrs of KC. Abdominal temperatures were not different between periods and groups; toe temp was sig higher during KC than incubator periods; Maternal breast temp met neutural thermal zone within 5 minutes of onset of KC. Similar preterm infants can maintain body warmth with 3 hours of KC. Temperature synchrony appears possible. Preterm, RCT, Abdominal temp, toe temp, breast temps, stability, temp synchrony.

Ludington-Hoe, S.M., & Swinth, J. (2001). Kangaroo mother care during Phototherapy: Effect on bilirubin profile. Neonatal Network, 20 (5), 41-48. Randomized controlled trial of 3 groups of infants with 10 in each group: one with 1 hour of KC per day with biliblanket over back, one with biliblanket and under lights without KC, and one with KC alone. No significant differences in bilirubin reduction over 4 days and no difference in rebound. RCT, PT, Bilirubin


Ludington-Hoe SM, Wagner N, Wright C, & Abouelfetoh A. (in process, 2010). Does KC reduce severity of Neonatal Abstinence Syndrome? Case reports. Available from Susan.ludington@case.edu. One infant who had Finnegan Severity of NAS Score >8 had no change with one hour of KC, but another infant who had Finnegan Scores of 11,12, and 14 prior to KC, had scores drop to 2, 3, or 4, within one hour of onset of KC and the scores stayed in the 2-4 range during 7-11 hours of continuous KC over 3 days. When KC ended, Finnegan scores rose to >10. FT, Case study, NAS. Not on charts as of 5/31/2010.


Lutsch, N. (2009). Basic principles of promoting the development of premature and newborn infants. Kinderkrankenschwester, 28(7), 282-287. Review of developmental care practice in Germany and they say that Kangaroo Care is a basic principle of promoting development, as is non-separation. See also Kinderkrankenschwester, 2009, 28(11), 472-473 for commentary and author’s reply. PT, FT, separation. Not On Charts yet 11/2010.

Lutter CK & Chaparro CM (2009). Neonatal period: linking best nutrition practices at birth to optimize maternal and infant health and survival. Food & Nutrition Bulletin 30(2 Suppl), S215-S224. Review. One purpose was to “examine evidence base for short and long term benefits to the newborn and/or mother from delayed umbilical cord clamping, immediate skin to skin contact, early initiation of BF and neonatal vitamin A supplementation.” (pg. S215). KC at birth is simple, safe, effective and should be implemented in all deliveries, with very few exceptions, and should be integrated with other standard life saving practices such as delayed cord clamping and initiation of breastfeeding within one hour of birth.” Says that Vitamin A supplementation in Asia is still controversial and provides evidence. “dissemination of the evidence base for the practice is necessary and should underlie all clinical practice, medical and nursing school curricula, and public health policy. The knowledge must be accompanied by training and practice in the skills necessary for implementation. Although the skills are not new nor highly technical, training and practice will be needed by many practitioners. Therefore, training materials that address HOW to deliver each practice and WHY each practice is important and answer concerns and questions related to implementation are essential.”(pg. S220) To increase the impact and coverage of the recommended practice, implementation must be coordinated with the efforts of already established global initiatives for improving maternal and neonatal health, like Saving Newborn Lives, Prevention of Postpartum Hemorrhage Initiative, and Partnership for Maternal, Newborn, and Child Health.” Pg. S220). “Ideally the mother and newborn will stay together in the quiet of the delivery room in skin-to-skin contact for at least the first hour after birth. This setting provides the cocoonlike atmosphere that probably best fosters maternal-newborn bonding. It also avoids any disruption during the critical period when the newborn is alert and awake and is most likely to initiate breastfeeding with little or no assistance. The next best option is to initiate skin to skin contact in the delivery room and to cover the mother and infant while they are moved to the general maternity ward. All routine newborn procedures such as bathing, weighing, and clinical examinations should be delayed for at least the first hour.” (S220-S221). “In conclusion, delayed cord clamping, immediate skin-to-skin contact and early initiation of breastfeeding have been shown to be simple, safe, and effective for decreasing neonatal mortality, with benefits for maternal and child health goig well beyond survival.” (Pg. S221). Position Paper, Guideline, Review,Full Term Birth KC, mortality, routine, morbidity.implementation guidelines, TRANSPORT IN KC. See also Chaparro & Lutter articles above.

Lutz K.F., Anderson, L.S., Riesch, S.K., Pridham, K.A., & Becker, P.T. (2009). Furthering the understanding of parent-child relationships: A nursing scholarship review series. Part 2: Grasping the early parenting experience – The insider view. J of Society of Pediatric Nurses, 14(4), 262-283. This is a systematic review of parent’s perspective of early parenting. KC is on page 268 inTable 1 listing Johnson 2007’s article on maternal experience of holding infants in KC in the NICU, and then on page 270 citing Neu’s 2002 about mother’s choice of KC or standard holding of healthy

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preterm infants “Five investigations studied specific aspects of parent infant interaction in the NICU –breastfeeding, and skin-to-skon or kangaroo holding (and she cites Neu, 1999,2004, Johnson 2007). Common themes that emerged included the parent child relationship as a process, vacillating emotions, the NICU as stressful environment, and influences of interpersonal relationships and interaction” (pg. 272) Page 274 it states “Neu (2004) discovered that mothers who switched form KC holding to blanket holding postdischarge experienced more anxiety about hold their fragile infant than those who continued KC holding at home. The main factor that influenced mothers who chose to use the Kangaroo hold both in the hospital and at home was the perceived benefit of close contact with the infant.” On Pgew 281 in the box entitled How do I apply this evidence to nursing practice? it states “Thus, emphasis on providing instruction and guiding regarding routine infant caregiving activities like feeding, bathing, diapering, and Kangaroo Care, as well as providing information about infant growth and development continue to be important nursing interventions for new parents.” PT, systematic review, Maternal feelings, stress, interaction, NOT ON CHARTS YET

Maastrup, R., & Greisen, G. (2010). Extremely preterm infants tolerate skin-to-skin contact during the first weeks of life. Acta Paediatrica, 99(8), 1145-1149. 22 stable extremely preterm infants of mean GA of 25 weeks +4 days, mean postnatal age of 8 days, pma 26 wkws+6 days and were clinically stable, mean actual weight of 702g. Mean duration of KC was 98 min, 16 were kced by mom, five with father, one with older sister. No sig differences in mean skin temp, HR, RR, SaO2 before, during and after KC. While staying in normal range, mean skin temp rose 0.1 C during KC with mom, decreased 0.3 C during paternal KC. Clinically stable, extremely preterm infants can keep adequate skin temp and adequate physiologic stability during KC with parents. PT, prêtest-posttest quasi experimental, paternal KC , surrogate KC, HR, RR, SaO2 and temp, stability NOT ON CHARTS Yet.

MacDonald A. (2005). The pan-European approach to breastfeeding. Maternal & Child Nutrition 1, pp.121-122. This is a report of the goals of the Protection, Promotion and Support of Breastfeeding in Europe: A Blueprint for Action document that was published June 18, 2004. Though KC is not directly mentioned, under the goal of “Protection, promotion and support” it states on age 122 “…commitment to meeting best standard practices in all maternity and child care services; and clearly KC at birth is one of the best practices for initiating BF (See American association statements in bib and European Commission Guidelines in this bib/” FT, PT, BF, guidelines.

Magill-Evans J., Harrison MJ., Rempel G., & Slater L. (2006). Interventions with fathers of young children: systematic literature review. Journal of Advanced Nursing 55(2), 248-264. A meta-analytic review of literature that includes Feldman et al’s. 2002 study (pg. 254 & 258). Authors conclude that though number of intervention studies is limited, if interventions involve active participation of the father with his own child, enhanced interactions with the child will result and fathers will have positive perception of child. More research is needed to determine effect of fathers interactions on child development. Review. PT, FT, Paternal KC, not KC study, just refers to one.

Mahmood, I, Jamal, M, & Khan, N. (2011). Effect of mother-infant early skin-to-skin contact on breastfeeding status: A randomized controlled trial. Journal of the College of Physicians and Surgeons of Pakistan, 21(10),1 601-605. 92 Full term moms got early KC (don’t know when or how much they got because this article is not available in the USA but it sounds like this is at delivery because they measured time til first feed and say early KC at the end of the abstract) and 91 did not. The first breastfeed was 26.25% more successful (as measured by IBFAT) in KC group (58.8% in KC vs. 32.5% in controls, p=0.001) KC mean time to initiate first breastfeed was 61.6 mins shorter than controls (40.62 vs. 101.88 mins, p=0.001). Mean time to achieve effective breastfeeding was 207 minutes earlier in KC group (149.69 vs 357.70). “Level of satisfaction in the mothers of KC group was significantly high as compared to controls (56% vs 6.2%)(abstract) but SML does not know if this means level of satisfaction was higher or % of women reporting satisfaction was higher?). 53.8% of mothers of KC group showed preference for similar care in future and only 5% of control group had preference for similar care in future. IN KC group, 85.3% infants were exclusively breastfed at one month vs. 65.7% of control infants. “Maternal-infant early skin to skin contact significantly enhanced the success of first breastfeed and continuation of breastfeeding til one month of age and it also reduced the time to initiate the first feed and time to effective breastfeeding. FT, RCT, Birth KC, Breastfeeding, initiation, exclusivity, satisfaction with care, maternal desire for same care, BF success, effective breastfeeding, 3rd world, BF duration. Not on charts
Maia, C., Brandao, R., Roncalli, A., & Maranhao, H. (2011). Length of stay in a neonatal intensive care unit and its association with low rates of exclusive breastfeeding in very low birth weight infants. *Journal of Maternal, Fetal, and Neonatal Medicine,* April 7. [Pub ahead of print.](http://www.ncbi.nlm.nih.gov/pubmed/21527275) NO DOI. 119 very low birth weight infants (<1500 g) were watched from July 2005 through August 3006 from birth to first ambulatory visit post-discharge from a unit that used 24/7 KMC and Baby Friendly in Brazil. 88 of the 199 (75%) returned for visit, 22 (25%) were EXCLUSIVELY breastfeeding, and 66 (75%) were weaned. The longer the hospital stay, the lower the birth weight, the more prolonged the enteral feedings, and the longer the postnatal recovery period, the greater the likelihood of being weaned by first postdischarge visit even in the presence of KMC. The length of NICU stay was best predictor of early weaning. PT, Descriptive, Breastfeeding. Not on Charts 5/2/2011. GET THIS WHEN OUT.

Mail Foreign Service (2010, August 27). Miracle Mum brings premature baby son back to life with two hours of loving cuddles after doctors pronounce him dead. Mail Online, 8 pages. Available from [http://www.dailymail.co.uk/health/article-1306283/Miracle-premature-baby-declared-dead-doctor.html](http://www.dailymail.co.uk/health/article-1306283/Miracle-premature-baby-declared-dead-doctor.html). This is the story of Kate Ogg and how she kangarooed her 27 week preterm son who weighed 2 lbs after the doctor told her that Jamie had not made it after 20 minutes of battling to get him to breathe. She kangarooed the baby for two hours and then he started showing signs of life. See also Roos R and Roos N book for the same story in that book and also CNN and NBC reports of this death and restoration. PT, End of life, Compassionate Care. Not on Charts 7/25/2011.

Malik GK, Das V, & Hasan MU. (2004). Some observations on Kangaroo Mother Care in Neonates. Presentation at “Workshops on KMC at Neoncon 2004. XXIV NNF Annual Convention at Chandigarh, 28 October, 2004” Available from [file://E:/KangarooMotherCareInitiative(KMCI).htm](http://file://E:/KangarooMotherCareInitiative(KMCI).htm). Randomized controlled trial of KMC (78 infants with birthweight <2000 gm medically stable) (KC=41 got “continuous KMC every day during hospital stay and at home; incubator care = 37).in two hospitals on low birth weight infant growth (at 40 weeks postmenstrual age KCers had greater mean daily weight gain than controls; at 6 months no differences in weight, head circumference,and body length), health (more episodes of hypothermia, hyperthermia, apnea in controls;at 3 months KCers had more episodes of upper respiratory tract infections; more episodes of serious infections in controls at 40 weeks and 3 months), breastfeeding (more infants exclusively BF at discharge, 3 months), length of hospital stay (KCers had shorted hospital stay than controls), motor-mental development (no differences between groups) at 6 months postconceptual age (3 months corrected age). Higher incidence of breastfeeding and lowe incidence of serious infections are advantages of KMC. Preterm, RCT, 3rd world, weight, temperature, apnea, BF, length of stay, development, home KC, head circumference, length, infections. (Not yet on charts)

Mallet I, Bomy H, Govaert N, Goudal I, Brasme C, Dubois A, Boudringhien, S & Pierrat, V. (2007). Skin to skin contact in neonatal care: knowledge and expectations of health professionals in 2 neonatal intensive care units. *Archives de Pediatrie, 14*(7), 881-886 (FRENCH). A descriptive evaluation of the barriers, knowledge and d expectations of physicians (one questionnaire), nurses (another questionnaire), and auxiliary personnel in 2 level III NICUs (N=69 at Lille; N=31 at Calais) that differed in their level of implementation of KC. 80% of physicians and 71.4% of nurses answered questionnaires. Difficulties with KC were linked to technical and architectural constraints. No diffs between hospitals, 90% considered KC “fully fledged care”, positive effects of KC were not all known, ie. “attachment” was noted by 96% of respondents, but sleep benefits (2%), Breastfeeding (5%), and pain (0%) effects were not known well. Barriers centered on infant safety (Apnea/bradycardia, hypothermia, poor sleep, increased nosocomial infection risk, source of parental stress (pg. 884 in Table 5), majority of health professionals wanted education and wanted parents to be educated too. Medical and nursing staff still do not know enough about KC. Descriptive, implementation, barriers, difficulties, knowledge of staff, A/B, infections, stress, hypothermia, sleep, PT.

Mance MJ. (2008). Keeping infants warm. Challenges of hypothermia. *Advances in Neonatal Care 8*(1): 6-12. The is a clinical review article of the causes of heat loss, normothermia range is 36.5-37.5; hypothermia is <36.5; hyperthermia is >37.5. Contains big section on Routine Care in the Delivery Room (pg. 8-9) and on pg. 9 it states: “Routine thermal care includes…. Paying careful attention to drying the head. Wet linens should be removed quickly,
and the head should be covered with a hat.” In Table 3 on page 9, she has a step 12 in her “Competency checklist for Maintaining Infant’s Temperature in the Delivery Room”. “12. Skin-to-skin care can be initiated once infant and mother have been dried and a hat has been placed on the infant’s head (This can be accomplished on the mother’s abdomen.) Once skin-to-skin care is initiated, a warm blanket should be placed over the infant, cocooning the infant with the mother.” But she never addresses KC in the body of the manuscript, and drying and head cap placement can occur after skin-to-skin has been initiated. Review, FT, Preterm somewhat, temp, hypothermia, Birth KC.


Marchi L. (2004). Kangaroo habitat, a home care experience. Soins Gerontol March-April (46), 27-28. French article and I am not sure it is about infant Kangaroo Care as it is in a gerontology journal. Unavailable to me in the U.S. KC? Gerontology. NEED TO GET THIS


Marin Gabriel, M., Llana Martin, I., Lopez Escobar, A., Fernandez Villalba, E., Romero Blanco, I., & Touza Pol, P. (2009). Randomized controlled trial of early skin-to-skin contact: Effects on the mother and the newborn. Acta Paediatrica, 99, 1630-1634. Randomized controlled trial of pediatricians (6 did Birth KC, 7 did not do Birth KC) with 137 patients (in Birth KC group = 137 and patients in NO BIRTH KC group = 137) at hospital in Spain. Mothers were 35-42 wks gestation, no fetal distress, no cesareans, no resuscitation, no meconium in amniotic fluid and no respiratory problems. In SSC group cord was clamped 10-15 sec after birth, infant put on mom’s abdomen, dried, put diaper and cap on, then moved to be held upright between maternal breasts, covered with warm blanket. Infant ID conducted during KC and KC continued uninterrupted for 2 hours. Then baby separated from mother for routine care (weighing, eye, hepatitis B vaccine, Vitamin K shots) Babies then dressed and given to mother. Same routine for control group, but babies were immediately placed on radiant warmer receiving unit for 2 hours and had been wrapped by 10 minute post birth. Axillary temp taken at 1 min, 5 mins, and 2 hours old (hypothermia was temp <36; recovery from hypothermia was when temp was >36 which occurred in SSC at 5 minutes postbirth). Placental delivery was totally expelled placenta, Visual analog scale for pain was completed while suturing episiotomy (women without episiotomy and who had perineal lacerations were excluded. 95% of moms had epidural anesthesia. Hospital Anxiety and Depression Scale (HADS) was assessed at hospital discharge – it is 4 point likert scale of 7 items for maternal anxiety and 7 items for maternal depression. IF score was 7 or less, there was not a problem, problem was doubtful if score was 8-10, it was a problem if ≥11. Follow-up calls at one month to determine duration of BF and exclusivity (infant only breastfed) of BF. Partial BF was infant got BF at least once a day. Infant birthweight was lower in KC group. More thermal stability during KC (temp rose a Mean of 0.07 degreesC in KC; -0.22 degree drop in controls. Mean temp at one minute was 36.6 KC and 36.9 in controls. No temp differences at 5 mintes nor at 2 hours of life. 30 KC infants and 11 control infants had hypothermia at 1 minute of life. 80% of KCers and 54.5% of controls had recovered by 5 minutes, KC moms exclusively breastfed more frequently at discharge but no diffs at one month. 5 KC infants and 12 control infants were admitted to NICU in first two hours of life. Placental expulsion was shorter in KC group (408.7 sec) than in controls (475.2 seconds), but no difference in episiotomy pain (KC= 1.4 vs. 13 controls). No differences in mean anxiety score (KC= 4.7; controls = 5.2) and no differences in depression (2.1 KC vs. 2.4 controls) FT quasi-experiment (docs were randomized, not subjects), Temp, Exclusive BF, episiotomy pain, placenta expulsion. VEKC Birth KC. hypothermia, REWARMING, maternal anxiety, maternal depression. (NOT On CHARTS 2/1/7/2011).

mothers) of 137 KC subjects (got KC within 1 minute of birth and continued for 2 hours) vs. 137 controls (no KC at all, under warmer for 10 minutes postbirth then given, wrapped and swaddled to mom to hold for rest of 2 first two hours postbirth – all newborn care and identification done after first two hours of birth and cords were clamped 10-15 seconds after birth of infants, and 95% of mothers had epidural) in SPAIN that is based on oxytocin effects induced by KC. to determine if KC improved recovery from hypothermia, increased BF at discharge and one month post discharge, determine KC effects on # of infants admitted to NICU, reduces pain during suturing episiotomy by 10 cm visual analog scale and decreases placental expulsion time, and effect of KC on maternal anxiety and depression using the Hospital Anxiety and Depression Scale (HADS) likert scale not published before (and scale is not included here). Infants were 35-42 weeks GA and smaller birth weight in KC group than controls. Hypothermia defined as axillary digital temp <36C and temps were taken at 1 min, 5, minutes and 60 minutes post birth. End of hypothermia defined as axillary temp ≥ 36C. 30 KCers (21.8%) and 11 control infants (8%) had hypothermia at one minute and 80% of KCers had recovered from hypothermia by 5 minutes and 54.5% of controls had recovered by 5 minutes but not statistically sig difference. # of women BF at discharge and at 1 month post birth revealed that mothers in KC group EXCLUSIVELY BF more frequently at discharge than controls; no differences at one month of life. 5 KC(3.6%) and 12 control infants (8.8%) were admitted to NICU but not statistically significant difference. KCer expelled placenta in 408.7 sec vs 475.2 seconds in controls (Sig diff). VAS score of episiotomy pain was 1.4 (SD=2.6) in KC and 1.3 (SD =1.8) in controls (Not stat different). KC maternal mean anxiety score was 4.7 SD=2.88; control score was 5.2 SD=3.3 in controls; maternal depression in KC was 2.1 SD=2.2 and in controls was 2.2 SD= 2.4). Neither anxiety nor depression were statistically different between groups. I believe that epidural made the episiotomy pain low to begin with and Law of Initial Values created in part the lack of significant difference. Also axillary temps within one minute of birth are usually inaccurate because the axilla is still wet, which makes me question the number of KC infants who were hypothermic at one minute. Also, randomizing the obstetricians is NOT a randomized trial which means that the subjects providing data are randomized into groups so that there is balance and equivalence between the groups – thus they got significant difference in birth weight between the groups and lower birth weight contributes to lower body temp. I believe the randomization procedure is a fatal flaw and that this should be regarded as a quasi-experimental study at best. Not an RCT, Late Preterm, Full Term, Birth KC, Temp, hypothermia, BF, episiotomy pain, placental delivery time, oxytocin,maternal anxiety, maternal depression, NICU admissions


Martin, J B, Ludington-Hoe SM (2010). Effect of KC on Cerebral Oxygenation. Presentation at 8th Biannual Meeting of the International Network of Kangaroo Mother Care, Quebec, CANADA. See the citation below. It is the same study, same results.

Martin, J.B., & Ludington-Hoe, S.M. (2010). Near infrared spectroscopy measure of brain activation in premature infants in an incubator and during kangaroo care. Advances in Neonatal Care, 19(4), 214-215. Randomized cross over trial of 10 preemies (5 male, 5female) with Mean birth weight of 1487.5 g (R=1076-2218g); mean GA of 30weeks +4 days (R=27wk+5days-33wks+1day), mean entry weight of 1764.9g (R=1380-2341g), and mean postconceptional age at entry of 33 wk+4days (R=31wk+1day – 34 wk+6 days) participated when no oxygen support needed. After vital signs and feeding, Near infrared spectroscopy sensor (Somanetics, Inc. Troy, MI) placed on left forehead and pulseox on left foot. Sequence A was KC for first 90 minutes of data recording then left (data not recorded) until the next feeding and after that then prone in incubator for next 90 minutes of data recording; Sequence B was incubator for first 90 minutes after feeding with data recording, then left in incubator til next VS and feeding and then in KC for 90 minutes of data recording, but left in KC after that until next vital signs and feeding. This was noisy, busy multibed unit and infants were separated only by curtain. During KC periods, Respiratory Rate, regional cerebral oxygenation (rSO2), and % time in quiet sleep decreased in comparison to incubator time. % of time in agitated state increased as did the number of loud noises (overhead paging and alerts, telephone, loud talking) were present. No changes between periods (incubator vs KC) nor difference s between sequence groups occurred in HR, saO2. There were no residual or cross-over effects of KC on rSO2 and rSO2 remained within clinically acceptable range at all times.
Lower regional cerebral oxygenation indicates a calming brain deactivation effect, even in the presence of behavioral agitation that was most likely due to extreme environmental noise frequency. When KC ended, the increase in rSO2 indicated an increase in sympathetic control of cerebral hemodynamics. PT, Randomized Cross Over Trial, HR, RR, saO2, rSO2, environment, behavioral state, sympathetic control.

Martinez JC. (1991). El contacto madre-hijo prematuro piel a piel un apote a la moderna asistencia neonatal. Arch Argent Paediatr, 89: 142-147. PT Also as follows:

Martinez, JC. (1991). Skin-to-skin contact between preterm babies and their mothers. A contribution to the modern neonatal assistance. Argentine Pediatric Archives, 89: 142-147. Safety and effectiveness of KC with continuing-care preterm infants was established in this manuscript and led Dr. Martinez and his team of neonatologists to practice KC since 1991. PT, HR, RR, SaO2, and maybe other outcomes. I cannot get this article, if anyone else can, please send it to me at S. Ludington 3850 Ellendale Road, Moreland Hills, OH 44022, USA.

Martinez, JC. (2007). Skin-to-skin contact: a paramount contribution in the modern neonatal paradigm. NeoReviews 8(2), e55-e56 [NeoReviews is a newsletter of the American Academy of Pediatrics]. This is an excellent, succinct review of the benefits of KC to preterm and full term infants and encourages all pediatricians to use KC because KC is “real progress in modern neonatal assistance.” “It is of paramount significance to understand clearly the substantial difference between an excellent innovation and real progress in modern neonatal assistance. Real progress is built on those interventions (actions) that can be implemented worldwide and whose tested beneficial effects are long-lasting or better, last forever. One such advance has been the discovery of the oldest beneficial stimulation for humans: the somatosensory stimulation produced by the special and deep contact between infants and mothers, represented by skin-to-skin contact. The kangaroo care technique involves…” (pg. e55). Martinez reports encountering a mother who had participated in KC at his hospital with her mechanically ventilated infant who died a few days later. The mother told him, “I will never forget that moment (KC). I will never forget that moment (KC). I feel that at least I could do something good for him. I know that both of us will always remember, wherever he is now.” (pg. e56). Preterm, fullterm, review. End-of-life.


Massachusetts Breastfeeding Coalition & Stuebe A. (2005). It’s my birthday, give me a hug! Skin-to-skin contact for you and your baby. Available from Massachusetts Breastfeeding Coalition, 254 Conant Road, Weston, MA 02493 or from their website 222.massbfc.org. This relates what skin-to-skin contact, breastfeeding, and how KC helps breastfeeding, smoothing the transition to extraterine life, bonding, and care beyond the delivery room, FT.

Maternal & Newborn Health/Safe Motherhood Unit. (1997). Thermal Protection of the Newborn: A Practical Guide. WHO: Geneva, pp. 30-37. This shows developing nations how to keep babies warm in KC. This is a nice follow-up to the SAREC report from Sweden. Available from Maternal and Newborn Health/Safe Motherhood Unit. Reproductive Health (Technical support), WHO, 1211 Geneva 27, Switzerland. Temp, guidelines, essential care, FT< PT.

Matos, T.A., Souza, M.S., Santos, E.K., Selbert, E.R. & Martins, N.M. (2010). Precocious skin-to-skin contact between mother and child: meanings to mother and contributions to nursing. Revista Brasileira de Enfermagem, 63(6), 998-1004. NO DOI. Nine mothers were observed and interviewed. Four themes were identified: predelivery orientation surrounding preterm infant skin to skin contact with mother, establishing preterm infant-mother skin to skin contact, meanings of perter skin to skin contact, and nursing contributions to establishing KC with preterm infants. Meanings attributed to KC were positive, and nursing’s contribution to establishing KC is significant. PT, Qualitative phenomenology study, maternal feelings. Implementation, staff support. Not on Charts 2.17.2011.
Blood glucose, crying episodes/duration, Birth KC/VEKC impaired. KC is protection against hypothermia and hypoglycemia. KC(60 mg/dl), grp 2=52, grp 3= 49.6 mg/dl. In Grp 2 27% did not get warmer over the 75 min and metabolism was and less than grp 2. KC group had op

Grp 3(n=22) in

til end of experiment; grp 2 (n= 22) infant wrapped in blanket and given to mom, no skin to skin, covered with a sheet,

Full

of immediate newborn care on infant adaptation to the environment.

Factors associated with exclusive breastfeeding. Determinants of newborn feeding in maternity hospital care. Part II. Factors associated with exclusive breastfeeding. Ginekologia Polska 71(7), 604-610. KC in first 2 hrs postbirth is an independent predictor (a factor) of exclusive Bf in fullterms at discharge. Descriptive, Fullterms, BF, Birth KC/VEKC, Exclusive BF

Mazurek T., Mikiel-Kostyra K., Mazur J, Wieczorek P, Radwanska B, & Pachuta-Wegier L. (1999). Influence of immediate newborn care on infant adaptation to the environment. Med Wieku Rozwoj, 3(2), 215-224. Three randomized groups n=22in each group) (KC, swaddled newborns beside the mother, swaddled and separated from the mother) of FULLTERM newborns observed for 75 min after birth. Skin Tem, bl.glucose, HR, RR, crying differences all favored KC group. PH not sig. Diff between groups. For all but two unseparated newborns (KC or lying besides) temp was increasing during the 75 minutes, in separated group temp was unstable and not growing in 6 (27%) of infants. Bl glucose highest in KC (60.1mg/dl),lower in swaddled lying beside (52.5) and lowest in separated (49.6). Crying was shortest in KC, and 3 times longer in separated group. Episdoes of crying were 7,17, and 38 in KC, lying beside, separated groups respectively. KC is optimal for newborn adaptation and a protection against hypothermia and hypoglycemia. RCT, FULLTERM, Temp, HR, RR, crying, blood glucose See next citation for same study but more information.

Mazurek,T, Mikiel-Kostyra K., Mazur J, Wieczorek P, Radwanska B, & Pachuta-Wegier L. (1999). Influence of immediate newborn care on infant adaptation to the environment. Medycyna Wieku Rozwojowego, 3(2), 215-224. Full terms randomly assigned to grp 1 (n=22) put in mom’s arms skin-to-skin and both covered with sheet & stayed here til end of experiment; grp 2 (n= 22) infant wrapped in blanket and given to mom, no skin to skin, covered with a sheet, grp 3(n=22) infant wrapped and kept separate from mom at a distance in same room. Observed for 75 min. Study began 6-8 min after birth. Skin thigh temp, HR, RR, and glucose level best in KC group. KC grp cried 3 times less than gp 3 and less than grp 2. KC group had optimal adaptation and special protection against hypothermia. Glucose highest in KC(60 mg/dl), grp 2=52, grp 3= 49.6 mg/dl. In Grp 2 27% did not get warmer over the 75 min and metabolism was impaired. KC is protection against hypothermia and hypoglycemia. RCT, FULLTERM, temp, thigh, HR. RR, pH, Blood glucose, crying episodes/duration, Birth KC/VEKC
Mazurier E, & Picaud JC. (2005). Kangaroo mother care vs niccap: a problem of semantics. Arch Pediatr 12(4), 471-472. This article is an author reply. Confusion exists in France about the terms “kangaroo method”, “kangaroo care”, and “skin-to-skin”. Kangaroo method must be differentiated from skin-to-skin care use in neonatology units. The “kangaroo method” was developed in Bogota and means preterm born in hospital, preterms ≤2000 grams birth weight, when infant is able to breathe on his own, has a good suck/swallow reflex, and does not need feeding tube, the infant gets Kangaroo method of care, which further meant placement against the breasts 24 hours/day until baby becomes uncomfortable at which time it should be discontinued permanently (based on Charpak et al., 1996 report). In technical units, kangaroo method has changed. Skin time varies according to infant’s capacity and parent’s presence (author says this does not resemble any part of the kangaroo method (p.471). States that Dzukou’s review confirmed that practice of skin-to-skin does not cause physiologic instability in premature or low birth weight infants and does promote maternal-infant bonding. Also, he goes on to say that the Brest article (see Sizun et al., 1999) is based on one case study with very precise measurements. Still, Kangaroo care cannot replace or be compared to individualized neonatal care (theNIDCAP program) (pg. 472). The five categories of Kangaroo care according to starting time are listed and then the state of kangaroo care in France is discussed: It is called “Kangaroo Unit” in France, means geographic closeness of mother and baby once infant is spontaneously breathing. France needs a complete definition of Kangaroo care that includes criteria, length of KC, cost, transport in KC, level of center to do it, in which unit: nicu or maternity. Authors also call for research to define developmental care in the prevention of DEVASTATING CONSEQUENCES of early separation, but an RCT may not be ethically possible. So, Dzukou’s analysis should not prevent the practice of KC, called “kangaroo unit.” (FRENCH). PT, Commentary and Ideas, Developmental care.

McAllister, H.M., Bradshaw, S., &n Ross-Adjie, G. (2009). A study of in•hospital midwifery practices that affect breastfeeding outcomes. Breastfeeding Review, 17(3), 11-15. Has picture of KC on first page of article. This is regresional analysis of strategies to improve breastfeeding, and of course skin-t-skin contact within one hour of birth was considered as one of the four independent variables that might relate to breastfeeding duration. Of women who gave a first feeding within 60 minutes of birth, 73% had KC within first hour post-birth. The two variables that significantly related to BF duration (increased length of bf) were whether a mom could independently attach the baby on discharge and whether or not artificial milk was administered in the hospital. Skin to skin contact was not found to influence the length of BF. FT, KCBIB FT, Regression analysis, BF, KC, duration of BF. NOT ON CHARTS

McCain G, Ludington-Hoe SM, Swinth, JY, & Hadeed AJ. (2005). Kangaroo Care effects on heart rate variability: A case study. J Obstet Gynecol Neonatal Nurs. 34(6), 689-694. One subject pretest (incubator), test (KC) and posttest (incubator) 1.5 hours incubator time was compared to 1.5 hours in KC in a 35 week preterm infant. Heart Rate Variability was measured by ANSAR 1000. Low frequency, high frequency, and Low/high frequency ratio were calculated. Much more data was available during KC than in incubator because of infant quiescence during KC; sympathetic control remained high during KC even though it decreased and LF/HF ratio revealed that parasympathetic control increased during KC. Decrease of LF and HF during KC. (Contradicts Smith who found increase of LF during KC)and Begum et al. 2009 who found increase in LF during KC and the LF of regional oxygenation was decreased during KC). Preterm Case Study, HRV, HR, behavioral state

McCall EM, Alderice FM, Halliday HL, Jenkins JG, & Vohra S. (2005, 2007). Interventions to prevent hypothermia at birth in preterm and/or low birth weight babies. Cochrane Database of Systematic Reviews a 2005, issue 1. Art. No.:CD004210.DOI: 10.1002/14651858.CD004210.pub3. Retrieved March 20, 2006 from www.nichd.nih.gov/cochrane/mecall.htm. Also published in 2007 in Cochrane Database of Systematic Reviews 2007, Issue 1.Meta-analysis of six studies with 304 infants (295 completed data collection) of interventions designed to prevent hypothermia in preterm and/or low birth weight infants when applied within 10 minutes after birth in the delivery suite compared to routine thermal care. Two types of interventions were reviewed: 1. barriers to heat loss (4 studies, plastic wrap, bag, stockinet caps) and 2. external heat sources (KC was one study; transwarmer mattress was one study). Skin-to-skin contact was effective in reducing the risk of hypothermia in preterm/LBW infants when compared to conventional incubator care for infants 1200-2199 gram birthweight. “Consideration should be given to using these interventions in the delivery suite.”(2007, pg. 2) PT, Meta-analysis, temperature, hypothermia, Birth KC
McCall EM, Alderice FM, Halliday HL, Jenkins JG, & Vohra S. (2008). Interventions to prevent hypothermia at birth in preterm and or low birth weight babies. Cochrane Database of Systematic Reviews (1). Art. no. CD004210. This meta-analysis concludes that skin-to-skin contact keeps infants warmer than routine measures (warmers, plastic shielding, wrapping and swaddling) to prevent hypothermia. GET THIS. PT, temp, hypothermia

McClellan MS, & Cabianca WA. (1980). Effects of early mother-infant contact following cesarean birth. OB GYN, 56(1), 52-55. 40 C/S dyads in early contact (n= 20) or brief contact control (n=20). observed. Early contact infant taken to examine outside delivery room and care given, then returned to mom for visual contact for 5-15 min. After C/S complete, in recovery room KC (covered with light blanket) began and continued for 60 min in recovery room. Then spent 4-5 hrs in recovery, alternating KC and visual contact when baby was in warmer next to bed. Brief contact group infant put in warmer, cared for, then presented to mom for <5 mins for visual contact only then no contact during 6 hr recovery period. Maternal Perception of infant, maternal behaviors, and postnatal research inventory taken once on either 1st or 2nd PP day and then once between 28-32 days of age at home visit. Maternal perception in hospital was significantly higher for KC than controls, and higher maternal behavior scores in hospital and at home. RCT, Fullterm. Mat. Perception/behavior, Early KC (in birth recovery room), cesarean section

McDermott, K. (2003). Kangaroo care: It’s not just for marsupials.Available from www.cwru.edu/menu/research/kangaroo.htm. Report of Gene Anderson’s experimental study with preterm infants with KC beginning soon after birth. Tells of the McN case study of KC beginning 4.5 hrs postbirth, saying the premise is that mothers can stabilize their infants. Says crying occurs twice as often in separated fullterm infants and fullterms have pathologic levels of salivary cortisol. Daddy says he still feels baby on his chest even when not holding him. Mom reports less anxiety when attending to other things while daddy was kangarooing. Parents learn how to do KC quickly. Review, PT,FT, VEKC, paternalKC, mat. Anxiety, cortisol, crying, learning to do KC

McGrath JM. (2006). Family presence during procedures: breathing life into policy and everyday practices. Newborn and Infant Nursing Reviews 6(4), 243-244. Review editorial not about KC per se, but says that parents want to be there and be involved even during heelsticks (pg. 243) and on page 244 she has guidelines and #3 states that “parents can be encouraged to speak to their infant, touch, comfort, and soothe them while also facilitating the procedure by holding the child in the appropriate position for the successful completion of the procedure.”(pg. 244.) PT, FT, pain, review. NOT A KC STUDY BUT A RECOMMENDATION FOR KC during pain procedures. Not on charts yet

McGrath JM, & Brock, N. (2002). Efficacy and Utilization of Skin-to-Skin Care in the NICU. Newborn & Infant Nursing Reviews, 5(1), 17-26. Finally, we have an updated review since 1996. This reviews the research studies in chart form and comes to conclusions that are not surprises but are succinctly presented for those who have not kept up with the literature. Nurses do not use the evidence, i.e. they do not use KC to reduce pain. Review, BF, pain, Implementation, PT

McInnes RJ & Chambers J. (2008). Infants admitted to neonatal units- interventions to improve breastfeeding outcomes: a systematic review 1990-2007. Maternal Child Nutrition 4(4), 235-263. 86 papers were reviewed and 27 met review criteria. Studies employed a range of methods and targeted different aspects of breastfeeding in the neonatal unit. There was no clear message of what works best, but “skin to skin contact and additional postnatal support seemed to offer greater advantage for the infant in terms of breastfeeding outcome.”(pg. 235). PT, breastfeeding, meta-analysis. NOT on Charts Yet.


McQueen, K.A., Murphy-Oikonen, J., Gerlach, K., & Montelpare, W. (2011). The impact of infant feeding method on neonatal abstinence scores of methadone-exposed infants. Advances in Neonatal Care, 11(4), 282-290. DOI: 10.1097/ANC.0b013e318225a30c This is NOT A KC STUDY PER SE. It is about how breastfed infants have lower NAS scores than formula fed infants implying that some of the opiate to which the mother has been exposed and/or treated is getting through the breast milk and calms the infant. Says hospital stay of these babies is very long too and negatively impacts mothering and shortening hospital stay is of critical importance not only for reduced costs but to increase opportunity for bonding and breastfeeding as mothers provide care in a natural environment (page 287-288). Moms like to experience empowerment in their ability to comfort and soothe their infants. On page 288 it says “In the absence of specific guidelines (regarding interventions to support breastfeeding mothers with infants experiencing NAS) evidence-based strategies from the general breastfeeding literature should be integrated whenever possible, including the Breastfeeding Best Practice Guideline, Baby Friendly Hospital Initiative 10 Steps, and systematic reviews of effective breastfeeding interventions. Examples of evidence-based strategies to promote breastfeeding success include, but are not limited to, early initiation of breastfeeding (<1 hour after delivery), skin-to-skin contact, practice rooming-in with unrestricted (on-demand) feeding, and provision of additional support by professionals and/or peers.” FT, PT, substance abusing, BF (NOT ON CHARTS YET)


Meek, J., & Huertas, A. (2012). Cochrane review: non-nutritive sucking, kangaroo care and swaddling/facilitated tucking are observed to reduce procedural pain in infants and young children. Evidence Based Nursing, Epub ahead of print, March 12, 2012 pg. 1 of 2). In this Cochrane review 3396 participants were analyzed from 30 randomized controlled trials and 30 crossover trials with 91 treatment arms. Kangaroo care was effective for preterm infants for reactivity and immediate regulation. These authors do not believe that handling is really noxious and handling was a noxious treatment in Riddell’s Cochrane review and these authors say handling studies are stressful, they are not strictly noxious and there is difficulty differentiating between STRESS and PAIN (pg. 1). There is new evidence that noxious stimuli can elicit generalized intense delta brush activity rather than localised cortical responses (Fabrizi, L, Slater R, Wurley A. et al., A shift in sensory processing that enables the developing human br

Not on Charts Yet.
Meier PP. (2001). Breastfeeding in the special care nursery: Prematures and infants with medical problems. Pediatric Clinics North American, 49(2), 425-443. This is a summary of the BF program at Rush that starts KC as soon as infants are extubated and allows them to have Nonnutritive sucking at breast as early as 24-25 weeks postconceptional age. Shows picture of 900 gm and 25 weeker on CPAP in KC at breast. 90% of infants <1500 gms are BF at discharge in this program. **Breastfeeding, Preterm, clinical article, CPAP**

Meier PP (2003). Supporting lactation in mothers with very low birth weight infants. Pediatric Annals, 32 (5), 317-325. Reviews the Rush Mother’s Milk Club Program elements, all strategies to improve BF, including Pictures of KC on page 317, pg. 321, and a section on bottom left column page 320 says “Mothers and fathers are encouraged to hold even the smallest ventilated infants in KC to minimize apnea, bradycardia, and hypoxemia that can accompany bolus gavage feedings” (pg. 320). Shows on page 320 the “My Mom Pumps For Me” recording form for recording KC sessions. **Preterm, Breastfeeding, Ventilated KC, apnea, bradycardia, SaO2**


Meier PP, Engstrom JL, Mingoletti SS, Miracle DJ, & Kiesling S. (2004). The Rush Mother’s Milk club: Breastfeeding interventions for mothers with very-low-birth-weight infants. JObstet Gynecol Neonatal Nurs, 33 (5), 164-174. Daily KC is an integral part of the Rush Mother’s Milk Club program. They reviewed 207 VLBW records from 1997-1998. Lactation initiation is 72.9%, mean dose of own mother’s milk at 15,30, & 60 days was 81.7%, 80.1%, and 66.1% respectively, of total volume fed. 57.2% of hospital days infants were exclusively breastfed and 72.5% of hospital days infants received some of their own mother’s milk. The outcomes of low income African American women are the highest in the literature and these outcomes approach national health objective. **PT, BF, lactation initiation rate, % feeds of mothers’ own milk.**


Mellien AC (2001). Incubators vs. mother’s arms: Body temperature conservation in very low birth weight premature infants. Journal of Obstetric, Gynecological and Neonatal Nursing, 30(2), 157-164. **THIS IS NOT A KANGAROO CARE STUDY EVEN THOUGH NIRMALA ET AL HAVE CITED IT AS ONE.,** Clearly the infants were dressed in t shirt, stockinette cap and wrapped in two blankets and figure 1 shows them fully dressed in mother ‘s arms. But it shows that VLBW premature infants can maintain stable temp while in their mothers’ arm. **PT, Swaddled holding. NOT KC. Not on charts yet.**

Mendes EW, & Procianoy RS,. (2008). Massage therapy reduces hospital stay and occurrence of late-onset sepsis in very preterm neonates. Journal of Perinatology, 28, 815-820. 104 newborns of GA<32 weeks & birth weight < 1500 gms randomly selected for massage or control, 52 in each group. KC was routine care for all babies. Treatment babies got 15 minutes of massage 4 times a day during a 6-hour period each day. Massage was massage of face and limbs plus passive exercises of upper and lower limbs.. Infant was able to be discharged when able to maintain body temperature while dressed and take oral feedings without suction difficulties. Growth, feeding behavior, and late-onset (72hrs postbirth or more) sepsis (harmful bacteria and toxins in tissue). Infants in KC + massage left hospital seven days sooner than KC alone infants; controls had higher incidence of infection. Thus, massage increased probability of hospital discharge 1.85 times. **PT, RCT, micropreemie, length of stay, infection, routine KC. GET FULL CITATION and ARTICLE.** **See also Fidler 2010 review.**


M. Merenstein & Gardner, (2002) neonatology textbook that states that KC is a good analgesic. Text, pain

Messmer PR, Rodrigues S, Adams J, Wells-Gentry J, Washburn K, Zabaleta I, & Abreu S. (1997). Effect of Kangaroo Care on sleep time for neonates. Pediatric Nursing, 23(4): 408-414. One group of 20 stable (no O2) 30 wk PMA preterms in preKC, KC, post for one hour, four times. Increase in % of quiet sleep time (Braaelton’s 6 stage scale) during KC (pretest=13.60%, KC = 25.55%, posttest = 14.95%), less awake time (pretest = 59.8%, KC = 46.9%, posttest = 60.95%), had longer and deeper sleep periods (pg. 413), less agitation, few episodes of apnea and bradycardia during each period and stable SaO2 in KC as compared to incubator. HR, RR, SaO2 did not change. Most infants experienced few episodes of apnea and bradycardia during each period, similar to Bauer et al, 1996”(pg. 412). LOS did not differ between KC infants and others in nursery. Nonsignificant but positive trend for improved maternal attitude and emotional affect and decreased stress during KC. Hispanic moms less accepting of kc, resistant to unbutton blouse (pg.413). Quasi Experimental, pretest-test-posttest own control, repeated measures. PRETERM, RR, HR, T, sleep, apnea, bradycardia, oxygenation, agitation, crying, Mat stress, maternal confidence, mat attitude, mat affect, paternal KC, hispanic


Meyer, K., & Anderson, G.C. (1999). Using kangaroo care in a clinical setting with fullterm infants having breastfeeding difficulties. MCN. The American J. of Maternal Child Nursing, 24, 190-192. One fullterm who wasn’t BF @ 20hrs postbirth got 60 min KC before next feeding. Spontaneously sought and latched on. Two others did same thing at 18 and 40 hrs postbirth when given KC “for about 1 hr, usually one hour prior to a feeding and continuing into the next breastfeeding session. KC may be worthwhile to try when moms are having breastfeeding difficulties.”. FULL-TERM, BF difficulties. NOT ON CHARTS
Mikiel-Kostyra K, Boltruszko I, Mazur J & Zielenska M (2001). Skin-to-skin contact after birth as a factor determining breastfeeding duration. Med. Wieku Rozwoj, 5(2), 170-189. 1250 Polish children at Early KC is an independent predictor of BF duration. One group had less than two hours of VEKC and the other had two hours. Fullterm, BF, Regression, VEKC, BF

Mikiel-Kostyra K, Mazur J. (1998). Determination of newborn feeding in maternity hospital care: Part I: Factors associated with breastfeeding initiation. Ginekologia Polska, 60(OR maybe volume 69)(11), 783-788. Data from 11,750 FULLTERM collected from 427 polish hospitals in 1995 showed that lack of KC after birth (odds ratio 8.5; population attributable risk in percent = 60.9%) and maternal-infant separation longer than 1 hour/24 hrs (odds ratio 13%, PAR = 87.2%) are factors associated with artificial feeding. BF, KC is routine. FULLTERM

Mikiel-Kostyra K & Mazur J. (2000). Birth weight as a factor influencing infant feeding in Polish maternity wards. Med Wieku Rozwoj 4(3), 337-346. POLISH) FULLTERM. 11,784 newborns from 427 maternity hosps were studied. 97.2% of all newborns breastfeed; 72.5% of preterms breastfeed. KC was compared to rooming-in and was strong predictor of initiating BF and KC and rooming in as influences for BF were more evident in lower birthweight infants than higher. They use KC routinely. BF, KC is routine, FULLTERM

Mikiel-Kostyra K, Mazur J, & Boltruszko I. (2002). Effect of early skin-to-skin contact after delivery on duration of breastfeeding: A prospective cohort study. Acta Paediatr, 91, 1301-1306. 9612 healthy fullterm newborns were in three groups according to hospital care in Poland in 1995. Group 1 got no KC after birth (n=208), Group 2 got <20 minutes of KC (n=845); 532 got 1-4 min of KC, 200 got 5-9 min of KC, and 113 got 10-19 min of KC) and a third group got >20 minutes of KC (n=72; 20-29 min = 19; >30 min = 53). Years later the national data set was mined for chart review. 1923 healthy newborns were randomly assigned to complete follow-up questionnaires when infants were 3 years old. 1340 (69.7%) of questionnaires were returned and 1250 subjects were included in analysis. KC was given to 1020 dyads (81.6%); 96% of KC contact was initiated within first 10 minutes of birth. After c/s, only 11.2% of cases got KC, and in half of them KC was started 1 hour or later after delivery. In 586 moms, KC was initiated within first 5 min of birth and lasted <5 minutes. KC >20 min prolonged duration of exclusive BF by 1.35 mo, overall BF by 2.10 months compared to no KC group. Especially beneficial was KC >30 min and longer. KC>20 minutes duration after delivery in DR increased duration of exclusive BF, but not overall BF. Only 6% had KC for 20 minutes or more, 76% had it for 1-19 mins, and 18% had no early contact at all. Irrespective of the duration of KC, 97% initiated KC within 10 minutes of birth. Duration does affect EXCLUSIVITY OF Breastfeeding: no contact group had an exclusive BF duration of 2.47 months, Group who had 1-19 mins of KC had 2.77 months exclusive breastfeeding, and >20 minutes had 3.82 months; any BF had similar pattern: no KC = 6.97 months, 1-19 minutes of KC = 8.33 months, and >20 minutes of KC = 9.07 months;> 30 minutes KC = 10.07 months of BF. KC was main prognostic factor for duration of exclusive BF, even just under 6 minutes of KC. Extensive contact (>20 min) was more beneficial. Short KC was not very supportive for BF (30% of infants with KC <20 min started suckling, but 81% of infants with KC >20 min did so). VEKC significantly increased mean duration of exclusive BF by 0.39 months and overall BF duration by 1.43 months. BEST TO DO KC FOR 30 MINUTES OR MORE and FEED WITHIN 2 HOURS OF BIRTH. VEKC coexists with other hospital BF practices. Pairs who got VEKC had a greater likelihood for other supportive care (rooming in, no separation of mother and infant for more than one hour day, and early feeding initiation. Fullterm, BF, short vs long KC(>20 minutes), C/S, VEKC, Exclusive BF, BF duration. See also Nommsen-Rivers annotation below. See Nommsen-Rivers report of this study that follows in the bib.

survey in 1995 in hospitals (n=11,422 newborns) and a second in 1997 in primary care centers serving infants after discharge (n= 10,156 newborns) submitted data to regression. In hospital factors contributing to non-exclusive BF were C/S, BF initiation after 2 hr post-birth, lack of KC, use of pacifiers, separation > 1 hour/24h, and infant health problems. After hospital discharge, factors were use of pacifier, mom’s reluctance to exclusively BF more than 4 months, and low level maternal/paternal education. Lack of KC was a significant contributor to non-exclusive BF during hospitalization, but does not contribute after discharge (because they only did six minutes of KC in the hospital and did not do it any more after that six minutes of birth). Descriptive survey, Fullterm, BF, exclusive BF, C/S.

Miles, R., Cowan, F., Glover, V., Stevenson, J., & Modi, N. (2006). A controlled trial of skin-to-skin contact in extremely preterm infants. *Early Human Development* 82(7), 447-455. Randomly chosen hospitals (2) either gave daily KC for 4 weeks or routine care for four weeks. 145 Infants <32 weeks GA were recruited within 7 days of birth, were given one session of KC (n=46)(in chair, no strong perfume, infants had diaper & woolen hat between breasts covered by light blanket, flexed limbs) for 20 minutes per day for 4 weeks (pg.448) beginning within one week of birth or were given standard care (n=32). Authors say that care in both hospitals is exactly the same. After 4 weeks of assignment (pg. 448), a washout period took place and continued until infants were discharged, and then infant cross over into other group at home, so routine care infants eventually did get KC. Non-ventilated infants, medically stable (No A/B and stable temp), could have CPAP or low flow O2 by cannula were included). Infant behavior at discharge, pain response to immunization at 4 and 12 months age, salivary cortisol before and 20 minutes after injection as well as mean cortisol during weeks 1-4, memory, behavior (by maternal report using the Infant Toddler Social and Emotional Assessment), and development (Hammersmith Infant Neurological Examination and Revised Griffiths Mental Development Scale) at 1 year age showed no differences between groups. Maternal depression, stress (by Parenting Stress Index), anxiety, lactation performance and infant interaction were assessed at infant discharge, 4 & 12 months later. No differences between groups in any variable. Mean infant plasma cortisol for weeks 1-4 ranged from 17-2041 nmol/l (for weeks 1-4, control M=418 SD=379 nmol/l; KC M=333(SD=128nmol/l)(effect size -0.22, not significantly different). Change in salivary cortisol from baseline to 20 minutes post immunization at 4 months was M=5.22nmol/l (SD=7.48) in controls and M=3.25nmol/l(SD=6.36) in KC (effect size -0.26, not significant); at 12 months change in salivary cortisol was M=-0.03 SD=5.43 for controls and M=-0.28 SD = 5.78) for KC (Effect size = 0.06, nonsignificant difference). KC, after extremely preterm birth, has neither benefit nor adverse consequences. Considerable variation in KC duration by the 46 moms in KC group: M=507 min SD =414 R=0-3350 mins – this all equals 126.75 mins per week or just over two hours in a week), # of KC sessions M=11.26,SD =8.17, R=0-27(If there are 2 hours/ wk and only 2.75 sessions/wk, they gave 45.82 mins per session). No significant relationships between amount of KC provided and cortisol. Authors are unable to recommend resource allocation for the implementation of KC for extremely preterm infants. PT, Randomization of hospitals but not subjects, cross-over design, micropreemie, pain, development, behavior, memory, maternal stress, maternal anxiety, BF, infant interaction, maternal depression, one year follow-up, CPAP, salivary/serum infant cortisol. Not on charts yet.


Miller-Petrie, E. (2012). MCHIP and USAID host first Latin American and the Caribbean Annual Conference on Kangaroo Mother Care. *Healthy Newborn Network*, Washington, DC: Save the Children. This is a blog that appeared on Jan. 20, 2012 on the Newborn News Express site on the HealthyNewborn Network.org/blog and relates how Kangaroo Mother Care in third world countries is saving babies’ lives and improving the health of mothers too. The meeting brought together many countries implementing Kangaroo Mother Care so they should share what they have learned with other programs. Aims of conference were to present recent scientific advances in the field, share experiences of implementing KMC programming throughout the region, create a regional network for sustainable implementation of KMC with a standardized methodology and common indicators, create a community of practice in the region, and showcase the KMC program supported by MCHIP at the SanVicente de Paul hospital in San Francisco de Macoris. Participants represented 12 countries in the region, and found many issues in common, including lack of funds, lack of health care staff, and resistance towards innovation and implementation. However,
throughout the conference, common solutions were much more popular topics, and there was no shortage of ideas in the regional brainstorming sessions. Participants stressed methods of building awareness and cost-effectiveness tools, among other strategies. A common issue included resistance in the medical community toward accepting KMC as a valid medical intervention despite scientific evidence supporting its implementation. During the conference, a new scientific study linking KMC care to improvements in brain development was presented (must have been Morgan et al 2011 article that includes Nils Bergman on it that was presented that showed that one hour of KMC sleep was better (more quiet sleep) and less stressful (less sympathetic nervous system activation) to fullterm newborns than one hour in a cot beside the mother). Dear Susan I participate to a meeting in December in Dominican Republic but it was not a scientific meeting. As we trained 6 central american countries with USAID's y The neonatal alliance (with Save the children), i meet with all the KMC program of these countries and peru and bolivia. Paraguay came by they don’t have really a KMC program. Ecuator came and normally they will come for a training now in Colombia. Haiti was invited too a a first step of their integration in the Carribbean countries. They trained with us in December We spoke about the difficulties of the implementation, the resistances, each countries presented their KMC program, we spoke about economical difficulties and autosustaininbility. I presented the results of our study on excitability of the brain and KMC and nothing more, Nils was not there. It was a practical workshop and not a scientific workshop. 3rd world, KMC, PT, implementation

Miranda-Wood, C., & Morelos, J. (2010). Promoting early breastfeeding nd attachment: Our journey to SOFT. Journal of Obstetric, Gynecologic and Neonatal Nursing, 39 (Suppl 1), S31. The first t3 hours post birth are a SENSITIVE Period that is critical for establishing early attachment. The was a performance improvement project to use KC to promote attachment and BF. Previous to this project, the infant and mother were allowed some time together but then infant was taken to transitional nursery. 271 charts were reviewed and showed that 64% of moms had a desire to BF and 32% received birth KC, but documentation of BF was inadequate and there were differences in HOW EACH STAFF person ACCOMPLISHED SKIN to SKIN CONTACT. So they embraced S(skin toskin) O Open eye-to-eye, F fingertip touch, and T time together, formed a committee, developed patient education brochure, a DVD and a two-part class and a SOFT resource nurse during implementation. Now 100% of perinatal staff have been trained. This project breaks the barriers of resistance, and protected the maternal/infant dyad and promoted early attachment. One nurses noted that “Mothers provide the habitat, babies breastfeed, fathers and nurses protect the dyad and keep them together.” FT, quality improvement project, implementation attachment, BF, paternal role is to PROTECT THE DYAD.

Mizuno K, Mizuno N, Shonohara T, & Noda M. (2004). Mother-infant skin-to-skin contact after delivery results in early recognition of own mother’s milk odour. Acta Paediatrica 93(12), 1560-1562. Randomized control trial in 2002 of 60 healthy fullterm infants into KC (n=30) (KC for a mean 63.7 ±7.7 minutes immediately after birth and stopped once infant had suckled at breast and no fathers were present) and control group (n=30) (no contact with mothers until 24 hours old, no skin contact after birth, and no fathers present) who were given mother’s milk odour to follow at day 1 and day 4 after birth. All infants remained in observation ward for 24 hours postbirth (and fed formula in nursery) and then went to moms for BF every 3 hrs. Moms stayed in hospital for 4 days. Infant facial action (and frequency of mouthing movements (sucking, licking, chewing) were assessed on day 1 and 4 before 1st BF of the day, and BF every 3 months was assessed. KC infants demonstrated a larger difference in frequency and duration of mouthing movements between their own and another mother’s milk odour (and more movement with formula than orange juice or water) at 4 days age than control infants (and they mouthed more with own mother’s milk smell than other mother’s milk scent on day 4) and KC infants breastfed 1.9 months longer than controls. Most common reason for stopping was insufficient milk supply. KC results in enhanced infant recognition of own mother’s milk and longer BF. During 1st hour of life serum noradrenaline levels are 20-30 times higher than later and noradrenaline neurons in the locus coeruleus send signals to the olfactory bulb and promote olfactory learning (Refs 8 & 9 in article). See also Winberg for stuff on olfaction during labor. Attraction to mother’s milk odor could be genetically determined as infants who have no contact with mom for 2 wks also demonstrate this preference (pg. 1643). Fullterm, RCT, BF, Birth KC, mouthing and facial action to show recognition of milk odor, olfaction,
Modi, N. & Glover, V. (1998). Non-pharmacological reduction of hypercortisolaemia in preterm infants. Infant Behavior and Development, vol. 21, April 1998, Special ICIS issue, pg. 86. Extremely preterm infants experience numerous stresses and they have shown that preterms have very high levels (often exceeding 1500nmol/l) while baseline level in healthy infants of equivalent GA are around 150nmol/l of circulating cortisol (a glucocorticoid steroid hormone). Glucocorticoids are neurotoxic. In animals, exposure to high cortisol leads to hippocampal cell death and loss of hippocampal volume (hippocampus plays role in learning and intermediate memory and contains highest concentration of glucocorticoid receptors in the brain. In adults, hypercortisolism is associated with reduced hippocampal volume, memory dysfunction, and hippocampal atrophy in Alzheimer’s disease. Cortisol potentiates hypoxic-ischemic brain injury which is a major cause of neurodevelopmental impairment, raising possibility that chronic stress may exacerbate existing neurological injury. Reducing hypercortisolism will lead to measurable benefit. Massage results in ↓ in plasma cortisol, but not catecholamine levels. Median difference in cortisol before and after massage was -35.8nmol/l, 95%CI -0.5-94.0. Intrauterine like sound stimulation did not change circulating cortisol nor β-endorphin. KC caused circulating cortisol and β-endorphin to fall significantly after KC (cortisol geometric mean change 66%, p=0.008; β-endorphin geometric mean change 74%, p =0.002) KC and massage study done too and KC alone caused significant fall in salivary cortisol; massage caused salivary cortisol to rise in some and fall in others (inconsistent responses and may be effective only if behavioral state of infant is appropriate). Significant fall in salivary and serum cortisol was NOT sustained when compared to a control period on a separate day (No residual effect beyond one day). KC appears to result in most consistent response but may need to be applied over a prolonged period of time to produce benefit. PT, Review of 4 studies. Stress, cortisol, massage, beta-endorphin, residual effects. No duration of KC mentioned.

Modrcin-McCarthy, M.A., Harris, M., & Marlar, C. (1997). Touch and the fragile infant: Comparison of touch techniques with implications for nursing practice. Mother Baby Journal, 2(4), 12-19. Provides overview of historical perspectives on touch, Sister Callista Roy’s adaptation model as a framework for touch studies, and a comparison of the types of touch (procedural, comforting — that includes stroking, massage, tactile-kinesthetic touch, gentle human touch, and Kangaroo Care (pg 17-18). Author admonishes one to “frequently monitor the infant during kc for temperature instability, patency of tubes, and stimulation tolerance” (pg. 17) and states that “minimal detrimental effects are associated with KC if the infant is medically stable” (pg. 17). Preterm, stability, over stimulation, >32 weeks

Modrcin-McCarthy, M.A., McCue, S., & Walkers, J. (1997). Preterm infants and STRESS: A tool for the neonatal nurse. Journal of Perinatal and Neonatal Nursing, 10(4), 62-71. This is a clinical review article about preterm infant stress and that preterm infant response to stress is immature or disorganized. The article reviews actual and potential stressors of premature infants, describing autonomic, motor, and state behavioral responses and proposed a clinical tool called STRESS (signs of stress, touch interventions, reduction of pain, environmental considerations, state, and stability) that encompasses all one needs to know about stress in the infant, but no tool is provided nor are any scoring criteria, so this is just a conceptual paper identifying content relevant to measuring stress in premature infants. On page 68 it says as part of the TOUCH Interventions portion of the STRESS tool “Stoking, massage, tactile/kinesthetic, and kangaroo care types of touch may be appropriate, (Sml’s note: meaning it may meet the criteria of being gentle human touch that is a form of continuous touch that is spoken about before this statement), but the nurse needs to know that stroking, massage, and tactile/kinesthetic touch may be inappropriate to too much stimulation for some fragile infants.” Pg. 68. Review, theoretical article, PT, Stress, pain. Not on charts 11/13/2011


Mohrbacher, N. (2008). Breastfeeding the preterm baby. Ameda Breastfeeding Products. Available from Ameda Breastfeeding Products, Evenflo Company, Inc. 1801 Commerce Drive, Piqua, OH 45356, 1-866-992-6332. In this two page clearly written, no-nonsense and engaging handout for mothers, on page 2 it states under the heading of Boosting Milk Supply: “hold your baby skin-to-skin before pumping” and under the heading Starting To Breastfeed, it states, “Your hospital may have policies that affect when you start breastfeeding. Even before then, try to hold your
baby skin-to-skin as much as you can. This helps your baby stay warm and calm, and sleep better. It may also help you make more milk.” Preterm, breastfeeding.


Mohrbacher, N. (2008). Holding Your Baby and Latching On. Ameda Breastfeeding Products. Available from Ameda Breastfeeding Products, Evenflo Company, Inc. 1801 Commerce Drive, Piqua, OH 45356, 1-866-992-6332. Under the heading “Using your baby’s hard wiring” it states “To see your baby’s inborn feeding skills in action, undress your baby down to her diaper and open your shirt or take it off. Hold her upright between your breasts skin-to-skin facing you. When a calm, hungry baby is held this way: her head starts bobbing from side to side. Then she lunges down toward the breast. FT, PT, BF


Mondlane, R.P., de Graca, A.M.P., & Ebrahim, G.J. (1989). Sin-to-skin contact as a method of body warmth for infants of low birth weight. Journal of Tropical Pediatrics, 35, 321-326. 132 preterms <2500 gram started 24/7 KMC at 3-5 day of life and continued at least til discharge during the cold season (ambient temp 22-32°C) in Maputo, Africa. 67% of those who had home visit were still doing KC at home. KMC was principal means of warmth, no hypothermia occurred. Readmission to NICU was required for 4 for diarrhea, 2 for respiratory infection, 2 for jaundice, one for poor sucking. 3rd World, temp, Preterms, post-discharge KC, home KC, infection. Not on charts

Moon J. (2004). Verse and Vision: Kangaroo Care. J Perinatal Education, 13 (1), iii. A picture of twins in shared KC accompanies the following verse: “In talking to the Kangaroo, its opinion would be… To care “for your child as my mother cared for me.” In order to be stable, when you are able, “Care for your child the way my mother cared for me.” Close to her heart—warmth, gentle beating, love unfleeting. Research shows it’s so, this Kangaroo Care, no matter what the species, it’s a mother’s care. Poem

Mooncey S, Giannakoulopooulos X, Glover V., Acolet D., & Modi N. (1997). The effect of mother-infant skin-to-skin contact on plasma cortisol and Beta-endorphin concentrations in preterm newborns. Infant Behavior and Development, 20(4): 553-557. Preterm study that says the extra handling of KC may lead to harmful fluctuations in physiologic parameters and that is why units have minimal handling policies (cites Harrison L, Olivet L, Cunningham K, Bodin M & Hicks, C 1996. Effects of gentle human touch on preterm infants: pilot study results. Neonatal Network 15,35-42 for minimal handling). From 23 weeks Gestation infant mounts hormonal stress response to painful stimuli (Giannikoulopooulos et al. 1994). Animal (Sapolsky RM, Uno H 1990) and human (Starkman MN, Gebarski SS, et al., 1992 Biologic Psychiatry ) found that high levels of glucocorticoids are neurotoxic and that chronic levels of high cortisol has adverse effects on cognition and memory (Starkman, et al. 1992). If stable, spontaneously breathing preterms (12 in cribs, 3 in incubators) getting NG, bottle and breast feeds, 2 still on O2 by nasal cannulae in one group, who were 25-33 weeks GA (Median = 31 weeks), median postnatal age 21 days (R=8-96), median BW 1420 g (R=520-1760) and median study weight was 1583 g (R=1205-2313 g). Studied between 11-3 p.m. on two days and fed 30-60 mins before testing. Day 1 infant prone, 30 degree tilt in cot/incubator and NO handling for 40 min. Then undressed by MOM and held in KC for 20 mins as mom sat at 60 degrees tilt in rocking chair. On Day 2 (control day), infant left unhandled throughout entire study period of 60 mins.fully clothed in crib/incubator at 30 degree tilt. HR, Sao2 measured every 5 min during incubator phase and then every 2 mins in KC. Temp taken and 0.5 ml blood taken with 27 guage need from vein in dorsum hand at 5-10 min prior to and after the 60 min study period on both days. Plasma beta-endorphin and plasma cortisol were measured after 20 minutes of KC to determine if attenuation of stress response occurred in

1.
comparison to a control day. All infants remained stable, no brady no apnea. O2 requirements for the two oxygen dependent infants decreased during KC by 25cc/min. Temp was maintained between 36.5-37.0 C. No crying during KC. No sig changes in HR, SaO2, T during control and KC periods. All mothers said KC was “pleasurable”. Cortisol did drop significantly after KC (geometric mean change of 66%) on the KC day and after control period (geometric mean change of 78%) the next day (but ANOVA showed no difference in degree of fall between KC and control days); Endorphin dropped significantly after KC (geometric mean change of 74%) but not after control (incubator/cot) period and ANOVA showed beta endorphin fall on KC day was significantly different than fall on control day. Wide variation in basal cortisol and beta-endorphin on both days (KC day cortisol = 47-856 nmol/l; beta = 10-63 pg/ml; Control day cortisol = 95-1560 nmol/l; beta = 10-97 pg/ml). Weak correlations between basal cortisol and beta values each day. The fall in cortisol on control day may be due to paradoxical response to blood sampling because Lewis & Thomas 1990 found that 24/69 2-month old infants had fall in salivary cortisol with inoculation prick. They say “we accept that this is small study of heterogeneous grp of babies with respect to GA and postnatal age. These factors are potentially compromising…” Further study is needed. KC results in significant reduction in B-endorphin as sign of attenuation of stress response; no adverse effects occurred. PT, descriptive, serum cortisol, stress, HR, FiO2, Temp, apnea, bradycardia, crying, maternal feelings, SaO2

Moore, E. & Anderson, G.C. (2007). Randomized controlled trial of very early mother-infant skin-to-skin contact and breastfeeding status. J Midwifery & Women’s Health 52(2), 116-125. RCT of 20 mothers intending to BF with fullterm infants (KC= 10; swaddled holding = 10) who were placed between maternal breasts for KC or given to mother/father for swaddled holding (hands left out for observation of hunger cues) at 15 minutes post birth after eye care, Vit K shot, drying, footprinting, banding was done under warmer. When infant demonstrated hunger cues (mouthing, rooting, open mouth, looking around, alertness, head turning, sucking on fingers or fist, etc) then put onto breast in cross cradle position (upright infants slipped down during feeding), but not before hunger cues were seen because infant is not ready to breastfeed before cues appear. KC group demonstrated hunger cues significantly earlier (between 30-45 minutes post-birth; swaddled infants at ?? - ?? mins postbirth) and in greater number (more hunger cues in KC group) than swaddled grp. Both grp got equal BF attention from lactation consultant. All BF sessions over 1st 7 days of life scored by mother using IBFAT (Infant Breast Feeding Assessment Tool – Mathews MK, 1988; scores arousal, eating behaviors, nipple grasp, consistent sucking) in which score of 10-12 = effective feeding. KCers had higher IBFAT scores than swaddled grp at 1st feed. After feeding complete, KC could continue. Length of KC varied between 1.5-3.0 hours in delivery room because mother being cared-for by the research nurse and deliveries were on weekends when DR was less busy. Nipple protractility was confounder because babies did not suckle or latch on at 1st feeding as well if mom had flat or minimally erect nipples (future study should score erectility and control for this). Time of effective BF (measured as time when first of 3 consecutive IBFAT scores of 10 or more occurred) showed that KCers were nipple feeding effectively sooner (took ½ the time that control group to achieve this outcome). One, 3,and 6 months postbirth follow-up showed: at 1 month babies who had earlier effective sucking had fewer BF problems than later effective sucking, but no differences between the grps. 3 and 6 month data not assessed as of August 1, 2005. Trend for KC moms to return to work sooner and more were full time (perhaps because babies feeding well?). ONSET OF MILK production should be measured and asking when mom feels breast is fuller [consider babies weight loss at 72 hrs postbirth and milk production in response to birth weight loss as recent 2004/2005 article shows]. Authors concluded that KC has profound effect on early BF, but did not see diff in exclusivity and duration of BF. Qualitative results showed that mothers wanted qualified woman to help with 1st feeding. Fullterm, RCT, BF Effectiveness, IBFAT, BF exclusivity, BF duration, KCBF, VEKC, maternal feelings, infant feeding behaviors (hunger cues). Elizabeth.moore@Vanderbilt.edu
Moore, E.R., Anderson, G.C., & Bergman, N. (2009). Early skin-to-skin contact for mothers and their healthy newborn infants. The Cochrane Database of Systematic Reviews, 2009, Issue 1, 1-76. Updated Cochrane Meta-Analysis showing that the 3 main findings were KC helps initiate breastfeeding, keeps infants warm, and infants cry less in KC than in incubator. Late PT, FT Meta-Analysis, BF, Crying, Temp.


Moore, E.R., Anderson, G.C., Bergman, N., Ludington, S.M., Rojas, M., & Chiu, S-H. (2010). Skin-to-skin contact for mothers and their preterm or low birth weight infants in the neonatal intensive care unit [Protocol]. Cochrane Database of Systematic Reviews, Issue 3. This is a protocol that will compare intermittent KMC with Preemies (<37 wks) in NICU hospitalized preterm or low birth weight infants to outcomes in incubator and swaddled care and will compare <30 weeks with infants >30 weeks and assess the safety of intermittent KMC on hypothermia (<36.5C), bradycardia (HR <100 x 15 seconds), desaturations (sao2 <80% for 15 seconds), apnea (20 second or 10 seconds with bradycardia or desat), hypoglycemia (<40 mg/dl), stability using SCRIP scores, infection rate,. Outcomes are lactation, growth, length of stay, neuro-behavioral, bonding/attachment, thermoregulation, respiratory functions, heart rate, metabolic functions, mortality. Review excludes fathers and other KC providers.


Moran, M, Radzyminski S.G., Higgins, KR., Dowling, D.A., Miller, MJ, & Anderson, G.C. (1999). Maternal kangaroo (skin-to-skin) care in the NICU beginning 4 hours postbirth. MCN(Amer.J. Maternal/Child Nursing), 24(2),74-79. A case study of a 32 weeker. Infant was 32 wks, 1953 gr, gotKC beginning at 4.5 hours post-birth, then got 6hrKC/day in 2-3 hr intervals. Both parents got to KC their son, and nursing support was given and described. To intermediate care on day 2, regained BW by Day 12, Discharged on day 21, exclusively BF at 40 wks,had Bayley mental and motor development within normal limits at 6 months, and normal develop at 18 mos. EARLY KC, BF, Preterm, Development, mental and motor development, Paternal KC too

Morelius, E., Angelhoff, C., Eriksson, J., & Olhager, E.(2011). Time of initiation of skin-to-skin contact in extremely preterm infants in Sweden. Acta Paediatric, in press. Dot:10.1111/j.1651-2227.2011.02398.x. A descriptive study of how soon intermittent KC begins for 520 infants <27 weeks GA in 7 regional hospitals in Sweden (do not know if it includes Uppsala and Karolinska in Stockholm, but I doubt it because both of those practice 24/7 KMC within 24 hours of birth. Intermittent KC began at a median of 6 postnatal days (R= 0-44). Data were collected for first 180 days of life until discharge or death, which ever was first. 601 infants were alive at 24 hours and entered into study; 81 died in first 28 days of life and were separately analyzed. For the 330 infants who got KC, their mean birthweight was 777(SD 17) gm, crib score =6.0 (SD=3.6), GA median was 25\( ^1 \) (22\( ^1 \)-26\( ^1 \)), days on vent was 16.5 (SD=19.1) and 45.8% were females. Low GA, high score on Clinical Risk Index for Babies (CRIB score), and # of days on ventilated delayed first I-KMC. Also, statistically significant differences between hospital 2 (start Intermittent KC at median 3 postnatal days (R=0-12) and others (region 4 was median 17 postnatal days (R=2-44). and between hospital 5 and others was found. Region 2 also had fewer number of days on a ventilator than another region. 190 infants were alive after day 28 and had no KC reported. The mean Birth weight for this group was 765g (sd=166; R=375-1315 gm), GA Median was
Cross over trial, negative impact on quiet sleep duration was 3295 +/- transformed. Mothers were 17 but only 6 entered into quiet sleep in both places and HRV data did not distribute normally for all subjects so were log transformed. Mothers were 17-40 yrs, a 86% decrease in quiet sleep duration during maternal neonatal separation compared to KC sleep. Sleep latency was time from entry into SSC or cot until onset of quiet sleep. All 16 babies entered into active sleep state when infants were 2-21 days old, one on mechanical vent and 16 on CPAP with 25-33 wksGA.

Maternal stress decreased during KC (salivary cortisol dropped 32%, HR by 7%, and visual analog scale of stress by 89% and mood increased by 6%). Before the 4th session mothers rated less stress on the VAS and salivary cortisol and HR improved faster. Infant salivary cortisol increased in some and decreased in others, Infant HR and PIPP and NIPS pain scores decreased during KC. At the first KC day, infant salivary cortisol increased in 5 infants during KC, did not increase nor decrease in 3 infants. At the first KC day, the median infant cortisol level was highest post-SSC and lowest pre-SSC and changes were not significant and did not depend on environment characterized as calm vs noisy. At the 4th KC day, 4/11(36%) infants decreased salivary cortisol during KC; 7/11 (64%) infants increased cortisol during KC. Day 1 vs Day4 pre-KC cortisol was 60% higher on Day 1; Day 1 vs Day 4 post-KC was 47% higher on Day 1 than on Day 4. Seven infants had PATERNAL KC on Days 2 and 3 but Day 4 cortisol were not related to Paternal KC on Days 2 and 3 and were not related to environment classification (using Fisher’s exact test). Moms need more support with KC during 1st session than later sessions. Descriptive one group, maternal stress, cortisol, infant HR, maternal HR, Pain scoring (PIPP and NIPS), maternal emotion (MOOD), infant stress, visual analog scale of maternal stress and, Paternal KC, PT

Morgan, B.E., Horn, A.R. & Bergman, N.J. (2011). Should neonates sleep alone? Biological Psychiatry 70, 817-825. Doi: 10.1016/j.biopsych.2011.06.018 Measured Heart rate variability as a sign of stress in 16-2 day old cesarean birth fullterm infants sleeping skin-to-skin with mother or sleeping alone (semi-prone, left side down, facing mother and in loose swaddling in open air cot next to mother’s bed) for 1 hour in each place before discharge from the hospital. Infants were fed and then put into randomly assigned order of KC for one hour and then cot for one hour on a side versa. In KC they were prone wearing Nil’s KC shirt. Infant behavior (Anderson behavioral state scale) was observed manually and continuously. Cardiac interbeat intervals and ECG measured heart rate variability. Heart rate variability (ms²/Hz) was only taken for analysis during sleep states and used frequency domain. There was a 176% increase in autonomic activity and a 86% decrease in quiet sleep duration during maternal neonatal separation compared to KC sleep. Sleep latency was time from entry into SSC or cot until onset of quiet sleep. All 16 babies entered into active sleep state but only 6 entered into quiet sleep in both places and HRV data did not distribute normally for all subjects so were log transformed. Mothers were 17-40 yrs, all five min apgars were >9 and no postnatal complications. Mean birthweight was 3295 +/- 437 g. and age was 42-74 hours (M=53+/-.9.3). Significantly higher LF (sympathetic control) in separation than in KC. This indicates central anxious autonomic arousal during separation (stress). Separation had a profoundly negative impact on quiet sleep duration. Maternal separation may be a stressor and may not be benign! Randomized cross over trial, FT, sleep, stress, separation, HRV

Mori, R., Khanna, R., Pledge, D., & Nakayama T. (2010) A meta-analysis of physiological effects of skin-to-skin care for an unselected group of mothers and infants in Neonatal Intensive Care. Pediatrics 116(5), 1105-1113. Doi:10.1542/peds.2004-2524. Seventeen dyads were studied at 1st and 4th KC sessions to measure infant stress in each 30 minute session of KC when infants were 2-21 days old, one on mechanical vent and 16 on CPAP with 25-33 wksGA. Salivary cortisol and mood scale and pain NPS, PIPP, and VAS from mother were taken before KC and after 30 minutes of KC and again 60 minutes later (but KC continued for 30 minutes more after the second data collection at 30 minutes into KC, so total KC was 60 minutes, but second salivary cortisol was taken at 30 minutes into KC) on days 1 and 4. Maternal stress decreased during KC (salivary cortisol dropped 32%, HR by 7%, and visual analog scale of stress by 89% and mood increased by 6%). Before the 4th session mothers rated less stress on the VAS and salivary cortisol and HR improved faster. Infant salivary cortisol increased in some and decreased in others, Infant HR and PIPP and NIPS pain scores decreased during KC. At the first KC day, infant salivary cortisol increased in 5 infants during KC, did not increase nor decrease in 3 infants. At the first KC day, the median infant cortisol level was highest post-SSC and lowest pre-SSC and changes were not significant and did not depend on environment characterized as calm vs noisy. At the 4th KC day, 4/11(36%) infants decreased salivary cortisol during KC; 7/11 (64%) infants increased cortisol during KC. Day 1 vs Day4 pre-KC cortisol was 60% higher on Day 1; Day 1 vs Day 4 post-KC was 47% higher on Day 1 than on Day 4. Seven infants had PATERNAL KC on Days 2 and 3 but Day 4 cortisol were not related to Paternal KC on Days 2 and 3 and were not related to environment classification (using Fisher’s exact test). Moms need more support with KC during 1st session than later sessions. Descriptive one group, maternal stress, cortisol, infant HR, maternal HR, Pain scoring (PIPP and NIPS), maternal emotion (MOOD), infant stress, visual analog scale of maternal stress and, Paternal KC, PT

Morelius, E, Theodorsson E, & Nelson N. (2005). Salivary cortisol and mood and pain profiles during skin-to-skin care for an unselected group of mothers and infants in Neonatal Intensive Care. Pediatrics 116(5), 1105-1113. Doi:10.1542/peds.2004-2524. Seventeen dyads were studied at 1st and 4th KC sessions to measure infant stress in each 30 minute session of KC when infants were 2-21 days old, one on mechanical vent and 16 on CPAP with 25-33 wksGA. Salivary cortisol and mood scale and pain NPS, PIPP, and VAS from mother were taken before KC and after 30 minutes of KC and again 60 minutes later (but KC continued for 30 minutes more after the second data collection at 30 minutes into KC, so total KC was 60 minutes, but second salivary cortisol was taken at 30 minutes into KC) on days 1 and 4. Maternal stress decreased during KC (salivary cortisol dropped 32%, HR by 7%, and visual analog scale of stress by 89% and mood increased by 6%). Before the 4th session mothers rated less stress on the VAS and salivary cortisol and HR improved faster. Infant salivary cortisol increased in some and decreased in others, Infant HR and PIPP and NIPS pain scores decreased during KC. At the first KC day, infant salivary cortisol increased in 5 infants during KC, did not increase nor decrease in 3 infants. At the first KC day, the median infant cortisol level was highest post-SSC and lowest pre-SSC and changes were not significant and did not depend on environment characterized as calm vs noisy. At the 4th KC day, 4/11(36%) infants decreased salivary cortisol during KC; 7/11 (64%) infants increased cortisol during KC. Day 1 vs Day4 pre-KC cortisol was 60% higher on Day 1; Day 1 vs Day 4 post-KC was 47% higher on Day 1 than on Day 4. Seven infants had PATERNAL KC on Days 2 and 3 but Day 4 cortisol were not related to Paternal KC on Days 2 and 3 and were not related to environment classification (using Fisher’s exact test). Moms need more support with KC during 1st session than later sessions. Descriptive one group, maternal stress, cortisol, infant HR, maternal HR, Pain scoring (PIPP and NIPS), maternal emotion (MOOD), infant stress, visual analog scale of maternal stress and, Paternal KC, PT

Morgan, B.E., Horn, A.R. & Bergman, N.J. (2011). Should neonates sleep alone? Biological Psychiatry 70, 817-825. Doi: 10.1016/j.biopsych.2011.06.018 Measured Heart rate variability as a sign of stress in 16-2 day old cesarean birth fullterm infants sleeping skin-to-skin with mother or sleeping alone (semi-prone, left side down, facing mother and in loose swaddling in open air cot next to mother’s bed) for 1 hour in each place before discharge from the hospital. Infants were fed and then put into randomly assigned order of KC for one hour and then cot for one hour on a side versa. In KC they were prone wearing Nil’s KC shirt. Infant behavior (Anderson behavioral state scale) was observed manually and continuously. Cardiac interbeat intervals and ECG measured heart rate variability. Heart rate variability (ms²/Hz) was only taken for analysis during sleep states and used frequency domain. There was a 176% increase in autonomic activity and a 86% decrease in quiet sleep duration during maternal neonatal separation compared to KC sleep. Sleep latency was time from entry into SSC or cot until onset of quiet sleep. All 16 babies entered into active sleep state but only 6 entered into quiet sleep in both places and HRV data did not distribute normally for all subjects so were log transformed. Mothers were 17-40 yrs, all five min apgars were >9 and no postnatal complications. Mean birthweight was 3295 +/- 437 g. and age was 42-74 hours (M=53+/-.9.3). Significantly higher LF (sympathetic control) in separation than in KC. This indicates central anxious autonomic arousal during separation (stress). Separation had a profoundly negative impact on quiet sleep duration. Maternal separation may be a stressor and may not be benign! Randomized cross over trial, FT, sleep, stress, separation, HRV

skin contact for newborns and mothers. *Pediatr International, 52*(2), 161-170. A meta-analysis of 23 studies of stable preterm and fullterm infants (not all were randomized controlled trials as some were just pretest-test-posttest one group studies) to examine difference in HR, SaO2 and body temp from before KC to during KC, and then from during KC to after KC. Only studies with rectal and axillary temps were included, and if both temps were taken, only rectal temp data was analyzed as that reflects core temp better than axillary. Across all studies, **body temperature increased** (weighted mean difference of 0.22 °C, p <0.001) and **SaO2 went down by 0.60%** (p=0.01) during KC when compared to pretest values. Both of these effects were more marked in cold environment (cold environment means the temperature of the city in which the study was conducted – NOT the temperature of the unit in which the infant was housed!). No difference in heart rates. Duration of KC sessions was considered and varied considerably. **Meta-analysis, HR, Temp, SaO2.PT, FT**

Morrison, B. (2010). Implementing Kangaroo Care: creating evidence-based practice. *Advances in Neonatal Care, 10*(4), 218. Descriptive report of the Iowa Model of Implementation of birth kangaroo Care at Fairview Hospital in Cleveland, Ohio. 15 months after the task force was created implementation began (Sept. 2008) and between April 2008 and April 2009 there was a five fold increase in the number of dyads doing some birth kangaroo care. Significantly more mothers declared an interest in breastfeeding and more dyads were discharged breastfeeding (54.2 vs. 60.5%). Parental responses were unanimously positive. Physicians are asking for BKC to be implemented throughout hospitalization. After 3 years, the journey to full implementation is far from complete. **Full term, implementation, breastfeeding, birth kangaroo care. Not on CHARTS.**

Morrison, B., & Ludington-Hoe, S. (2012). Interruptions to breastfeeding dyads in an LDRP unit. *MCN: American Journal of Maternal Child Nursing, 37*(1), 36-41. This is a descriptive study of 1593 interruptions (mean of 53 interruptions from 8a to 8 p) to breastfeeding dyads and data show that interruptions were a mean of 18.5 minutes long and time alone was a mean of 15.4 minutes, so there is little time for breastfeeding. Thus, on page 41 there is Box2: Strategies to Decrease Interruptions and Increase Opportunities for Breastfeeding. In the first section of Box2 it says During Prenatal Visits, childbirth class and birthing center tours discuss:…. Kangaroo (skin-to-skin) care (KC) as frequently and as long as possible” and in the second section of Box 2, it says “During postpartum, support and encourage: Using door signs or lights to signal time alone periods for Kangaroo Care, breastfeeding sessions, and rest.” **Descriptive, FT, postpartum KC, BF, Not on Charts 1/3/2012**

Morrow, C., Hidinger, A., & Wilkinson-Faulk, D., (2010). Reducing neonatal pain during routine heel lance procedures. *MCN, Am J Mat Child Nurs, 35*(6), 346-356. 42 FT neonates were in RCT of heel stick when held upright and fully swaddled vs. heel stick when lying in open air crib and only loose blanket over baby, not good swaddling. On page 349 it has a review of KC “KC has been shown to be an effective analgesic; is has been studied more extensively in stable preterm neonates than full term neonates” (p. 349) and it cites Kaahaninia et al. 2008 that showed significantly reduced NIPS; Gray et al., 2000 is also cited and showed that KC was better than swaddling for reducing crying by 82% and grimacing by 65%. Then it cites Castral’s 2009 meta-analysis of 12 studies in which KC reduced pain in all of them. “Although more studies are needed to determine the magnitude of KC as an analgesic, KC does seem to be an effective analgesic for acute painful procedures among infants, and it is a readily available intervention that is easy to initiate on any nursing unit.” (pg. 349). In the reported RCT, held and swaddled infants had less pain than unswaddled infants in a cot. The article also reviews non nutritive sucking, oral sucrose, breastfeeding, and swaddling and their effects on pain reduction. **FT, Not KC, swaddled holding, PAIN, NOT ON CHARTS AS OF 11/2010**

Morton JA. (2003). The role of the pediatrician in extended breastfeeding of the preterm infant. Pediatric *Annals 32* (5), 308-316. This article identifies variables that predict the best outcomes for BF at discharge from NICU, reviews factors that led to compromised milk production, and lists strategies to transition the infant from milk feedings to breastfeeding. On page 312 it talks about KC under the Stimulants to Milk Production section, saying it “provides innumerable benefits to mother and baby and has consistently been associated with improved milk production, improved infant growth, and competence in BF and extended lactation” pg. 312. **Preterm, BF, pediatricians**


Mukhopadhyay, K., Narang A, Kumar P, Pradeep GCM, Arora U, Mahajan R, & Dutta S. (2004). Premature infants need dads too! Presentation at “Workshops on KMC at Neocon 2004. XXIV NNF Annual Convention at Chandigarh, 28October, 2004” Available from file://E:\KangarooMotherCareInitiative(KMCI).htm. Descriptive study of paternal KC (during the daytime) with preterms weighing at least 2000 grams and being medically stable (no oxygen support). Duration of KMC was measured, as was infant and father temperature before and after KC. Socialworker interviewed parent to learn their perception and response to KC. 81 infants eligible from Feb-July (mean GA = 30.5 wks, mean birthweight = 1364.2 gms, mean enrollment weight= 1363.4 gms. Father gave KC in 24 (29.6%) of infants, father + other family member(sister, mother-in-law, grandmother) in 28 (34.5%). Mean duration of KC by father = 2.8hr/day. Mean father temp during KC= 36.8 (SD=0.27)°C. Mean temp of baby during KC was 36.9 (SD=0.26)°C. No hypothermia, no hyperthermia during KC. Fathers were more supportive of mothers during hospital stay and after discharge in families where both mother and father gave KC, and these babies had increased duration of KC after discharge. Descriptive, PT, preterm, 3rd world, paternal KC, grandmother KC, father KC, mother-in-law KC, sibling KC, surrogate KC, duration of KC, home KC, maternal support.

Mullany, L.C., Katz, J., Khatry, S.K., Leleq, S.C., Darmstadt, G.L., & Tielsch, J.M. (2010). Neonatal hypothermia and associated risk factors among newborns of southern Nepal. BMC Medicine, 8(1), 43+ (13 pages) DOI, but http://www.biomedcentral.com/1741-7015/8/43. Descriptive study of 23,240 babies in Nepal who were visited at home and had their temperatures measured. Hypothermia was associated with smaller birth weight, being born in the hot season (because moms did not think they had to keep the babies warm in the hot season), and hypothermic mothers. 50% of infants had hypothermia. Hypothermia was not associated with delayed bathing, hat wearing, room warming, and KC. But, 2,799 babies did not get KC in first 14 days and 221 moms did do KC in first 14 days. Also, those who got KC (4% of the 23,240 babies) were more likely to initiate BF. Descriptive, 3rd world, epidemiological study, hypothermia, and BF.

Mulet, R.C., Figueroa de Leon, R., & Gonzalez, J.V.B. (1992). Mother-child early contact with the mothers kangaroo program and natural breastfeeding. Rev Latin.Perinat. 12, #3-4, 54-60. Randomized trial in Guatemala; 61 in conventional care, 51 KC began KC in hospital and followed for 3 months: 78% KC vs. 34% controls (p<.005) exclusively BF at 3 mos., growth/development at 3 months was same in both groups. Has English summary on page 60. RCT, PT, exclusive BF, and growth/development, Intermediate KC, Is this preterm or fullterm?? probably preterm because these are Colombia team members who may have spread KC to Guatemala. Was this KMC or KC? On charts?

Mullen, K., Conrad, L., Hoadley, G., & Iannone, D. (2007). Family-Centered maternity care. One hospital’s quest for excellence. Nursing for Women’s Health, 11(3) June/July 2007, pg. 282-291. Review of Hoag Hospital’s (in Newport Beach, CA) quest to move toward NON-SEPARATION of fullterm infant and mother and family centered care throughout all maternal-newborn units. On page 285 the 10 principles of family centered care are listed (1. childbirth is wellness, not illness; 2. prenatal care is personalized to needs; 3. comprehensive perinatal education begins before birth, 4. hospital team assists family in making choices, 5. father and other support people are actively involved in education, birth, postpartum and newborn care, 6. family and friends are encouraged to be present when mom wishes, 7. labor and birth occur in same location, and also postpartum and newborn care, 8. moms encouraged to keep babies in their room at all times, 9. same nurse cares for mother and baby even when separated, and 10. parents have access to high risk
newborns at all times), on page 286 are their goals (to create new labor support skills ie. Aroma therapy, massage, music, etc) and new mother-baby unit skills (non-separation means “newborn transition occurs at the mother’s bedside”(pg. 288). States on page 290 that “We continue to carry out new developmental strategies, including kangaroo care, co-bedding, and retinopathy of prematurity guidelines…Most importantly, we encourage parents to touch their baby and participate in their baby’s hands-on care throughout the baby’s hospitalization.” Reference to KC only, not a KC study.Clinical review, implementation, FT, PT KC, separation, not on charts yet

Munninghoff, B. (2010). Kangaroo mother care department in Kapstadt receives tombola proceeds of the Breast Feeding and Lactation Congress in Hamburg. *Kinderkrankenschwester*, 29(6), 223-224. This unit in Mainz has done so well with increasing preterm breastfeeding that they were designated the winning unit for funds generated at a breastfeeding congress. *Comment, BF, PT*

Munson, M, Saatkamp, R., & West, C. (2012). Late Preterm Infants: Steps to Success. Neonatal Network, 30(4), 267-270. DOI: 10.1891/0730-0832.30.4.267 This is not a KC study, but this review of best care for late Preterm infants says under What Can Nurses Do? 1. Goal: monitor frequently (q 30 min for first two hours after birth until stable and then every 4 hour) and intervene to promote thermoregulation and avoid thermal stress. The risk for cold stress edxtends through the first day of life: 1a.”Immediately after birth, dry the infant and place directly (naked or hat/diaper only) ventral-to-ventral, skin-to-skin with mother. Encourage continuous skin-to-skin contact as much as possible. 2. Skin-to-skin contact can be maintained during hearing screenings, blood screening, nad so forth. There is evidence of increased difficulty with breastfeeding for babies who are separated from their mothers (cites Moore, Anderson, Bergman 2007 cochrane review). 3. Clothing, hat, socks, and double-wrapping may be added if skin-to-skin contact and/or the warmer is not being used.4 Delay first bath until the temperature is stable. II. Goal: Monitor blood sugar and maintain euglycemia. 1. Temperature instability can lead to hypoglycemia and vice versa. Maintaining newborn skin-to-skin contact has been shown to stabilize temperature and, therefore, is a preventive measure to protect against hypoglycemia” (cites Moore, Anderson, Bergman 2007 Cochrane & Laptook & Jackson, 2006). Pg. 267-268 for this quote. Also on page 268 in Table 1, Practice Guideline Summary for Late Preterm Infants, on Day 1 it says under the “breastfeeding” section: “Provide skin-to-skin” and this is listed in the Day 1, Day 2, and Day 3+ of life categories, encouraging KC during postpartum and at home. And on page 269 in Table 2 Breastfeeding Guidelines for Late Preterm Infants, it says “Day1. 1. Continuous skin-to-skin with mother as much as possible (encourage family member skin-to-skin participation if mother is unable or available)” so this is supporting surrogate KC. PT, Late preterm, clinical guidelines, breastfeeding, hypothermia, hypoglycemia, postpartum KC, home KC, surrogate KC, KC during infant tests.

Nagai, S., Adrianarimanana, D., Rabesandratana,N., Yonemoto, N., Nakayama, T., & Mori, R. (2010). Earlier vs. later continuous Kangaroo Mother Care (KMC) for stable low-birth-weight infants: a randomized controlled trial. *Acta Paediatrica*, 99(6), 827-835. A randomized trial (really a comparison study between early and late KC but because late KC is common practice in Madagascar, late KC is considered control), of 73 (early KC = 37; late KC or control = 360??) infants. Early KC began as soon as possible (within 24 hours postbirth), and late KC began after infant was completely stable (off all oxygen supplementation), generally after 24 hours postbirth). This was a24/7 KMC. Earlier KC group had higher (but not statistically significant) mortality within first 28 days of life, no difference in morbidity between groups, birth weight loss from birth till 24 hours of age was significantly less for early KC (~34.81 gms) than late KC (~73.97 gms), and no difference in adverse events and length of stay between groups. PT, RCT, 24/7 KMC, Early KC, mortality, morbidity, length of stay, weight, negative effects. Madagascar study (3rd world).

Nakai More stable thermoregulation when infants have continuous KC was cited in a paper. Susie find this citation

Fullterm, Very Early Kangaroo Care, nipple search, crying, development. Not on charts yet


Nakamura T, & Sano Y. (2008). Two cases of infants who needed cardiopulmonary resuscitation during early skin-to-skin contact with the mother. J. Obstet Gynaecol Res. 34(4 Part 2): 603-604. This is an article put out by the journal of the Japan Society of Obstetrics and Gynecology. Two case studies are reported. Infant #1 was female, 38 weeks gestation, 2907 gm birthweight with 1 minute APGAR of 8. Cord was clamped “soon after delivery and SS was started after the neonate was dried off” (pg. 603). Nurses found the pale, hypotonic and apneic infant on the mother’s breast at 5 minutes after birth, HR = 90, temp = 36.8, bag and mask resuscitation begun and HR =100 but infant had tachypnea and went to NICU were pH = 7.263; PCO2=55.4mmHg, pCO2=30mmHg, Base excess was -2mEq/L, BS =70mgdL. No infection, but nasal CPAP x 3 days. EEG on day 6 was normal, MRI of brain on day 10 was normal, infant discharged day 13 and neurological development at 1 year was normal. Infant #2: male, 40 weeks gestation, 3036 grams, APGARS were 8,9,9; cord clamped soon after delivery and SSc began after 10 minute APGAR. At 70 minutes postbirth nurse found pale, apneic, hypotonic infant at breast, HR=50, temp =36.0, bag and mask resuscitation quickly brought HR to 100 but infant went to NICU for paleness, pH =7.123, pCO2=28.8 mmHg; Po2=75 mmHg, BE = n-20mEq/L, BS =165 mg/dL. Had tonic seizures x 3 days; EEG on days 2 and 6 normal; MRI of brain on day 10 normal, discharged day 15, normal neurological development at one year. In conclusion, authors state that cardiopulmonary arrests occur in full term infants shortly after birth when not in KC, so a nurse should monitor color, respirations, tone, and heart rate throughout the first two hours postbirth. Descriptive, Full term, birth KC, negative outcomes, pH, pCO2, HR, Ianfection, CPAP, MRI, ALTE, life threatening events.


Namiiro, F.B., Mugalu, J., McAdamcs, R.M. & Ndeezi,G. (2012). Poor birth weight recovery among low birth weight/preterm infants following hospital discharge in Kampala, Uganda. BMC Pregnancy and Childbirth, 12(1), 1-?? Epub ahead of print. 235 preterm and/or LBW infants from the Kangaroo Mother Care unit were followed to determine by descriptive study how many had regained their birthweight by 21 days of life. 113 (48.1%) had NOT regained birthweight by 21 days postbirth and hospital stay longer than 7 days and initiation of first feeding after 48 hours of age were both independently associated with failure to regain birthweight by 21 days post-birth. Maternal factors and infant factors and physical exam were not associated with failure to regain birth weight. PT, Descriptive, 3rd world, weight


National Association of Neonatal Nurses (NANN). (2008). Pain Assessment and Management Guideline for Practice. 2nd Ed. This may or may not include Kangaroo Care now, must get it to determine. Available for $20.00 from NANN (same as next citation source). Product # 7061-291. PAIN, PT, FT

National Association of Neonatal Nurses (NANN) Board of Directors. (2009). Transfer procedure for ventilated kangaroo care wall poster. June 2009. This colorful laminated poster is a useful tool for units. The poster clearly and concisely outlines the transfer procedure for the ventilated infant receiving Kangaroo Care. Steps are presented for before transfer, for transferring the infant from the incubator into kangaroo care position, and from ventilated kangaroo care back to the incubator. Instructions are provided for both a sitting and standing transfer. Available for $15.00 from NANN at www.NANN.org or by calling in USA 1-800-451-3795. NANN product # 6010-244. Ventilated KC, transfer, guidelines, PT
National Association of Neonatal Nurses (NANN) Board of Directors. (2009). The Use of Human Milk and Breastfeeding in the Neonatal Intensive Care Unit. Position Statement #3046. Advances in Neonatal Care, 9(6): 314-318. On page 316 it states: “3. Transitioning the Vulnerable Infant to At-Breast Feedings. Skin-to-skin care provides a valuable opportunity for all mothers to feel connected to their infants. Prior to holding her infant skin to skin, the mother should pump her breasts to prevent the leakage of milk. In addition, skin to skin care is an important component of transitioning the infant from tube feeding to direct feeding from the breast. As a component of skin to skin care, nonnutritive sucking at the emptied breast during tube feeds can be initiated as soon as the infant is no longer ventilator dependent. PT, BF, National Guidelines

National Association of Neonatal Nurses (NANN) Board of Directors. (2012). The Use of Human Milk and Breastfeeding in the Neonatal Intensive Care Unit. Position Statement #3052. Advances in Neonatal Care, 12(1), 56-60. Of course, they promote use of human milk and breastfeeding and encourage all nurses to do it. The recommendations are 1. Assess Human Milk Supply, 2. Use Fortified Human Milk when needed, 3. Transition the infant to at-breast feedings and here, the first thing it says is “Skin to skin care provides a valuable opportunity for all mothers to feel connected to their infants and has been demonstrated to improve breastfeeding outcomes. Prior to holding her infant skin to skin, the mother should pump her breasts to prevent leakage of milk. In addition, skin to skin care is an important component of transitioning the infant from tube feedings to direct feedings from the breast. As a component of skin to skin care, nonnutritive sucking at the emptied breast during the feeds can be initiated as soon as the infant is no longer ventilator dependent.” Pg 58. KC is not mentioned in the conclusion. PT, National Guidelines. Breastfeeding

National Collaborating Centre for Primary Care (NCCPC). (2006). Postnatal Care. Routine postnatal care of women and their babies. See citation under Demot, Blick, Norman et al. 2006 FT

Naughten, F. (2005). The heel prick: how efficient is common practice? RCM Midwives, 8(3), 112-114. States that Kangaroo Care can be used to reduce heel stick pain. Review, Pain, FT, PT READ AND PUT ON Charts

Ndjaye O, Diouf A, Diouf NN, Cisse CT, Sylla A, Gueye M, Sall MG, Moreau JC, & Kuaakuvi N. (2006). Efficiency of kangaroo care on thermoregulation and weight gain of a preterm newborn cohort in Dakar. Dakar Medicine 51(3), 155-160. A retrospective survey of charts of preterms <2000 gm birthweight who were cared for in KC unit. Efficiency was conducted using thermic curve evolution and daily weight gain. 56 preterms (GA = 33 +/-7.6 wks; mean birthweight=1488 +/-277.6 gms) had mean temp “around 37.0 +/- 0.5°C at discharge (temp was satisfactory during follow-up and was stable at discharge from hospital”). Mean daily weight gain was 33.0 +/- 7.6 gms. Only one case of death occurred. KC is good for thermoregulation, weight gain, and survival of preterm babies and has low cost. Descriptive, Preterm, 3rd world, weight, temperature, mortality, cost. Not yet on charts

Nelson, J.M. (2010). This skin-to-skin thing really works. Journal of Obstetric, Gynecologic and Neonatal Nursing, 39(Suppl 1), S31-32. Reports a quality improvement project to educate labor and delivery nurses about Birth KC after hearing comments like “The patients don’t want to hold their babies.” “I haven’t seen that skin-to-skin does anything in my practice” “I don’t believe the research”, and “How will we ever get our assessments done?” (pg. S31). So they educated with theory and evidence, used a “coaches” among the staff model and support BIRTH KC in their “go live” period, collected success stories and shared them with peers in formalized process to identify and accentuate successes, and birth KC initiation rate data were collected. FT, Birth KC, Implementation, quality improvement, staff resistance, barrier

Neu, M. (1999). Parents' perception of skin-to-skin care with their preterm infants requiring assisted ventilation. JOGNN, 28 (2): 157-164. Nine parents (8 moms, 1 father) of ventilated preterms were interviewed and were apprehensive when first doing KC and needed support to do it with these infants. Parents valued the experience but needed intervention to alleviate apprehension, enhance autonomy feelings, and modify environment. Those who continued with KC had more active parenting role. Preterm, descriptive, vent KC, FATHER, Qualitative study.
Neu M. (2004). Kangaroo Care: Is it for everyone? Neonatal Network 23 (5), 47-54. Qualitative study of two interviews with mothers, one B4 & one after discharge asking them to relate their experience of holding in the NICU and at home. Mothers who held in KC and who held swaddled infants were interviewed. KC moms had no anxiety, no frustration, and no fatigue (pg. 50) and perceived many benefits of close contact with the infant. 4 mothers who switched from KC holding to swaddled holding expressed emotional distress (pg. 53). Building a trusting relationship and providing individualized attention about holding the infant are important for all mothers of preterms, even when they appear competent and satisfied because they may not be discussing their feelings of emotional distress or dissatisfaction with nurses in the NICU. Preterm, descriptive, Qualitative, maternal stress/distress, anxiety, fatigue, swaddled holding, KC at home.

Neu M., Browne, J.V. & Vojir, C. (2000). The impact of two techniques used during skin-to-skin care on the physiologic and behavioral responses of preterm infants. Nursing Research, 49(4), 215-223. 15 ventilated preterms (MGA=30.2wks; Mwgt=1094g, Mage=18.3days) each received one day each of transfer by nurse (sitting) or transfer by parent (standing)(14 Moms, 1 Father) on 2 consecutive days in random order in interrupted time series, cross over design. Min-by-min HR, S02 recorded manually for 30 min B4 & after transfer & every minute during 1 hr of KC. Axillary Temp was stable, HR increased, S02 decreased and there was more motor disorganization with transfer but returned to baseline during and after KC regardless of transfer technique. More physiologic and motor disorganization, less self-regulation, more need for caregiver support during transfers than during pre, post, and KC periods. During and after KC, infants showed NO SIGNS of ENERGY DEPLETION. VENT KC, FATHER, Infant own control. HR, S02, Temp, motor movements, energy conservation, self-regulation, SITTING and STANDING transfer, PT.

Neu M, Laudenslager ML, & Robinson J. (2009). Co-regulation in salivary cortisol during maternal holding of premature infants. Biologic Research for Nursing, 10(3), 226-240. Doi: 10.1177/1099800408327789. A descriptive study of 20 mother-infant dyads (14 did KC for 60 minutes and 10 did swaddled holding) at 34.7 weeks (mean of 15 days old) who had salivary cortisol samples taken when mothers first picked up KC or swaddled infants and 60 minutes after KC or swaddled holding began. Co-regulation was defined as minimal difference between maternal-infant cortisol levels immediately after KC holding as compared to before KC holding. Salivary cortisol data from mothers and infants did not distribute normally, so were log transformed. When infants were held, either in KC or swaddled, the mean mother-infant difference in salivary cortisol after holding was less than the mean difference before holding, showing a moderately strong trend toward co-regulation of HPA activity (effects size was moderate = .50). The strongest factors predicting a change from before-to-after holding in HPA scores were not KC and swaddled holding, but were noise level and use of antenatal steroids. Noise was the only independent significant predictor (if you want salivary cortisol to drop, drop the noise level of the environment- KC did not make salivary cortisol level drop [which is contrary to Mooncey et al.1997, Modi & Glover, and Morelius et al. 1998 and Morelius et al.2005 studies]. When the mothers quietly held the sleeping infant or consoled a fussy infant by gentle stroking or patting, these activities were not related to a decrease in salivary cortisol levels and did not amplify or detract from overall effect of KC and swaddled holding. Descriptive comparative study, swaddled holding, salivary cortisol, lighting, PT. Studied at late preterm/nearterm age Noise level increases stress, massage. SEE Neu M, Goldstein, M, Gao D, Laudenslager ML (2007) Salivary Cortisol in Prematures: Validation of a simple method. Early Human Development, 83(1), 47-54.

Neu, M., & Robinson, J.A. (2010). Maternal holding of preterm infants during the early weeks after birth and dyad interaction at six months. Journal of Obstetric, Gynecologic, and Neonatal Nursing, 39(4), 401-414. A randomized controlled trial of 65 mother infant dyads of mean GA of 33 wks. An 8-week home intervention of daily 1-hour uninterrupted KC or wrapped and held in mother’s arms was conducted. Weekly home visits were made to provide encouragement to hold the infant, emotional support, and info about infant behavior and development. Mothers completed the Edinburgh scale for DEPRESSION and State Trait Anxiety(have to get article to relate these outcomes).At 6 months the still face test for maternal-infant interaction was done. KC infants had more coregulation behaviors during play than blanket-holding group. No differences between groups in infant vitality during neutral face. KC in the early weeks of life helps infants develop more co-regulation strategies. She reports trouble recruiting mothers to KC holding and noted that, although the mothers were informed about benefits of KC, they rarely practiced it or did so only with support from nurses. PT, RCT, Home KC, psychosocial development, coregulation, attention,
interaction, swaddled, long term development outcome, 6 months. Mutual caregiving has become co-regulation, Little KC going on, Depression, Maternal Anxiety, duration one hour. Not on charts

Neves, P.N., Ravelli, A.P. & Lemos, J.R. (2010). Humane care newborn low-weight (kangaroo mother method): mother’s perceptions. Review Gauche Enfermeria, 31(1), 48-54. From August to October 2006 6 Brazilian mothers were included in a qualitative study using semi-structured interviews to determine their perceptions of how KMC helped them accomplish breastfeeding. The specific areas investigated were Maternal Experience with KMC (the method per se and then maternal breastfeeding, and experiences with kangaroo practice) and KNOWLEDGE of KMC. Nursing plays an essential role introducing families to KMC and providing care. No results of BF listed in the abstract and the article is in Portuguese. PT, BF, Qualitative study, 3rd world, maternal feelings, nursing support.


Newman, J. (2009). Importance of Skin-to-skin contact. Posted on Facebook by Janel Martin Feb. 23, 2010. This is a summary of the effects of KMC and it is interesting that he is using special words used by speakers without acknowledging who the original authors were, and he does not cite any references for any of the studies reviewed. I think this is an ad for people to visit his breastfeeding practice. Available at Natural Child Project website which is: www.naturalchild.org/guest/jack_newman2.html . Accessed 9/11/2011. Review, FT, PT.


New York Daily News, 2010 (August 26). Miracle at Birth: Mother Revives Dead Infant with Kangaroo Care. See CNN 2010 for the full story as I know it. FT. Case study, Life threatening event – dead baby revitalized, Birth KC.

Nguah, S.B., Wobil, P.N., Obeng, R., Yakubu, A., Kerber, K.J., Lawn, J.E. & Plange-Rhule, G. (2011). Perception and practice of Kangaroo Mother Care after discharge from hospital in Kumasi, Ghana: A longitudinal study. BMC Pregnancy Childbirth, 11(1), 99-?. A longitudinal study of 202 mothers and their inpatient LBW neonates was conducted from November 2009 to May 2010. Mothers were interviewed at recruitment to ascertain their knowledge of KMC, and then oriented on its practice. After discharge, the mothers reported at weekly intervals for four follow up visits where data about their perceptions, attitudes and practices of KMC were recorded. A repeated measure logistic regression analysis was done to assess variability in the binary responses at the various reviews visits. At recruitment 23 (11.4%, 95% CI: 7.4 to 16.6%) mothers knew about KMC. At discharge 95.5% were willing to continue KMC at home with 93.1% willing to practice at night. 95.5% thought KMC was beneficial to them and 96.0% beneficial to their babies. 98.0% would recommend KMC to other mothers with 71.8% willing to practice KMC outdoors. During the follow-up period the neonates gained 23.7g (95% CI: 22.6g to 24.7g) per day. Maternal knowledge of KMC was low at outset. Once initiated mothers continued practicing KMC in hospital and at home with their infants gaining optimal weight. Continued KMC practice was not affected by perceived community attitudes. PT, Descriptive study, one group,
Kangaroo mother care: effect and perception of mothers and health personnel. *J Neonatal Nursing*, 12, 177-184. KMC tested on LBW babies nursed in NICU (n=31) or in OB unit (n=19) in 3rd level NICU in INDIA. NICU infants were mean GA of 33.88 wks and OB units were 36.41 weeks. Mean weight of NICU was 1790(400) grams and OB was 2310 (130 grams). Non-random purposive sampling of one group of 50 stable LBW babies 29-41 weeks GA (1070-2460 gm birth weight). Data were collected in four sessions just before starting KMC, 30 minutes after KMC started, just before ending KMC and 30 minutes after ending KMC on one day of study. Each infant had 4 sessions of KMC that lasted for a mean of 43.43 (SD 15.61) minutes per day for 4.55 (2.91) days in NICU starting at 9.48(1.18) days of age and in OB unit they got 1.14 (0.23) sessions per day that lasted 44.36 (34.88) minutes/session for 3.32 (0.95) days starting at 2.32 (1.53) days of age.

Effect on physiologic variables comparing routine care pretest and posttest to two measures taken during KC. Axillary temp in NICU were higher than in OB unit for all time intervals (just B4 KC, 15 minutes into KC, just before discontinuing KC, and 30 minutes after KC ended. Temps dropped in NICU group (pretest = 97.7 and KC =97.5) but stayed within normal limits and no differences between periods. Temp in OB unit rose from 97.1 pretest to 97.3 KC and was 97.2 at posttest. Mean HR increased by 4-5 beats/min from preKC to KC 15 minutes after start of KC and then rose again by 1-2 beats/min from 15 mins ofKC to end of KC and then dropped by 5-6 beats/min in posttest in NICU group (OB unit HR rose by 3-4 in first 15 mins of KC then another 4-5 beats/min til end of KC and then dropped 4-5 beats/min in posttest and there were no differences between the periods for either group (pg. 181); oxygen saturation increased during KMC for both NICU and OB units and dropped in posttest but stayed within normal limits and no differences between periods(pg.181). Similar findings as SaO2 were found for RR (NICU pretest=44.43, KC 1 = 46.02, KC2=46.81 and postKC=43.78; OB unit was 43.27-45.38KC1 – 46.8 at KC 2 –44.08 at postKC. Change in weight from time of KC start to discharge showed weight change was within normal limits, no adverse effects of KMC on weight. No changes occurred in any parameter across the four periods. Mothers and health personnel had positive perceptions (73%) respondents for 6 weeks reported “makes baby feel secure” (21.2%), provided warmth (78.9%), aided weight gain (51%), improved bonding (100%), increased milk production (33.3%), made mother more confident (45.6%) and more satisfied (72.7%) . KMC is feasible with stable, 1000 grams or more infants., No descriptions of routine care in NICU and OB unit.

PT, repeated measures descriptive study pretest-test-posttest, HR, RR, SaO2, Temp, weight, staff perceptions, maternal feelings, 3rd world. Late Preterm/NEarterm, residual effects.


Nissen E, Lilja G. Widstrom AM, & Uvnas-Moberg K. (1995). Elevation of oxytocin levels early postpartum in women. *Acta Obstetrica & Gynecologica Scandinavica* 74_530-533. It is highly probable that skin-to-skin contact by itself stimulates oxytocin release. Thus, KC may assist in delivery of placenta and involution when used in early postpartum. FT, RCT?? sounds descriptive, one group, Oxytocin, delivery KC. Get this as we don’t have.

Nolan, A., & Lawrence, C. (2009) A pilot study of a nursing intervention protocol to minimize maternal-infant separation after cesarean birth. *Journal Obstetric, Gynecologic and Neonatal Nursing*, 38(4), 430-442 DOI: 10.1111/j.1552-6909.2009.01039.x Randomized controlled trial of 50 live repeat cesarean section singleton births >37 weeks which were given treatment during intraoperative and immediate postoperative periods (care in postanesthesia care unit). NIMS (n=25) or control (n=25). NIMS was Nursing Intervention to Minimize Separation and on page 433...
the procedure is clearly spelled out. NIMS was baby never more than 8 feet away from mom, and mom could see infant at all times. When infant handed to nurse, infant take n to radiant warmer for resuscitation, drying, and stabilization for 10 min. Then mom given infant to look at en face intraoperatively for 5-15 seconds, then placed cheek to cheek for at least 3 minutes as nurse held infant, then infant held by nurse within 8 feet of mom or given to mom to hold for rest of surgery. Baby put in cot and rolled to recovery(PACU) beside mom so always within 8 feet and can see each other. Transfer took 5 minutes. In PACU baby put in radiant warmer for routine weighing, banding etc while mother’s admission to PACU assessment was made (10-15 minutes). Then KC began (beginning >30 minute post birth) either ventral to ventral, ventral to lateral contact, or modified cradle contact (lateral contact in maternal axilla). Control was infant not in the same room with mom at all. One NIMS mom reported no shaking. KC infants had better HR, RR, and temp stabilization and lower cortisol levels than controls. KC moms had less anxiety and more satisfaction with their care. GET REST OF RESULTS

Nommersen-Rivers, L. (2003). Early skin-to-skin contact: Does duration matter? J. Human Lactation, 19 (3), 331-332. This is a review of Mikiel-Kostyra et al., 2002 study. Cites Baby Friendly’s guideline that step 4 is to “help mothers to initiate BF within 30 minutes of birth.” She states that in Mikiel’s study the duration of KC was very brief, lasting only 1-4 minutes for 58% of the mothers. Only 6% had KC for 20 minutes or more, 76% had it for 1-19 mins, and 18% had no early contact at all. Irrespective of the duration of KC, 97% initiated KC within 10 minutes of birth. Duration does affect EXCLUSIVITY OF Breastfeeding: no contact group had an exclusive BF duration of 2.47 months, Group who had 1-19 mins of KC had 2.77 months exclusive breastfeeding, and >20 minutes had 3.82 months; any BF had similar pattern: no KC = 6.97 months, 1-19 minutes of KC = 8.33 months, and >20 minutes of KC = 9.07 months.> 30 minutes KC = 10.07 months of BF. KC >20 minutes and education beyond high school were significant predictors of EXCLUSIVE BF duration. REVIEW OF OTHER STUDY, VEKC, Exclusive BF, See Mikiel-Kostyra et al. 2002.


Nye, C. (2008). Transitioning premature infants from gavage to breast. Neonatal Network, 27(1), 7-13. A review of methods to transition infant to breastfeeding. Measures that help transition to the breast are KC, nonnutritive sucking, avoidance of bottles, and consistent and supportive staff. On page 9 there is a section on KC, says start KC as soon as infant is off ventilator. Says effects of KC on weight gain remain unclear according to Dodd 2005 who cites improved weight gain by Charpak (but not by Rojas). She states that “placing the infant in KC shows faith in parents’ current and future ability to care for their infant, and the intimacy and respect in the NICU environment may explain the greater sense of competence, improved breast milk production, and breastfeeding success seen in mothers who kangaroo their infants” (pg 9). On page 11 there is Table 1 - a NO Bottle protocol for BF premature infants <34 weeks Gestational Age, and KC is in 4 steps: “For the use of KC in this protocol: When the infant is physiologically stable, he will participate in KC with his mother.” “The mother will pump her breasts prior to time spent with the infant in KC.” “During KC, the infant will be placed in a breastfeeding position and allowed access to the breasts for nonnutritive sucking.” And “The infant will be provided with a pacifier during all gavage feedings when the mother is not present to provide KC.” PT, review, ventilator KC, breastfeeding. Not on charts yet.

Nyqvist, KH. (2004). How can Kangaroo Mother Care and high technology care be compatible? J. Human Lactation, 20 (1), 72-74. This is an implementation article that answers the questions, How can someone work with NICU staff to overcome barriers, whether perceived or real, to implementing KC? Answer is 1) educate everyone KC’s + effects, and 2) reach an interdisciplinary agreement about practical, evidence-based guidelines that ensure safe and consistent care. This article includes the policy at Children’s Hospital in Uppsala, Sweden. PT, Implementation, Policy/Guidelines.

Breastfeeding program in which 97% of lowbirthweight infants were fed breastmilk upon discharge are conveyed. On page 36 is a section entitled “Kangaroo Mother Care” under the heading “Models of care that support breastfeeding.” In this section she reites previous work showing that KMC has high BF success rate. On page 40 she has a section entitled “skin-to-skin contact” under “Feeding policy: A Swedish Example.” in which she states that infants who are ventilated are provided KMC as soon as they show adequate physiological stability in connection with transfer out of and back into incubator.” They avoid KMC during first week of life for infants <1000 grams to prevent hypothermia. Other than signs of severe bradycardia, apnea, or desats, there are no restrictions for KMC in frequency and duration. Clinical report, Preterm, BF, Ventilated, Guidelines, sxs of apnea, sxs of bradycardia, sxs of desats, transfer of ventilated infants.

Nyqvist KH. (2008). Early attainment of breastfeeding competence in very preterm infants. Acta Paediatrica 97(6), 776-781. KMC helps with early attainment of BF competence. A prospective descriptive study of 15 infants and their mothers (26–31 wks Gestation) using the Preterm Infant Breastfeeding Behavior Scale for daily assessment of oral motor behavior in hospital. BF was initiated at 29 weeks postmenstrual age and rootine, areolar grasp, and short sucking bursts were present at 29 weeks and occasional long sucking bursts and repeated swallowing appeared at 31 weeks. Full BF was attained at median 35 weeks (Range was 32-38 weeks). On page 776, the article relates “Although there are numerous reports of early discharge of healthy breastfed preterm infants who were treated with Kangaroo Mother Care mentioning benefits of this method of care on lactation and breastfeeding, these studies did not provide any data on the development of infants’ oral motor competence” and she cites Ruiz-Pelaez, Charpak, & Cuervo, 2004 and Cattaneo, Davanzo, Worku, Surjono, Echeverria, Bedri et al., 1998). On page 780 it states “There is sufficient evidence that the KMC model, applied in its fulness with continuous skin to skin care (or as much SSC as possible) is the optimal method for infant thermoregulation (cites Ruiz-Pelaez et al., 2004). AS shown in several studies, extended SSC also facilitates the mother’s milk production and earlier attainment of breastfeeding (citing Whitelaw et al., 1988 and Hurst et al, 1997). On page 780 she states that the mother’s presence should be taken for granted and adequately supported in her capacity as optimal/natural caregiver and the optimal ‘place’ for her infant’s care.” pg. 780 PT, Breastfeeding, KMC is PLACE of care, NOT ON CHARTS 5/24/2011

Nyqvist KH, Anderson GC, Bergman N, Cattaneo A, Charpak N, Davanzo R, Ewald U, Ludington-Hoe S, Mendoza S, Pallas-Alonso C, Pelaez JG, Sizun J, Widstrom A-M. (2010). State of the art and recommendations. Kanagaroo mother care: application in a high-tech environment. Acta Paediatrica 99(6), 812-819. Or DOI:10.1111/j.1651-2227.2010.01794x pgs. 1-8. These are additions to the WHO’s practical guidelines so that the book has universal appeal and can be used to guide KMC implementation world wide, just like WHO started the Baby Friendly movement. But WHO’s practical guidelines have not included KMC in advanced settings, such as NICUs in developed countries. So these add those components. Has an historical overview of neonatal care in affluent settings, then why KMC in these settings matters (to avoid maternal-infant separation, provides a thermally controlled environment, improves maternal well-being and less chance of depression, has many physiological benefits to moderately preterm and full term infants, and then states that after the first week of life, infants born at 22-25 wks gestation tolerate KMC well but could not find any published reports with infants less than moderately preterm – pg 2). The next section is Aims of KMC (support infant’s optimal adaptation to extrauterine life, provide optimal neurosensory environment for brain development, facilitate maternal-infant bonding and attachment, empower mother as primary caregiver, facilitate initiation of lactation and breastfeeding, prepare a successful discharge.(pg. 2). They proceed to “Information for parents” (give it before delivery, should know benefits, how and when it is practiced, who can do it (i.e. father during cesarean section), and provide follow-up conversations (pg. 3). When to start KMC has 3 sections (>32 wks [cared for continuously in KMC, initial assessment performed on mother’s chest in delivery (preterm birth KC) when possible or in connection with stabilization, introduce KMC immediately after initial stabilization in infants with mild problems provided infant is stable enough to tolerate care in the KC position and that this is permitted by the infant’s needs”(pg. 3). After initial stabilization, infants with CPAP treatment can be transported to the mother’s bed in the delivery unit. A nurse lifts the infant and places her/him in the kangaroo position on the mother’s chest”(pg. 3)], 28-31 wks [KMC can sometimes be initiated immediately after the initial assessment, provided that the infant is considered stable enough and that care in the
The kangaroo position is permitted by the infant’s condition and requirements for technological support (pg.3), and 26-27 wks [KMC can be applied during the first week of life based on current assessment by attending neonatologists” pg. 3], infants born <25 wks GA: KMC can be applied during the first four weeks of life based on ongoing assessment by the attending neonatologists. The goal of the infant’s care should be to gradually increase the proportion of KMC to 24 hours/day, pg. 4]. “When to start KMC after cesarean section/maternal surgery or illness “infant may be cared for in the kangaroo position by the father/substitute from birth. When the mother is not under general anesthesia during the cesarean section and it is feasible considering the mother’s care, the infant can be placed skin-to-skin on the mother’s chest for a short period of time before being placed on the father’s chest. When the infant does not need ventilator assistance and is born at a GA of at least 28 weeks, the infant can be transferred to the NICU in the kangaroo position on the father’s chest (pg. 4). When the mother requires treatment in another hospital ward, such as adult intensive care, the infant can be transported to her in the kangaroo position by the father… who stays with the infant for observation and care as long as possible, and offer the mother skin-to-skin contact to the extent that this is possible, considering the infant’s and the mother’s condition”(pg.4). KMC clothing (tube top, binder, blouse/shirt are available and types of clothing) should be demonstrated for the mother and the mother should be given assistance in putting them on if she wishes. The infant should wear a warm cap and a diaper.” pg. 4. The next section is Transport of the infant in kangaroo position from the delivery/operating room to the NICU (whenever possible on the mother’s chest, or on chest of father/other family member; KMC clothing is brought to the delivery room (binder, tube top etc, and a hat for the infant in a special bag that is included in the standard equipment on the transport incubator), and depending upon clinical stability the possibility of KMC transport is assessed by the attending neonatologist regardless of gestational age (pg. 4)”. The next sections are “transfer between incubator and mother with standing sitting, and ventilator assistance transfer addressed, Infant instability and KMC (only severe instability during handling (apnea, brady and desaturation during repositioning and touch during routine caregiving) should be considered an obstacle to KMC. Guide parent in recognizing signs of infant instability.” Pg.5). When infant is in Kangaroo position, be sure top is tight, plan infant care with parents, calm and quiet environment, offer mirror, and when short interruptions cannot be avoided, place infant on a water bed on the parent bed instead of in an incubator or crib/cot. Feeding and Nutrition are next, facilitation of KMC in infants with intensive care, physiologic monitoring, caregiving activities in the kangaroo position, staff responsibility, documentation, KMC in special situations, KMC and infant instability. Policies for NICU KC should include specific criteria for initiation, the proper KC position, transfer to/from KMC, transport in the KC position, KC nutrition, parents’ role, modification of the NICU environment, performance of care in KMC, and KMC in case of infant stability. International GUIDELINES, Birth KC even for preterms, cesarean, transport, stability, transfer, clothing, extremely preterm, moderately preterm, full term, paternal KC, surrogate KC. Not on charts as of 3/20/2010.


Nyqvist KH, Anderson GC, Bergman N, Cattaneo A, Charpak N, Ewald U, Ibe O., Ludington-Hoe SM, Mondoza S, Pallas K, Ruiz-Pelaez JG, Sizun J., & Widstrom A-M. (2010). Towards universal Kangaroo Mother Care: Recommendations and report from the First European Conference and 7th International Workshop on Kangaroo Mother Care. Acta Paediatrica, 99(6), 820-826. DOI:10.1111/j.1651-2227.2010.01787.x. This document summarizes key note addresses at the conference, the product of the workshop groups and concludes with our recommendations for KMC with preterm infants in community, level 1,2, and 3 hospitals in underdeveloped, developing, and developed nations. The article traces the history of KMC, that two forms of KMC exist (continuous, 24/7 called C-KMC and intermittent KMC called I-KMC), that KMC is practiced in varying durations (from 10 minutes [Acolet et al., 1989] to a mean of 13.5 hours per day[Rao et al., 2008]). It summarizes positive effects of studies to date (i.e. pain, stable cardiorespiratory condition, breastfeeding, bonding, infection, weight gain,etc), and then relates that even though guidelines exist (WHO, 2003; Fundacion Canguro, 2007; Ludington-Hoe et al., 2008) practice is still not widespread. The next section relates summaries of presentations: for thousands of years mothers
and infants have had very high levels of skin-to-skin contact, verbal and focal interaction, prompt response to crying and nursing of about 4 times/hour. Consequences of departures from this pattern are unknown, but we have moved from “native closeness” to “industrialized separation.” Oxytocin is a major hormone released during KMC. A new view of KMC is from the feminism perspective in which children are perceived as objects of social planning, and with industrialization maternal decision making was removed and fixed feeding and child care schedules were established. Bergman reported on increased stability with KMC beginning immediately after birth to ease preterm infant transition from intra-uterine to extra-uterine environment. Conclusions are that KMC enhances bonding and attachment, reduces maternal postpartum depression symptoms, increases parental sensitivity to cues, contributes to establishment and longer durations of breastfeeding, and has positive effect on infant development and infant/parent interaction. Intrapartum and postnatal care in all types of setting should adhere to a paradigm of non-separation of infants and their mothers/families. KMC should begin as soon as possible and be applied as continuous skin-to-skin contact to the extent that is possible and appropriate and continue for as long as possible.

Guidelines, PT, Review, NON-separation., pain,


Nyqvist, K (actually listed as Hedberg Nyqvist, K) & Heinemann, A-B. (2011). Kangaroo Mother Care: Optimal support of preterm infant’s transition to extra-uterine life in the high tech NICU environment. Current Women’s Health Reviews, 7(3), 278-287 doi:10.2174/157340411796355171. This article describes practical guidelines for 24/7 KMC in a tertiary level NICU in Sweden (Uppsala). The guidelines are based on the norm of parent-infant non-separation and infant care in the kangaroo position and were based on observations and research of infant’s and parents’ responses during gradual implementation of components in the guidelines. Ideally KMC is initiated and continues uninterrupted in infants born at ≥ 32 weeks, also after cesarean and this is also possible at 28-31 wks gestational age. For infants <27 weeks Gestation, intermittent KMC can be introduced during the first week of life based on individual assessment. The guidelines describe initiation, infants and parents positions, transport, transfer instability, support of the parental role, and early discharge. KMC, as continuous as possible, should be the norm for preterm infants. PT, review, guidelines, c/s, transport, transfer, NICU environment, family support, non-separation. Not on charts 10/2/2011.

Nyqvist KH,& Kylberg E. (2008). Application of the Baby Friendly Hospital initiative to neonatal care. Suggestions by Swedish mothers of very preterm infants. J. Human Lactation 24(3), 252-262. Qualitative. 13 mothers of very preterm infants were interviewed 2-6 months post-discharge to get their suggestions regarding modification of the Baby Friendly Hospital Initiative. 15 suggestions emerged: 1. respect for mothers individual decisions about BF, 2. education of staff in specific BF knowledge and skills, 3. antenatal lactation information in event of preterm birth, 4. KMC, 5. breastmilk expression, 6. early introduction of breastfeeding, 7. facilitation of mother’s 24 hour presence in NICU, 8. preference for mother’s own milk, 9. semi-demand feeding for transition to demand breastfeeding, 10. special benefits of pacifier sucking, 11. alternative strategies for reduction of supplementation, 12. use of bottle feedingwhen indicated, and 13. a family centered supportive physical environment, 14. support of father’s presence, and 15. early transfer of infants’ care to parents. And 13 steps also emerged, many similar to the BFHI’s steps now (these begin on page 256). Step 5 (pg.e 257) is “encourage early, continuous, and prolonged mother-infant skin-to-skin contact (KMC) without unwarranted restrictions, and offer opportunities for mothers to remain together with their infants 24 hours a day.” All mothers had been separated from their infants and regarded this step as the most important item in a breastfeeding policy.” 9pg. 257). Most moms had given KC for 6 hours/day and reported that infants were calmer in KC and picked up good family bacteria. When father did KC, infant knew him well before discharge. Probes were conflicting staff opinions about timing and duration of KC and differences in helpfulness. Mothers also recommended co-care (mother and father staying together with the infant in a single room and providing the infant’s care – p.g 258). Preterm, policy, breastfeeding, implementation, Baby Friendly.
Nyqvist, K.H., Sjoden, P-O., & Ewald, U. (1994). Mother’s advice about facilitating breastfeeding in neonatal intensive care units. *Journal of Human Lactation, 10*(4), 237-243. 178 mothers felt that deprivation of early contact with infants was a cause of BF failure.” Ample opportunities for early skin-to-skin contact should be offered both mothers delivered vaginally and by cesarean section in order to compensate the delayed physical contact with the infant.” p.240. *Descriptive, BF, cesarean section, separation, FT, PT*


Odent, M. (1989). Natural caregiving in home births. *Mothering, Winter,* 72-73. Get complete citation Clinical impressions over 70 homebirths in which KC occurred continuously in an intimate environment with unlimited BF access over the first hours and days after home birth. 33% of homebirth babies and continuous immediately KC with BF in KC do not lose birthweight while birthweight loss is regular phenomenon in Netherlands where they have restricted KC in homebirths. He even says that sustained KC outside the familiar home environment is inadequate to prevent birthweight loss. He proposes that KC in a familiar birthing context produces less infant stress (physiologic stress of newborn is immediately alleviated by arms of ecstatic mother, minimizing energetic output and stopping wgt loss. Another mechanism to prevent birth weight loss is that babies take in more colostrums than thought possible and colostrums has lots of IgA antibodies (proteins with huge osmotic charge can hold lots of water), so when baby takes colostrum, he increases his capacity for water retention, and colostrums has enzymes important to metabolism, large bioavailability of zinc (and these are growth related substances), and normal colostrums ejection reflexes (let down) don’t work if we separate the infant right after birth (pg. 73). Birth weight loss is not a physiologic necessity. *Clinical report, weight, KCBF, FT antibodies in milk, stress, separation*

Odent, M. (2006). From Homo Super-predator to Homo Ecologicus. Available from http://www.wombecology.com/homo.html#top. This is a theory and review article on the human’s ecology that Odent first published in 1979. The natural ecology is for the infant to be skin-to-skin with the mother. Primal health is a branch of epidemiology that brings together studies exploring correlations between what happens during the primal period (fetal life, perinatal period and the year following birth) and what occurs later in life in terms of health and personality traits. Such studies are compiled in the Primal Health Research Data base at www.primalhealthresearch.com FT, ecology, separation

Ogi S, Arisawa K, Takahashi T, Akiyama T, Goto Y, Fukuda M, & Saito H. (2001). The developmental effects of an early intervention program for very low birthweight infants. *No To Hattatsu, 33* (1), 31-36. KC group got NBAS as intervention at 40 weeks PCA and then 44 wks (or may be from 38-44 wks for treatment) of KC starting at 38 weeks PCA. NBAS used at 44 wks, Bayley at 12 months. KC group scored higher on orientation, motor performance, state range & regulation tasks, supplementary on NBAS, lower scores in intensity and higher scores in Mood on Carey at 6 months; at 12 month KC infants had higher Bayley Mental and Motor Scales. KC promotes neonatal behavioral organization and developmental outcome over 1st year of life. *Development, NBAS, PT, Temperament. Longitudinal non-randomized as KC grp compared to historical control, state regulation.*


(2002). The effects of kangaroo care on neonatal neurobehavioral organization, infant development and temperament in healthy low-birth-weight infants through one year. J. Perinatology, 22 (5), 374-379. 26 KCers (healthy LBW1500-2100 gms birthweight, singleton, no prob, no single moms, no welfare moms) got 20min-2 hours of KC per day from 33 wk-40 wks PCA and were compared to 27 controls who got no KC (were studied in years before KC started in hospital, therefore not a randomized controlled trial). Birthweights were between 1501-2099 gms Maternal or Paternal KC started at 1-3 days age and first KC were 20-30 min long and then extended to 1-2 hours. KCers showed significantly higher scores in orientation [animate visual, auditory and visual-auditory orientation, alertness, cuddliness, self-quieting, attention, irritability (decreased), and state regulation], state regulation and on supplementary items on NBAS, lower scores in Intensity and higher scores on MOOD at 6 months on Infant Temperament Questionnaire than 27 standard care infants. At 12 months, KC scored higher on Bayley Mental (significant) and Motor (but not significant). KC effectively promoted neonatal behavioral organization and enhanced developmental outcome over 1st year of life. HOME scale also conducted at home visits at 6 and 12 months (no differences between groups). So, at 40 weeks, KCers were more alert, more responsive, less irritable, less fussy, had better state control, could concentrate their attention and orientation responses better, had higher capability for state regulation, had less stressful reactions in autonomic, state and motor systems

**Non-randomized trial with historical control, NBAS@40wks, Bayley and Carey Temperament at 6,12 mos. Development, autonomic nervous system, HOME, orientation, attention, PT, calming, relaxation, attention, state regulation**

Ohio Department of Health. (2008). *Hold me, Mom.* Columbus, Oh: Ohio Dept. of Health Printing, Warehouse #3977.23. Has breastfeeding cards that WIC is giving out and the words are “Hold me, Mom. Babies who are held skin-to-skin on their mother’s chest right after birth are happier and less likely to cry, are more likely to latch on and breastfeed well, have better heart rates, have better temperatures than under a warmer, have better blood sugars, burn less calories than under a warmer. So, be sure to tell your doctor and the hospital nurses that you want to hold your baby for at least the first hour after the birth, skin-to-skin (baby naked, not wrapped in a blanket). That’s the best way to introduce your baby to the world.” Available from [GMORROW@ohiohealth.com](mailto:GMORROW@ohiohealth.com), FT, pamphlet

Okan, F., Ozdil, A., Bulbul, A., Yapiçi, Z., & Nuhoglu, A. (2010). Analgesic effects of skin-to-skin contact and breastfeeding in procedural pain in healthy term neonates. *Annals of Tropical Pediatrics, 30*(2), 119-128. Doi: 10.1179/146532810X12703902516121. A randomized controlled trial of 3 groups: breastfed in KC (n=35); held in KC but no breastfeeding (n=36), and lying on table before, during and after heel stick (n=36). Mean birthweight was 3355 grms (SD=270), GA of 39.5 wks (SD=0.5), mean postnatal age was 33.1 (SD=5) hours when heel stick occurred. NO difference in group characteristics and time spent doing heel stick. HR, SaO2, and crying length were significantly reduced in breastfeeding in KC and KC without BF groups compared to no intervention; no differences between KC+ breastfeeding and KC without BF groups, but KC alone group had less grimacing than controls. **Full TERM, RCT, HR, SaO2, crying, grimacing, Pain, BF + KC, KCBF CHECK on CHARTS**

Olanders, M. (2011). Kangaroo Mother Care. An interview with Dr. Nils Bergman. Available from [http://home.mweb.co.za/to/tonrgren/eng-berg.html](http://home.mweb.co.za/to/tonrgren/eng-berg.html). Mother’s body is the only natural, healthy environment for a new baby and he talks about protest despair response (separation), the right environment also means free breastfeeding, the developmental of the brain is benefitted and normalized by skin contact, and that mothers need support. **Not on charts 9/15/2011.** FT. brain dev, BF, separation.


Olausson, H., Lamarre, Y., Backlund, H., Morin, C., Wallin, B.G., Starck, G., Elholm, S., Strigo, I., Worsley, K., Vallbo, A.B., & Bushnell, M.C. (2002). Unmyelinated tactile afferents signal touch and project to insular cortex. *Nature Neuroscience, 5*(9), 900-904. Human hairy skin has dual tactile innervation: fast conducting myelinated A- afferent fibers, and slow conducting unmyelinated (C) afferents that respond to light, caressing touch. Activation of C tactile (CT) afferents produced faint sensation of pleasant touch. Activation of C-Tactile fibers in skin activate the insular cortex (limbic system), not somatosensory areas of S1 and S2. CTactile Afferents is a system for limbic touch that
underlies the emotional, hormonal, and affiliative responses to caress-like, skin-to-skin contact between individuals. **Touch physiology. KC as pleasant experience.**

**Brain studies**

Olausson, H., Wesberg, J., Morrison, I., McGlone, F., & Vallbo, A. (2010). The neurophysiology of unmyelinated tactile afferents. *Neuroscience and Biobehavioral Reviews, 34*, 185-191. NOT a KC study, but the physiology of the c-afferents that KC’s skin-to-skin contact stimulate. Need 3 centimeters of exposure to be activated, they are exquisitely sensitive. (See also Bystrova, 2009; Loken, LS et al., 2009; and Bjornsdotter M et al., 2009, Lindgren et al. 2011). **Brain studies,**

Oltman BL., & Schmidt CL. (1999). The Effect of Kangaroo Care on the Development of the Preterm Infant. Doctoral Dissertation from North Georgia College and State University. Available from Dr. Sherri Williams, Dissertation chair, Dept. of Physical Therapy. Barnes Hall, R. A-8, Dhlonega, GA 30597, 706-864-1969. A randomized trial of 5 KC and 9 routine parental holding of 27-32 wk PCA premature. KCers got 30 min/day x 4 days/wk x 4 wks. Control got adlib parental visiting and holding x 4 wks. At end of 4th week, no differences between groups on weight gain, Test of Infant Motor Performance, and Maternal Attachment Inventory and length of stay – but KC infants had significantly lower PCAs at entry. **PT, RCT, MOTOR DEV, Maternal attachment, Lenth of stay, wgt gain, duration 30 mins/day,**

Page, J. (1995). Kangaroo Care: Enhancing infant and parent well-being in the NICU. *Perinatal Newsletter*, 12(1), 5-8. Provides limited review of KC (does not identify all studies, such as Ludington-Hoe’s 1992 paternal KC study) and then talks about Page’s proposed study of cardiopulmonary effects with Canadian infants. Does include Protocol for KC. **PROTOCOL, policy, guidelines, Preterm.**


Palencia, D., Mendoza, C.J., Torres, J., & Echandia, C.A. (2009). Kangaroo mother program: physical growth and morbidity in a cohort of children, followed from 30 weeks of postconceptional age until first year. *Colombia Medica, 40*(3), 292-299. This is 40 wks-12 months follow up of KMC program LBW infant at Universitario del Valle. 390 infants <2000 g were admitted to KMC program and 5.4% were readmitted to hospital for anemia and apnea before 40 wks. After 40 wks, 13% were readmitted for bronchopneumonia, acute diarrhea. They had better size than weight. Cumulative incidence for age at 13 months for morbidity was 22%. LBW infants need iron and folic acid. **PT, descriptive, follow-up, morbidity, growth (length), readmissions, weight, 3rd world. (See also Torres 2006 article for similar study of infants at same institution.) NOT ON CHARTS.**

Pallas-Alonso, R.C., Lopez-Maestro, M. (2011). Human milk and Kangaroo Mother Care. *Current Women’s Health Reviews, 7*(3), 262-269. Doi:10.2174/157340411796355207. Human milk has many benefits to the preterm infant and KMC has been shown to be helpful in initiating and maintaining breast milk feedings, so personal breastfeeding education and support by skilled nurse should be given. KMC is low cost and has consistent benefits, so use it. **PT, Review, Breastfeeding, BF, NOT on charts 10/2/2011**

Parikh TB, Udani RH, Nanavati RN & Rao S. (2004). Kangaroo Mother Care Initiative in India – Where are We? Presentation at "Workshops on KMC at Neoncon 2004, XXIV NNF Annual Convention at Chandigarh, 28October, 2004" Available from [file://E:/KangarooMotherCare Initiative(KMCI).htm](file://E:/KangarooMotherCare Initiative(KMCI).htm). A pretest-posttest study of knowledge among 95 participants (65 pediatric and ob nurses, 30 pediatricians and obstetricians who were not doing KC at their institutions) All were given one day skill-based awareness program. Given questionnaire the morning of the.
Development, support sensitive parent contact responses, vocalizations, and content begins on page 228 and continues to page 229. “Touch can reinforce and maintain high rates of infant eye
and is called increase or decrease the strength, efficacy or number of synapses (pg 224). When brain is at rest it is in default mode 
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and decrease in n umber through the 3
cites Shonkoff 2009 for this statement. The newborn brain has the same number of neurons as mature adult brain, but the connections between the synapses are not fully established (Nowakowski 2006). If synapses not formed neurons die off and decrease in number through the 3rd decade of life.(pg. 224) Synaptic plasticity is the most important mechanism that allows environmental factors to influence brain development throughout the lifespan. Plasticity refers to changes that increase or decrease the strength, efficacy or number of synapses (pgl 224). When brain is at rest it is in default mode and is called default mode of brain function. Default mode is immature in premature and at term (Gao et al. 2009). KC content begins on page 228 and continues to page 229. “Touch can reinforce and maintain high rates of infant eye contact responses, vocalizations, and smiles during face to face interactions with the other. Skin-to-skin contact is widely reported to be beneficial to infant development. It has been shown to aid infant motor, perceptual, and cognitive development, support sensitive parent-infant interaction, aid attachment process in preterm infants, attenuate physiologic

Parker L. & Anderson GC. (2002). Kangaroo (skin-to-skin) care for adoptive parents and their critically ill preterm infant. MCN, Am J Mat Child Nurs, 27 (4), 230-232. Infant that couple was going to adopt was delivered prematurely at 27 wks Gestation and went to NICU where she needed ventilator assistance by mechanical ventilation. KC began on DAY 3 of five days of ventilation for a 917 gr preterm infant. Adoptive parents both felt immediate and intense connection and began to know infant during KC. PT, Case study, VENT KC ADOPTIVE KC. End of life KC? Also reported in Anderson, Dombrowski, & Swinth, 2001.

Parmar VR, Kumar A, Kaur R, Parmar S, Kaur D, Basu S, Jain S. & Narula S. (2009). Experience with Kangaroo Mother Care in a neonatal intensive care unit (NICU) in Chandigarh, India. Indian J Pediatrics 76(1), 25-28. Clinical evaluation of implementation of KC by determining feasibility and acceptability of KMC by mothers, family members, and health care workers and to determine effect of KMC on HR, RR, SaO2, temperature, hypothermia, apnea. Not really KMC which is 24/7 KC, these infants had to complete 4 hours of KC /day . 135 (74 boys, 61 girls) of mean gestational of 30 weeks and 1460 grams started KC within first week (< 3 days for 21%; 4-7 days for 26%; 8-15 days in 31%, >15 days in 22%) once out of critical illness but still on IVs and oxygen support). Babies wore head cap, booties and diaper for KC. Mean duration of KC was 7 days (3-48 was range). 60 mothers gave KMC, 40 fathers, 32 mothers-in-law, and 21 close relatives. Vital signs recorded before and every half hour of KC. HR dropped by 3-5 bpm, respirations stabilized for all, no apnea occurred, SaO2 increased by 2-3%, temp rose from 36.75 ±0.19 to 37.23±0.25, no episodes of hypothermia. Vital signs remained within clinically acceptable limits (pg. 26). KMC was accepted by 96% of moms, 84% of fathers, 84% of other family members. 94% of health care workers considered KC to be safe. Benefits of KC on infant behavior and maternal confidence were reported by 57% of moms, 94% of fathers, 80% of family members. 12% of moms needed more than one session to do KC alone, then 98% positioned baby comfortably and reported they felt close to baby and that KC removed stress of separation from baby. Maternal mood elevated, better confidence and feelings of positive contribution to baby’s care was reported by 96% mothers. 98% of mothers felt empowered to handle infants at home and agreed to continue KC at home. 18% of moms thought KC interfered with their routine activities (toilet, bathing) and 6% had concerns about privacy. 85% of the 30 health care workers (14 doctors, 16 nurses) reported a decline in use of heating devices and 79% of staff said it did not increase their work load. PT, Clinical evaluation, HR, RR, apnea, SaO2, hypothermia, temp, paternal KC, surrogate KC, maternal confidence, maternal stress, stabilization, acceptance, work load, Not on charts 5/30/09

Parsons, C.E., Young, K.S., Murray, L., Stein, A., & Kringelbach, M.L. (2010). The functional neuroanatomy of the evolving parent-infant relationship. Progress in Neurobiology. 91, 220-241. This is major review of how the brain changes and develops in presence of nurturing interaction and attachment with parents.”It is clear that the parent and the environment created by the parent has an impact on neurodevelopment” pg. 224. “Construction of the infant brain is heavily dependent on learning and the interaction of environmental factors with gene-expressions “ pg. 224 and cites Shonkoff 2009 for this statement. The newborn brain has the same number of neurons as mature adult brain, but the connections between the synapses are not fully established (Nowakowski 2006). If synapses not formed neurons die off and decrease in number through the 3rd decade of life.(pg. 224) Synaptic plasticity is the most important mechanism that allows environmental factors to influence brain development throughout the lifespan. Plasticity refers to changes that increase or decrease the strength, efficacy or number of synapses (pgl 224). When brain is at rest it is in default mode and is called default mode of brain function. Default mode is immature in premature and at term (Gao et al. 2009). KC content begins on page 228 and continues to page 229. “Touch can reinforce and maintain high rates of infant eye contact responses, vocalizations, and smiles during face to face interactions with the other. Skin-to-skin contact is widely reported to be beneficial to infant development. It has been shown to aid infant motor, perceptual, and cognitive development, support sensitive parent-infant interaction, aid attachment process in preterm infants, attenuate physiologic

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reactions to stress, and have an analgesic effect. Sensory saturation, where the infant experiences simultaneous visual auditory tactile olfactory and gustatory stimulation, has been shown to have an analgesic effect on the pain response induced by the heel stick procedure for taking blood in both full-term and pre-term infants). \textbf{Theoretical Review, brain development, plasticity, synaptogenesis, pain, pain Mechanisms}


Pattinson RC, Arsalo I, Bergh A-M, Malan AF, Patrick M, & Phillips N. (2005). Implementation of kangaroo mother care: A randomized trial of two outreach strategies. \textit{Acta Paediatrica} 94, 924-927. RCT to test if educational package alone or educational package + visits by facilitator increased KMC implementation. 34 hospitals in KwaZulu-Natal Province. Visits were done 3 times – first was 3 hour long and was held 6 weeks after launch and helped professionals go through a workbook on KMC (did not give lectures, only answered questions and facilitatted discussion based on workbook), 2nd visit was 8 weeks later and only facilitation, 3rd visit was to the site and took 2 hours to score implementation, answer questions, and give advise on issues raised by site. Evaluation done 8 months after initiation and were scored on the progress monitoring tool (See Bergh et al., 2005). Evidence of practice (score >10) was success. Group with visits scored higher than group without visitor. Median score of package + visitor group was 15.44 (N=17 hospitals and all demonstrated practice), only 12/17 in control group demonstrated practice and score was 11.33. Successful implementation can be achieved better with supportive visits. \textbf{RCT, PT Implementation}.

Pattinson RC, Bergh AM, Malan AF, & Prinsloo R. (2006). Does Kangaroo Mother Care Save Lives? \textit{Journal Tropical Pediatrics} 52(6): 438-441. Descriptive study of 40 hospitals (neonatal mortality rate was 88.14/1000 live births before KMC) and results of 11 hospitals that reported mortality rates before (87.72/1000 live births) and after (60.76/1000) implementation of KMC. This is large and significant reduction in neonatal mortality rate for infants between 1000-1999 grams birth weight. KMC reduces mortality. \textbf{Descriptive, PT, mortality}. \textcolor{red}{Not on charts yet}.

Pearson J, & Andersen K. (2001). Evaluation of a program to promote positive parenting in the neonatal intensive care unit. \textit{Neonatal Network: J. of Neonatal Nursing}, 20(4): 43-48. Not a study of KC per se, but a qualitative study of a parent support groups use to promote parenting. On page 46 under the theme “Awareness of Cues and Optimizing Interaction” three comments from parents are reported: “KC is interesting”, “KC, I love this idea!!!!”, and “They talked about KC and parents then want to do it.” \textbf{Preterm, Qualitative Evaluation of Program that included KC but was not focused on KC, implementation, maternal feelings}

Penalva, O. & Schwartzman, J.S. (2006). Descriptive study of the clinical and nutritional profile and follow-up of premature babies in a Kangaroo Mother Care Program, \textit{Jornal de Pediatria} (Rio Jornal). 82(1), Jan-Feb., 33-39. Descriptive study of 70 preterm infants given KC at least 3 days of KC when 32.5 weeks GA and if their birthweight was 1560 grams or more in Brazil. Preterms were discharged from KC weighing 3000 gms and followed up at one year. Birthweight, GA, APGAR scores were determinants of entry into the KC program. After discharge, 8.6% were readmitted for apnea, Exclusive BF started at 35.5 weeks postmenstrual age (mean postpartum age was 18.6 days). At discharge, infants were a mean 29 days old, and 85.7% were exclusively BF. 60.3% were predominantly breastfeeding up to 6 months post-birth age, and motor disorders occurred in 42.8% and then 14.3% by one year, with cerebral palsy in 6.9% of population, and retarded motor development in 6.9%. KMC proved itself a good breastfeeding instrument. \textbf{PT, descriptive, apnea, BF, exclusive breastfeeding, cerebral palsy, motor development}.

Penfold, S, Hill Z, Mrisho M, Manzi F, Tanner M, Mshinda H, Schellenberg D, & Schellenburg JRMA (2010). A large cross-sectional community-based study of newborn care practices in Southern Tanzania. \textit{PloS ONE}, 5(12), e15593. DOI:10.1371/journal.pone.0015593. 213,220 women’s (13-49 yrs age and 92% participated) had 22,2243 deliveries were followed. 41% delivered in health center and 57% at home with skilled attendants at 40%. 10% dipped baby in cold water immediately after delivery and KC was RARELY practiced. 83% of women breastfed within 24 hrs of delivery, only 18% within first hour of delivery. Over 1/3 of infants were wrapped within 5 minutes of birth Delivery practices need to be changed. \textbf{FT, PT, 3rd world, Community-based KC, Birth KC}.


Peters, C, Becher,J.C. Lyon, A.J., Midgley,P.C. (2009). Who is blaming the baby? Archives of Diseases in Childhood Fetal Neonatal Edition, 9(5), F377-F378. DOI: 10.1136/adc.2008.143628 Case study of sudden collapse in healthy newborns. Sudden unexplained collapse within the first 12 hours of life is a RARE but recognized event. The association between positioning the infant prone and apparent life-threatening events (ALTE) in the early newborn period is well described in Hays S 2006 (on this bib). Over 2 years, 5 infants were found collapsed in the maternity unit in Edinburgh in the care of primiparous mothers. All died, four during the first month and the other at 18 months. Two were found prone on mother’s chest, two were in their sleeping mother’s bed, one in mother’s arms. All had postmortems. Baby #1 was found supine on bed next to mother at 2 hr, 9 min by father who said baby looked blue. He died at 25 hours of age and postmortem showed widespread gliosis and micromineralisation of the brain, representing extensive brain injury of several days predating labour and delivery. Baby #2: male who was prone in skin-to-skin contact. At 1 h 5 min he was collapsed in same position while mother was still in lithotomy position having episiotomy sutured. Baby died at 79 hours age. Postmortem showed severe hypoxic-ischemia at time of collapse. Baby #3: female in KC for breastfeeding. At 1 hr, 42 min during episiotomy repair with local anesthetic, mom said baby had slipped beneath her breast. Midwife found baby floppy, apneic, and bradycardic. MRI at 3 months showed cerebral atrophy with loss of white matter volume, enlarged ventricles and thin cortex. She developed spastic quadriplegia, blindness, deafness, seizures before dying at 18 months. No postmortem. Baby #4: born to primigravid mom with APGARS of 10. Found collapsed at 36 mins of life in mother’s arms. Severely acidotic, resuscitated and NICU care. Died within 4 days from severe encephalopathy and multiorgan failure. Postmortem showed severe hypoxic damage at birth or time of collapse. Baby #5: primigravid mom with APGARS of 10. Collapsed at 8 hours of age while lying in a lateral position on mother’s bed. Everything else same as baby #4. Rate of sudden unexplained collapse was 0.4 /1000 live births here (was 0.06/1000 live births in Polberger S, 1985 and 0.5/1000 live births in Rodriguez-Alarcon et al., 1994 on this bib) and for this unexplained collapse group mortality is 50% with significant neurological sequelae in a majority of survivors. No cause for collapse was identified. Even in postmortem exams. All were cared for by primiparous mothers, unsupervised by staff, ‘first time’ moms have less experience in normal behavior of infant and may not recognize abnormal appearance or activity of infant “(pg. F378). Their awareness may be impaired by fatigue and effects of analgesia or distracted by simultaneous painful procedures. The authors postulate that some infants with an underlying vulnerability may maladapt to extrauterine life following a hypoxic stressor possibly caused by positional airway obstruction. Confirms other reports of association between birth KC and ALTE, and bed sharing is not recommended before 6 months because airway obstruction occurs more frequently on maternal bed than in cot (Ball HL, Ward-Platt MP, Hestop E et al., 2006. Randomised trial of infant sleep location on the postnatal ward. Arch Dis Childhd 91, 1005-1010). Adapting to extrauterine life is a critical period, and some vulnerable infants who have antenatal brain injury may maladapt to a hypoxic stressor, precipitated by positional airway obstruction when prone or breastfeeding, both of which
are almost universal features of such infants reported in literature. **Full term, Case study, Birth KC, life threatening events, mortality, morbidity, antenatal brain injury.** Not on charts 11/12/2011. See also Heinmann et al., in this bib for excellent physiology report of positioning and pulmonary dynamics.

Phillipp BL & Jean-Marie S. (2007). African American Women and Breastfeeding. The Courage to Love Infant Mortality Commission. DC: Joint Center for Political and Economic Studies. 1-26. Available from Joint Center for Political and Economic Studies, 1090 Vermont Ave. NW, Suite 1100, Washington, DC 2005 or from www.jointcenter.org. This is a major review of how lack of breastfeeding relates to the high infant mortality rate in African American infants and then focuses on factors influencing their low breastfeeding rate and promising models and practices such as WIC, use of Doulas, peer counselor programs, Rush Mother’s Milk Club, Baby Friendly Initiative, and National Breastfeeding Awareness campaign. On page 10 under Rush Mother’s Milk Club it states “Criteria 2 of Rush Mother’s Milk Club is: Skin-to-skin(kangaroo) care and suckling at the empty breast as tactile stimulation and ‘practice’ for the infant” (pg. 10.) On page 11 it states ‘The routine in a Baby-Friendly hospital is for mothers to be given their babies to hold in skin-to-skin contact immediately after birth (OR AS SOON AS MOTHER AND BABY ARE ABLE). This takes advantage of the alert period in a baby’s first hours oflife and facilitates a successful first breastfeed. **Review, Breastfeeding, Disparities, African- American, Birth KC, Baby Friendly**


Phillips, C., & Bulmer, J. (2012). Postpartum care of a woman with cerebral palsy and deep vein thrombosis. A case study. Nursing for Women’s Health, 16(1), 36-44 DOI:10.1111/j-1751-486X.2012.01698.x. NOT A KC study (reference to it only). This is a case study of a fullterm birth in a women with cerebral palsy and thrombosis but it covers couplet care and on page 42 it says “...facilitating maternal newborn attachment is a priority. Despite their complex care needs, these women, like all new mothers, need close physician proximity to their infants, which allows them to interact with their newborns and respond to their cues. Supportive nursing care can include rooming-in, skin-to-skin care with the newborn, and infant massage (Karl,D., Beal, J., O’Hare, C.,& Rismille,P. 2006.). FT, Case Study, NOT KC. Reference only, attachment. Testimony that KC is becoming standard postpartum practice.

Pignotti MS, & Rubaltelli FF. (1997). Kangaroo Care: Parents’ answers and staff problems. Riv Ital Pediatri 23, 1054-1057. In three years 95% of LBW and VLBWs (580-2000 gm, 25-38wkGA) got KC. Nurses had difficulty with organization and surface space and time for mothers; mothers firmly believe in KC and its help in forming relationship with infant and nurses. **Italian with English Abstract, PT**

Pignotti MS, Rapisardi G, & Rubaltelli FF. Kangaroo mother care: Parents’ and nurses’ opinions and problems. ITALY Need complete citation from Rapisardi on the researcher’s list or at gherapi@dada.it

Pineda RG, Foss J, Richards L, & Pane CA. (2009). Breastfeeding changes for VLBW infants in the NICU following staff education. Neonat Netw 28(5), 311-319. This is NOT a study of KC but instead includes information about KC as apart of the educational program to change breastfeeding rates in an NICU. Med record data were extracted before and after the education (as pre-intervention and post-intervention groups) and significant improvements in breastfeeding rate occurred after the education (BF initiation Increased by 11% and breast milk feeding at discharge was up by 5%, but these increases failed to meet significance. On pg. 313 it says: “foster continued pumping and skin-to-skin holding throughout each week.” And the education included “ Some prefeeding interventions included in the training were skin-to-skin care, ...When KC content was included and taught to nurses, BF improved. ” PT, descriptive, pretest-posttest, knowledge, PT, implementation so to speak

study in Germany of sudden deaths and severe life-threatening events in full term infants within 24 hours of birth after being alerted to possible deaths during BIRTH KC in France. On page 870 they report that they observed two infants with severe ALTE in the delivery room in initially well-adapted term newborns while lying prone in skin-to-skin contact with their mother (pg.270) and an informal inquiry of neighboring hospitals reported several similar cases. Infants who had good apgar ($\geq 8$) and had good postnatal adaptation for 10 minutes were to be reported. In one year, 2009, 43 cases of Severe apparent life threatening events were reported. Of those 43, 17 met criteria of good apgar and good adaptation and that yielded an incident rate of 2.6 in 100,000 live births and there were 7 deaths (1.1/100,000), 6 of the 10 Severe-ALTE infants were neurologically abnormal at discharge. 12 infants were found lying on their mother’s chest or abdomen, or very close to and facing her; another infant was found while lying supine next to his mother and 2 others were lying supine in their own beds, and two infants became lifeless while being held in their father’s arm (pg.870). 2 mothers had delivered by cesarean and 2 mothers had had sedatives within 24 hours of birth. Nine events occurred in the first two hours postbirth: 7 were only noticed by health professional despite the mother being present and awake. NO where in this article does it say that babies died or had ALTEs during skin-to-skin contact or during Kangaroo Care but I am assuming that the 12 who were found lying on their mother’s chest or abdomen were in KC. It only mentions that “12 newborns were found lifeless while lying on their mother’s breast/abdomen or very close to and facing her” (pg. 870). Severe-ALTEs may occur in the first 2 hours postbirth, particularly within the first 2 hours after birth. The rate of 17 newborns with Severe ALTEs on first day of life was 2.6 events per 100,000 live birth (including 1.1 deaths per 100,000 live birth). Their data were similar to Branger’s data, but the number of events occurring on the first day of life seems relatively high. Events were often related to a potentially asphyxiating position – infant’s nose pressed against the breasts or mother’s abdomen may lead to acute upper airway obstruction (pg. 872) (12/17 events occurred in such a potentially asphyxiating position. WATCH FOR OVERWEIGHT MOTHERS ESPECIALLY. Many of the cases occurred in primipara women- maybe they don’t know how to position their babies safely. Or, postnatal fatigue of mother or child could contribute too( 9/17 S-ALTEs occurred in the first 2 hours after birth and 5 when mother was asleep (with death as outcome in 4 of the five sleeping mothers). Another cause may be the drop in sympathetic nervous activity in the newborn – a wavethat occurs right after birth and then diminishes and the infant is not responsive to potentially asphyxiating circumstances (SML’s note: today we know that a decrease in sympathetic activity may be due to oxytocin in the infant too). “Parents may be too fatigued or otherwise not able to assess their infant’s condition correctly. Closer observation during these earliest hours seems warranted” (pg. 870). “We do not wish to imply that our observation should be interpreted as suggesting that mother and infant should be separated after birth! Our data only reveal that placing the infant to sleep in his own bed, preferably next to his mother, may be a somewhat safer sleep environment than placing him in close body contact to a fatigued mother….Animal experiments indicate that experiences made shortly after birth may have lifelong consequences through experience-dependent chromatin plasticity. Thus, support of close proximity of mother and infant shortly after birth enables them to experience mutually beneficial physiology” ( pg.873) Need close surveillance of infant every 6-8 minutes throughout the first 2 hours of life and “the newborn should not lie on or be snuggled to the mother while she is sleeping; there should be a possibility to put the newborn in a bed if the mother is too exhausted after birth” (e873). FT, ALTE, Descriptive, sudden infant collapse.

Porges, S.W. & Furman, S.A.(2011). The early development of the autonomic nervous system provides a neural platform for social behavior: A polyvagal perspective. Infant and Child Development (epub ahead of print). This is a review article of the development of the autonomic nervous system and on page 5, 3rd paragraph from the top, it states “During the preterm period there is a monotonic increase in RSA (respiratory sinus arrhythmia) from 32-37 weeks gestational age. Opportunities for skin-to-skin contact (i.e. Kangaroo care) between mother and preterm (Feldman & Eiderlman, 2003) enhance the development of RSA.Paralleling the enhanced vagal regulation, these authors also reported more rapid improvement in state organization and a more mature neurodevelopmental profile. However, the enhanced development of RSA was only relative to preterm controls not receiving skin-to-skin contact and was still substantially lower than reports of RSA in typically delivered fullterms (Porges, 1992). Review, FT, PT, autonomic nervous system, development, heart rate variability, vagal tone, parasympathetic control NOT on CHARTS as of 9/7/201.

odors stimulate BF activity and recognition of mother as a distinct individual. KC and exposure to maternal odors facilitate infant’s adaptation to the early postnatal environment. Commentary on other article Acta Paediatrica 2004, 93(12), pg 1640-1645. FT., BF, birth KC, olfaction, maternal odors, scent, maternal recognition / discrimination.

Pozzati, F., (2010). From Tube to Breast. Minerva Pediatrics 62(3 Suppl 10, 211-212. (No DOI). WHO wants breastfeeding for first 6 months even for NICU infants. In the NICU, the following are needed for BF: precocious and frequent stimulation of the breast, counseling, NIDCAP, KMC, 24 hour open NICU, feeding consultant, teamwork in presence of these elements in NICU. PT, Clin report, BF, NICU

Price, M., & Johnson, M. (2005). Using action research to facilitate skin-to-skin contact. British Journal of Midwifery, 13(3), 154-159. Action research is the combination of qualitative and quantitative appraisals of change in action-based settings such as medical and nursing practice. Action Research is also “study of social situation carried out by those involved in that situation to improve both their practice and the quality of their understanding” (Winter & Munn-Giddings, 2001) and the practitioners are involved in the research. In Britain, nurse-midwives are the labor, delivery, postpartum, and mother-newborn staff nurses. This is a report of focus group results with midwives related to starting the practice of uninterrupted skin to skin contact to increase initiation of breastfeeding by 2% a year (which is the British Health Dept.’s goal). Contact immediately after birth should be uninterrupted because hurry and interruptions minimize breastfeeding success (cites Richard & Alade, 1990). Aims were to improve awareness of BF, awareness of importance of birth KC by educating midwives and also to improve women’s choices and facilitate the best practice known as BIRTH KC. The first 8 midwives and mothers who experienced Birth KC participated in focus group which encouraged ownership of the changes. Mothers reported improved relationship, and being “besotted” with infant after KC and thinking that KC is “lovely.” RNs needed reminders like a space on admission sheet saying “Birth KC discussed” and pictures in each patient room and a Table of Benefits of Birth KC in each patient room. They also started a newsletter. Birth KC practice started at 0%, and was 56% at month 10, 52% at month 11, and 80% at month 18. Full term, Descriptive, implementation, BF, Birth KC, Cesarean section. Action Research


Prochnik M & de Carvalho MR. (2001). Metodo Mae-Canguru de Atencao ao Prematuro, BNDES Social. Banco Nacional de Desenvolvimento Economico e Social (Brazilian Development Bank: Rio de Janeiro, September. This is a book in English outlining the new paradigm for mothering premature infants known as Kangaroo Care. It relates Why it is done, how it will be done in Brazil, the mobilizing event that started KC in Brazil, the 10 steps to the KMC method in Brazil (Written policy, specially trained personnel, well-informed women, initiation of KMC as quickly as possible, demonstration of KMC, skin-to-skin contact, bed for both mother and infant, accompanied breastfeeding, no pacifiers nor bottles, and assistance groups), and data collection forms that all hospitals in the country are using. The book also defines three phases of KMC: Phase One is KMC during intensive care of the LBW infant; Phase Two KMC is during Intermediate care of the LBW infant, and Phase Three is KMC at home. Early discharge to 24/7 KMC for the first 6 months of life is part of the national program of KMC in Brazil. PT, Implementation, Guidelines, and Phase Two based (KMC DURING INTERMEDIATE PRETERM CARE) data collection tools.

Procianoy RS, Mendes EW, Silveira RC. (2009). Masage therapy improves neurodevelopment outcome at two years corrected age for very low birth weight infants. Early Human Development doi:10.1016/j.earlhumdev.2009.112.001 RCT of VLBW infants in Brazil who got 24/7 KMC routinely who were compared to VLBW infants who got 15 minutes of maternal massage of extremities and face + kinesthetic stimulation (passive limb exercises) 4 times a day every day beginning within 48 hours of birth and continuing until discharge and these developments were done up to 2 years later. MDI was significantly higher 85.1 ±1.99 in KC + Massage than KC alone (82.9±5.61) and PDI was moderately (but not statistically significant) higher in KC+ massage (86.2±2.14) than in KC alone (84.2±6.28) at two years. This is the same study as Mendes & Procianoy 2008, but this one reports only developmental outcomes. VLBW, RCT, massage, routine KC, dev outcome. 
Public Health Agency of Canada. (2009). *What Mothers Say: The Canadian Maternity Experiences Survey. Ottawa, 2009*. Ottawa: Public Health Agency of Canada. Chapter 2: Labor and Birth (pg. 107-168), Section 26 Mother-Infant Contact at Birth by Chalmers, B, O'Brien, B., & Boscoe, M. pages 157- 184. has the following about KC on page 157: “Introduction. Early skin-to-skin contact between mother and infants has been shown to be beneficial. In addition to improving breastfeeding outcomes and early mother-infant attachment, studies indicate that skin-to-skin contact may reduce infant crying and increase infant cardio-respiratory stability, and has no adverse effects (cites Moore et al. 2007) It should not be momentary, but continue for the first hour or more after birth and as much as possible thereafter. Restriction of mother-infant contact and skin-to-skin contact after birth may have undesirable effects including breastfeeding failure and less affectionate behaviour by the mother toward her baby (Cite Enkin M, Keirse M, Neilson J, Crowther C, Duley L, Hodnett E, et al., Mother and Baby. In: *A guide to effective care in pregnancy and childbirth. 3rd Ed. Oxford:* Oxford University Press,2000, p. 428-439).”. On page 158, the report goes on: “Fewer than a third (31.1%, 95%CI: 29.8-32.3) of women reported holding their baby naked against their own naked skin (skin-to-skin contact) when first holding their baby. Skin-to-skin contact after birth ranged from 62.2% (95% CI 56.4-68.0) in Yukon and 50.2% (95%CI=47.4-53.0 in Quebec to 13.8% (95%ci: 10.8-16.8) in Prince Edward Island and 11.8%(95%CI: 8.6-15/3) in Newfoundland and Labrador. Younger women (15-19 yrs) were less likely to report skin-to-skin contact with their baby immediately after birth compared with older women. Similarly, women giving birth by cesarean were less likely to have skin-to-skin contact with their baby immediately after birth than women experiencing a vaginal birth. In Chapter 3: Postpartum Section 30 Baby-Friendly Hospital Initiative by Chalmers, B, & Royle, C. on pages 179-184. It states on page 179 that Step 4 of the Baby Friendly Hospital Initiative is: “Step 4 is clarified by the BFHI to include skin-to-skin mother-infant contact as soon as the baby is born, followed by breastfeeding when the baby shows signs of readiness to feed, usually within the first hour after delivery. Breastfeeding within the first five minutes after birth is usually not appropriate and is not recommended (cite Chalmers B, Mangiaterra V, Porter R., 2001. WHO principles of perinatal care: the essential antenatal, perinatal, and postpartum care course. *Birth.* 28(3), 202-207). In relation to Step 4, 19.8% of women reported putting their baby to breast for the first time within five minutes of giving birth, 21.5% of women firsts put their baby to the breast between six and 29 minutes, 26.6% between 30 minutes and less than two hours, and 21.6% two hours or more after the birth.” (pg. 180). Descriptive study, FT, Essential care of newborn, FT, BF, Birth KC. CANADA results. Not on Charts 8/29/2011, DO NOT PUT BABY TO BREAST IN FIRST 5 MINS OF LIFE, they are not ready to do so.

Puig G & Squassero Y. (2007). Early skin-to-skin contact for mothers and their healthy newborn infants: RHL commentary (last revised: 9 November 2007). TheWHO Reproductive Health Library; Geneva: World Health Organization. Available on line from [http://apps.who.int/rhl/newborn/](http://apps.who.int/rhl/newborn/). This is WHO’s statement about KC with fullterm healthy infants, and says that “SSC (skin to skin contact) begins immediately after birth by placing the naked newborn prone on the mother’s bare chest. This practice…may facilitate maternal infant behavior and interactions through sensory stimuli such as touch, warmth, and odour. Moreover, SSC is considered a critical component for successful breastfeeding initiation. This updated review examined RCTS or quasi-RCTs of SSC starting within first 24 hours of life versus routine neonatal care in both healthy full term and late preterm (34-37wk GA) babies. Principal outcome of interest was breastfeeding. 30 trials (29 RCTs) were included, mostly from developed countries, but 8 were from developing countries. KC improves breastfeeding at discharge and positive impact on duration of BF in the first four months, but no data could determine impact on BF at 4-6 and 12 months. KMC also reduces infant crying, improves maternal infant interaction, keeps baby warmer, (end of page 1 quote) and helps mother breastfeed successfully and no important negative effects were identified.” (page 2 quote). “Extra tactile, odour, and thermal cues provided by skin-to-skin contact may stimulate babies to initiate breastfeeding more successfully. So, this practice (SSC) should be seen as a beneficial, low cost, and feasible intervention to promote lactation after delivery especially in settings that lack sanitation and safe water where breastfeeding can be life-saving. 16% of neonatal deaths could be saved if all infants were breastfed from day 1 and 22% if breastfeeding started within the first hour.”(p. 2- citing a Ghana study Edmond KM et al., 2006. Delayed breastfeeding initiation increases risk of neonatal mortality. Pediatrics 117(3): e380-e386 — also cited under Textbooks with KC Hale and Hartmann’s book.) “Early SSC should be considered as a routine health care intervention after delivery both in developed and and developing country settings.” “Appropriate definition of SSC is apriority…taking into account specific timing, frequency, and duration….Well conducted RCTS are warranted to demonstrate the real impact of early SSC on maternal and infant health, including preterm babies and
mothers who delivery by Cesarean section and in different settings."

Quasem I, Sloan NL, Chowdhury A, Ahmed S, Winikoff B, & Chowdhury AMR. (2003). Adaptation of Kangaroo Mother Care for community-based application. J Perinatology 223 (8, Dec. 2003), 646-651. 35 expectant or newly delivered moms were taught about KMC, did it and at 1 month postpartum were interviewed to evaluate kMC experience. 77% of moms initiated KMC and 85% with LBW babies did not. Moms delayed newborn bath and some slept upright with babies for 24hr/day KC. KMC was quickly and popularly adopted. Includes simple guidelines for choosing infants appropriate for KMC. Descriptive, PT/FT, Implementation, community-based, maternal experience.


Ramanathan K, Paul VK, Deorari AK, Tanjya U, & George G. (2001). Kangaroo mother care in very low birth weight infants. Indian J Pediatrics, 68(11), Nov. 1019-1023. Stable preterms <1500gm BW were randomized into KMC (n=14) for at least 4hr/day in not more than 3 sittings starting once stable and in intermediate (incubator) care and continued at home) or control (n=14)) who got standard care in incubator. KMCer’s had better wgt gain 15.9±4.5gm/day vs. 10.6±4.5 gm/day, and earlier discharge (27.2 vs. 34.6 days) than controls. # of moms exclusively BF at 6 wks postdischag was double for KMC (12/14) than control (6/14). PT, RCT, BF, HOME, WGT gain, length of stay, Exclusive BF, 3rd World

Ransom-J-Arvidson AB, Matthiesan AS, Lilja G, Nissen E, Widstrom AM, & Uvnas-Moberg K. (2001). Maternal analgesia during labor disrupts newborn behaviors: Effects on breastfeeding, temperature, and crying. Birth, 28(1), 5-12. 28 FULLTERM newborns were placed in KC immediately after birth and videotaped. Grp 1(n=10)=no anesthesia; grp2 (n=6)= mepivacaine via pudendal block, grp 3(n=12)= pethidine, bupivacaine or multiple analgesia –hand movements,hand-to-mouth movements, touching nipple with hands prior to sucking, licking movements, and sucking breast all less in grp 3, nearly 40% of grp 2 and 3 infants did NOT breastfed in first 2.5 houes of life. Grp 2 & 3 infants had higher temp (intrascapular temp went from 35.5-35.6 to 36.3-36.5 in analgesic groups (but from 35.4 to 35.8 over first 120 minutes of KC) and cried more (for longer periods) especially group 3. Reports that analgesia during labor makes mothers hyperexic, and this may make infants too warm, or increased crying can make infants warmer. FULLTERM, BF, Comparative Survey, Birth KC,analgesia, temp, crying.

Rao PNS, Udani R, & Nanavati R. (2008). Kangaroo mother care for low birth weight infants: a randomized controlled trial. Indian Pediatrics 45(1), 17-23. 206 neonates with birth weight <2000 grams in western India received either KMC (n=103) or conventional incubator care (n=103). KC given as much as possible but at least one hour at a time. Mean duration of KMC was 13.5 hr/day. Average daily weight gain and anthropometric measures (head circumference, chest circumference, mid-arm circumference, foot length) at 40 weeks postmenstrual age and at 2500 grams in term SGA infants. All babies were exclusively breastfed + calcium+phosphorus+multivitamins. Babies who had problem or bilirubinemia were temporarily withdrawn from KC. KMC babies had better average daily weight gain (kmc=23.99 g, controls= 15.58 gm, p<0.0001). Weekly increments in head circumference (KMC =0.75 cm, controls =0.49 cm, p<0.02) and length (KMC =0.99 cm vs control = 0.7 cm, p<0.008) were higher in KMC infants. Significantly more control infants suffered from hypothermia, hypoglycemia, and sepsis but no difference in length of stay. KMC significantly reduced the incidence of apnea in VLBW infants. More KMC were exclusively breastfeeding at end of study (KMC = 98% vs 76% in controls). KMC was acceptable to most mothers and families at home without any adverse events (pg. 21). One of KMC and 5 control infants died during study. Had mothers complete diary of home KC, KMC improves growth and reduces morbidities in LBW infants. KMC can be continued at home. Preterm, RCT, 3rd World
world, wgt, head circumference, growth, hypothermia, hypoglycemia, infection, apnea, length of stay, exclusive breastfeeding, home KC, diary, maternal feeling, 1hr sessions of KMC. Not on charts yet.

Reid, C. (2004). Kangaroo care. Neonatal Network, 23 (2), 53. This is an author’s reply to some comment.

Renfrew, M., Craig, D., Dyson, L., McCormick, F., Rice, S., King, S., Misso, K., Stenhouse, E. & Williams, A. (2009). Breastfeeding promotion for infants in neonatal units: a systematic review and economic analysis. Health Technology Assessment, 13(40), 1-179. Available at http://www.hta.ac.uk/1611. Wow, what a long article. The abstract is long, too. 48 studies met criteria for breastfeeding, but no studies met criteria for economic analysis. “There is strong evidence that short periods of kangaroo skin to skin contact increased the duration of any breastfeeding for one month after discharge and for more than weeks among clinically stable infants in industrialized settings. Multidisciplinary staff training may increase knowledge. Kangaroo skin to skin contact, peer support, simultaneous breastmilk pumping, multidisciplinary staff training and the Baby Friendly initiative have been shown to be effective. Length of stay for KC was 66-586 pounds less than for incubator infant. Systematic review, meta-analysis of meta-analyses, BF, duration of Breastfeeding, education is needed, cost, knowledge. FT, PT

Renfrew MJ, Lang S, Woolridge MW. (2001). Early versus delayed initiation of breastfeeding (Cochrane Review). In: The Cochrane Library, Issue 1, 2001. Oxford: Update Software. Available from http://www.update-software.com/abstracts/ab000043.htm. Three studies reviewed comparing early skin contact with late skin contact and BF. Early contact and BF was associated with greater communication between mothers and infants but not with BF duration or # of women BF after birth. The studies reviewed are from 1978,79 and 90 (before KC really became established) and the first one does not say they did KC at all, but just put baby to breast. The other two are clearly KC studies. Breastfeeding, Birth KC, Review, fullterm


Richardson, H. (1997). Kangaroo Care: Why Does It Work? Midwifery Today, International Midwife 44. Winter 1997, 50-51. This sounds very much like a talk that Dr. Ludington gave and it cites Dr. Ludington throughout. Relates brief history, talks of mother’s breast modulating infant temperature, regulated HR and RRs and coherence (wrongly cited as 4 weeks of growth when it is really two wks of growth), increased growth, improved sleep. PT, Review of Ludington talk, Maternal-Neonatal Thermal Synchrony. REVIEW only

Ridley, K. (2000 or 1994? Probably 1994). NICU offers high-touch in a high-tech world: Kangaroo Care. Inside, 10-12. This reports RECOVERY, RESUSCITATION, or CONSOLATION KC, in which dying preterm is given to parents to hold and then physiologic recovery takes place. SaO2 rose dramatically and parents continued 24hr/day KC for 3 days and then every night of hospitalization. Tells of 14 infants given KC at Brigham & Women’s hospital in Boston. No date on article which is hospital newsletter, but Jennifer Wallace reported this at the 1993 National Council
of Nurse Researcher’s meeting in Los Angeles in Feb. 1994 and Wallace-Ridpath wrote an article on it too. I wrote and asked for year and got no response. Clinical report of 14 infants given RESUSCITATION KC, compassionate KC, end of life KC, PT??

Richard L. (2008). The baby is breastfeeding – not the mother. Birth 35(1), 1-2. This is a guest editorial that relates that we should tell moms that they don’t have to have anxiety about not being able to breastfeed, and there should be no more uneasiness in health care professionals about asking the mother to breastfeed – because it is up to the baby to decide!! Let newborns spontaneously crawl and latch because it is the infant that feeds, not the mother. This editorial also says on page 1 “The starting point is already the first hour after a normal delivery. The prerequisites are that the newborn baby is not affected by drugs given to the mother and that he/she is allowed to be in continuous skin-to-skin contact with the mother during the first hour after birth at least….The first examination of the baby can be done without disturbing the skin-to-skin contact. Remember that one prerequisite for the crawling and first latching on is that the baby is NOT taken away from the mother! Weighing and measuring can easily wait. Early cutting of the cord cannot be recommended because it might stress the baby. In normal physiological birth in native people, both baby and placenta are born before anything happens to the cord. In normal birth, just leave the cord to finish pulsating before being cut, that is, wait at least 4 to 5 minutes after birth. This step gives baby approximately 100 ml extra blood” (pg. 1) (Montgomery TL. 1960. The umbilical chord. Clin Obstet Gynaecol, 3, 900-910). FT, Review, BF, crawl, cord cutting, Choice about BF etc. if YOU ARE NOT SUPPORTING BREASTFEEDING YOU SHOULD NOT BE IN MOTHER-CHILD HEALTH NURS. (SEE ALSO Miracle DJ & Fredland V, 2007. Provider Encouragement of Breastfeeding: Efficacy and Ethics, J. Midwifery and Women’s Health, 52(6), 545-548. This article reports “health care workers caring for expectant and new mothers have an ethical obligation to discuss all appropriate and all applicable issues related to breastfeeding. Health care providers are also obligated to disclose the evidence of potential harm related to infant feeding method (pg. 546).” Physicians, Pediatricians

Richard, L., & Alade, M.O. (1990). Effect of delivery room routines on success of first breast-feed. The Lancet, 336, 1105-1107. Comparison of fullterm infants who laid on mother’s belly for 20 min. immediately after delivery (n=34)(separation group) and were then removed were compared to those who stayed nude on belly and chest for at least 1 hour (n=38)(contact group = KC contact). The KC contact infants began crawling to the breast at 20 min, began rooting, and at mean 50 minutes after birth most were sucking at breast. 17KC infants completed the breast crawl, none needed help latching on, and all of them moved to the nipple. More KC contact infants had correct sucking technique (24/38 vs. 7/34). FT, KCBF, BF, crawling, separation, spontaneous latch


Roberts, K.L., Paynter, C., & McEwan, B. (2000). An RCT comparison of Kangaroo Mother Care and Conventional Cuddling Care. Neonatal Network, 19(4), 31-35. Australia RCT of 30 healthy preterms, ≥30wk GA (KC BW = 1562 ad GA= 31.70), control = 1481 and GA= , no O2 help, with stable temp for 24 hrs, in crib or incubator randomly assigned to 2 hrs /day X5days/wk x4 wks of KMC (n=16) or holding while clothed (n=14). Control group got some swaddled holding. No differences in weight gain, temperatures, duration of BF, parental stress (PSS-NICU score KMC= 3.3, 4.0, 4.4, 4.4 while controls = 3.2,4.0, 3.4, 4.3), or parental expectations score. Also measured Parental Expectations Survey (KMC= 8.4 controls = 8.8) Limitations were clinician values for temp & wt gain, no calibration of scales or interrater reliabilities, small sample size, and inability to do inferential stats because of small sample size.Says Holding while Clothed is not a Control. PT, RCT, Preterms, PARENTAL KC. Paternal KC, Weight, BF, parental stress, temperature. SEE TURNER COMMENTS.

An increase in apparent life threatening events was seen in the hospital in the first two years in which birth KC became routine practice. So they looked at apparent life threatening events in four periods comprising 35 years, examining charts from 208,220 live neonates. In the most recent period, there was a statistically significant increase in the rate of ALTE and sudden deaths in neonates. Risk factors were birth KC, primiparity, increased incidence in night hours, and invariable occurrence of these events in the second period of neonatal adaptation (30 minutes to 90 minutes of life). 8 patients had ALTE and of these 8, two had neurological sequelae and another died. ALTE in the first two hours after birth are uncommon, but have serious consequences. One of the main risk factors may be skin to skin contact between infant and mother in the delivery room during early adaptation period. As such contact has been proven to be beneficial and without apparent risks, this practice should be promoted. However, maternity staff should be vigilant during skin to skin contact, especially if the mother is alone with her neonate or other risk factors are present. FT, Birth KC, mortality, negative event, ALTE, Spain See also Melchor Marcus from Spain too,. Apparent life threatening event. This may be officially listed in pubmed under GOMEZ, but I can’t find it under that so I listed it under Melchor

Rojas, MA, Kaplan M, Quevedo M, Sherwonit E, Foster LB, Ehrenkranz RA, & Mayes L (2003). Somatic growth of preterm infants during skin-to-skin care versus traditional holding: A randomized controlled trial. J Developmental and Behavioral Pediatrics 24(3), 163-168. 60 preterms (swaddled holding = 27; KC = 33) <32 wks gestational age, <1500 grams, hemodynamically stable with minimal ventilatory support. KC was for up to 8 hours/day (periods up to 4 hours/twice a day) every day until infant reached 2000 grams or was discharged, whichever was first (KC occurred for 1-28 days, swaddled holding occurred for 0-15 days with a median of 1 session per day). Fathers held infants a mean 27% of swaddled holding and 31% of KC time, and 30/33 fathers gave KC. Rate of head growth was higher in KC group; weight gain, linear growth, caloric intake, survival were not significantly different between groups (but 2 KC babies died during study, one swaddled died). KC group had significantly greater total head growth and head growth rates once head size at birth was accounted for. 9/26 (35%) of swaddled were successfully breastfed, 18/30 (60%) of KCs were successfully breastfed. KC was “strongly associated with successful breastfeeding” (p. 165). Fewer KC infants had episodes of oxygen desaturation during handling, and trend for fewer episodes of hypothermia and regurgitation in KC group (p. 166). Preterm, RCT, Paternal KC, temperature, regurgitation, BF, LOS, head circumference, length, weight, daily caloric intake, mortality, oxygen saturation, SaO2 desaturation, successful BF, hypothermia (Not on charts yet)

Roller, CG. (1999). Kangaroo care for a restless infant with gastric reflux: One nurse midwife’s personal experience. MCN Am. J. Maternal Child Nursing, 24(5): 244-246. Full-term infant who was given SURROGATE KC by the CNM because mother was unavailable. Infant had severe and refractory GER but was GER free during two feedings given with KC two days apart. Fullterm, Case study, SURROGATE KC, FT, gastrosophageal reflux

Roller CG. (2005). Getting to know you: Mothers’ experiences of kangaroo care. J Obstet Gynecol Neonatal Nurs 34(2), 210-217. 10 mothers of preterms with APGAR of 6 or more at 1 minute and 7 or more at 5 mins (1500-3000 gms who have completed 32-36 wks age) answered in 15-90 minute semi-structured interviews “What was it like for you to provide KC for your preterm infant while in the hospital?” They were questioned at home and videotaped, at 1-4 weeks postpartum. 4 themes emerged all related to ’knowing the infant.” The two major themes were “Mother kept from knowing the newborn” and “mothers getting to know their newborn.” Mothers found KC calmed them (pg. 215) and calmed the infant. KC facilitated bonding and maternal-infant acquaintance (interactions). All ten moms said KC was “wonderful way to get to know their babies” (pg. 214). KC is “a warm, calming, positive, bonding experience, and the women stated that KC calmed their jittery babies.”(pg. 215). One baby was still calm 3 hours after KC ended (pg. 215). One grandmother did KC in hospital (pg.215). One mom said “Every time I breastfed him I was holding him skin to skin” (pg. 215). KC was pleasant experience for moms. 9/10 women did KC at home. Descriptive, Qualitative, PT, maternal feelings. Maternal stress, bonding, residual effect, Surrogate KC, KCBF, home KC, Very Early/Early KC

Romano AM. (2007a). Research summaries for normal birth. J. Perinatal Education 16(4), 70-74. This is a review of the Moore, Anderson and Bergman Cochrane Database of Systematic Reviews 2007 Early skin-to-skin contact for mothers and their healthy newborn infants. It repeats the findings and has a big section of significance for normal birth, eschewing the separation that occurs, the sensitive period being the first 1-2 hours postbirth, and concludes that delaying healthy infants skin to skin contact is harmful (pg. 71). “With such compelling evidence, it is unethical to continue to deny healthy babies and their mothers skin-to-skin contact after birth. The principles of beneficence (doing good) and nonmaleficence (do not harm) demand that uninterrupted time for mothers and babies after birth take priority over labor-ward routines intended for staff convenience and hospital efficiency and that postpartum and newborn interventions be either delayed or, when necessary, carried out with the baby and mother skin-to-skin”. Pg. 71 Review, BF, Fullterm, separation.

Romano AM. (2007b). Research summaries for normal birth. J. Perinatal Education 16(3), 53-58. This months summary reviews the Jonas et al., 2007 article, repeating the findings and saying that the small study does not provide strong evidence of any harm of epidural or oxytocin augmentation, but does tell of wide-ranging and unpredictable disturbances caused by intervening in the normal birth process. Babies might not get full benefit of KC if not able to respond to KC as nature intended (without medication influence) p. 55. Does provide beginning information that epidurals containing fentanyl (close to sufentanil, a drug which crosses the placenta) increase the risk of early breastfeeding cessation. Review, Fullterm, Breastfeeding, temperature, birth KC, epidurals.

Romano, A.M. (2009). Deconstruction junction: how to separate the good evidence from the bad (and from the ugly). J Perinatal Education 18(4): 49-55. The Bystrova et al., June 2009 study is critiqued so that readers will not be misled. Two other articles are also reviewed. She says, “GARBAGE IN, GARBAGE OUT”. She relates that one message given to new mothers is “Keep mothers and babies skin-to-skin after birth. This exposes the baby to beneficial bacteria on the mother’s skin, facilitates early breastfeeding, and lowers the likelihood that the baby will exhibit signs or symptoms that mimic infection, such as low temperature, or low blood sugar, which could cause the need for blood tests or spinal taps to rule out infection.” (p. 51) On page 53 she starts her critique and is critical of the fact that KC begins after a battery of procedures and disruptions (Bystrova, 2009, Mizuno et al, 2004, Moore & Anderson, 2007) and says this is a weakness in the studies and this practice represents harm to the newborn because routine care of the newborn is not normal and is harmful because normal bonding is really adaptation to and overcoming disruptions that are not benign because they disrupt normal adaptation which is being with mother. The harms of compulsory practices dictated by tradition overwhelm and obscure the benefits of KC. Just imagine what benefits we might see if KC truly was immediate, prolonged, and undisturbed.” (pg. 54). Review, FT. Birth KC, non-separation.

Romano, A.M. (2011). Safe and healthy birth: The importance of data. The Journal of Perinatal Education, 19(4), 52-58. Review article of aspects of maternity care about which data is needed in addition to the routine data of birth which is for medical billing practices only and does not identify supportive, low tech practices that could drive improvements that will affect long-term physical and emotional health, maternal infant attachment, breastfeeding, family-centeredness, and women’s satisfaction with care. Data means anything observed, measured, and documented. 3 new types of data are needed: 1) duration of skin-to-skin contact after birth as a means to improve exclusive breastfeeding rates for Joint Commission accreditation, 2) role of qualitative data describing how women and providers experience maternity-care practices, and 3) limitations of combining data from many different contexts to glean information about the safety of planned home births. “A new vital sign for maternity care: Duration of skin-to-skin contact after birth. The Joint Commission rolled out a bundle of perinatal quality measures in 2009 (See Advance for Nurses as author). One measure is the proportion of newborns discharged from hospital having consumed only breastfeeding during their stay. The USBreastfeeding Committee (USBC, 2010 reference) stated that “Compliance with the
new core measures may require facilities to modify their paper charts and/or electronic medical records. Thus, facilities may want to consider charting modifications that support breastfeeding (such as length of time in skin-to-skin contact, especially immediately following birth)” (pg2 of USBC, 2010) and page 53 of Romano article. “If hospitals are serious about improving their exclusive breastfeeding rates, they should get serious about measuring the duration of skin-to-skin care. A new study in the J of Human Lactation demonstrates a strong dose response relationship between skin-to-skin care and exclusive breastfeeding at hospital discharge (and cites Bramson et al, 2010). …Using data from nearly 22,000 mothers and their healthy, full term babies, the research found the dose response relationship even after controlling for whether the woman intended to exclusively breastfeed, education, ethnicity, anesthetia, mode of birth and other factors. The findings are strong and consistent – the dose response pattern held up in multiple calculations applying various assumptions. FT, FT, guidelines, Birth KC duration, electronic medical record, CORE MEASURE. NOT ON CHARTS 9/10/2011

Roos, T. & Roos, N. (2011). The Miracle of Kangaroo Mother Care. For Every Parent and Every Baby. Rare Inspirational Stories of Infant Care. No publisher, You get this book online, Pay $27.00-47.00 US Dollars for it and then download 120 pages on your own printer. The book is available at www.themiracleofkangaroomothercare.com. This begins with the store of Kate and David Ogg whose baby was declared dead and then came back to life 2 hours later while in Kangaroo Care (Chapter 6, The Twins From Down Under. Pg. 58-75). Though mostly stories of how mothers had to fight the nurses and hospitals to be able to do Kangaroo care with their preterm and full term infants, the stories also include some evidence from Natalie Charpak and Kerstin Nyqvist. The book ends with Yamile Jackson’s use of KC in the hurricane and how she developed the Kangaroo Zak in honor of her son Zachary who survived (Chapter 12. Zachary Jackson: 906 grams of Pure Inspiration) Pg. 111-119. PT, FT, mother’s feelings, implementation, Compassionate KC, end of life, separation Book

Rowe-Murray, H, & Fisher, J. (2003). Baby Friendly Hospital practices: Cesarean section is a persistent barrier to early initiation of breastfeeding. Breastfeeding Review 11(1), 21-27. This is a study to improve BF and KC is mentioned on pages 128, 129,and 130. Review of practice of step 4 of Baby Friendly initiative which is skin-to-skin contact within half hour of birth. Says that in cesarean section births this seldom occurs and continues to impede initiation of breastfeeding. FullTerm, BF, Very Early KC., Cesarean section, Baby Friendly Not on charts yet.


Ruiz JG, Charpak N, & Figuero Z. (2002). Predictional need for supplementing breastfeeding in preterm infants under Kangaroo Mother Care. Acta Paediatrica 91 (10), 1130-1134. Preterms >1200 grams can grow properly on exclusive BF. 45% of infants on ambulatory KMC grow properly, but 55% need supplementation to grow properly. Descriptive, Preterm, BF, post-discharge, weight, supplements


Ruiz-Pelaez, J.G. & Charpak, N. (2007). Systematic Review and Evidence-Based Guidelines for Kangaroo Mother Care. Bogota: Kangaroo Foundation (Fundacion Canguro). Available in English, French and Spanish from Fundacion Canguro, Calle 56 No. 40-02, Bloque A13, Apto 416, Edificios azules, Pablo VI, Santafe de Bogota, Colombia, S.A., or by email at Kangaroo@javeriana.edu.co or herchar5@colomsat.net.co
Ruiz-Pelaez JG, Charpak N, & Cuervo IG. (2004). Kangaroo mother care, an example to follow from developing countries. British Med J, 329(7475), 1179-1182. Review article of what KMC given 24/7 with exclusive BF does. He concludes that KMC is at least as safe as standard care, and quotes from specific studies that KMC improves BF rate, decreases infection, reduced hospital stay, non-significant reduction in mortality, and slight improvements in developmental indices (but infants at higher developmental risk had markedly better neurodevelopmental outcomes), and improved bonding. He talks about KMC wards and quotes one in Manila and one in Sweden and cautions use of KMC with moms who feel intimidated or overwelled in caring for a baby. He lists many centers for KMC in the world and summarizes with WHO’s statement. (States on page 1180 that infants reject permanent KC contact at 37 wks postmenstrual age, but we have not seen that in USA and why would there be ambulatory KMC up to one year of life if infants are rejecting KMC?). PT, Review, length of stay, development, bonding, mortality, infection, BF, weight, maternal feelings, NOT YET ON CHARTS

Russell, K., Weaver,B., & Hsu, J-P. (2011). Effect of a maternal simulated intervention on physiologic and developmental behaviors of 28-34 week gestation infants in a Level III neonatal intensive care unit. Presentation Nov. 2, 2011 at American Public Health Association 139th Annual Meeting and Exposition, Oct.29-Nov.2,2011, Washington, DC. Abstract #235705. Preterms have many problems that interventions have been created to ameliorate, i.e. nesting rolls, etc. But few of these have been studied. Quasi-experiment of 45 infants randomized into four groups of different interventions to explore over time when developmentally appropriate interventions were applied. Differences in pain scores, apnea/bradycardia episodes, vital signs, occurrence of self-regulatory and stress behaviors were observed. Infants receiving the maternal simulated intervention (does not mention what it is in any way, nor what the other four interventions are), had fewer episodes of apnea/bradycardia. The odds of observing stress over time were higher for standard care than for simulated intervention. The simulated intervention was an efficacious method to reduce adverse physiologic and developmental behaviors of 28-3 week gestation infants. PT, RCT, simulated maternal features, apnea, bradycardia, stress, self-regulatory, pain. Not on charts 9/18/2011. THIS IS NOT KC. THE DEVICE is THE ZAKY hand.

Sachdev HPS. (2003). “Kangaroo Mother Care” method to reduce morbidity and mortality in low-birth-weight infants: RHL commentary (last revised 2 June 2003). The WHO Reproductive Health Library, Geneva: World Health Organization. Available from http://apps.who.int/rhl/newborn/hpscom/en/prints.html. This is a 3 page document of a Cochrane type meta-analysis of 14 trials (11 were not randomized and were excluded) yielding 3 trials in developing countries of 1362 infants <2000 gm. Trials were Charpak et al., 1997; Cattaneo et al., 1998; Sloan et al., 1994; Charpak et al., 2001). Meta-analysis showed that KMC reduced nosocomial infection at 41 wks, including lower respiratory tract infection at 6 months. KMCers gained more weight per day at discharge even tho this was of low clinical significance (3.6 gms/day 95%CI =0.8-6.4. No differences in mortality, KMC reduced likelihood of NOT being EXCLUSIVELY BF at discharge but there was no difference in exclusive BF rates at one and six months follow-up. Fewer mothers were dissatisfied with care. Psychomotor development was similar between KMC and incubator groups at one year age. Page 2 says that hypothermia and not being BF are the major underlying contributors to morbidity in LBW and predispose them to infection and mortality. Maternal acceptability of 24 hour KMC in hot and humid environments has not been studied. This Cochrane meta-analysis of 3 24/7 KMC RCTs is not robust and “does not as yet support the use of this method on a large scale” (pg. 2). Has good summary of LBW incidence & problems in Southeast Asia. PT, LBW, Meta-analysis, 24/7 KMC, infections, weight gain, EXCLUSIVE BF, mortality, maternal dissatisfaction, psychomotor development

Saeidi, R., Tafazoli, M., & Robatsanghi, M.G. (2010). Kangaroo mother care for infantile colic: a randomized controlled trial. Tehran University Medical Journal, 67(12), 870-875. 70 infants (3-12 weeks old) with persistent colic symptoms had two day baseline taken and then were randomized into KC or conventional care for 7 days during which mom completed daily diary. At baseline, KC group had 3.5 hrs/day crying and it significantly dropped to 1.7 hr/day, awake and content behavior significantly increased in KC group, as did sleep. NO difference between groups in feeding duration. (FT, RCT, crying, colic, sleep, wake, feeding, Diary) Write to Mahbobhe Gholami Robatsanghi at midwiferymaster26279@gmail.com

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Saeidi, R., Asnaashari, Z., Amir nejad, M. Esmaeili, H., & Robatsangi, M.G. (2011). Use of “kangaroo care” to alleviate the intensity of vaccination pain in newborns. Iran Journal of Pediatrics, 21(1), 99-102. Randomized controlled trial double blind, two group clinical trial in which 60 NSVD healthy (Apgars 7-10) and birthweight 2500-4000 gm were randomly assigned to KC (n= got two minutes of KC before vaccination and then got 3 more minutes after vaccination; control n= wrapped in blanket and put aside mother). HR, Sao2, crying time and pain by

Neonatal/Infant Pain Sclae (NIPS = score >3 indicates pain and measures facial expression (relaxed muscle 0, grimace1), crying (none -, whimper 1, vigorous cry 2), Breathing pattern (Relaxed 0, change 1) Arms (relaxed/restrained 0, extended 1), State of arousal (sleeping/awake 0, fussy 1)) were measured. Infants were not fed for 30 minutes before vaccination. Randomized case controlled clinical trial of 60 healthy FULLTERM infants who were videotaped receiving the vaccination when at least 24 hours old. Non-random purposive sampling but did use random assignment. During shot, 30% KC infants had 6.0 pain & 70% had score of 7; 96.6% of controls had score of 7 and 3.3% has score of 6(p<0.001). Three minutes after vaccination, 93.3% of KC infants had pain score 0 and only 6.6% had score of 6 or 7; 70% controls had score of 0 and 26% had scores of 6 or 7 (p<0.021). Mean pain intensive 3 minutes after injection was sig lower in KC infants. KC infants had shorter cry duration during and after vaccination than controls. Oxygen saturation before vaccination (KC= 95.80 , control +94.07) during vaccination (KC= 96.17;controls=94.53) and after vaccination (KC= 95.60; controls = 95.10) essentially no difference in SaO2 between groups. No Sao2 values were significantly different. FT, RCT, pain, HR, SaO2, Crying time, vaccination, intermediate KC. NOT ON CHARTS

Safe Motherhood, (2004). Kangaroo Mother Care. Safe Motherhood. A newsletter of worldwide activity. Issue 31, 2004(1), p. 5. This a review of the Kangaroo Mother Care book produced by WHO so countries can establish their own programs of KMC. This newsletter is available from World Health Organization, 1211 Geneva 27, Switzerland or through rhrpublications@who.int. The ISSN is 1014-9511. FT, guidelines


Sajedi, F., Kashaninia, Z., Rahgozar, M., & Noghabi, F. (2007). The effect of kangaroo care on physiologic responses to pain of an intramuscular injection in neonates. Iranian J of Pediatrics, 17: 339-344. This is same group of subjects as Kashaninia 2008 study. 100 infants, 50 who got 10 minutes of maternal KC before during and after injection until newborn stopped crying. Other group got 10 minutes of undisturbed positioning in quiet room before injection and after the injection until the infant stopped crying (n= 50). Mean HR was lower (p<0.001) and SaO2 was higher (p<0.001) during and 3 minutes after injection in KC vs no-KC group. FT, PAIN, HR, RCT, SaO2

Sakaki H., Nishioka M, Kanda K, & Takahashi Y. (2009). An investigation of the risk factors for infection with methicillin-resistant Staphylococcus aureus among patients in a neonatal intensive care unit. American Journal Infection Control (Am J Infect Control), 37(7), 580-586. 961 infants hospitalized in a teaching hospital NICU in Japan from July 2002 through December 2005 provided records to determine risk factors for MRSA. 28 infants (2.9%) developed MRSA. Multivariate logistic regression analyses demonstrated the following risk factors: low birth weight (odds ratio 0.91), presence of eye mucous (OR 6.78), practice of kangaroo mother care (OR 3.82), and MRSA colonization rate (OR 11.12). Thus, practice of KMC is a risk factor for developing MRSA and isolating MRSA infants should prevent spread. Descriptive study of records, PT, infections, MRSA, negative findings NOT ON CHARTS AS OF JULY 1, 2009.


Samra, N.M., El Taweel, A., & Cadwell, K. (2011). The effect of kangaroo mother care on the duration of phototherapy of infants re-admitted for neonatal jaundice. *Journal of Maternal-Fetal and Neonatal Medicine*, 24, 2011, 1-4. Online. DOI: 10.3109/14767058.2011.634459. Fifty preterm (60% of subjects) and full term infants (Gestational age ranged from 35-40 weeks) with birth weights ranging from 2000-3750 gms who were admitted to the NICU over a four month period for clinical jaundice (80% or 40/50 had physiologic jaundice and 20% or 10/50 had breastfeeding associated jaundice. were studied. Moms who could give intermittent KMC were assigned to the KMC group (n=28) and gave KC three times a day for at least one hour in each session, 7 days /week until jaundice resolved and had phototherapy intermittently (pg. 2 upper right column., 2nd paragraph); mothers who could not come to give KMC were assigned to control group (n=22; continuous phototherapy and no KC). All infants were fed formula or expressed mother’s milk when available.Inclusion criteria were: onsent of jaundice at 48-72 hours, peak serum bilirubin occurring at day 3-5 of age, rate of rise of bilirubin <5 mg/dl/day and conjugated bilirubin level less than 2 mg/dl at any time. They excluded breastmilk jaundice infants (defined as onset of clinical jaundice on days 5-10 of life, peak serum bilirubin level occurring at day 15, rate of rise of bilirubin 1-2 mg/dl/day, and the infant is thriving (Page-Goertz, S.

Hyperbilirubineia and hypoglycemia. In Walker M. (ed.) Core Curriculum for Lactation Consultant Practice. Sudbury, MA: Jones & Bartlett Publishers, 2002, p. 289). Phototherapy stopped when bilirubin plateaued and began to fall (pg. 2,left column, 3rd paragraph), or in babies whose Total Serum Bilirubin=18 mg/dl or higher when serum bilirubin levels falls below 13mg/dl. No significant differences between groups on delivery mode, gender, gestational age, mean birth weight, mean onset of jaundice, mean peak bilirubin level, and cause of neonatal jaundice. Clinical jaundice appeared later in babies with breastfeeding jaundice than in physiologic jaundice babies. KMC and cause of jaundice (BF or physiological) were two independent predictors of the duration of phototherapy. Duration of phototherapy was significantly shorter in KMC (68.14 +/- 24.32 hours, R= 40-130 hrs) than control group (100.86 +/- 42.26 hours, R= 48-192 hrs) (p=0.004). Babies with Breastfeeding associated jaundiced needed longer duration of phototherapy (125.80 days) than physiologic jaundice babies (71.72 days). This article also addresses pain and length of stay, saying that KMC reduces pain and stress that preterm infants have and reduces length of stay which should reduce cost of care. PT, FT, NOT an RCT, but quasi-Experimental, PT, FT, bilirubin, phototherapy

Sandin-Bojo, A-K, Hall-Lord, M-L., Axelsson, O., & Wilde Larsson,M-L. (2007). Inpartal care in a Swedish maternity unit following a quality improvement project. *Midwifery*, 23, 113-132. Quality improvement project to have more the WHO 1996 guidelines put into practice in a Swedish maternity unit and this did occur. Improvements in skin to skin placement so that it was almost routine, were seen. *Quality Improvement Project, Descriptive evaluation, FT, Birth KC, guideline implementation.*

Sandin-Bojo, A-K., Hashimoto, M., Kanal,K, & Sugiura, Y. (2011). Intrapartum care at a tertiary hospital in Cambodia: A survey using the Bologna Score. *Midwifery*, Epub ahead of print. Developing countries aim to reduce maternal-infant mortality by establishing good health care practices. This is a descriptive study of childbirth care practices in a Cambodian hospital that delivers 8,500 birth /year, as measured by the Bologna Score instrument. The Bologna Score Instrument reflects the adaptation of evidence-based care and attitudes of caregivers. Bologna Score was calculated for 177 consecutive midwife managed (63%) or physician managed (35%) childbirths of term infants. All women survived., but a full 5-point Bologna Score was not achieved for any woman. A full 5-point score indicates that evidenced-based management of vaginal delivery is occurring. Use of supine position, presence of accompanying person in the birth room, use of the partogram, use of skin-to-skin contact, absence of labor augmentation, and lack of episiotomy are evidenced-based practices measured by the Bologna Score. Only ¾ of the vaginal births had skin-to-skin contact during the first two hours postbirth. The Bologna Score is easy to use and identifies practices that can be improved. Bogota score of good third stage of labor practice The fifth question on the score is whether skin to skin contact is maintained for at least 30 minutes during the first hour after birth Descriptive, FT, Birth KC, Bologna Score, routine Birth KC, Evidenced-based implementation measure. Not on Charts 1.3.2012 Put in Fairview manuscript and in KC course.

Sandin-Bojo, A-K & Kvist, L-J. (2008). Care in labor: a Swedish survey using the Bologna Score.Birth, 35(4), 321-328. The Bologna Score measures 1.presence of a companion to the woman 2. Whether a partogram (Friedman curve) was used, 3. Absence of augmentation including external physical pressure on the fundus or
emergency cesarean, 4. Woman gave birth in a non-supine position, 5. The fifth question on the score is whether skin to skin contact is maintained for at least 30 minutes during the first hour after birth. **FT, Bologna score, Birth KC Recommendation. NOTON CHARTS and need to finish reading this for full annotation of results.**


Sandin-Bojo, A-K, Wilde Larsson, B., Axelsson, O., & Hall-Lord, M-L. (2006). Intrapartal care documented in a Swedish maternity unit and considered in relation to the WHO’s recommendations for care in normal birth. *Midwifery, 22*, 193-286 or is it 2007-217?? Descriptive evaluation of the 1996 WHO recommendations that include in “After birth of baby” that “infant is placed skin to skin.” In the text and in a table they have listed skin-to-skin as a demonstrably useful (and should be encouraged) intervention in third stage care. Three items were not documented at all, and infant being in skin-to-skin was not recorded at all. This was NOT being done consistently in Swedish units in 2005, and other factors, such as minimization of pharmacologic measures for labor pain, also were not being used. **FT, Birth KC, Descriptive study.**

Sandin-Bojo, A-K, Wilde Larsson, B., & Hall-Lord, M-L. (2008). Women’s perceptions of intrapartal care in relation to WHO recommendations. *Journal of Clinical Nursing, 17*, 2993-3003. Doi: 10.1111/j.1365-2702.2007.01232.x The is a study of women’s perceptions of their childbirth experiences in Sweden with midwives and comparing the practices to those recommended by WHO for normal births. Practices revealed that there is little evidence that birth is seen as a normal physiological process with as few interventions as possible in the birthing process (pg. 2994) and all the interventions are associated with a negative birth experience. One of the WHO recommendations and the FIRST in the category “After the baby is born” is “the baby was placed skin-to-skin” (Figure 1 on page 2996) and on page 2996 it says “almost all women reported that “the baby was put skin-to-skin” and on page 2997 it states “After the baby was born the items ‘the baby was placed skin-to-skin’ followed by ‘I was helped to breastfeed” within two hours’ showed the highest ratings for being practice.” Women’s perceptions of birth were negative if the infant was sent to NICU and 84% perceived their deliveries as normal even though they received practices that were harmful, have insufficient evidence for practice exists, and practices that were frequently used inappropriately. **FT, Birth KC, Guideline/Recommendation, routine birth kc. Be sure to go to Sandin-Bojo AK, Hall-Lord ML, Axelsson O, Uden G, and Wilde Larsson B, (2004) Midwifery care: development of an instrument to measure quality based on the World Health Organization’s classification of care in normal birth. Journal of Clinical Nursing, 13, 75-83 because I think this is development of the Bologna Score.**

Sandink, Attie (2/25/2012). Attie reports this KC Story: I had an awesome situation today while working in Labour and Delivery. Baby with severe fetal distress and mother with CPD and loads of Meconium. Post birth APGARS 5/8/9. Still a bit grunty after deep suction for mec below cords by RT. who than suggested baby should go skin to skin in Recovery Room. It took about 15 minutes for us to get mom out of OR and baby still a bit grunty went skin to skin in 30 degree angle between breasts. Warmed up and pinked well and became calm etc. I have seen much of this but usually these kids have gone to the nursery because of the deep suctioning and as the circulating nurse I can't say too much but I become the mom and baby nurse in the RR so this went very well. I loved the changes. Parents were pleased to especially since baby breastfed before leaving RR and was transferred to the PP floor in the skin to skin position. Could not have gone better. ;-) Sure I would have liked to see skin to skin in OR but mother was very nauseous and shaky. Connect with Attie at Attie.Sandink@gmail.com. **KC Story**


Save the Children. (2010). Advocating for Kangaroo Mother Care in Mali. Westport, CT: Save the Children.
Schanler, R.J. (2001). The use of human milk for premature infants. *Pediatric Clinics of North America, 48*(1), 207-219. This review article covers the role of fortification and states “the potential stimulation of an enteromammary pathway through skin-to-skin contact provides species-specific antimicrobial protection for premature infants, and this needs to be explored. Thus, neonatal centers should encourage the feeding of fortified milk, together with skin-to-skin contact, as reasonable methods to enhance milk production while potentially facilitating the development of an enteromammary response.”

Schanler, RJ. (1995). Suitability of Human Milk for LBW Infants. *Clinics in Perinatology, 22*(1): 207-222. A nursery policy that advocates early skin-to-skin contact between LBW infant and mother may improve host defense of the infants”(211). “Guidelines for feeding LBW infants must include skin-to-skin contact to promote development of maternal antibodies”(217). Premise is that baby’s skin picks up NICU pathogens and when in contact with mom’s skin passes them to her. She then makes antibodies, “it is possible that the mother may make specific IGA antibodies against nosocomial pathogens in the infant’s environment and pass them along to the infant in her breastmilk”.

Schanler, R.J., Fraley, J.K., Lau, C., Hurst, N.M., Horvath, L., & Rossmann, S.N. (2011). Breastmilk cultures and infection in extremely premature infants. *Journal of Perinatology, 31*(5), 335-338. DOI: 10.1038/jp.2011.13. Correlational study to determine if serial microbial cultures of mothers milk predict infection in premature infants because mothers milk is known to be colonized by microbial species based on the hypothesis that the presence of specified microbial flora in expressed mothers milk was correlated with subsequent infection in the neonate.. 161 mothers of preterm infants <30 wks gestation contributed aliquots that were subjected to plate counts for microbial flora. 813 samples of milk yielded 1963 isolates. KC was practiced by 77% of the mothers who were mostly graduates of college and 11% had incomes >100,000. Most common isolate was staphylococcus epidermidis, but it lists many more on the 3rd page. There were no relationships between microbial counts and maternal age, ethnicity, education, KC, and infant infection. Initial cultures of milk did not predict later cultures of milk, so taking a milk sample just once is not sufficient to predict exposure during all feedings. Routine milk cultures are not useful in identifying potential infection. *PT, correlational study, breastmilk, infection.*

Schanler RJ, Lau C, Hurst NM, & Smith EO. (2005). Randomized trial of donor milk versus preterm formula as substitutes for mothers’ own milk in the feeding of extremely premature infants. *Pediatrics 116*(2), 400-406. Preterm <30 wks GA were enrolled on Day 4 of life and were randomly assigned to receive either donor milk (n = 81) or preterm formula (n = 92) if mothers milk (mm) supply was insufficient from birth to 90 days of age or hospital discharge (whichever was sooner) and compared to infants who received only mother’s milk (n = 70 or 29%). Duration of KC was measured daily. 17 infants in donor milk (DM) group had insufficient weight gain and were switched to preterm formula (PF). Outcomes measured after attainment of milk intake of 50mL/Kg were late onset sepsis (no diff between donor milk and preterm formula grps), NEC (no diffs), meningitis (no diff), presumed sepsis (no diff), urinary tract infection.
(no diff), dietary intake (DM intake > PF but slower rate of weight gain), weight gain (see note above), head circumference (no diffs), KC (mother’s milk gave more episodes and longer duration of KC than other 2 groups- detailed below), and duration of hospital stay (no diffs) and mortality (no diffs). MM group had less LOS, NEC, and total infection related events, and shorter hospital stay, fewer gram neg organisms in blood cultures. Donor milk offered little observed short term advantage of Preterm formula. Exclusive mothers own milk showed advantages of fewer infection related events and shorter stay in hospital. “Skin-to-skin contact was correlated positively to intake of mother’s milk (r=0.47, p<0.001), negatively with preterm formula [intake] (r = -0.25, p=0.18), and not with donor’s milk (r= -0.08, p=0.18). Skin-to-skin contact was not correlated with the number of infection –related events (late onset sepsis, necrotizing enterocolitis, meningitis, presumed sepsis, or urinary tract infection)”(pg. 403). KC was given by 56(69%) moms and 21 (26%) pops in donor milk group; by 60(65%) moms and 22(24%) pops in preterm formula group, by 65(93%) moms and 33(47%) pops in mother’s milk group. The percent of mothers and fathers providing skin-to-skin contact was not significantly different between donors milk and preterm formula groups, but was significantly greater (p<0.001) in mothers milk group compared to combined values for the donors milk and preterm formula groups (pg. 404). The number of episodes of KC also differed between the groups: M=5.0,SD=7.5 in donors milk group, M=5.2, SD =7.7 in preterm formula group, and M=11.6,SD = 12.6 in mothers milk group, with no significant difference between donors milk and preterm formula groups but significant difference (p<0.001) between mothers milk and combined donors milk and preterm formula groups. Duration of KC also differed between groups: M=318 minutes SD =673 in donor milk group, M=349, SD = 596 in preterm formula group; M=962, SD = 1452 minutes in mother’s milk group and this was not different between donor’s milk and preterm formula groups, but was different (p<0.001) between mother’s milk and combined donors milk and preterm formula groups.

Scher, MS. (2007). Ontogeny of sleep. Sleep Medicine. 9(6): 615-636. This review article traces the expected patterns of postnatal brain maturation and changes occurring due to alterations from genetically programmed neuronal processes under stressful and /or pathological conditions. Also says that kangaroo care improves sleep and may be beneficial to the brain. Automated analyses of cerebral and noncerebral signals provide time- and frequency- dependent computational phenotypes of brain organization and maturation in healthy and diseased states. These computational phenotypes can be used to design longitudinal studies for the assessment of gene-environment interactions. Review, brain maturation and development. Not on charts yet.

Scher MS, Ludington-Hoe SM, Kaffashi F, Johnson MW, Holditch-Davis, D, & Loparo KA. (2009) Neurophysiologic assessment of brain maturation after an eight week trial of skin-to-skin contact on preterm infants. J. Clinical Neurophysiology, 120(10): 1812-1818. A Quasi experimental pretest-test historical control design with 10 preterm infants (8 provided complete data sets for all analyses) who had been randomized by computerized minimization technique into the KC care for 8 weeks of KMC (1.5 hours/day x 4 days/week from 32-40 weeks postmenstrual age (enrollment and testing occurred within 2 weeks of both dates). EEG sleepanalyses conducted at 32 and 40 weeks PMA in incubator in NICU for pretest and in KMC in NICU for KC group. 126 historical controls (X no-KC preterms tested in NICU in incubator for pretest for test periods; and X fullterm infants tested in sleep lab with 48 hours of birth). 22 EEG-based outcomes were evaluated and calculated as test-pretest change. Scorer of EEG was blind to period, but new that some of the preterms had been given KMC. When KC preterms were compared to both fullterms and non-KC preterms, KC group had fewer REMS (p=.0001), longer sleep cycle lengths (p=.0148), higher percentage of quiet sleep (p=.0005), less spectral beta power (p=.0259) (less energy in the beta band because infant is in quiet sleep more than active sleep), and increased spectral respiratory irregularity (p=.0077)(more chaotic respiratory signal in the brain so its value is higher and closer to 1.0 than a sinusoidal signal that has all of its energy focused at a single frequency for score close to 0.0). When KC preterms were compared to non-KC preterms at term age, the K group had fewer REMS (p=.00006), higher percentage of quiet sleep (p=.0002), more arousals during quiet sleep (p=.0002), and lower spectral beta power (p =.0136). EEG frequencies have been separated into bands, alpha (8-13 Hz) and beta (13-22 Hz). Each band is a unitless measure of the energy in the band and the energy differs dramatically between quiet and active sleep states. Measures of sample entropy (complexity of neuronal connections) showed that KC infants had greater complexity in five brain regions than non-KC preterms at term age (the brain regions were in the right hemisphere and...
left and right parasagittal regions. When KC infants were compared to both non-KC preterms and term infants as one group, 3 brain regions had greater complexity in the KC preterms: all 3 regions were in the right hemisphere. And KC infants had less complexity in the posterior quadrant of the left hemisphere when compared to both non-KC groups. More advanced neurophysiologic development for KC infants over an 8 week period. More advanced maturation and complexity of multiple neuronal pathways within the brainstem, diencephalon, and cortex. Better development of ponto-medullary to basal-frontal pathways of respiration was present in KC preterms; better development of pedunclo-pontine/geniculo-calacarín pathways of REM behavior, and better development of the ascending reticular activating pathway serving arousal; better development of the corticothalamic pathways service quiet sleep, and better development of cortico-cortical pathways service spectral beta power and complexity of the brain. KC positively affected neuronal networks throughout the neuroaxis. Changes in the right hemisphere reflect the right hemisphere’s greater responsivity to sensory stimulation than the left hemisphere which is “hard wired” for activation at later age control of language and motor functions. KC hastens brain maturation and may influence neurodevelopmental outcomes. Quasi-experiment with historical controls, sleep, arousals, REM, quiet sleep, active sleep, respiratory regularity, and brain maturation, complexity.

Schlez, A., Litmanovitz, I. Bauer, S., Dolfin, T. Regev, R., & Amon, S. (2011). Combining kangaroo care and live harp music therapy in the neonatal intensive care unit setting. Israel Medical Association Journal, 13(6), 354-358. Anxiety reduction in the NICU is needed (P. 354) and music reduces stress. Live harp music was used because Lai found that recorded music and KC reduced maternal anxiety and live music is better stress reducer than recorded music. The tempo of the music was 60-70 beats/min and was played 1-2 meters from dyad and decibel level 10 cm from infant’s ear was 50=65dB with a frequency of 25-10,000 Hz, but they aimed for listening volume of 50-65 dB. The background noise during KC alone was 40.6 dB and during KC + harp it was 58.1 dB. They played familiar Jewish and Arab music like lullabies. 52 Stable infants, 32-37 weeks gestation with normal hearing were randomly assigned to KC and live harp music or to KC alone. Neonatal and Maternal HR, SaO2, RR and neonatal behavioral state (documented every two minutes) and maternal anxiety. Behavioral state was measured on 7 point scale (deep sleep, light sleep, drowsy, quiet awake or alert, actively awake and aroused, highly aroused, upset, or crying, and prolonged respiratory pause >8 seconds (based on Als, Lawhon, Brown et al., Pediatrics, 1986, vol. 78, 1123-1132.) , maternal anxiety measured by state trait anxiety inventory scale of Spielberger CD, Gorschul RL, Lushene R, Vagg PR, & Jacobs GA. Manual for state-trait anxiety inventory: STA1 (Form Y), Palo Alto, Consulting Psychologist Press, 1983) KC and live harp music had significant beneficial effect on maternal anxiety only (46.8 vs 27.7) over KC alone, but did not change any other parameter. No correlation between mother’s age, ethnicity, years of education and affinity for music and maternal anxiety was found. KC with harp music is more beneficial in reducing maternal anxiety than KC alone, but the combined therapy had no effect on infant’s physiologic responses and behavioral state. Susie Ludington has one problem with concealment in this RCT: On page 356 it states “Data were recorded by a single physician (SA) who remained at the bedside throughout each session. Data were analyzed in a blinded fashion by SA who was unaware of treatment allocations”(pg. 356.) How can one be UNAWARE of live harp music being played as you stay at the bedside? So Susie contacted the author and learned that SA was not present during the treatment’s administration, so the concealment issue is now mute but has been left here in case others are wondering the same thing based on the written text. PT, RCT, infant stress, maternal stress, maternal anxiety, Mat HR, Mat SaO2, mat RR, RR, SaO2 and HR of infant, behavioral state music See also Lai et al., 2006 for another RCT of KC + Music. Not on charts 8/19/2011


Schneider, C., Charpak, M., Ruiz-Pelaez, J.G., & Tessier, R. (2012). Brain motor function in very premature-at-birth adolescents: a first transcranial magnetic stimulation study and influence of Kangaroo Mother Care. Acta Paediatrica, in press as of 3/15/2012. This is a 16 year follow=up to Charpak’s RCT of 28-32 week Gestation preterm infants given 24/7 KMC once off of oxygen support in Colombia (see Charpak 1998 and 2001). Transcranial stimulation was applied over the primary motor cortex of ten term and 39 very preterm adolescents (<33 wks GA, 21 of
whom got 24/7 KMC and 18 who got no KMC at all. Short interval intracortical inhibition (SICI) and facilitation were
tested as was the integrity of each hemisphere function for motor planning, and the short—interval interhemisphere
inhibition to test callosal (corpus callosum) function. Corticomotor latency was lengthened in the noKMC adolescents
when compared to KMC and term adolescents, and SIKI was decreased, SIHI latency was delayed, and SIHI duration
was shortened, and SICI and intracranial facilitation were more difficult to obtain. All outcomes were similar between
KMC preterms and term born adolescents. “The brain motor pathways worked better in the KMC group, thus reflecting
on one side the sustained impairment of the premature brain functional connectivity, and on the other side the positive
impact of KMC on brain circuits and synaptic efficacy up to adolescence. PT, RCT, brain studies, brain
development, long term follow-up, motor development. NOT on charts 3/8/2012.

Schrod L. & Walter, J. (2002). Effect of head-up tilt position on autonomic function and cerebral oxygenation
in preterm infants. Biology of Neonate, 81, 255-259. Handling, temperature control, and head elevated body position are
stress factors for infants during KC (pg. 258). 36 preterms (32.5 wks, bw=880-2980 with median BW of 1460g) were
tested in supine horizontal position in incubator, then raised on a wedge to 30 degree incline and then returned to supine
horizontal position to determine if head-up position of KC causes autonomic stress. Each position was tested one hour
after the previous feeding and was tested over 20 minutes. After 3 minutes of adaptation, prolonged head-up position did
not produce further changes in HR, MAP, SaO2, and resp. frequency was reduced by 6-12% (42 → 38). HRV showed
greater increase in low frequency than high frequency activity after being tilted, but both changed significantly on day 8
only, suggesting a relative increase in sympathetic versus vagal activation. Pretermrs <1500 g showed significant
decrease of regional cerebral oxygen saturation of about 2-5% from day 2-day 8 (this level is clinically insignificant) of
the study (showing maturational changes in regional cerebral oxygenation). From supine (69% (R=37-88) to head up tilt
(68%(R=39-82) to horizontal supine (67% R=29-84) the only significant difference was between pretest percent and
head up percent, not between head up tile and then back to horizontal supine. Cerebral hemoglobin (total, in micromols
was 41(R=7-100) in pretest supine, in head up tile it was 40 (R=9-106), and in posttest supine horizontal it was 45 (R=7-
125). Only median values and Range reported, no means, no standard deviations. There were no prolonged side effects
of prolonged head-up position (tested by using a wedge under the baby) in stable pretermers over first days of life (2-12
days of life), though initial decline in total cerebral hemoglobin in first 3 minutes of head-up position might be critical in
very immature infants. “Prolonged head-up positioning has no undesirable effects in preterm infants with stable
circulation including very immature infants of 25 weeks gestation”(pg. 259). The authors state that “handling,
temperature control and head elevated body position are the main stress factors for infants during KC. The change in
body position from horizontal to heat up results in pooling of blood in the lower body part, a decrease in venous return
and a lower venotricular filling rate, which in turn induces the baroreceptor reflex and thus an increase in sympathetic
tone. In the fetus, intense sympathetic activation results in concomitant vagal stimulation and bradycardia, in stead of
vagal deactivation as seen in adults.(pg. 258). RR decreased with head up positioning and SaO2 remained the same due
to higher tidal volumes and a decrease in intraabdominal pressure and better ventilation of lower lung segments. Heart
rate and blood pressure did not change between horizontal and head up after 3-5 minutes of settling in to each condition.
For HRV outcomes, low frequency reflect sympathetic activities such as baroreceptor reflex, and high frequencies
reflect vagal activity. The increase in sympathetic activity during the first weeks of life was evidenced by an increase in
LF response to orthostatic stress from 26% on Day1 to 70-8-% on Day 8. HR increases with age, too, but to a less
degree.”(p258). Authors conclude that “the orthostatic stress associated with kangaroo care is insignificant in clinically
stable preterm infants if abrupt tilting is eschewed by slow position changes.”pg 259. Case controlled pretest-test-
posttest one group. RR, HRV, HR, SaO2, MAP, cerebral hemoglobin, cerebral hemoglobin, cerebral oxygen
pressure, Not a KC study but refers to KC.

in 5 tertiary NICUS in Sydney Australia answered questions about perception of pain, effects of pain, pain assessment
tools, and safety and efficacy of pain treatments for both procedural and long-term pain. They have adequate knowledge
about pain effects but a low proportion knew difference in long term effects between neonates and older children. Pain
assessment tools are not perceived as reliable, valid, or routinely used, and they were appropriately unsupportive of
topical anesthetic agents. They knew efficacy of breastfeeding and oral sucrose during short term painful procedures, but
KC and massage were less recognized as useful. Most agreed that sedation does not provide adequate pain relief. Conclusion: junior doctors need more education about neonatal pain. **Descriptive, pain, assessment of pain and effects of pain. Don’t know about KC for pain, nor do they know about massage. DO THIS SAME STUDY WITH NURSES.**

Schwartz B, Fatzinger C, & Meier PP. (2004). Rush special kare keepsakes: Families celebrating the NICU journey. _MCN, the American J of Maternal/Child Nursing_ 29 (6), 354-365. Parents are encouraged to participate in weekly scrapbooking (or scrap booking) sessions held each Saturday (funded by Paula Meier) to record pictures and anecdotes of their feelings and experiences in the NICU (which acts as a parent-to-parent support group) and Family Holiday Photo Shoots (always including family members rather than picture of infant alone in holiday attire). Mothers get a picture taken on their first KMC session and are prompted to write by the following words: “What a beautiful photograph! What would you like to remember always about the way you felt when that picture was taken? What would you like to share about it with your baby when she is old enough to learn about her NICU stay? Did she wake up and look at you, or did she relax so much that she settled into a deep sleep?” “Mrs. G---, you journaled about your first Kangaroo Care last week. Do you have any suggestions for Mrs. T?” In this way, scrapbooking techniques transform the weekly session from a craft project to a parent support network (358). Also on page 358 there is a picture of one mother’s scrapbook page of KMC and it shows “Joshua, In this life you have mommy time, daddy time, family time but the time I had with you was called Kangaroo time. It was one of the best times with you. I enjoyed talking to you, singing, telling stories, praying, laughing, crying and most important time spent with you.” (358). **Clinical report, scrapbooking, parent support, bonding**


Senarath U., Fernando DN, & Rodrigo I. (2007). Effect of training for care providers on practice of essential newborn care in hospitals in Sri Lanka. _J. Obstetric, Gynecologic, and Neonatal Nursing_, 36(6), 531-541. An RCT of hospitals assigned to intervention group (education of WHO Essentials of Newborn Care over 4 days [32 hours of training]) or no education. Estimates of baseline levels of newborn practices of immediate BirthKC, initiation of Breastfeeding within 30 minutes of birth, and handwashing in postpartum unit were assumed to be 50%. After the education, care of women was evaluated and immediate Birth KC increased by 1.5 times baseline and early initiation of BF by 3.5 time’s baseline. Undesirable health events of newborns were reduced from 32 to 21 per 223 newborns in the treatment group vs. 20 to 17 per 223 in the control group. A comprehensive 4 day training significantly improved essential newborn practices. Birth KC is considered an ESSENTIAL NEWBORN PRACTICE by WHO. **Fullterm, RCT, Birth KC, essential newborn care, Step4 of Baby Friendly Initiative, Implementation**


Shah, V., & Jefferies, A. (2012). Preterm infants receiving heel lance procedures have slightly lower pain scores and quicker time to return to baseline heart rate when held in kangaroo care by the mother than by the father. Evidenced Based Medicine, Mar 7 epub ahead of print. **PT, PAIN, HR, paternal KC**

Shealy K, Li R, Benton-Davis S, & Grummer-Strawn LM (2005). _The CDC Guide to Breastfeeding Interventions_. Atlanta, GA: USDHHS CDC Publications. On page 1 of the book it states “maintaining skin-to-skin contact between mother and baby after birth has been demonstrated to have a positive effect on breastfeeding.” “Breastfeeding is an extremely time-sensitive relationship” (pg. 2). **Policy, BF, guidelines, full term**

Sheridan, B. (2000). Katie’s story: A little inspiration. _Central Lines_ 16(4): 27. Story of a 28 weeker’s recovery. KC was started and author states “Probably one of the greatest parts of my job is when a parent first kangarooed...
her baby.” PT, Case study. Nurses’ opinion

Sheridan V. (1999). Skin-to-skin contact immediately after birth. Practicing Midwife 2 (9), 23-28. Concern over temp regulation during KC is concern still. Birth KC, Very Early KC, FT. Shiau Chiu has this article as she reviewed it for her Birth article.

Shetty AP. (2007). Kangaroo mother care. Nursing J India, 98(11): 249-250. This is a review article that has far too few references because many studies are cited without references given. The article reviews the definition, research findings, benefits of healthier heart rate and respiration, increased breastfeeding, improved immunity, increased weight gain, regulated body temperature, physiologic stabilization, maternal bonding, breastfeeding, improved resolution of preterm birth issues. She goes into detail about the infants position for KC and that maternal willingness, general health, availability and support from family and community need to be assessed before conducting KC. She also makes statement that “babies who suffer from respiratory distress and stayed in KC positions were relieved within 48 hours without respirators”(p. 249), but gives no citation. Review, PT and FT, definition and position guidelines. NOT ON CHARTS YET.

Shiau, S-H. (1999). The effects of kangaroo care on sleep and crying of healthy fullterm newborns. Nursing Research (China), 7(3): 198-208. 22 Kcers and 22 standard care infants (No sig difs between groups on demographics)were compared. Kcers had significantly less total crying (7.14 min vs 10.73, p=.000) on days 1 & 2 but not 3; Kcers had more sleep (total47.64 min vs 40.36, p=.000 on days 1,2,3) and less awake time (total 14.55 vs. 17.45 min, p=.046) and less awake time on day 3 but not on days 1,2. FULLTERM, RCT crying, sleep, wakefulness Chinese.


Simkiss DE (1999). Kangaroo mother care [Editorial]. J Tropical Pediatrics, 45(4), 192-194. This two page editorial talks about origins of KMC, components of KMC (Kangaroo position for 24 hours per day, Kangaroo feeding at breast, Kangaroo discharge), summarizes the 1996 INK meeting recommendations and consensus paper, says hi tech European and US units have adopted KC, cites temperature, apnea, periodic breathing, oxygenation, oxygen consumption, development, infection, and breastmilk production outcomes (pg 192), mentions paternal KC and Feldman & Eidelman’s improved self-regulation findings, and relates outcomes in resource poor countries (Bergman, Sloan, Addis Abbaba and Mexico studies). She says ‘good evidence to show that KMC is physiologically safe (pg.193), but long term effects on neuropsychological and emotional development in infants need to be explored further. She states KMC does not increase mortality, instead it reduces hypothermia, improves weight gain, improves BF at discharge rates, is cost effective, leads to early discharge and is acceptable to parents. She next cites the INK research goals (from Cattaneo et al., 1998). REVIEW, INK, recommendations, 24 hr KC, KCBF, KC discharge, guidelines, weight, infection, length of stay, low cost, temperature, BF, mortality, emotional dev., development, parental acceptance, apnea, periodic breathing, SaO2, oxygen consumption, milk production. Not on charts yet

Simmons, L.E., Rubens, C.E., Darmstadt,G.L. & Gravett, M.G. (2010). Preventing preterm birth and neonatal mortality: exploring the epidemiology, causes, and interventions. Seminars in Perinatology, 34(6), 408-415. NO DOI. A review of the global problem of 13 million infants born preterm. Goes over causes of preterm birth, and says that “antepartum and postnaqtal interventions (e.g. antepartum maternal steroid administration, or KMC) to improve neonatal survival after birth have been demonstrated to be effective, but have not been implemented widely. …scaling up known efficacious interventions to improve the health of the preterm neonate is needed.” (pg. 408) KC NEEDS TO BE SCALEDUP FOR PRETERM INFANTS. Yeah!!!!!. PT, Review, Implementation Not on charts 2/17/2011.
Sinclair, John C. (????) Supporting parents and promoting attachment. In Jack Sinclair and Mike Bracken (Eds.) Effective Care of the Neonate. Pp. 50-24. On page 52 there is a whole section on Kangaroo Care that relates how KC got started and benefits derived from uncontrolled studies (i.e. reduced mortality, morbidity and abandonment, thermal stability, more successful lactation, and positive parental attitudes (and cites references 79, 80). But then it says the evidence about thermal protection is of concern. LBW babies whose mean skin temp is <35-36°C have cold-induced rise in metabolism. Quoting Gagge, Winslow, and Herrington (ref 81) that adult chest skin temperatures are 34-35°C at environmental temps of 20-30°C, mother’s skin temp is not warm enough to transmit heat to baby. Thus, KC is predicted to result in heat loss by conduction from baby to mother, and mother would only conduct heat to baby if baby was HYPOTHERMIC. “the concept that the method allows the baby to be ‘warmed’ by the mother is misleading.” (pg. 52). Then it goes on to cite Fardig’s study in which rectal temp at 45 mins postbirth in early KC (at cord cutting), late KC (after 5 minute APGAR) and no KC groups was above 36°C. So, Sinclair said, “This (Fardig’s) randomized trial shows for health full term babies that rapid drying of the skin, followed by skin to skin contact with the other under warmed blanket, is an effective method of preventing heat loss after birth.” (pg. 52). Reviews Acolet (1989) too and says “skin temp of 3 vlbw babies was well maintained during skin to skin contact with their mothers, under conditions in which the babies wore a hat and had a blanket over the back.” (pg. 52). Reviews Whitelaw et al., in which “temperature instability was not a problem”. Evidence of thermal effects of KC is very limited at time of publication, and research is needed on direction and rate of heat transfer, body temps both deep and superficial, effect on metabolic rate and clinical effects should be done in large scale RCTS in developing and developed world to provide valid basis for assessing or recommending this practice. This is end of page 52 review, but on page 224 it starts talking about KC again, related to maternal behaviors and feelings and a Table 1 shows all the studied reviewed and this chapter’s author summarized on page 225: “There was no discernible pattern of effects related to length of skin to skin contact between mother and infant in the immediate postnatal period. Studies reporting no significant differences offered exposures of 30-60 minutes.

Sinclair, John C. (????) Supporting parents and promoting attachment. In Jack Sinclair and Mike Bracken (Eds.) Effective Care of the Neonate. Pp. 50-24. On page 52 there is a whole section on Kangaroo Care that relates how KC got started and benefits derived from uncontrolled studies (i.e. reduced mortality, morbidity and abandonment, thermal stability, more successful lactation, and positive parental attitudes (and cites references 79, 80). But then it says the evidence about thermal protection is of concern. LBW babies whose mean skin temp is <35-36°C have cold-induced rise in metabolism. Quoting Gagge, Winslow, and Herrington (ref 81) that adult chest skin temperatures are 34-35°C at environmental temps of 20-30°C, mother’s skin temp is not warm enough to transmit heat to baby. Thus, KC is predicted to result in heat loss by conduction from baby to mother, and mother would only conduct heat to baby if baby was HYPOTHERMIC. “the concept that the method allows the baby to be ‘warmed’ by the mother is misleading.” (pg. 52). Then it goes on to cite Fardig’s study in which rectal temp at 45 mins postbirth in early KC (at cord cutting), late KC (after 5 minute APGAR) and no KC groups was above 36°C. So, Sinclair said, “This (Fardig’s) randomized trial shows for health full term babies that rapid drying of the skin, followed by skin to skin contact with the other under warmed blanket, is an effective method of preventing heat loss after birth.” (pg. 52). Reviews Acolet (1989) too and says “skin temp of 3 vlbw babies was well maintained during skin to skin contact with their mothers, under conditions in which the babies wore a hat and had a blanket over the back.” (pg. 52). Reviews Whitelaw et al., in which “temperature instability was not a problem”. Evidence of thermal effects of KC is very limited at time of publication, and research is needed on direction and rate of heat transfer, body temps both deep and superficial, effect on metabolic rate and clinical effects should be done in large scale RCTS in developing and developed world to provide valid basis for assessing or recommending this practice. This is end of page 52 review, but on page 224 it starts talking about KC again, related to maternal behaviors and feelings and a Table 1 shows all the studied reviewed and this chapter’s author summarized on page 225: “There was no discernible pattern of effects related to length of skin to skin contact between mother and infant in the immediate postnatal period. Studies reporting no significant differences offered exposures of 30-60 minutes.

Singh Joy, S.D. (2010). Skin-to-skin contact after a cesarean and risk of hypothermia. American Journal of Nursing 110(8), 67. This is a review of Gouchon et al.,’s 2010 experimental trial in Nursing Research. It reiterates the specifics of the study and that fear of hypothermia with KC after cesarean is not substantiated. This review does not discuss any of the breastfeeding outcomes nor maternal satisfaction. Full Term, cesarean, temperature, hypothermia

Singh M & Deorari A.K. (2003). Humanized care of preterm babies. Indian Pediatric, 40, 13-20. A REVIEW paper that reviews the virtues of the womb, principles of humanized care, elements of a baby-friendly ecology in the NICU (i.e. sound, light, positioning, handling, feeding with human milk, rhythmic gentle stimulation, tactile/vestibular development [through intermitten KC “during KC most babies feel comfortable, stop crying and achieve physiologic stability. At times, intractable apneic attacks may be relieved by skin to skin contact. During skin to skin contact there is a possibility of transfer of tremendous electromagnetic energy from compassionate mother to her tiny baby, producing calmness, comfort, autonomic stability, promotion of physical growth and augmentation of forces of healing. These virtues of skin to skin contact need to be further studied and exploited”], auditory stim, visual stim, and olfactory stim. PT, Review, apnea, crying, comfort, autonomic stability, growth, humane care Not yet on charts.

Singh, H., Sing, D., Jain, BK, Kaur, H & Kaur S. (2004). Immediate cognitive impact of KMC workshop on medical students. Presentation at “Workshops on KMC at Neoncon 2004. XXIV NNF Annual Convention at Chandigarh, 28October, 2004” Available from file://E:\KangarooMotherCareInitiative(KMCI).htm 63 senior medical students were given a questionnaire immediately before and immediately after a one-hour lecture with demonstration on Kangaroo Care. Maximum possible score was 25. Pretest scores were 0 (54% of students), 1 (39.7%), 2 (6.3%). Post test scores were 100% in 46% of students, 96% (19%), 92 (11.1%), 88(6.4%), 84 (11.1%), and 76 (6.4%). Immediate cognitive impact of KMC lecture was excellent. Quasi-experimental one group, 3rd world, knowledge, medical students/doctors (Not yet on Charts)

Sinunas K & Gagliardi A. (2001). Initial management of breastfeeding. American Family Physicians, 64(6), 981-988,991-992). This is a review article of important things for family physicians delivering and caring for newborns to know and it cites KC in several places. Pg. 981 relates “infant should be placed on mother’s chest or upper abdomen
based kangaroo mother care to prevent neonatal and infant mortality: a randomized controlled cluster trial. Doi:10.2147/157340411796355153.

meta-analysis and ssays that she aggregated incomparable data and drew definitive conclusions in the absence of definitive data. See Lawn et al.’s reply in same journal starting on page 525. This review concludes that more randomized controlled trials of developmental care are needed and says that there are only 3 of NIDCAP. REVIEW, developmental care, infection, BF, wgt.

Complementary care.

Sizun J, Westrup B, & ESF Network Coordination Committee. (2004). Early developmental care for preterm neonates: a call for more research. Archives Diseases in Childhood: Fetal and Neonatal Edition 89, F384-F389. On page F385 it says that KC has been proposed as an alternative or complement to conventional neonatal care for preterms and that positive effects have been reported (improved growth, breastfeeding rate, and reduced nosocomial infections – citing Charpak et al., 2001), that most trials have been in developing countries and results may not have same relevance in countries where high technology neonatal care is more widely available” (and it cites Conde-Agudelo et al., 2000 to support this last statement). This review concludes that more randomized controlled trials of developmental care are needed and says that there are only 3 of NIDCAP. REVIEW, developmental care, infection, BF, wgt.

Complementary care.

Sizun J, Westrup B, & ESF Network Coordination Committee. (2004). Early developmental care for preterm neonates: a call for more research. Archives Diseases in Childhood: Fetal and Neonatal Edition 89, F384-F389. On page F385 it says that KC has been proposed as an alternative or complement to conventional neonatal care for preterms and that positive effects have been reported (improved growth, breastfeeding rate, and reduced nosocomial infections – citing Charpak et al., 2001), that most trials have been in developing countries and results may not have same relevance in countries where high technology neonatal care is more widely available” (and it cites Conde-Agudelo et al., 2000 to support this last statement). This review concludes that more randomized controlled trials of developmental care are needed and says that there are only 3 of NIDCAP. REVIEW, developmental care, infection, BF, wgt.

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Complementary care.
KMC or no KMC. One village per union was randomly selected. 39,888 eligible consenting women provided demographic data. Community based workers taught KMC to all expectant and postpartum women in the intervention villages. 4165 live births were enrolled. Newborns were followed for 30-45 days and then quarterly thru first birthday for care, feeding, growth, health, and vital status. 40% overall and 65% of newborns who died were not weighed at birth. No diff in overall neonatal mortality rate nor infant mortality rate. KMC behaviors were more common in KMC than control group, except for care seeking behaviors. Implementation of KMC was weak. RCT, community-based KMC, mortality, 3rd world. NOT ON CHARTS YET.

Sloan, N.L., Camacho, L.W.L., Rojas, E.P., Stern, C., & Maternidad Isidro Ayora Study Team. (1994). Kangaroo mother method: Randomized controlled trial of an alternative method of care for stabilized low-birth weight infants. Lancet, 344 (8925)September 17, 1994, 782-785. Longitudinal randomized controlled trial with infants <2000 g who were out of risk KC=128, incubator care group = 147. Over 6 months follow up, KC groups had lower rates of serious illness (respiratory tract disorders, apnea, aspiration, pneumonia, sepsis, general infections – all were 7% of KC and 27% of controls). No differences in growth or % of women breastfeeding, but proportion of BF is high in both groups. Mortality was same in both groups. KMC moms made more visits to post discharge, but their infants had fewer readmits and so the cost of care was lower for KMC. Eligibility criteria excluded 50% of LBW infants. PT, RCT, 3rd world. Apnea, costs, infection, post-discharge visits to doctor , BF, mortality, morbidity, RCT, growth/weight, readmits.


Smith, J., Plaat, F., & Fisk, NM. (2008). The natural cesarean: a woman-centered technique. British Journal of Obstetrics and Gynecology, 115, 1037-1042. Cesarean birth remains entrenched in surgical and resuscitative ritual which delay maternal contact, impair maternal satisfaction, and reduce breastfeeding. This is description of KC for c/s, describing a natural approach by allowing parents to watch birth of child as active participants (Holding mom up and no drape separating her from sterile field), slowing delivery with physiological autoresuscitation (let baby’s head emerge and stay in that position so uterine contractions clear lung field of fluid, then surgeon slowly delivers baby and baby flings arms out in extension reflex and they watch baby for one minute APGAR, and transferring baby directly onto mothers chest for Birth KC (actually baby goes to midwife’s arm and mom is told not to reach for baby because she may contaminate sterile surgical field. Midwife places baby on mom’s chest and dries and covers with blanket and bubble wrap and then Mom can embrace baby. They do Vit K shot before mom embraces baby. After surgery, in OR, baby is weighed and given to partner for paternal KC (pg. 1039) while mom is transferred to bed. Biggest obstacle has been reluctance of staff to change roles and give up rituals. OR temp is maintained at 25 degrees C to keep babies warm. No evaluation criteria of the technique are presented and they mention that this needs to be done. See also Varner, 2008 for his commentary on this “controversial” type of care (pg. 1042). Full term, Birth KC, Cesarean section, breastfeeding, paternal KC, implementation.

Smith, J., Plaat, F., Fisk, N.M. (2009). “The Natural Cesarean” Birth, 36(4), p. 356. This is a letter to the editor in regards to Newman and Hancock's comments about how a cesarean birth can not ever be natural! They make the point that cesarean patients should have some autonomy in their maternity care and the time for DOCTOR KNOWS BEST with no input from patient and patient remaining a passive participant in the cesarean birth experience has PASSED!!!! They think not doing KC permits regression from informed autonomy to yesteryears’s doctor knows best approach, an approach that even the NIH conference statement on cesareans says is outdated (NIH State of the Science Conference Satement : Cesarean delivery on maternal request. March 27-29, 2006. Obstet Gynecology 107(6), 1386-1397.) The authors do not think that skin to skin contact and breastfeeding should be sacrificed as part of the aim to improve cesarean care (which is meant to mean reduce elective cesareans). They agree that safety and maternal satisfaction with skin to skin at cesarean birth should be measured. They conclude that women and their partners welcome the introduction of some normal elements into an otherwise abnormal birth. PT, FT, commentary, Birth KC, Cesarean, Breastfeeding.
Smith, K.M. (2007). Sleep and kangaroo care: clinical practice in the newborn intensive care unit: where the baby sleeps. *J. Perinatal Neonatal Nursing* 21(2), 151-157. An implementation report of using KC to increase stable preterm infant sleep and rest. KC was started earlier in each infant’s NICU course by increasing interactive education, support, ongoing review of unit practices and outcomes. Education regarding sleep states and cues was a focus of the project and understanding infant sleep assisted staff in recognizing levels of restful sleep or restless sleep in infants. The implications of sleep and infant success in achieving discharge to home allowed staff to see their role in infant sleep and parent’s role in infant sleep and growth/development overall. **Preterm, implementation, sleep, growth in nursery, not weight in particular, developmental care NOT ON CHARTS YET**


Smith, S.L. (1999). Skin-to-skin care in intubated very low birthweight infants. *Parent to Parent Update* (Univ. Utah Med Ctr in house newsletter). Summer 1999, pg. 4. 14 mechanically ventilated infants (X wgt=2 lbs. 3oz; X GA = 30.5 wks) were randomly assigned to cross over of 2 hrs of KC before 2 hrs of incubator or vice versa. During KC higher skin (37.02) and leg temps occurred than during incubator (36.58 for skin temp). Babies needed 14% more O2 during KC and their SaO2 was lower during KC than in incubator. **Smith postulates that increased energy and O2 consumption occur during two hours of KC with ventilated infants. PT, RCT, VENT KC, thigh temp, skin temp, FiO2, oxygenation, SaO2, Randomized cross-over study**

Smith SL (2001). Physiologic stability of intubated VLBW infants during skin-to-skin care and incubator care. *Advances in Neonatal Care, 1*(1), 28-40. 14 bronchopulmonary dysplasia mechanically ventilated infants (X wgt=2 lbs. 3oz; X GA = 30.5 wks) were randomly assigned to cross over of 2 hrs of KC before 2 hrs of incubator or vice versa. During KCs significantly higher skin (37.02) and leg temps occurred than during incubator (36.58 for skin temp). Babies needed 14% more O2 during KC (significantly higher FiO2) and their SaO2 was lower but not significantly lower during KC than in incubator. Smith reported no stability in KC group, incubator group was more stable and she postulates that increased energy and O2 consumption occur during two hours of KC with ventilated infants. **PT, VENT KC, randomized quasi experimental cross over study. Skin temp, thigh temps, SaO2, FiO2, stability.**

Smith SL. (2002). Infant holding in intensive care. *AACN News, 19*(2), pg. 4, 5. Short clinical scenario of KC with intubated infant that gives Smith chance to review the lit again and say that KC with intubated infants may not be the best practice. She reviews her 2001 study here as well. **PT, Case Study, ventilated KC, temp**

Smith SL. (2003a). Research corner: Myth vs. Reality: Holding intubated infants in the NICU. *AACN News*. Available on http://www.aacnnews.nsff. A case study of Jay, a 26 weeker who is 38 days old and intubated and given KC. This report relates myths that she dispels. Myth #1 is Intubated infants are physiologically more stable when held than when in incubator; She says the rectal temp of a 772 grammer decreased to 37.2 during KC, showing the fragility of very small infants during KC (But 37.2 is a great temp! and near the upper limit of normal of 37.5 for this infant according to Scopes and Ahmed’s work). She reviews Neu’s work and concludes that the “data regarding safety and efficacy of KC on intubated VLBW infants is conflicting.” **Clinical review or Case study. Vent KC 2nd report of temp drop during KC, micropreemie 772 grams when KCed.**

Smith, SL. (2003b). Heart period variability of intubated very-low-birth-weight infants during incubator care and maternal holding. *Am J Critical Care 12*(1), 54-64. 14 preterm infants tested at mean of 34 postnatal days who were on mechanical ventilation (BPD babies) served as own controls and were randomly assigned to 2 hrs of intermittent KC for 2 consecutive days followed by 2 days of incubator care or vice versa. Multiple 300 second epochs of 5Hz data was analyzed. Mean interbeat interval (time domain assessment) was 332 ms during KC, 368 ms during incubator. **No differences in low frequency, high frequency, low/high frequency ratio power (Frequency domain assessment) between KC and incubator existed (pg. 60). Mean LF for kc was 124.6 ms² (R=51.9-71.4 ms²), LF for incubator was 70.3 before KC, 71.4 after KC and 51.9-61.7 ms² during incubator period. Mean HF power was similar for KC (8.8) and incubator**
HR, neg

HR if you put the leads on the ventral surface. Better to put leads in axilla in infant to avoid this. See also Kluthe study and checked wires, and then moved infant leads to axilla and extra systoles went away. Can get extrasystoles in infant monitoring of premature infants during Kangaroo care.

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Hypothermia

They considered hypothermia a threat. Thorough drying, direct skin contact immediately upon delivery and covering with a blanket and bonnet initiates colonization of the newborn with maternal flora (as opposed to hospital flora) and facilitates olfactory learning, with a blanket and bonnet. Successful intake of colostrums and sustained breastfeeding, the risk of neonatal sepsis. Sustained skin-to-skin contact also initiates normal parasympathetic nervous system development. Not a KC Study but related to Smith 2003a. Stress

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Characteristics of heart period variability in intubated very low birth weight infants with respiratory disease. Biology of the Neonate, 86, 269-274. This was with 16 intubated infants at 30.4 week pma and it says that High frequency and low frequency powers were not different between awake and sleep states and that HF power did not improve with gestational age as expected and that LF power did improve with age, albeit nonsignificantly. The NICU stimulates a sympathetic response in LBW infants with respiratory disease and it disrupts normal parasympathetic nervous system development. NOT A KC Study but related to Smith 2003a. Stress

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Immediate newborn care practices delay thermoregulation and breastfeeding initiation. Acta Paediatrica, 100(8), 1127-1133. DOI: 10.1111/j.1651-2227.2011.02215.x. An evaluative study of hospital care after a deadly outbreak of nosocomial infection in Philippines. Interventions that protect newborns against infection-related mortality include drying, skin-to-skin contact, delayed cord clamping, breastfeeding initiation, and delayed bathing. (in abstract on page 1. Also, "WHO has identified simple interventions that, if applied routinely, mitigate some of the threats that newborns face. These early interventions are integral to hospital infection control practices because they reduce the risk of neonatal sepsis."

Hypothermia is a threat. Thorough drying, direct skin-to-skin contact immediately upon delivery and covering with a blanket and bonnet prior to cord clamping mitigates this threat. Sustained skin-to-skin contact also initiates colonization of the newborn with maternal flora (as opposed to hospital flora) and facilitates olfactory learning, successful intake of colostrums and sustained breastfeeding. The risk of neonatal sepsis. 481 deliveries were observed by trained physicians in 51 hospitals. Only 9.6% of infants got skin to skin contact in the delivery room. While 68.2% of infants were put to breast, all were separated two minutes later!!! Many vigorous infants were unnecessarily suctioned. Timing and sequence of interventions was poor and wrong and minute-by-minute care is below WHO standards. FT, birth KC, infection, third world, hypothermia

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Hypothesis of newborns is associated with excess mortality in the first 2 months of life in Guinea-Bissau, West Africa. Tropical Med and International Health 13 (8), 980-986. This is NOT a KC study but it says that in community-based care of newborns they considered 34.5°C or less HYPOTHERMIA. Whoa, that is low!!! In US we consider 36.5 the onset of hypothermia. FT, temp.

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Pitfalls in respiratory monitoring of premature infants during Kangaroo care. Archives Disease in Childhood Fetal Neonatal Edition, 72(2), F115-117. Case study of one preterm infant who had extrasystoles during KC. Could not find any clinical reason for it and checked wires, and then moved infant leads to axilla and extra systoles went away. Can get extrasystoles in infant HR if you put the leads on the ventral surface. Better to put leads in axilla in infant to avoid this. See also Kluthe study.

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Kangaroo transport instead of incubator transport.
Sosa R, Kennell JH, Klaus M. & Urrutia JJ. (1976). The effect of early mother-infant contact on breastfeeding, infection, and growth. In Elliott K, Fitzsimmons DW (Eds.) Breastfeeding and the Mother. Ciba Foundation Symposium vol. 45, NY: Elsevier Excerpta Medical, 1976: 170-193. This is a report of 3 studies conducted in Guatemala. Primip moms of NSVD of 37-42 weeks GA. Study #1: KC group (n= 30) given 45 minutes KC under radiant warmer beginning after episiotomy repair; control (n=30) had mom and baby separated for 12-24 hours with FU at 35 days, 3.6,9,12 mos. KC group BF for mean 173 days during 1st year, controls for 274 days. Fewer infections in KC. Early postnatal KC did not result in an increase in BF. Study #2: KC (n=34) got 45 minutes post delivery, control (n=34) separated for 12-24 hours. KC group BF for mean 159 days over 1st year, control for 109 days: KCers BF longer, & fewer infections in KC. Study #3: KC (n= 20)also got 45 minutes of KC, and controls (n=20) were separated for 12-24 hours and third group (n=20) got nude infant at 12 hrs age. KC group BF for mean # of 96 days over 1st year of life, controls BF for mean of 104 days. KCers did not BF longer in Study #3. Observations at 36 hours in study #3 showed KC moms had sig more maternal affectionate behavior (being en face, looking, talking, fondling,kissing, smiling to infant), but no diff in proximity behavior (keeping baby in mom’s bed or holding it close) or in taking care of baby (burping, wiping mouth). Conclusion: KC moms BF 50% longer than controls (p.183). Wgt gain sig more at 6 months (4.5kg kc VS. 3.7kg non-KC) and sig. More at 1 yr (6.0kg vs 5.7kg) maternal sensitive period is <12 hours and early Mat-infant contact PP has far-reaching effects on infant health during 1st yr. RCTs Full-term, BF, Infection, Wgt gain.

Spatz, DL. (2004). Ten steps for promoting and protecting breastfeeding for vulnerable infants. J Perinatal Neonatal Nursing, 18(4), 385-396. This is a review of the author’s ten rules to promote BF with vulnerable infants. Rule #5 is Skin-to-skin care. On page 390 she provide a brief review of KC benefits to gas exchange, heart rate, apnea, weight gain, sleep, length of stay, infection rate, mental/motor development, maternal stress, and lists several Randomized controlled trials. She also states that KC improves milk production, BF initiation, BF duration, and then goes on to relate the QI project to increase KC at Children’s Hospital of Philadelphia that had 8 implementation parts: 1) random chart audits each month, 2) daily chart review, 3) patient packets about KC [they call it skin-to-skin contact], 4) Nursing staff education, 5) KC resource binder, 6) Visual cues at the bedside, like a calendar and pictures and recording form, 7) parent education, and 8) qualitative interviews with nursing staff. The QI project resulted in only a modest increase in use of SSC (from a mean of 1 to a mean of 4 babies doing SSC over the course of 10 months (Figure 3 on page 391). Nurses do not document holding and SSC as often as it is done. Says “infant should be positioned skin to skin at the breast and mother should manually express a few drops...”(pg. 391) PT, Review, BF, QI, quality improvement, Implementation, KCBF, nurses’ recording of KC time, takes nursing time, nurse’s time NOT MUCH KC BEING DONE

Spatz, DL. (2007). Skin-to-skin contact for premature infants. Children’s Hospital Of Philadelphia video of transfer technique available on the CHOP website under neonatal. PT, ventilated KC, transf

Spatz, D.L. (2012). Innovations in the provision of human milk and breastfeeding for infants requiring intensive care. Journal of Obstetric, Gynecologic and Neonatal Nurses. 41(1), 138-143 DOI: 10.111/j.1552-6909.2011.01315.x Not a KC article per se, as this is about colostrum and oral care of preterm infants and how to maintain milk supply and...
transition the preterm to breastfeeding. On page 141 it says under the section on transitioning to breastfeeding: “Spatz (2004) detailed 10 specific steps that protect and promote breastfeeding in vulnerable infants including informed decision, establishment and maintenance of milk supply, breast milk management, feeding of breast milk, skin-to-skin care, nonnutritive sucking at the breast, transition to breast, measuring milk transfer, preparation for discharge, and appropriate follow-up. These 10 steps have been collapsed into five-step pathway that can be implemented by the bedside nurse to achieve breastfeeding success with even the most vulnerable infants (Edwards & Spatz, 2010), including the initiation of pumping and maintenance of milk supply, mouth care with human milk, skin-to-skin care, nonnutritive sucking at the breast, and transitioning to breast feeds. The next step of the pathway is skin-to-skin contact. The research on skin-to-skin contact demonstrates numerous benefits for infants including improved oxygen and heart rate stability, temperature stability, and transition to breastfeeding (Moore, Anderson & Bergman, 2007). For the mother, skin-to-skin contact has been associated with improved milk production and successful transition to breastfeeding as well as longer breastfeeding duration (Conde-Aguedelo, Belizan, & Diaz-Rosello, 2000). Colosrum is very important for infant: the immunological components of colosrum are critical in establishment of positive gut flora and priming the fragile gut wall. Infants should get 48-96 hours of colosrum (to mimic what healthy term infant will get). Preterm milk is higher in fats, protein, and CHO than full term milk and that these differences persist for 8 weeks.

**PT, BF, milk supply, duration, Not on Charts 2/7/2012.**

Snyder, A.R. (2012). Review of The Preemie Parent’s Survival Guide to the NICU—How to Maintain your Sanity and Create a New Normal. Neonatal Network, 30(4), 275. This reviews the book and does not mention that it contains KC, but it is listed here because I have also listed the Conn & Discenza book in the bib.

Stening W. (1997). Die Kanguruh-Methode (Haut-zu-Haut-Kontakt) bei fruhgeborenen Kindem (The kangaroo method (skin-to-skin contact) for premature infants. Kinderkrankenschwester, 16(8), 308-310. A REVIEW article for nurses of all the benefits of KC. **PT, Review**

Stening W, Kribs S, Kiencke P, Stutzer H, Roth B. (1999). Die Verbreitung der Kanguru-Methode in Deutschland. Monatsschr Kinderheilkd, 147, 766-769. KC is routine in German NICUs to reduce respiratory difficulties and reduce length of stay. KC helps promote bonding and is widely used throughout German NICUs. **PT, bonding GERMAN**


Stening W, & Roth B. (1999). Dissemination of the Kangaroo Method in Germany. Journal of Perinatology 19(6): 450-451. 91% of German NICUs offer KC; ¾ of those to ventilated infants with “good or very good” experiences. Most offer it for 30-60 minutes, but they think this is too short. Hypothermia is infrequent, infection is not found, spontaneous extubation of ventilated pts. is a problem. **Implementation, Infection, hypothermia, ventKC, extubation**

Stenson, B. (2009a). Sudden unexpected early postnatal collapse. Archives Diseases in Childhood Fetal Neonatal Edition, 94(5), F313. Doi: 10.1136/adc.2009.170647 This is one paragraph that refers to “Peters et al’s report of 5 cases where apparently well newborn infants collapsed within 12 hours of birth, requiring CPT and went on to have very poor outcomes. This is increasingly reported and is now the subject of a British Paediatric Surveillance Unit Study to describe the condition more fully and work towards a standardized investigation protocol.” Go to [http://bpsu.inopsu.com/studies/Neonatal_Collapse/](http://bpsu.inopsu.com/studies/Neonatal_Collapse/). **FT, Birth KC, life threatening events, comment NOT ON CHARTS 10/5/2011**

Stenson, B. (2009b). Sudden unexpected postnatal collapse. Archives disease childhood fetal neonatal edition, 94(3), F157. Foran reports that a small number (12) of apparently healthy term newborns who were in good
condition at birth but collapsed suddenly and unexpectedly at the median age of 75 minutes. All required CPR and median post resuscitation pH was 6.75. Collapse often occurred at the breast during or soon after the first feed and in these cases the infants followed a course suggestive of severe hypoxic-ischemic insult or severe respiratory problems and tended to have better neurologcal outcome. No infant had metabolic disease or infection. Full post mortem should be done. The British Paediatric Surveillance Unit study starts in Nov. 2009 and will run for 13 months to determine the incidence of this occurrence within 12 hours of birth and examine range of affected infants to inform development of national guidelines and management of the condition. FT. review, Birth KC, life threatening events. Not on Charts 10/5/2011.


Storkstories. (2010). Skin-to-skin minutes after cesarean section in the OR: Speaking up and making it happen. June 3,2010. The is an online store of how one mother with a birth plan came to hospital and they found double footling breech and birth plan was discarded as she went to emergency cesarean, but the nurse did advocate for the mother who had “on chest and first feeding at breast” as part of her birth plan, so when the infant was delivered (robustly crying and pink), it was “automatically” taken to warmer unit and then mother cried out “You took him out of me, now he has to be ON me. I want him one me, now.” The anesthesiologist was starting to get some meds ready to calm the baby with his mother and provide all initial evaluations and steps with the bay on the mother’s chest. The anesthesiologist did not give the meds to the mother and released her right arm as well for holding her infant skin to skin and everything went well. The story notes that anesthesiology is one barrier to c/s KC, and the story includes a link in it to a 7 minute video of KC at cesarean birth. The textual content begins with “Kangaroo Care is an important part of the continuum of nurturing of pregnancy, the process of birth and the transition of nurturing from inside the mother to outside the mother. This is the natural habitat for the infant. This habitat was recognized by the American Academy of Pediatrics in 2000 in their changes to the Neonatal Resuscitation Program algorithm. The recommendation was to “keep the baby with his mother and provide all initial evaluations and steps with the baby on the mother’s chest. The recommendation was for all healthy babies.” (pg. 1)This citation is available from http://obnurse35yrs.wordpress.com/2010/06/03/skin-to-skin-minutes-after-cs-in-the-or-speaking-up-and-making-it-happen/. FT, Birth KC, cesarean, barriers, video. SML accessed this 9/19/2011 and it was up and running then.


Sule SS & Onayade AA. (2006). Community-based antenatal and perinatal interventions and newborn survival. Nigerian Journal of Medicine, 15(2), 108-114 (Apr-June). Review of neonatal mortality (constitutes 40-70% of infant deaths; 99% of these deaths occur in developing countries, highest neonatal mortality rate is in sub-Saharan Africa, 4 million babies die in developing countries each year, 42% of deaths due to infection, 21% to perinatal asphyxia, 11% birth injuries, 10% LBW and prematurity, 11% congenital anomalies). 2/3 of deaths are in first week of life (2/3 of these occur in first 24 hours)). Skin-to-skin care (KC) needs to be incorporated into a functional and sustainable health care...
delivery system. **Preterm, review, mortality, infection, developing countries, community KC. Not on charts yet.** **KC should be sustainable, culture of consistent care**


Suman, R.P., Udani, R., & Nanavati, R., (2008). Kangaroo mother care for low birth weight infants: a randomized controlled trial. *Indian Pediatrics, 45*(1), 17-23. RCT in level III NICU in India, KMC = 103; controls = 103. Infants were >2000 gm, both preterm and term SGA infants. KMC babies had better weight gain per day (kmc=23.99g, control =15.58g, p<0.0001), head circumference weekly increments were higher in KC (0.75 cm) than controls (0.49 cm)(p=0.02) and length was longer in KMC (0.99 cm) than controls (0.70 cms, p=0.008). More control infants had hypothermia, hypoglycemia, sepsis. No difference in length of stay and more KC were EXCLUSIVELY breastfed (98% KC vs 78% controls) at end of study. KMC was acceptable to most mothers and families at home. KMC was continued at home. Evaluations were at 40wks pma and at 2500 g. weigh. **RCT, PT, FT Daily weight gain, head circumference, length, LOS,hypothermia, hypoglycemia, sepsis, EXCLUSIVE BF,**

Svensson K, Velandia M, Matthiesen AS, & Widstrom A-M. (2007). Skin-to-skin contact between mother and baby as a therapy for breastfeeding problems. Presentation at the 2007 International Conference on the Theory and Practice of Human Lactation Research and Breastfeeding Management, Orlando, FLA Jan.13, 14, 2007. When breastfeeding is complicated, do fullterm babies who are more than 4 hours old do better with BF with KMC or without KMC? RCT of KMC after optimal counseling vs. no KMC after optimal counseling. BF was videotaped in hospital and at one week, one and four and 18 months post-birth. Results are yet to come. **RCT, BF, BF difficulties**


This report says that one of the best way for developing countries to keep babies warm is Kangaroo Care and it recommends that for prevention and recovery from Hypothermia. **POLICY, warming, temperature, guideline.**

Swinth JY, Anderson GC, & Hadeed AJ. (2003). Kangaroo Care with a preterm infant: Before, during and after mechanical ventilation. *Neonatal Network, 22*(6), 33-46. Case study of infant with mild RD at 2-18 hrs postbirth without improvement til KC began. 4.75 hrs of pre-ventilation KC, 4.0hr of VentKC, and 6.0 hrs of post-ventilation KC given. KC assisted in recovery from RD and fostered maternal relaxation and reduces maternal stress. Vent KC, Case study, Maternal relaxation, Mat stress, sleep, crying, FiO2, SaO2, protocol for positioning and securing lines on pg. 35. Guidelines.

nuzzled up easily in KC. Vital Signs stable?? Triples were co-bedded nursery. 

**Triplet preterm KC. Shared KC, attachment, co-bedding, HR, RR, temperature, case study**

Syfrett EB, Anderson GC, Behnke ML, & Hilliard B. in progress since 1996. Very early kangaroo care for healthy breastfed preterm infants: A pilot randomized controlled trial. Available from Dr. Anderson at Gene.Anderson@case.edu

Sylla, M., Kassogue, D., Traore, I, Diall, H., Charpak, N., Dicko-Traore, F, N’diaye, M, Doumbia, D, Kamissoko, F, Sidbe, T., & M. Keita, M. (2011). Towards better care for preterm infants in Barnako, Mali. Current Women’s Health Reviews, 7(3), 302-309. DOI:10.2174/1573404117963555199. This study assessed the feasibility, acceptability, and outcome of KMC (24/7 in one unit) on 480 LBW infants, including morbidity and mortality. Longitudinal study, moms were M=25 yrs and had 3 prenatal visits and deliveries were in community and district health centers,M ga was 32.5 wks, M birthweight was 1432 g, height M=41 cm; head circumference M=29 cm.. Mortality was very high (4.4%) before KMC; more than 1/3 of those surviving until off oxygen support were admitted to KMCunit. Somatic growth was satisfactory, weight gain was M=19g/day. Mean entry age into outpatient (KMC at home/community) program was9.16 days (R=2-32 days). Mortality of KMC unit infants was 7.91% (vs 51.5% of those who stayed in NICU). Most KMC deaths occurred between discharge and 30 wks postmenstrual age. Problems with home KMC program were non-compliance with visits, and GI, infection, failure to thrive, and neurological problems. KMC was accepted by all mothers and families. Problems remains with post=discharge homeKMC. PT, 3rd world, KMC unit, 24/7 KMC , weight, home-based KMC, post-discharge KMC, home KC, mortality, acceptance. NOT on Charts 10.2/2011


Takahashi Y, Tamakoshi K, Matsushima, M., & Kawabe T. (2011). Comparison of salivary cortisol, heart rate and oxygen saturation between early skin-to-skin contact with different initiation and duration times in healthy full term infants. Early Human Development, 87(3), 151-157. This is a two group, two hospital study of fullterm infants who got KC within 5 minutes of birth (n=32), or later than 5 minutes of birth (n=36) and infants who got 60 minutes or less of KC in the first two hours postbirth (n=18) and those who got more than 60 minutes of KC (n= 61). Found that HR stability at120-160 bpm occurred with better probability in infants who started KC within 1st five minutes post birth (2.52 times the efficacy of regular initiation). Earlier Kc initiation within 5 minutes of birth were significantly different between the groups. Sig lower salivary cortisol levels between 60-120 minutes post birth in the infants who were in KC longer than 60 minutes. Controlled for many variables influencing stress too. Earlier Kc beginning within five minutes postbirth and longer KC continuing for more than 60 minutes within a 120 minutes post birth are beneficial to cardiopulmonary dynamics and reduction of infant stress during early postbirth period. FT, quasi experimental, HR, salivary cortisol, stress. Birth KC, stability. Look at Branson article from California for similar data.(NOT ON CHARTS as of 1/21/2011)

Tallandini, M.A. & Scalembra, C. (2006). Kangaroo mother care and mother-premature infant dyadic interaction. Infant Mental Health Journal 27(3), 251-275. 21 preterm >1800 grams infant/mother dyads got a minimum of 60 mins per day (some mothers did more, pg. 258) from 32-34 weeks (at least two weeks of KC) while mother reclined next to incubator (birth through discharge for some babies) and 19 other dyads at another hospital (Not an RCT!) got traditional care (no KMC but swaddled holding ad lib). KMCers had better mother-infant interactive style, sig. decrease in maternal emotional stress (Parent Stress Index-Short Form, Barnard, 1975) and better infant ability to make requests and respond to parental interaction style (Barnard’s Nursing Child Assessment: Feeding Scale). Weight gain per day was 14.6 g for KCer and 10 g for condition over hospitalization (almost exactly same as De Leeuw et al., 1991 results) and during the two weeks of KMC the KC group gained 19.72 g per day (pg. 265). Length of hospital stay was reduced in KCers too (p= 0.001; pg 265). PT, Quasi-Experiment, Mother infant relationship, maternal anxiety and infant interactive signals, weight, length of stay, development, stress,interaction STRESS INDEX. Used two.
hospitals like Feldman did.

Tannir article from barb 11/10/2011 it is about stress of the NICU environment and how some nurses 5% tried KC to reduce stress but 85% did massage to reduce stress.

Taylor PM, Maloni JA, Taylor FH, & Campbell SB. (1985). Extra early mother-infant contact and duration of breast-feeding. Acta Paediatrica Scandinavica 316 (Supplement), pp. 15-22. This is an “extra contact” study in which 50 primiparous mothers and their babies, including skin-to-skin contact, found that skin-to-skin contact alone had no significant effect on breast-feeding duration. However, when suckling occurred with early skin-to-skin contact (that is, feeding within the first 30-70 minutes post-birth), women were more likely to still be breastfeeding at 2 months postpartum compared to those who did not suckle during extra contact. Fullterm, RCT, breastfeeding, Birth KC,


Terhaar, M. & Starr, KP. (2007). Skin-to-skin care: Focusing on the maternal-infant dyad. eNeonatal Review Newsletter 4(12),8 pages (August 2007). Available from eNeonatal Review Newsletter, news@johnshopkins.6cp.com The newsletter has several components, the first of which is a brief introduction called “In This Issue” which states that KC is “supported by strong research and advocated by respected organizations, including the World Health Organization. Despite a growing body of evidence detailing the benefits of this intervention, SSC (skin-to-skin contact) has yet to be adopted as standard practice within NICUs across the nation and the world” (pg. 1). The newsletter reviews the most recent literature (5 articles: Morelius et al., 2005; Feldman et al., 2002; Charpak & Ruiz-Pelaez, 2006; Heyns et al., 2006; Ludington-Hoe et al., 2006; Ludington-Hoe et al., 2005) including research on maternal and infant outcomes as well as barriers to implementation. The authors want the information to assist clinicians in evaluating the readiness of their NICUs to implement KC. Actually, this is a continuing education offer and physicians can take a post-test on the knowledge they gain and to determine how well they meet the medical continuing education unit objectives of describing the influence of KC on both the neonate and the mother, Explain the effects of KC on pain in the neonate, and discuss common barriers to the implementation of KC in NICUs. Review, Preterm, physician continuing medical education units and post-test, barriers, implementation of KC. Not yet on charts.

Tessier R, Charpak N, Giron M, Cristo M de Calume ZF & Ruiz-Pelaez JG. (2009). Kangaroo mother care, home environment, and father involvement in the first year of life: a randomized controlled trial. Acta Paediatrica, 98(9), 1444-1450. 194 families in KMC, 144 families in non-KMC (incubator only) followed from biggest social security hospital in Colombia. KMC was 24/7 until no longer tolerated by infant at 37-38 wks pma. HOME (KMC produced a more stimulating context and better caregiving environment, father involvement (environment was + correlated to father involvement.), and family environment with male infants were most improved by KMC. KMC has positive impact on home environment. Both parents should be involved as direct caregivers in KMC and this intervention should be directed more specifically to infants more at risk at birth. Griffiths developmental quotient results are not reported in abstract. PT, RCT. development, HOME, fathers, KMC Not on charts yet.

Tessier, R., Cristo, M., Nadeua, L., & Schneider, C. (2011). Prematurity and morbidity: Could KMC reverse the process? Current Women’s Health Reviews, 7(3), 254-261. doi: 10/2174/1573404355144. Premature birth is now known to be associated with cognitive deficits, poorer academic performance, attention problems, and less social competence than full term peers, and these consequences have impact on adolescence and adulthood. Can KMC reverse/reverse this trend? In short term KMC reduces length of stay and exposure to stressful NICU environment. When carried by parents noise is reduced and absorbed by clothing and body. Parents feel more confident and positive regarding the infant. Parents accept KMC and accary it out without ANY difficulty. Infants gain weight faster, breathe better, have less apnea, maintain body temp better, have fewer iatrogenic problems due to hospital stays. In the medium term (12-24 months) KMC protects fragile infants at birth and they have higher developmental quotient (10-13 points higher for the most fragile infants) than extremely preterm infants who only get conventional (incubator and swaddled holding) care. KMC infants also benefit from a family environment

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(Including father involvement) that is more dynamic and stimulating. Questions remain particularly in relation to neurological outcomes. Can KMC repair the brain to some extent at a very early age? Current neurophysiology studies on brain development and functioning should guide medical and rehab interventions aimed at minimizing long term neurodevelopmental disability in Preterms. **Review, PT, NICU environment, development, family environment, length of stay, parental acceptance, weight, apnea, breathing pattern, body temp, iatrogenic problems (ie infection). Not on charts 10/2/2011**

Tessier R, Cristo MB, Velez S., Giron M, Nadeau L, Figueroa de Calume Z, Ruiz-Palaez JG, Charpak, N. (2007). Kangaroo mother care: A method for protecting high risk, low birth weight and premature infants against developmental delay. Infant Behavior and Development 26 (3), 384-397. Randomized trial of 431 LBW and premature (<1801 g) given KMC (start when able to breastfeed, and off of all breathing support, did it for 24 hours a day until 37-38 weeks PCA, and other Kcers i.e father, grandmother) or incubator care (kept in incubator til appropriate wgt gain of 20 grams/day or more and discharged at 1700gm). At 12 months 336 took Griffiths test. At 12 months KMCers had higher IQ, and the more premature the infant (30-32 weeks) and sicker and for those with diagnosed abnormal or doubtful neuro develop at 6 months age, the higher the significance. The main kmc effect was on 3 subscales: Hearing and Speech, Personal-Social/development of personal relations)and Performance, and on planning functions related to brain developmental stage at birth. KMC provides BRAIN CARE. RCT, 24 hr KC, Development, Paternal KC, Surrogate KMC, Mixed fullterm with Preterms and LBW, Length of stay, Grandmother

Tessier, R., Cristo, M., Velez, S., Giron, M., Figueroa de Calume, Z., Ruiz-Palaez, J.G., Charpak, Y., Charpak, N. (1998). Kangaroo Mother Care and the Bonding Hypothesis. Pediatrics, 102 No.2 August 1998. Abstract e17, pg. 390-391. Web pages 1-8 available from [http://www.pediatrics.org/cgi/content/full/102/2/e17](http://www.pediatrics.org/cgi/content/full/102/2/e17). 100 dyads randomized into KMC group (BW= 1660; GA=33.10 wks) or Control (BW= 1736, GA= 33.70 weeks). Video recordings of Nursing Child Assessment Feeding Scale (NCAST and Mother’s Perception of Premature Baby). Questionnaire KMC group gave 24/7 KMC for 2.5-3.5 weeks. Outcomes measured at 41 weeks postmenstrual age they found that a delay before implementing KMC was a moderating variable. KMC mothers had greater sense of competence (1-2 days delay X=26 SD=3 and Controls=15; 14 days delay X=0.15 and controls =10; >14 days delay X= 0.09 and controls =12). KMC group (X=0.24) had greater sensitivity while control moms were more stressed when separated from infant for longer when compared to KMC moms (X=0.05). KMC moms felt less socially supported than controls but did have greater sense of competence than controls. Both groups showed greater sensitivity when infant was in NICU and infants gave clearer cues and were more responsive to mothers too. Preterm, RCT, attachment, maternal feelings, maternal stress, maternal sensitivity, interaction cues.

**Tessier R et al. See under ABSTRACTS for KMC as method of protecting high risk preemies against developmental delay. Also published as Tessier, Cristo et al., 2003 in Infant Behavior and Development.**

Theilig, P. (2003). The kangaroo method. Kinderkrankenschwester 22(8), 331-334. Review of KC as practiced in German NICUs and talks about 24 hr/day KC. A clinical review. **PT, Review, GERMANY**

Thomson LM. (2008). The changing role of parents in neonatal care: a historical review. Neonatal Netw 27(2), 91-99. On page 97 it has a picture of a mother holding her infant in KC, and it says “The practice of Kangaroo Care, for example, the skin-to-skin holding of a newborns on the chest typically performed by a parent, was first developed in 1979 and then slowly introduced into the hospitalized care of infants in the NICU. KC was found to have soothing, biobehavioral regulating effects with the exposure to maternal voice and heart beat, to gentle rocking from maternal respiratory expansion, and with content (Figure 5).(Citing Ludington-Hoe et al., 2004). **Review, addresses KC, parenting role. Stability. Not on charts yet.**

Thomson ME, Hartsock TG, & Larson C. (1979). The importance of immediate postnatal contact: Its effect on breastfeeding. Canadian Family Physician, 25 (Nov.), 1374,76,78. 15 control term infants were delivered, placed in heated crib, given silver nitrate, wrapped in blanket and held by mom for 5 min before going to nursery. Primip Mom next saw infant at 12-14 hrs postbirth. 15 KC term infants (called early contact group) had same routine but given to
mother 15-30 min postbirth, unwrapped and held against her bare chest for 15-20 min covered by warm blanket. Given after delivery of placenta, repair and transfer to stretcher bed. After 15-20 min of KC infant taken to nursery. BF success defined as BF for minimum of 2 months with daily supplementary feeding. 100% of KC were BF at discharge, 93% of control. Sig more KCers were successful BF at 2 months (60% KC vs. 40% control). All KCers attempted BF in delivery room, most sucked eagerly but 2 only mouthed nipple (pg. 1376). Greater BF success attributed to closer bond formed during early sensitive period. RCT, FULLTERM, BF Success, Birth KC, guidelines


Thukral A, Chawla D, Agrawal R, Deorari AK, & Paul VK. (2008). Kangaroo Mother care: An alternative to conventional care. Indian J. Pediatrics 75(5), 497-503. PT, Barb is getting this for me. Costs $34.00 GET THIS *

physicians. REVIEW

Tinkler AG, Paul VK, & Ruben JD. (2006). The right to a healthy newborn. International J. of Gynecology and Obstetrics, 94, 269-276. This is a report of Saving Newborn Lives’ efforts to strengthen and expand proven and cost effective interventions such as training in essential newborn care, kangaroo mother care, essential newborn care services, behavior change communityization and social mobilization for maternal neonatal tetanus immunization (pg. 275). States that Malawi has adopted essential newborn care including kangaroo mother care for all newborns (pg. 275). Review, global policy, essential newborn care. Not on charts yet.

Today Show. (2010-Sept. 3, Friday). “Mom’s hug revives baby that was pronounced dead. Premature infant stirs to life after two hours of kangaroo care.” This was a 6 minute, 39 second interview on the Today show with Amy Robach in which the parents of the 27 week preterm twin showed pictures and video of the infant reviving in KC. The title here is inaccurate, the infant was resuscitated for 20 minutes, did not show any signs of life other than morbid gasping for air, so doctor (Dr. John D’Arcy of Australia, the obstetrician) was sure baby was dead and gave “dead” baby to parents and then he and most others left the room. Shortly after starting KC the infant moved, sucked milk from mother’s finger and then looked at her. The staff called the Dr. three times and it took the doctor 2 hours to get back to the delivery room and undeclared the baby as dead. Dr. D’Arcy said he could not believe the baby was alive, he was really dead when he gave the baby to the mother, but the baby had been gasping occasionally during the resuscitation effort. The interview shows video of infant with both parents so someone was with them and videotaped the infant’s recovery. The video of the interview and the parents video of the baby at birth are available from http://today.msnbc.msn.com/id/38988444/ns/today-parenting/ or it is also called “Mothers touch saves baby’s life” and is also available from http://today.msnbc.msn.com/id/21134540/vp/38989084. See also CNN 2010. PT, End of life KC. Contact them at TodayShow.com

Tofteland, L. (2006). Conceiving care. How the desires of nursing mothers transformed the delivery of our care. AWHONN Lifelines, 10(4), 312-319. Descriptive. A lactation program to increase BF initiation rate in fullterm infants was started in 1994 and evaluated in 2001. BF initiation rate in 2005 was 85%. 292 moms completed the evaluation. The most helpful thing contributing to mothers reaching their BF goals was lactation support after discharge. Then in 2003 they evaluated the program again; 167 (45%) moms returned questionnaires. In hospital lactation consultant visits were most helpful in increasing BF initiation rates and post discharge lactation services (by phone & visits) for sustaining BF. Barriers to BF were going back to work, insufficient prenatal BF education, disruptive hospital practices (PG. 317) & policies. Skin-to-skin time was noted by 3 mothers in 2003 as being influential (in 2001 only one mother identified it as such (pg. 318). Without knowing how many mothers actually did KC, these data have little meaning for us other than very few mothers identified KC as being influential on their breastfeeding. (Dr. Morrison says some moms may not make any connection between KC and BF). Fullterm, Descriptive, Breastfeeding influences, breastfeeding barriers, implementation, Intermediate KC

an uneventful vaginal delivery is an extremely rare events (cites Gatti 2004 and Espagne, 2004). But, authors found 2 cases in term infants after non-medicated vaginal deliveries in which infants were found motionless after a few minutes of breastfeeding during birth KC. In the first, breast feeding was initiated in the DR, observed, immediately after birth. A short time later infant was found pale and motionless while still on the breast. After resuscitation and NICU care, discharge home without obvious neurologic deficit. Similarly, the 2nd infant initiated BF unobserved in the delivery room shortly after birth. A few minutes later, the mother noticed the infant was motionless. Resuscitation, respiratory support, inotropic and anticonvulsive therapies were required during 3 month stay in NICU. Infant is severely neurologically impaired (pg. 847). All infants were prone on mother’s abdomen during first breastfeeding (just like Gatti and Espagne). Most likely cause is acute respiratory (oronasal) obstruction and second most likely cause is increased vagal tone. Vagal tone is increased during the postdelivery period (Cordero) and the phenomenon of increased vagal tone can be activated by the initial sucking by the infant on the mother’s nipple and/or compounded by intiation of the gastric vagal axis (Von Berger, Widstrom). Vagal overactivity has been implicated in sudden infant death (Lucet). Or infant position and maternal feeding technique are more likely mechanisms. Then he cites the American Academy of Pediatrics 2005 policy (Gartner et al. 2005) on skin-to-skin contact immediately after delivery until first feeding is accomplished and says “This policy clearly should continue to be encouraged.” (pg. 848) They recommend proper supervision and attendance by caregivers during initial breastfeeding in the DR by inexperienced primiparous mothers. Careful monitoring and positioning of the infants during this time should be done in an unobtrusive manner to allow natural instinctual interactions. Citations are: Cordero L, Jr. & Hon EH. 1971. Neonatal bradycardia following nasopharyngeal stimulation at birth. J Pediatr, 78, 441-447; Von Berger L, Henricus I. Raptis, S. et al., 1976. Gastrin concentration in plasma of the neonate at birth and after the first feeding. Pediatrics 58, 264-267; Widstrom AM, Winberg J. Werner S. Sevensson K, Poslonccek B & Uvnas-Moberg K. 1988. Breast feeding-induced effects on plasma gastrin and somatostatin levels and their correlation with milk yield in lactating females. Early Human Development. 16, 293-301; Lucet V, Le Gail MA, Shojaci T. et al., 2002. Vagal hyperreactivity and sudden infant death: study of 15 families. Archives Malaise Coeur Viass, 95, 454-459 (French). FT, ALTE, life threatening event, sudden collapse, BKC, encourages continuation of BKC.

?? Author?? KC found helpful for breastfeeding by some mothers. Amount of KC or when it was done was not specified in article. 15 control term infants were delivered, placed in heated crib, given silver nitrate, wrapped in blanket and held by mom for 5 min before going to nursery. Primip Mom next saw infant at 12-14 hrs postbirth. 15 KC term infants (called early contact group) had same routine but given to mother 15-30 min postbirth, unwrapped and held against her bare chest for 15-20 min covered by warm blanket. Given after delivery of placenta, repair and transfer to stretcher bed. After 15-20 min of KC infant taken to nursery. BF success defined as BF for minimum of 2 months with daily supplementary feeding. 100% of KC were BF at discharge, 93% of control. Sig more KCers were successful BF at 2 months (60% KC vs. 40% control). All KCers attempted BF in delivery room, most sucked eagerly but 2 only mouthed nipple (pg. 1376). Greater BF success attributed to closer bond formed during early sensitive period. RCT, FULLTERM, BF SUCCESS, Birth KC

Toma, T.S. (2003). Kangaroo mother care: The role of health care services and family networks in a successful program. Cad Saude Publica, Rio de Janeiro, 19 (supple 2), S233-S242. 14 men and women answered questionnaires about how to get KC done for their infants. Health workers needed to address personal and family problems that prevented KC, and consider history of perinatal death, other kids in household, paternal/family involvement, and household management so that KC can be implemented. Descriptive, implementation.


KC were then fed by Ng TUBE. Blood taken before and 30 minutes after end of feeding. During KC median plasma cholecystokinin dropped from 10.3 to 9.0 pmol/L without feeding. Plasma SS did not change. Plasma CCK increased from 10.1 to 22.3 pmol/L after tube feeding during KC but were unchanged with tube feeding without KC. Plasma SS levels were unchanged after tube feeding in both groups. Parent (n =15) SS and CCK levels DID NOT CHANGE with KC even though they were taken at before and at 60 minutes of KC. Preterms kept in KC have lower levels of serum cortisol and cholecystokinin than babies kept in incubators. NG feeding in KC increased cholecystokinin response to feeding, promoting GI growth and secretion. Preterm, Cortisol, CCK, Somatostatin, Stress, Feeding behavior. Note: low CCK levels may predispose infants to excessive crying because they don’t have the high levels of CCK that induces satiety and calming (Huhtala V, Lehtonen L, Uvnas-Moberg K, Korvenrant H. 2003. Low plasma cholecystokinin levels in colicky infants. J Pediatric Gastroenterology & Nutrition 37(1), 42-46.

Tornhage CJ, Stuge E, Lindberg T, & Serenius F (1999). First week Kangaroo care in sick very preterm infants. Acta Paediatrica 88(12), 1402-1404. Descriptive study. Took 17 infants (12 on CPAP, 1 on vent, 4 no 02 support) conveniently sampled from other study. Had pretest-test-posttest design, 60 min or more of KC on median age of 3 days of life. Infants were median 28 weeks GA, median BW 1238g, median wt on study day 1072 g. 8 infants were fed 4-20 ml human milk by NG. KC did not stop due to infant deterioration in any subject (1403). One infant had brief apneic spell during blood sampling after study ended. During KC SaO2 was 88-98 (no desaturations), FiO2 had to be decreased by 0.09 in one infant, increased by 0.05 and by 0.12 in two infants. TcPO2 increased spontaneously in 9/17 infants and varied in others. TcCO2 changed <-0.5kPa in 15/17 infants (in two infants went from 5.2-6.3 or 6.5kPa). No difference in PaO2 (pg. 1403). PaCo2 changed <0.8kPa in 15/17 infants. TcPo2 was increased in one infant from 2.5 to 5.7 and decreased from 5.9 to 4.4 kPa in another. Arterial pH changed <0.06 in 15/17 infants, and decreased from 7.35 to 7.28 and 7.31 in two infants. HR range 130-180 Before KC and 135-190 after KC. No bradycardia occurred. Temp was unchanged or increased <0.2C in 8/15; decreased <0.5C in 6 and 0.5-0.9 in 2/15. The lowest post-KC temperature was 36.2 after a drop of 1.0C in one infant. Before KC, 7/17 infants were crying, awake. AT 30 minutes of KC 16/17 were quiet sleep, 1 was drowsy. At 60 minutes or more of KC 15/17 quietly slept 2 were awake. NG feed tolerated without adverse effects. Sick and very preterm infants tolerate KC early in life (1404). “Tolerability of repeated, prolonged periods of KC (≤4 hrs) has been excellent” in their nursery (1404). Descriptive, VENT KC, KC +NG, Apnea, Behav state, HR, SaO2, temp, TcPo2, TcCO2, Bradycardia, arterial pH, and arterial CO2, FiO2., sleep, crying, awake, CPAP, micropreemie, desats

Torowicz, D. Lisanti, A., Ludington-Hoe SM,(2010, June 16), KC in infants with Congenital Heart Defect Infants. Case report from Children’s Hospital of Philadelphia. Presentation at 2010 International Conference and Workshop of Kangaroo Mother Care, Quebec, Canada A case study. D.L. was prenatally diagnosed with hypoplastic left heart syndrome (HLHS). He was admitted to cardiac intensive care immediately after birth for monitoring and evaluation prior to his stage 1 palliative surgery. On the second day of life, DL was in stable condition, with a normal airway and on room air. His intravenous access included an umbilical artery catheter for continuous BP monitoring and one umbilical venous catheter, infusing PGE at 0.01 mcg/kg/min. Mother and father were visiting at bedside. The Clinical Nurse Specialist went to see the mother because of complaints of decreased production of breast milk. After counseling the mother that milk production is commonly low in the first 24-48 hours post birth, the CNS suggested KC as a way to improve mother’s milk supply. The mother agreed to perform KC after receiving education about the procedure. The infant’s VS before KC were 37.7, HR 165, RR90, BP 60/27 (40), spO2 97%. Mom changed into hospital gown, and CNS transferred infant from warmer into mother’s arms. During KC the infant remained stable with VS: T 37.6, HR 155, RR 43, BP 73/32(45), spO2 97%. Total duration of KC was 45 minutes. Infant’s pain scores by FLACC remained zero before, during and after KC. “ Another infant was KS. “KS was prenatally diagnosed with complete heart block and IUGR She was born via cesarean section at 30 weeks gestation due to her very low heart rate in utero. Immediately after birth she underwent a median sternotomy for placement of temporary pacing wires. Her underlying HR was in the 40’s to 50’s. Weighing only 975 grams, she would have to almost double her weight before she could have an internal pacemaker implanted. Two weeks later, KC was stable, temporarily placed at a rate of 96, and gaining weight. When her incubator required cleaning, the team decided she was stable enough to be held by her mother skin-to-skin. The next day,KS’s vital signs were still stable T=36.3, HR =96, RR=61, BP=55/26(40), SpO2 = 93%. The pacing wires attached to the temporary pacemaker was pinned to KC’s snuggle up wrap to alleviate tension.
on the wires. The mother moved her into KC using standing transfer and slowly sat down. KC remained stable, with the pacemaker functioning properly and adequately capturing each beat. But KC was not comfortable, squirming and kicking and not settling. The CNS assisted the mother in repositioning KC to a side lying position in which the infant’s chest remained skin to skin but her abdomen was visible for continuous assessment of the pacing wire insertion sites. KC relaxed after pressure on the pacing wires was alleviated. After 15 minutes of KC her vital signs were $T = 36.8$, $HR = 96$, $RR = 47$, $BP = 68/33$ (450, $SpO_2 = 97\%$). For 30 minutes KC remained stable with no pacing difficulties, no discomfort, and no thermoregulation issues. The mother requested that the father have the opportunity to Kangaroo, so the CNS moved the infant from the mother’s arms into her own while the father took the mother’s seat and then placed the infant in her father’s arms. Vital signs did not change with transfer and the father Kangarooed his daughter for 30 minutes and then returned her to her incubator by standing transfer technique. KS’s vital signs were stable and all pacing wires remained intact and secure. Parental responses to KC were "I was nervous at first but the nurses made me feel comfortable” “It helped me more confident as a mother and all me to bond with my son”, “the big thing is that it is scary with all the lines to be able to do the normal mom things…change diapers, feed him, etc. To be able to hold him so closely like that does help.”

**PT, Case study, cardiac KC, BP, Temp, HR, RR, SpO2, pain** (for another cardiac case study see Harrison, T. and LudingtonHoe, 2010).

Torres J, Palencia D, Sanchez DM, Garcia J, Rey H, & Echandia CA. (2006). Kangaroo mother program: Results of follow-up on 40 weeks postconceptional age. Colombia Medica, 37(2), 96-101. Descriptive study of 66 LBW ($\leq 2000$gm) in Cali, Colombia who reached term (40 girls, 26 boys) X GA= 32wk (27-38wks), X BW = 1434 g (700-1950), mean pma of 19 days (4-48) and mean weight of 1552 g (1359-2239) when admitted to KMC (had to be stable and off O2 support). Had mean weight gain of 18g/kg/day, 96% were BF at discharge and off O2 support). Had mean weight gain of 18g/kg/day, 96% were BF at discharge and 94% at term age. Exclusive BF in 67% at discharge, 51% at term. Main causes of morbidity were GER and anemia, 4.5% (n=3) were readmitted before 4 wks pma, 2 for criotherapy, one for apnea, none died. Hospital stay in NICU was 17.5 days and bed turn over was 1.37 patients/month. KMC is safe alternative for LBW care and fives early discharge, skin to skin contact, and good quality nutrition based on BF, PT, descriptive, 3rd world, BF, apnea, exclusive BF, weight, morbidity, mortality, readmission (See also Palencia et al., 2009 for follow up to one year of infants in same hospital).

Treleaven, E. (20120. Connecting across borders to implement kangaroo mother care. Healthy Newborn Network: Washington, DC: Save the Children, appeared 1/27/2012. This is ablog report available from HealthyNewbornNetwork.org/blog. This tells about the first international conference of Caribbean and Latin American Kangaroo Mother Care convention and that 12 nations were represented and that there were 62 registrants and that elhy want to establish common outcome evaluation criteria to show the proam is a success and to develop a “community of support” to sustain the program. 3rd world, PT, implementation.

Trotter, S. (2005). Skin-to-skin contact: therapy or treatment? Midwives 8(5), 202-203. A case study of a fullterm infant who started KC immediately after birth and had a success ful breastfeeding at that time. Within 8 hours of birth (actually at 6 hrs post-birth) the infant developed tachycardia and tachypnea, but stayed in KC based on Anderson et al.’s 2003 Cochrane analysis saying KC stabilizes vital signs. By 24 hours of age, $HR = 140-160$, $RR = 88$ with grunting and mild chest retractions. Body temp was stable, no cyanosis, no nasal flaring. MD reviewed case and let baby stay in KC until 36 hours postbirth when next exam done. HR, RR were normal and infant was declared fit. No further problems. “Had this infant been separated from his mother and transferred to the potentially stressful environment of the neonatal unit, it is possible that his condition would have deteriorated further, necessitating invasive procedures (Peters KL 1992. Does routine nursing care complicate thephysiologic status of premature neonates with respiratory distress syndrome? J Prenatal and Neonatal Nursing, 6(2), 67-84). The positive outcome suggests that, in carefully selected cases, it may be wise to instigate a period of observed KC… Sensory stimulation involving warmth, touch, and smell is an extremely powerful vagal stimulant causing oxytocin release. This in turn raises the skin temperature of the breast, decreasing anxiety, increasing calmness and enhancing parental behaviors (Uvnas-Moberg, 1998). Says skin to skin, as in co-bedding of twins, leads to immediately and consistent cessation of unstable symptoms and cities Lutes Km 1996 in Neonatal Network 15(7), 61-62. **FT, Case study, birth KC, VEKC, separation, transient respiratory distress, BF, NOT CHArts YET.**
Tsao JCI, Evans S, Meldrum M, Altman T & Zeltzer LK. (2008). A review of CAM for procedural pain in infancy: Part 11. Other interventions. Evid Based Complement Alternat Med 5(4); 399-407. This is review article that is very similar to the Tsao publication in 2007. This reports the Gray et al. 2004 study, and Johnston et al. 2003 studies on page 403. On page 405 it states “KC is an appealing method of pain management in infants undergoing painful medical procedures and appears to be safe for both term and preterm infants. However, only two trials of KC have been conducted (BIG MISTAKE!!!) and the generalizability and standardization of this intervention is complicated by variations in maternal attitudes and comforting styles. In several trials, mothers introduced additional comforting techniques such as stroking or verbalization when providing KC, which exerted unknown effects. Moreover, Johnston et al. (2003) reported a 45% refusal rate among mothers, indicating that not all women were comfortable with the approach; women who are less comfortable may be less effective in relieving their newborns’ distress. Further research on this method and the variable impact of maternal style and attitude are indicated. (pg. 405). Review, FT, PT, Pain, % women who refuse, other comforting issues.

Tsao JCI, Meldrum ML, & Zeltzer LK. (2007). Complementary and alternative approaches to pain in infancy. Chapter 21 in Anand KJS, Stevens BJ, and McGrath PJ (Eds.) Pain in Neonates and Infants. (3rd Ed.) N.Y.: Elsevier, Pp, 279-287. KMC is reviewed as an complementary, alternative medical therapy for pain. The discussion begins on page 283 and states that “KC is advocated as a natural, non-invasive method of providing analgesia during heel sticks and other painful procedures. Evaluation of this method in a well-controlled study is complex, both because it may be difficult to blind observers to the condition and because mothers may introduce an unknown factors of bias by additional touch or verbal interactions, unless otherwise instructed.” Pg. 283. She then cites Gray et al., 2000 and Johnstone et al., 2003 and concludes: “Thus, existing evidence suggests KC as a safe alternative analgesic for both preterm and term infants. KC may exert its effects via state regulation (de Leeuw et al., 1991; Ludington-Hoe et al., 2000); maternal touch has been implicated in the development of humans and animals (Fleming et al., 1999). However, as noted by Johnston et al. (2003), their study had a 40% refusal rate indicating that those mothers who were not as comfortable with the procedures may not have been as effective in providing KC to their infants. Further research on the generalizability of KC and maternal attitudes toward it are warranted.” (pg. 283). Review, Pain, alternate therapy.

Tunell R. (2004). Prevention of neonatal cold injury in preterm infants. Acta Paediatrica 93 (3), 350-355. A commentary on an RCT using a heated, water-filled mattress in the same issue. This commentary says KMC should be tested instead. Cold injury contributes to neonatal death. KMC is effective, affordable, available method to prevent neonatal hypothermia in developing countries. In developed countries use of incubators does the job, but incubators overstimulate babies. This is a randomized controlled trial of KMC and cot-nursing with a heated, water-filled mattress. KMC is as good a tool as incubator, radiant warmer, and heated mattresses in providing warmth to preterms in modern neonatal intensive care units. According to Jackson, 2010, Tunell states that KC is usually practiced at birth with fullterm infants and has recently spread to the NICU. (That is an interesting perspective-SML) Commentary PT, temp., RCT?, incubators are bad.


UNICEF, (2007). Breast crawl. (This is really Gangal’s report. See Gangal, 2007 above). This is a very big document that accompanies the video that everyone/anyone can see called BREAST CRAWL on the website http://www.breastcrawl.org. The film only shows a fullterm infant being placed between the breasts (not on the mother’s belly, so no crawl from belly to breast is possible), and moving his head over to a nipple and latching on. The infant’s head remains wet, and there is no covering over the infant’s back, so this film is not an optimal film to use in non-tropical environments especially. However, the Breast Crawl document does address KC: **FT, BF, crawl**

UNICEF/WHO. (2006). Baby-Friendly Hospital Initiative. Revised, Updated, and Expanded for Integrated Care. Section 3.2 Session Outlines. Breastfeeding promotion and support in a Baby-Friendly Hospital. A 20-Hour course for Maternity Staff. Preliminary Version for Country Implementation. Jan. 2006. N.Y.: UNICEF, pp. 1-237. This is a summary of the 20 hour course and for integrated care means in the hospital and in the community after hospital discharge so babies being breastfed in the hospital will continue to be breastfed for many months, not just two weeks. In Section 1 called Background and Implementation there is section 1.3 Global Criteria that states “The antenatal discussion covers the importance of breastfeeding, the importance of early skin-to-skin contact, early initiation of breastfeeding….” (pg. 28). Page 28 continues with the following criteria for successfully being Baby Friendly: “at least 70% (of mothers) are able to adequately describe what was discussed about two of the following topics: importance of skin-to-skin contact, rooming-in, and risks of supplements while breastfeeding in the first 6 months.” (pg. 28). On page 29 of this section, it states “Step 4 is interpreted as: Place babies in skin-to-skin contact with their mothers immediately following birth for at least an hour and encourage mothers to recognize when their babies are ready to breastfeed, offering help if needed.” The criteria for step four are that “out of randomly selected mothers with vaginal births or cesarean sections without general anesthesia in the maternity wards: at least 80% confirm that their babies were placed in skin-to-skin contact with them immediately or within five minutes after birth and that this contact continued for at least an hour, unless there were medically justifiable reasons for delayed contact. And at least 80% of mothers were encouraged to look for signs for when their babies were ready to breastfeed during this first period of contact and offered help, if needed. (The baby should not be forced to breastfeed but, rather, supported to do so when ready.) (Note: mothers may have difficulty estimating time immediately following birth. If time and length of skin-to-skin contact following birth is in the mothers’ charts, this can be used as a cross check.)” pg. 29 of Section 1. “If any of the randomly selected mothers have had cesarean deliveries with general anesthesia, at least 50% should report that their babies were placed in skin-to-skin contact with them as soon as the mothers were responsive and alert, with the same procedures followed. At least 80% of the randomly selected mothers with babies in special care report that they have had a chance to hold their babies skin-to-skin or, if not, the staff can provide justifiable reasons why they could not. Observations of vaginal deliveries, if necessary to confirm adherence to Step 4, show that in at least 75% of the cases, babies are placed with their mothers, held skin-to-skin within five minutes after birth, for at least 60 minutes, and that mothers are shown how to recognize the signs that their babies are ready to breastfeed and offered help, or there are justified reasons for not following these procedures.” pg. 29 of Section 1. On page 85 which is in Section 3.2 on how to teach the content, it states again “Place babies in skin-to-skin contact with their mothers immediately following birth for at least an hour and encourage mothers to recognize when their babies are ready to breastfeed, offering help if needed.” (UNICEF/WHO, 2006, p. 85). **Guideline, Cesarean section, birth KC.**

UNICEF/WHO. (2009). Baby-Friendly Hospital Initiative. Final Version for Country Implementation. This reports that skin to skin contact should begin within 5 minutes for vaginal and cesarean and remain uninterrupted

Geneva, Switzerland: UNICEF and WHO. Section 1 (80 pages long) Background and Implementation. In Section 1.3 on page 34 is “Step 4. Help Mothers Initiate Breastfeeding within A half Hour of Birth. This step is now interpreted as: Place babies in skin-to-skin contact with their mothers immediately following birth for at least an hour. Encourage mothers to recognize when their babies are ready to breastfeed and offer help if needed. Global criteria for Step Four: “Out of the randomly selected mothers with vaginal births or cesarean sections without general anesthesia in the maternity wards: - At least 80% confirm that their babies were placed in skin-to-skin contact with them immediately or within five minutes after birth and that this contact continued without separation for an hour or more, unless there were medically justifiable reasons. (Note: It is preferable that babies be left even longer than one hour, if feasible, as they may take longer than 60 minutes to breastfeed (pg. 34). – At least 80% also confirm that they were encouraged to look for signs for when their babies were ready to breastfeed during this first period of contact and offered help, if needed. (Note: The baby should not be forced to breastfeed but, rather, supported to do so when ready. If desired, the staff can assist the mother with placing her baby so it can move to her breast and latch when ready.) If any of the randomly selected mothers have had cesarean deliveries with general anesthesia, at least 50% should report that their babies were placed in skin-to-skin contact with them as soon as the mothers were responsive and alert, with the same procedures followed. At least 80% of the randomly selected mothers with babies in special care report that they have had a chance to hold their babies skin-to-skin or, if not, the staff could provide justifiable reasons why they could not. Observations of vaginal deliveries, if necessary to confirm adherence to Step 4, show that in at least 75% of the cases babies are placed with their mothers and held skin-to-skin within five minutes after birth for at least 60 minutes without separation, and that the mothers are shown how to recognize the signs that their babies are ready to breastfeed and offered help, or there are justified reasons for not following these procedures.”

Also, on page 28 is the Section 1.2: Annex 1 table entitled “Applying the Ten Steps in Facilities with High HIV Prevalence.” Step 4 in the table says in the section “Guidance on applying the “TEN STEPS” in facilities with High HIV Prevalence” “Place all babies in skin to skin contact with their mother immediately following birth for at least an hour. Encourage mothers who have chosen to breastfeed to recognize when their babies are ready to breastfeed, offering help if needed. Offer mothers who are HIV positive and have chosen not to breastfeed help in keeping their infants from accessing their breasts.”

Fullterm, Preterms, Breastfeeding, Guidelines, BirthKC. Not on charts 3/18/2010


United States Department of Health and Human Services & Centers for Disease Control and Prevention. (2010). Maternity Practice in Infant Nutrition and Care in Ohio. Centers for Disease Control and Prevention. On the website: www.cdc.gov/mpinc. Accessed July 28, 2010. This one page from the website says that in 2007 the CDC administered the first national Maternity Practices in Infant Nutrition and Care (mPINC) survey. This report relates the results for Ohio hospitals and reveal that “Strengths in BF support in Ohio Facilities” are Documentation of Mothers’ Feeding Decision (100 do this), Availability of Prenatal BF Instruction occurs in 99 of facilities. Areas in which there is “Needed Improvement In Ohio Facilities” are 1. Appropriate use of BF supplements (only 24% of facilities adhere to standard clinical practice guidelines against routine supplementation with formula, glucose water, or water. 2) Inclusion of Model BF Policy Elements. Only 9% have comprehensive BF policies including all model BF policy components recommended by the ABM. 3) Use of Combined Mother/Baby Postpartum Care. Only 10% of facilities in Ohio report that healthy fullterm infants remain with their mothers for at least 23 hours/day throughout hospital stay. And 4) Initiation of mother and infant skin-to-skin care. Only 33 of Ohio facilities initiate skin-to-skin care for at least 30 minutes upon delivery of the newborn. The paper concludes with BF being a national priority and that establishing BF supportive maternity practice as standards of care in US hospitals and birthcenter will help meet Health People 2010 objectives (Susan’s addition: and these practices are on the way to being Joint Commission requirements). Policy, BF, fullterm infants, Birth KC, guidelines NOT ON CHARTS

from the locus coruleus (LC) play regulatory roles in behavioral and physiologic components of fight-flight response. When a person perceives a threat, the central stress system is activated via the amygdala. The amygdala then creates the emotional state of fear. IF a person perceives a threat, the central stress system is activated via the amygdala—hippocampal complex. The amygdala then creates the emotional state of fear. CRF and vasopressin from hypothalamus and brainstem norepinephrine emanating from the locus coruleus (LC) play regulatory roles in behavioral and physiologic components of fight-flight response.


Uvnas-Moberg, K. (2003). The Oxytocin Factor. Tapping the hormone of calm, love, and healing. Cambridge, MA: Da Capo Press. 1-319. Chapter 8 Nursing: Oxytocin’s Starring Role:pp 93-103. Pages 96 and 98 have KC on them. “Newborn babies nowadays are often placed skin to skin on the mother’s chest immediately after delivery. If left to do so as they please, they will crawl up to the mother’s breast by themselves within one to two hours after birth and start to suckle or breastfeed. As they root around for the nipple, they massage the mother’s breast with their hands. During this time. Repeated pulses of oxytocin are released into the mother’s system. The stimulation of the breast by baby’s hands and the sucking activity are strongly and statistically significantly correlated to the number of oxytocin pulses. This interaction is important. These not only stimulate the ejection of milk but also dilate the blood vessels in the mother’s chest. In this way, as we have seen, the mother provides warmth to the infant. It is also possible that pheromones are released at this time, influencing mother and baby. This close, skin to skin contact also affects the babies. They become calmer and do not cry as long as they are allowed to stay on their mothers’ chests. They show that they are relaxed through an increased blood flow in their hands and feet. (Blood vessels dilate in relaxation) (pg. 96). This nuanced interplay between mother and infant is also evident in the increased warmth in the baby’s feet as well as in the mother’s body temperature.” (pg. 97). Women whose babies have been delivered by cesarean section have on the average fewer oxytocin pulses in connection with breastfeeding two to three days after birth when compared with women who have delivered vaginally. The mothers after surgery are also generally less calm than mothers who delivered vaginally, and also have less interaction with those around them. We do not know whether these differences are due to a reduced release of oxytocin during birth, delayed skin-to-skin contact after birth, or pain and stress caused by surgery.” (pg. 99). Oxytocin induces social memory and calmness in the infant. (pg. 103). Review, FT, oxytocin pulses, C/S have fewer oxytocin pulses compared to VAg delivery, breastcrawl. Breastfeeding, sleep, brain dev. Not on charts yet.

Uvnas-Moberg, K., Aron, I., & Magnusson, D. (2005). The psychobiology of emotion: The role of the oxytocinergic system. International Journal of Behavioral Medicine, 12(2), 59-65. Doi: No available on Pubmed system 10/8/2011 NOT A KC STUDY, but has relevance to KC because KC is pleasing touch and with pleasing touch the oxytocinergic system goes into play, contralateral to the stress-flight-flight system. In stress system: sympathetic nervous system is activated and the catecholamines epinephrine and norepinephrine are released in response to stimuli experienced as demanding, harmful, threatening, painful, tissue damage, cold, hunger and other somatic triggers. The pituitary secretes adrenocorticotropic hormone (ACTH) which stimulates adrenal cortex to produce corticosteroids, which indicate a more sustained stress-related effect. The amygdala then creates the emotional state of fear. IF a person perceives a threat, the central stress system is activated via the amygdala—hippocampal complex. These chemicals cause arousal, anxiety, aggression, increased cardiovascular activity, and elevated blood glucose levels. Corticotrophin-releasing factor (CRF) and vasopressin from hypothalamus and brainstem norepinephrine emanating from the locus coruleus (LC) play regulatory roles in behavioral and physiologic components of fight-flight response.
the level of the central nervous system. There is also a “calm and connected” system characterized by wellbeing, calm, and positive social interactions. The physiologic pattern consists of relaxation of muscles, decreased cortisol levels, decreased cardiovascular activity, enhanced gastrointestinal tract activity that promotes digestion and anabolism. The vagal, parasympathetic nervous system is activated and the hypothalamic-pituitary-adrenocortical (HPA) axis and the sympatho-adrenomedullary (SAM) system are both shut down. The calm and connection pattern is triggered by calming physiologic stimuli (i.e. nonnoxious somatosensory stimulation like touch and warmth) and by environmental and psychological triggers of analogous type. Signs of calm and connection system may be delayed (not instantaneous like HPA signs), and are decreased HR, decreased BP, HR and BP are kept at low, healthy, balanced level. Vagally controlled GI tract is activated, promoting digestion and storage of nutrients (weight gain). Growth and restorative processes are stimulated and energy would rather be used for anabolism than muscular or thermogenic activity. Reduced arousal, development of calm prevails. Positive social interactions occur. This is sense of RELAXATION AND WELL-BEING. Oxytocin is released in males and females, produced in paraventricular nucleus and supraoptic nuclei of the hypothalamus. Magnocellular oxytocinergic neurons in these nuclei project to the posterior pituitary. Parvocellular oxytocinergic neurons of the paraventricular nucleus ramify within the brain to reach limbic, medullary, and spinal areas. Thus, oxytocin fibers reach the amygdala (shut off the fear), the nucleus tractus solitaries, the vagal motor nucleus, the LC, the raphe nuclei of the brain stem (and the projection pattern of oxytocin nerves is same in males and females). Estrogen increases the release of oxytocin and the number of oxytocin receptors via receptors of alpha and beta type. A release of oxytocin in amygdala occurs after suckling and oxytocin is released from nerve terminals ion the specific brain regions receiving oxytocinergic nerve projections, Thus, oxytocin is a hormone and a neuropeptide. Oxytocin stimulates maternal behaviors, attachment, anxiety effects (through oxytocin receptors in the amygdala), sedative effects (pg. 61), and increases pain threshold, and recognition of others. Repeated administration of oxytocin induces long lasting effects via changed function in transmitter systems. Five daily injections of oxytocin for up to 3 weeks produced effects which lasted for 1-3 weeks after treatment (pg. 61). Oxytocin has anti-depressant–like properties (pg. 61). NEED TO FINISH THIS REVIEW. 

Review, stress, Arousal, depression, HR, RR, BP, anxiety, attachment, maternal behaviors, recognition of mother, digestion, weight gain, growth, healing, HRV (parasympathetic tone), energy conservation, pain threshold.

Uvnas-Moberg K, Widstrom AM, Nissen E, & Bjorvell H. (1990). Personality traits in women 4 days postpartum and their correlation with plasma levels of oxytocin and prolactin. J. Psychosomatic Obstetrics & Gynaecology, 11, 261-273. The personality profiles of BF women differ from those of nonpregnant, nonlactating women of same age. BF mothers describe themselves as more open, more interactive, and calmer than nonpregnant, nonBF women. This temporary shift in personality begins a few days after delivery and lasts as long as BF is continued, and is in part dependent on KC after birth and is reinforced by BF. Full term, BF, Maternal personality. See also Nissen article. Get this one, we don’t have it. Not on Charts Yet 9/9/09

Vaidya K, Sharma A, & Dhungel S. (2005). Effect of early mother-baby close contact on the duration of exclusive breastfeeding. Nepal Medical College Journal. 7(2), 138-140. 92 lactating mother-infant pairs were followed for six months to determine effect of perinatal factors on duration of exclusive breastfeeding. Early postpartum KC had powerful influence (p<.001) over duration of exclusive BF up to 4-6 month and was more significant than early initiation of BF (p=0.05). Mode of delivery had no effect on duration of exclusive BF. Recommends that a “few minutes of early postpartum KC and early initiation of BF to promote BF”. Fullterm, descriptive, exclusive BF, BF duration, birth KC? (Says early postpartum but until we get the article we don’t know if early postpartum = birth KC or later), third world, 6 month follow-up.

Vaire-Douret L, Papiernik E, & Relier JP. (1996). Kangaroo method and care. Archives Pediatrics, 3(12),1262-1269. Review article of KC’s development, KC’s use in many countries, its advantages (temperature regulation, better BF, promotion of maternal infant interactions, decreased mortality) In Europe it is mostly intermittent for a few hours each day and suggests putting the incubator in the mother’s room, and KMC requires qualified and devoted staff. Review, temperature, BF, maternal-infant interactions, 24 hour KC, KC staff requirements, use in countries. NOT ON CHARTS YET.


Van Rooyen, E., Pullen, A.E., Pattinson, R.C., & Delport, S.D. (2002). The value of the kangaroo mother care unit at Kalafong Hospital. Geneeskunde, The Medical Journal, April 2002, 6-10. This is a report of 18 months of mandated practice of KC with low birthweight PRETERM infants in South Africa at the public hospital. 466 infants were admitted to the 24-hour/day KC unit over 18 months. 81% (n=375) of the infants weighed less than 1751 grams; 12% weighed less than 1251 grams. Average Length of stay was 13 days, average wgt gain was 23g/day. 85% were fully BF at discharge (the other 15% had HIV). One infant died in the KMC unit and 32 were transferred back to NICU for infection. Length of stay for infants <1300 g was decreased by 3 days when compared to Length of Stay prior to KMC. Before KMC follow up was <50%; after KMC follow-up was 321 (69%), and 47% attended more than once.

Implementation, Preterm, 24 hr/day KMC, wgt gain, length of stay (LOS), BF, infection, follow-up.

van Sleen BE, Engelberts AC, Boere-Boonekamp MM, Kuis W, Schulpen TWJ, & L’Hoir MP. (2007). Swaddling: A systematic review. Pediatrics 120, e1097-1106. 78 studies of swaddling effects were reviewed and revealed that swaddling had beneficial effects on sleep continuity, sleep duration, temperature regulation (prevention of hypothermia is better with swaddling than being in a crib but swaddling is not as effective as KC in preventing hypothermia) and soothing after a painful experience. Swaddling also had special benefit to preterm and brain injured neonates. Swaddled babies have more sudden infant death (if prone positioned), poorer weight gain when swaddled and separated from mom at birth, and more respiratory infection when swaddled too tightly than unswaddled infants. PT, FT, REVIEW, pain, swaddling, temp, hypothermia.

van Zanten H.A., Havenaar A.J., Stight H.J.H., Ligthart P.A.H., & Walther F.J. (2007). The kangaroo method is safe for premature infants under 30 weeks of gestation during ventilatory support. J. Neonatal Nursing 13, 186-190. A pretest-test-posttest (called case control study) of 34 prematures <30 wks gestation in two groups separated by gestation (n=18 of infants <28 weeks; n= 16 of infants 28-30 wks gestation) who were getting mechanical ventilation, Nasal CPAP, or Infant Flow, postnatal age <7 days and had an arterial line. If they had double phototherapy, chest tubes, high frequency oscillating ventilation, were within 2 days post major surgery, skin infection of parent or unstable medical condition of infant they were not included. Measures were taken daily for a maximum of 5 days, depending on how long infant needed ventilation. HR, RR, SaO2 and arterial blood pressure were taken every 5 minutes for one hour before, during and after KC. No brady, no tachycardia were seen during or after KC. HR dropped during KC and remained lower after KC (in <28 weeks the posttest decrease was 2.1-3.9% less than pretest; 28-30 weeks had a decrease of 2.7-4.2% from baseline during posttest (p. 188). RR decreased during KC & increased after KC but still the mean RR was lower than pretest values (pg. 188). <28 weeks showed decreased RR of 4.5% during KC and an increase of 0.5% after KC (not significant); 28-30 weekers showed decreased RR of 12.6% during and 4.0% after KC (not significant). SaO2 increased during KC and remained high after KC, o2 requirements did not increase and ventilator settings did not change during and after KC. <28 weeks SaO2 increased by 1.2% during KC (significantly different from pretest), and remained 0.7% higher after KC (not significant); 28-30 weeks increased 0.7% during KC (sig) and remained 0.4% higher after KC. BP rose during KC and returned less than pretest values after KC. <28 weeks’ BP rose 8.3% during KC (significant) & decreased to 2% below pretest values after KC (not sig); 28-30 weekers’ BProse 6.8% during KC (significant) and were 1.4% less than pretest values after KC (not sig). Skin temp dropped during KC and remained low after KC (<28 weeks dropped 1.1% during KC (significant) and 1.4% after KC(s)h) (significant); 28-30 weekers’ decreased 0.5% during KC (not sig), and 0.8% after KC (sig). Male skin temp dropped more rapidly than girls’ (not sig). No sig differences in skin temp between maternal and paternal KC. All values remained within...
acceptably clinical range at all times (pg. 189). HR, RR, SaO2 improved during and after KC. Infants <30 weeks have to have their temps carefully monitored and be kept warm. PT, Pretest-posttest, HR, RR, SaO2, BP, Bradycardia, Tachycardia, temperature, residual effect, KCVent, CPAP, micropreemie, Paternal KC, 28 weeks NOT ON CHARTS YET as of 9/2/09.

Varendi H, & Porter RH. (2001). Breast odour as the only maternal stimulus elicits crawling towards the odour source. Acta Paediatrica, 90(4), 372-375. Fullterm infants will breast crawl toward the nipple when they smell the breast odour. And the breastodor comes with skin-to-skin contact. Similar work is one in which 22 babies on warming bed exposed to pad with mom’s breast odour 17 cm in front of baby’s nose and others had a clean pad. More babies moved and reached breast pad than clean pad. Natural breast odours unsupported by other stimuli appear to be sufficient to attract and guide neonates to odour source (Varendi H, Porter RH. 2001. Breast odour as the only maternal stimulus elicits crawling towards the odour source. Acta Paediatrica 90(4), 372-375). Unpleasant odors induce avoidant behavior. Full term, Birth KC, breast crawl, breastfeeding. Not on charts yet.

Varendi H, Porter RH, & Winberg, J.(1994). Does the newborn baby find the nipple by smell? Lancet 344(8928), 989-990. 30 full term newborns were placed in birth KC. One breast was washed, one was not and then baby moved to starting position: nose in midline of moms chest and eyes at nipple level. Data collection began 5-13 minutes postbirth and continued til infant found nipple and vigorously sucked, 25 completed breast crawl and grasped nipple and sucked by 22-100 minutes (average was 51 minutes), 5 reached nipple but needed help to attach, and none were in the “not moving, not reaching the nipple” category. 22/30 infants went to unwashed breast. Specifies starting position for breast crawl as infant prone, nose in midline of mother’s chest, eyes at the level of the nipples and between breasts (not on lower abdomen).Prefeeding behaviors were rooting, hand-to-mouth movement, head turning side to side, hand to areola/nipple contact, mouth to areola, mouth to nipple contact, head lunging, sucking attempts before sustained sucking, sucking latency (pg 990).Breast temps were taken to determine if infant went to warmer breast, but washed/unwashed breast temp difference was only 0.5C (actual breast temps not given). Areola secretes milk, colostrum and is dense with glands that secrete attractive odours. Breastfeeding is sensitive to even minor disturbances of the spontaneous interactions between mother and baby” (pg. 990). Attention should be given to biological factors and do not eliminate biologically relevant chemical signals. Even bottle fed infants prefer breast milk scent & at two weeks postbirth bottle fed infants spent more time turned toward a breastpad from an unfamiliar nursing mother than in the direction of a pad treated with their familiar formula (Porter RH, Makin JW, Davis LB, Christensen KM. 1991. An assessment of the salient olfactory environment of formula-fed infantsl. Physiol Behav 50, 907-911.) Fullterm, Descriptive, Birth KC, prefeeding behaviors, breast crawl, breastfeeding. Not on charts yet.

Varendi H, Porter RH, & Winberg J. (1996). Attractiveness of amniotic fluid odour: Evidence of prenatal olfactory learning? Acta Paediatrica 85, 1223-1227. 31 fullterm infants in birth KC were watched for breast crawl towards a nipple moistened with amniotic fluid and an untreated breast with natural odour.23/30 infants chose amniotic fluid treated breast. 22 completed the breast crawl, 8 reached the nipple but needed help to latch on, and one failed to move at all. Amniotic fluid on hands of infant, and substance on breast has similar scent as amniotic fluid and draws infant to the nipple. Infants preferred amniotic fluid treated breast (these findings are in contrast to 1997 study in which 3-4 day old babies preferred unwashed natural odour breast to amniotic fluid treated breast (especially the girls) and in another study 28 babies by days 2-5 had no difference in # choosing Amniotic Fluid treated to natural odour breast and then days later all infants chose natural odour breast, not amniotic fluid breast (Varendi H, Porter RH, Winberg J. 1997. Natural odour preferences of newborn infants change over time. Acta Paediatrica 86(9), 985-990.. Fullterm, birth KC, breast crawl, breastfeeding. Not on charts yet.

Vasquez, M.J. & Berg, O.R. (2012). The Baby-Friendly journey in a US public hospital. Journal of Perinatal and Neonatal Nursing. 26(1), 37-46. NOT A KC STUDY PER SE, but says there was little support for KC in the hospital. In May 2007 San Francisco General Hospital became first Baby Friendly certified hospital in San Francisco. This quality improvement program took 8 years to complete. Nurses had to be educated about breastfeeding and on day 2 of a 3 day education class, they were taught BF basics which included anatomy and physiology of lactation, milk supply, skin-to-skin and kangaroo care, correct latch and expressing and feeding human milk.(pg. 40 in Table 2), but the
online education program for physicians and advanced practice nurses DOES NOT INCLUDE KC AT ALL on page 41 in Table 3, but on page 44 in Table 4 it states in the table of Barriers “Babies not being placed skin-to-skin and removed from room to do routine nursing and medical tasks.’ And under the Education/Intervention column it relates “In-services and unit campaign on benefits of skin-to-skin, contest with recognition and coffee gift cards for RN who do the most skin-to-skin, Physician education on skin-to-skin and rooming-in, including provision of portable examination supplies for easier infant assessment in mother’s room” (pg. 44 in Table 4). Challenges to completion were the myriad social issues of the mothers (non-English speaking, drug abuse, poverty, homelessness), constantly changing perinatal health care workers with little or no breastfeeding knowledge, hospital practices that do not support rooming and skin-to-skin contact, and lack of overall patient breastfeeding education. On page 42 there is a whole section entitled SKIN TO SKIN CONTACT, defines STSC, says it improves breastfeeding and Baby Friendly requires healthy term infants be placed skin-to-skin within one hour of birth and that infants stay skin to skin for prolonged periods following birth and that skin-to-skin be used as a FIRST INTERVENTION FOR BREASTFEEDING PROBLEMS. Vaginal skin-to-skin was easy, but for cesarean births it was harder. Implementation of KC was hindered by parental concern about infants getting cold and nurses perception that KC was culturally INAPPROPRIATE. “Once staff realized improvements in breast-feeding behaviors, they became skin-to-skin champions” (PG. 43) “Currently, most infants are kept skin to skin throughout the hospital stay and fathers participate in this intervention as well. Inspired by the results of postpartum skin-to-skin, a quality improvement project was initiated this year to place infants skin to skin in the operating room suite right after cesarean sections. Initial data collection has showed positive results in decreased formula supplementation, quicker postoperative reunification, and maternal satisfaction.” Breastfeeding initiation rates went from 81% in 2002 to 98% in 2010. Exclusivity rates did not change. Taking babies to nursery DISRUPTS establishment of breastfeeding because once there, infant tasks were clustered (bathing, Physical exam, blood screens), increasing separation time from mother for hours and when infant got fussy, they were given formula because it is not considered harmful. Taking baby to nursery is a lost opportunity to maintain breastfeeding in the critical hours after delivery. Pocket size Q cards can help with essentials BF management and skin-to-skin management. Implementation suggestions are CUE CARDS for pockets, having nurses sponsor a bake sale and table so whole hospital becomes familiar with what is happening (changes the hospital culture), hold a KC fair, attach brochures about KC to pay stubs, hang a huge banner to increase staff awareness, hang lots of posters showing KC. GOOD IMPLEMENTATION IDEAS. FT, Breastfeeding, Implementation (CUE CARDS, ONLINE COURSE). separation, taking to nursery, cesarean birth KC, barriers, satisfaction, postpartum KC

Vaughans, B. (1990). Early maternal-infant contact and neonatal thermoregulation. Neonatal Network, 8: 19-21. Newborns dried and placed under radiant warmer immediately after birth were compared to 11 other fullterms who were dried, covered with warm blanket and put into KC immediately after birth. After 10 minutes, no sig. diff. in axillary temperatures. KCers had temps similar to those under radiant warmer. FULLTERM, axillary temps, Quasi-Experiment

Velandia, M., Matthiesen, A-S, Uvnas-Moberg, K., & Nissen, E. (2010). Onset of vocal interaction between parents and newborns in skin-to-skin contact immediately after elective cesarean section. Birth, 37 (3), 192-201. No DOI. 37 healthy term infants randomized to 30 mins (5 mins with mom and then either 25 mins in mat (n=17) or pat KC (n=20) group) for a total of 30 mins of KC after cesarean section with either mother or father after an initial 5 minutes of maternal KC after cesarean birth; parent who did not get assigned to do the 30 mins of KC was the control group (20 moms and 15 pops in control group)(pg. 193, 195). There were 37primip mothers and 35 fathers All infants had KC with one parent or the other. Videos of infant in KC and of parent who did not get KC were simultaneously made. Immediately after delivery, infant was dried, covered with towel and placed in KC transverse with head to the right. All moms got 5 mins of KC and then went to assigned group: staying with mom or going to father for 25 more mins as father sat in armchair beside wife’s head in the operating room. At birth, all infants started to cry and birth cry lasted for a mean 1.19 mins. Parental vocalization were video- and audio-recorded and scored for newborns’ and parents’ soliciting, newborn crying & whining, parental speech directed to other parent and to newborn. Parents talked to baby first, pops at 7.1 & moms at 7.2 mins postbirth and infant first made soliciting noise at 12.33 min with pat KC and at 14.71 mins with mat KC. Soliciting calls from baby lasted 4.16 mins with dad and 2.97 mins with mom. 9 moms and 9 pops responded to infant with soliciting noise. If infant did not solicit, parents did not solicit. Newborn solicitations
increased over time, mothers and fathers in KC group communicated more vocally with infant than parents without KC; fathers in KC communicated more with mothers and performed more soliciting responses than no-KC fathers. Infants in paternal KC cried less than those in maternal KC and shifted to a relaxed state or sleep earlier (at 5.5 mins after birth) in pat KC than in maternal KC(at 11.25 mins after birth) and slept for 3.79 mins with pop and 3.3 mins with mom (pg 196). Crying was more with moms and decreased significantly between 10 and 15 mins postbirth with dads, but did not decrease with moms probably because moms were made to scrub their chests with chlorhexidine, which is an unpleasant odor and unpleasant odors induce avoidant behavior (Varendi & Porter, 2001). Infants in mat KC whined less than those in pat KC, and no difference in amt of time of silence in infants. Mat KC moms directed more speech to baby than control moms and no difference in moms first soliciting sounds between mom groups, occurred at 13.8 mins for KC moms and at 12.5 mins for control moms and lasted for 0.68 mins (KC mom) and 042 mins (control mom).All KC fathers talked more to mom and baby than controls; and made more soliciting sounds than controls and first soliciting sound occurred at 18.9 mins and lasted for 1.4 mins. Control dads made no sounds (pg. 197). Mothers and fathers and infants had reciprocal parent-infant interaction. All infants touched parent’s breast, nipple, or both (for 13.8 mins with dad, and 18.25 mins with mom) KC after c/section promotes vocal interaction and when in KC and exposed to parents’ speech, infants initiated communicating with soliciting calls (a short, contact-seeking, ringling sound by baby or parent) with the parents within 15 minutes of birth. These vocalizations are inbred prefeeding behavior. The soliciting vocalizations occur after hearing the parents voices and activate speech motor areas in newborn (Gentilucci, M. & Dalla Volta, R. (2008) Spoken language and arm gestures are controlled by the same motor control system. Quarterly Journal of Experimental Psychology (Colchester) 2008, 61(6); 944-957.) and may be an imitation of parent soliciting sounds due to activation of mirror neurons (Lepage JF, Theoret H. 2007. The mirror neuron system: grasping other’s actions from birth? Developmental Science, 10(5), 513-523). Oxytocin released during KC facilitates communication by increasing parental responsiveness to infant cues (oxytocin increases vocalizations in pigs and rats and cites #25,26 in reference list). BE SURE TO INCLUDE FATHERS, don’t wash maternal breasts because it confuses newborn’s olfactory cues, and avoid parent-infant separation. FT, RCT, immediate BirthKC and for first 30 mins of life, paternal KC, crying, birth cry = 1.19 min, vocalizations, cesarean section, RELAXATION (behavioral state?), SLEEP, APGARS go up at 5 and 10 mins, reciprocal interactions, oxytocin, neurons, separation, (NOT ON CHARTS as of 10/14/2010).Soliciting noise with birth KC (See also Widstrom et al. 2011 on the 9 behaviors for self-regulation)

Velandia, M., Uvnas-Moberg, K., & Nissen, E. (2012). Sex differences in newborn interaction with mother or father during skin-to-skin contact after Cesarean Section. Acta Paediatrica, 101, 360-367. Doi: 10.1111/j.1651-2227.2011.02523.x. Randomized controlled trial of 20 girls and 17 boys (all fullterm 38-42 wks, Apgars of 7 or more at 1 min; planned C/S to primip uncomplicated pregnancy in Sweden over 4 years (1997 until 2001) to 25 mins of Birth KC (placed on mom’s chest in transverse position at 1 min postbirth and covered with warm towels and all stayed in maternal KC for 5 minutes and then assigned to maternal or paternal chest for 25 minutes pg. 361) either with mom or with father (infant’s eyes level with father’s nipple as Daddy sat in chair at head-end of operating table) and then all infants went to maternal KC for the next 90 minutes). Interaction was videotaped. Girls started rooting earlier than boys with either parent (p=0.027). First Breastfeeding appeared significantly earlier when in maternal KC than paternal KC. Maternal KC resulted in earlier start of breastfeeding during the first 5-30 mins of Birth KC (p=0.018). Girls cried more than boys in SSC with either parent (p=0.02), and girls did breast-massage earlier than boys (pg. 364) and mothers used more touching behavior than fathers (p=0.001) and fathers did more talking than touching, especially with boys. Mothers touched girls less than boys (p=0.038) and used fingertip touch (fathers used palmar touch). Fathers directed less speech towards girls than boys (p=0.042). Vocalization is as important as touch in activation of neuroendocrine mechanisms involved in the regulation of social bonding in humans (Seltzer LJ, Ziegler TE, Pollak SD. 2010. Social vocalizations can release oxytocin in humans. Proc Biol Sci, 277, 2661-2666). Sensory nerves were activated and caused a consequent release of oxytocin ( Loken Is, Wessberg J Morison I, McGlone F, Olauson H. 2009. Coding of pleasant touch by unmyelinated afferents in humans. Nat Neurosci 12, 547-548). Touch, warmth, stroking, light pressure stimulate oxytocin release and induce oxytocin-related effects (Uvnas-Moberg, K. Oxytocin may mediate the benefits of positive social behavior and emotions. Psychoneuroendocrinology, 1998, 23, 819-835). The results highlight the importance of immediate infant-parent skin-to-skin contact, even after cesarean section. The parents interacted differently with their infant (and the mother’s behavior is the same as maternal rats in which rats touch males more than females).
Uninterrupted SSC with the mother facilitated the initiation of breastfeeding in the mother-infant dyad exposed to a planned cesarean section. If the mother is unable to provide SSC immediately after birth, the father is a valuable alternative because SSC promotes his interaction with the newborn” (pg. 360). RCT, FT, cesarean, birth KC, breastfeeding, interaction, crying, paternal KC, maternal behaviors, oxytocin, c afferent nerves

Venancio, SI, & de Almeida H. (2004). Kangaroo Mother Care application in Brazil: scientific evidences and impact on breastfeeding. J. Pediatr (Rio Janeiro) 80(5 Suppl), S173-S180. Review article of KMC history and review of Cochrane review by Conde-Agudelo et al. Reports that Cochrane found KMC is protection factor for breastfeeding at discharge, reduced risk of nosocomial infection at 41 wks PCA, reduced risk of severe illness, reduced risk of lower respiratory tract disease at 6 months, and better weight gain/day. Pyschomotor dev at 12 months was same and no difference in infant mortality. Cites many dissertation and studies in Brazil that were reported at a conference but these citations are not available for retrieval. PT, Review, Portuguese, infection, breastfeeding, development

Veras, R.M. & Traverso-Yepez, M. (2011). The Kangaroo program at a Barzilian maternity hospital: the preterm/low –weight babies’ health-care under examination. Nursing Inq, 18(1), 84-91. DOI: 10.1111//j.1440-1800-2011.00520.x A review of the program shows that KC has been effective in saving lives and improving some of the infants’ health outcomes. There are conflicts between health care providers and KC users, lack of socioeconomic and emotional support are impairing implementation of the program. Moms have low literacy rate and hospital uses this to keep moms uninformed about their right to leave the hospital; KC is a choice in private health system but mandatory in social health system. 3rd world, PT, KMC implementation, barriers, Not on charts 2/17/2011

Verder H. (2007). Nasal CPAP has become an indispensable part of the primary treatment of newborns with respiratory distress syndrome. Acta Paediatrica 96 (4), 482-484. Clinical report of a treatment package for respiratory distress that includes CPAP rather than mechanical ventilation. This hospital uses the Scandinavian model of preterm care, defined as gentle ventilation at birth, minimal handling, NIDCAP, high priority of breastfeeding, use of Kangaroo Care (which facilitates observation and nursing of sick infants and optimizes possibility of early mother-child contact. Incidence of bronchopulmonary dysplasia is less of a problem in centers using nasal CPAP as primary treatment for respiratory distress. Preterm, clinical report, respiratory distress, CPAP Not yet on charts.

Victor, L., & Persoon, J. (1994). Implementation of kangaroo care: A parent-health care team approach to practice change. Critical Care Nursing Clinics of North America, 6(4): 891-895. This article discusses how the neonatal intensive care unit at Children's Health Care St. Paul became the first in the nation to successfully implement KC in a nonresearch based environment. This systematic process included use of research materials indicating positive outcomes, recruitment of primary nurses, and staff educational sessions that encouraged problem solving for potential adverse effects. IMPLEMENTATION


Villalon, U.H., & Alvarez, C.P. (1993). Short term effects of early skin-to-skin contact (kangaroo care) on breastfeeding in healthy fullterm newborns. Rev. Child Pediatr. 64(2), 124-128. Randomized controlled trial of 119 dyads(KC=59) who got early KC (started 2-4 hrs postbirth) vs controls who stayed in observation nursery for first 4 hrs postbirth in Chile. 89.9% KC vs. 63.3% control breastfeeding at 24 hrs postbirth; 93.3% KC vs. 66.7% control BF at discharge; 78.8% KC vs. 56.2% control BF at 14 days postdischarge. Maternal self confidence at discharge (89.9 KC vs.53.3 control p<.001) and at 14 days (97%) was better for KC. FULLTERM. RCT, BF duration (24 hrs postbirth,
discharge, 14 days postbirth), maternal confidence, early KC.

Vincent, S. (2011). Skin-to-skin contact. Part one: Just an hour of your time. Practicing Midwife, 14(5), 40-41. This is a brief review of Baby Friendly Hospital Initiative ‘s increase in the amount of time mom and infant should be together skin-to-skin immediately after birth to one hour and much more when possible. IT is an explanation of why they have made this change. Review, Birth KC, VEKC, BF, Fullterm NOT ON CHARTS 7/20/2011

Vincent, S. (2011). Skin-to-skin contact. Part two: The evidence. Practising Midwife, 14(6), 44-46. UNICEF/UK Baby Friendly Initiative has recently increased recommended minimum time spent in skin contact after birth from 30 minutes to one hour. This article looks at recent research in to the benefits of KC and summarizes the findings. Review. FT, Birth KC, NOT on Charts 7.22.2011

Visser A, Delport S, & Venter M. (2008). Molecular epidemiological analysis of a nosocomial outbreak of respiratory syncytial virus associated pneumonia in a kangaroo mother care unit is South Africa. J. Medical Virology, 80(4), 724-732. From March to May 2006, 23 preterm infants who had been in a KMC unit from birth til discharge in Gauteng Province developed nosocomial pneumonia. 52.6% of their mothers were HIV sero-positive. Inadequate infection control measures were taken by health care providers and mothers to infants in KMC units, thus they increased the risk of severe RSV infection because the cases were matched to genetically identical strains found in a general pediatric ward the same hospital the month before the outbreak began in the KMC unit. Preterm, Descriptive study, 24/7 KMC, nosocomial infection, RSV, negative outcome.

Vivancos, R.B.Z., Leite, A.M., Scochi, C.G.S., & Dos Santos, C.B. (2010). The skin-to-skin contact at birth and newborn crying during vaccination against Hepatitis B. Acta Paulista de Enfermagem, 23(4), 461-465. No doi available. A quasi-experimental comparative study of 40 full term newborns in two groups (one with skin contact with mothers after birth and one group without skin contact after birth, were compared in crying time during Hepatitis B vaccination. Crying changes across all phases of the Hep B vaccinewere seen in both groups, but no statistical differences appeared, thus KC did not decrease crying time statistically. Yet, the authors clearly state that “during the skin-to-skin contact period, 19 newborns (95%) remained in silence and did not manifest any audible vocalizations, though they were fully awake and active on their mother’s chests. Among the newborns from the control group, 15 (75%) presented non-measured episodes of crying while waiting for data collection in the heated crib.” Pg. 463-464. 19/20 KC infants did not cry at all. Stress induced crying was observed with the shot and KC was observed to modulate crying behavior in newborns. FT, quasi-experimental, crying, birth KC, pain, vaccination. NO CRYING Not on charts 2/18/2011.

WABA (2007). go to website and get statement


Wahlberg, V. (1991). The “kangaroo method” and breastfeeding in low birth weight babies. NU Nytt on U-landshalsovard,5(3), 22-26. Reports how KC began, that mortality and abandonment decrease (p.24), includes report of 33 KCers in Sweden and less HR, lower o2 needs, less restlessness, better temp maintenance, fewer digestive probs, more milk, and 24/33KCers (83%) BF at discharge vs 45% in control (p. 25. Has BF cycle wheel for KC. Clinical Report and review. Breastfeed. PT, HR, O2 needs, restlessness, temp, digestion, milk production

Wanga, C. & LaCoste, M. J. (2011). A father’s commitment to “kangaroo care”. Healthy Newborn Network. Washington, D.C.: Save the Children. This ia blog that is available on the HealthynewbornNetwork.org/blog as of Nov. 8, 2011 that relates a father in Stone Town, Zanzibar came every day to hold his twin sons in kangaroo care for 2 hours each day – something that most males would not do. But he is role model for others and knows that his body warmth has helped his sons survive. PT, Clinical report of one father, 3rd world, paternal KC

Waiswa, P., Nyanzi, S., Namusoko-Kalungi, S., Peterson, S., Tomson, G., & Pariyo, G.W. (2010). ‘I never thought that this baby would survive: I thought that it would die any time’: perceptions and care for preterm babies in eastern Uganda. Tropical Medicine and International Health, 15(10), 1140-1147. DOI: 10.1111/j.1365-3156.2010.02603.x A descriptive study of one midwife who observed care of preterm babies in one general hospital and 15 health centers using a checklist and a field diary. No health facility practiced KMC (1143). 11 community health workers (none knew about KMC pg 1143) and 10 mothers (readily accepted idea of KMC, thoughts were fear of hurting umbilical cord, can’t work with baby on the chest all the time, KMC is tiring (night and day, night and day and you can get sick and you can start bleeding again; they feed sugar water until milk comes in and do not use colostrums for feeds), 6 fathers (all thought KMC was for women only), 3 grandmothers were interviewed and went through focus groups analyzed by content analysis. Community health workers identified many features used to identify preterm infants. Care practices in hospital and at community level are inadequate and potentially harmful. Health facilities lacked capacity in terms of protocols, health worker’s skills, basic equipment, drugs and other supplies, but community health workers accepted KMC and other newborn care practices. Essential newborn care practices are CLEAN CORD CARE, THERMAL CARE by KMC after birth and after baths (pg. 1142), EARLY AND EXCLUSIVE BF (from Marsh DR, Darmstadt GL, Moore J, Daly P, Oot D & Tinker A. (2002) Advancing newborn health and survival in developing countries: a conceptual framework. J Perinatology, 22, 572-576). The comment in the title was about preterm infants in general and had nothing to do with palliative powers of KC. PT, 3rd world, descriptive, survival, essential care, maternal acceptance, barriers to implementation

Walden, M., & Jorgensen, K. (2010). Chapter 20: Pain assessment and non-pharmacologic management. In C.Kenner & J. M. McGrath (Eds). Developmental Care of Newborns and Infants. A Guide for Health Professionals. 2nd Edition: Chicago, Ill: National Association of Neonatal Nurses. Pp.411-425. On page 420 it relates “…heel squeeze is the most painful part of heel stick procedures (Grunau & Craig, 1987; Anand et al., 2004), and the use of topical agents does not provide effective pain management. Instead, facilitated tucking, skin-to-skin contact, and the use of sucrose pacifiers decrease the pain responses associated with the heel-stick procedure.” The next few paragraphs relate that bright lighting and/or continuous lighting levels are associated with increased physiologic and behavioral stress in preterms, and that for prolonged periods after a painful stimulus, other nonnoxious stimulants (handling, physical exam, nursing procedures) may cause heightened activity in nociceptive pathways, leading to systemic physiologic responses to stress in preterm infants. Consequently it is recommended that adequate rest periods be provided after painful procedures, and in clustered caregiving introduce the least noxious stimulus first and most noxious last to minimize stress of caregiving. Preterms and full term newborns who experience a series of handling and immobilization manipulations before a routine heel stick exhibit significantly more physiologic responses and behavioral arousal to heel stick compared to infants who had not been handled (SO LET THEM REST IN KC BEFORE STICK!!). Nesting facilitates infant’s self-regulatory development and may minimize pain. Containment reduces pain by providing gentle stimulation across proprioceptive, thermal, and tactile sensory systems (MacKenna BR & Callender, R. 1990. Central nervous system locomotor system. In Illustrated physiology (5th Eds. Pp. 220-284.) Edinburgh, Scotland: Churchill Livingstone. PT, Pain, Review, non-pharmacologic interventions and pain assessment tools. Not on Charts 10/22/10


Wallin, L., Ruflberg, A., & Gunningburg, L. (2005). Staff experiences in implementing guidelines for Kangaroo Mother Care—a qualitative study. International J Nursing Studies, 42(1), 61-73. A focus groups held to learn effect of change team to implement KMC guidelines in two units that had a facilitator working with the change team and in two units that did not have a facilitator working with the change team. The intervention being tested here was “facilitation” and facilitation promoted implementation activities and was appreciated by the change team. But, facilitation was no more effective than than a quality improvement focused organization in which nurse manager is involved in change. Learning about KMC and changes in practice of KMC is a social phenomenon that benefits from people’s interaction with each other. Lars told Dr. Ludington at the INK workshop in Brazil in Nov. 2004 that KMC is really only being done at delivery for fullterms in Sweden in 2004. PT, Implementation, barriers

Wallis, C. L. (2000). Kangaroo Care. Neonatal Network 19(7), 68. This is a letter to the editor saying that KC is used routinely and shows pictures of twins in KC. PT, TWIN KC, routine use in U.S.


Walters, M., Boggs, K., Ludington-Hoe, S.M., Price, K., & Morrison, B 2007. Kangaroo Care at birth: Temperature and blood glucose effects. MCN, American J of Maternal Child Nursing. 32(6), 375-381. Descriptive evaluative study. Ten infants were given KC within one minute of birth. Stable temperatures, normal blood glucose levels at 30, 60 and 90 minutes post-birth, and independent and spontaneous movement of infants from the mother’s abdomen up to the nipple, where infants spontaneously latched and had perfect scores on the MEALS breastfeeding effectiveness scale. In addition, physician’s reported that mothers were distracted by KMC from episiotomy repair. Adoption of birth KMC was easy and had negligible effect on workload Full term, Birth KC, HR, RR, temperature, glucose, hypoglycemia, breastfeeding, episiotomy pain.

Wang, Y.H., & Kuo, H.H. (2006). The nursing experience in helping unmarried adolescence girl to care for her premature infant. Hu Ki Za Zhi, 53(5), 76-83 (Chinese). Case study of helping an adolescent girl take care of her preterm infant. Major problems the mother had were potential risk of parent/infant malattachment, insufficient knowledge of childcare. Nurse taught mom Kangaroo Care to promote attachment. IT did the job! Article concludes that an adolescent ob service is needed to provide holistic care. PT, Case study, attachment.

Warnock, F.F., Castral, T.C., Brant, R., Sekilian, M., Leite, A.D., Owens, de la P., & Scochi, C.G.S. 2010. Brief report: maternal kangaroo care for neonatal pain relief: an systematic narrative review. Journal of Pediatric Psychology, 35(9), 975-984. doi:10.1093/jpepsy/jsp123 This is an attempted meta-analysis but they say they could not do it because standard errors were not published, just standard deviations and because only Cong’s study had effect size and a theory guiding the study. They recommend that studies report the theory guiding the study. They found 12 studies of KC to reduce pain (Akcan et al., 2009; Castral 2008; Cong 2009; de Sousa Freire 08; Ferber & Makhoul 07, Gray 2000; Johnston 03, 08; Kashninia 08; Kostandy 08, Ludington-Hoe 05; Sajedi, 07). They think future studies should report baseline measures of outcomes and measures of effect sizes (pg. 8). Review, pain, methodological issue. Theory guiding study.

Warren, R. (2008). Breastfeeding in the delivery room. British Journal of Midwifery, 16(2), 119-120. This is a review article about the benefits of breastfeeding and number of women initiating BF in the delivery room as mandated by the Baby Friendly Hospital Initiative. On page 119, she states “The Baby Friendly Hospital Initiative urges that support is there for the very first breastfeeding and that all mothers should have the opportunity to hold their babies with
skin to skin contact for an unlimited period as soon as possible after delivery (Unicef, 2008). Although the practice of skin-to-skin contact is commonly promoted by midwives, its duration can be short-lived because of other priorities in care organization.” Then it goes on that “just a brief period of separation between mother and infant during the first hour after birth has a strong impact on the success of the first breastfeeding (Righard & Alade, 1990).” In the next paragraph on effects of pethidine, it states “Richard and Alade’s study (1999) demonstrated that for babies exposed to pethidine, breastfeeding was problematic. However, WHO (1998) recommends that a longer period of skin-to-skin contact be required to compensate. Furthermore, the contact per se between mother and baby in this sensitive period can induce a physical state that is particularly conducive to initiation of breastfeeding. Finigan and Davies’ (2004) qualitative work relays powerful accounts of women describing the ‘gaze’ and the immediate instinctive feelings generated of wanting to touch and bring their babies to the breast.” Under hospital practices, she writes “cesarean section birth ranks highly as a significant barrier for skin-to-skin contact.” And “Ashmore (2003) makes a rather amusing observation that it is not the midwife who has to have the skin contact. Prolonged skin-to-skin contact employs very little time or effort, there are no financial implications and in a safe environment this simple practice has many potential benefits. The biggest obstacle to skin-to-skin contact appears to be that it requires a change to routines.”

Weller A, & Feldman, R. (2003). Emotion regulation and touch in infants: The role of cholecystokinin and opioids. Peptides 24 (5), 779-788. Cholecystokinin and opioid peptides mediate early learning about maternal odor, milk and contact in rats. This paper reviews all the work showing that neuuropeptide systems mediate emotion regulation in human infants, thus playing a role in the emergence of stress-reactivity and other motivational systems such as feeding. Maternal handling, proximity, and touch benefits the development of emotion regulation in the human. KC (pg 782) has been shown to improve the infant’s ability to self-regulate and to moderate the effects of separation and lack of maternal proximity and availability (even in depressed moms). In rats and humans, maternal proximity enables infant to smell maternal odor. Mat odor activates cholecystokinin and opioids (neuropeptides) that help infant learn that this is feeding time and help infant regulate his emotions, particularly stress reactivity as opioids are endogenous narcotics that calm the infant and reduces state level. KC is mentioned as it helps infants self-regulate and moderate effects of separation, like preterm birth and IUGR. Thus, KC is probably quieting due to opioid secretion. Theoretical review. Stress, emotional development. Cholecystokinin, metabolism. NOTON CHARTs 9/09

Weller A, Rozin A, Goldstein A, Charpak N, Ruis-Pelaez JG, Figueroa de Calume Z, Charpak Y, & Sack J. (2002). Longitudinal assessment of pituitary-thyroid axis and adrenal function in preterm infants raised by ‘kangaroo mother care.’ Hormone Research 57 (1-2), 22-26. A randomized controlled trial of KMC vs traditional care of 87 infants <2001 grms. Gave 3 blood spot samples on filter paper at entry (1-5postnatal days), 2 weeks later, and @ 41 weeks PCA. Infants had been discharged within 1st postnatal week. 17 alpha-hydroxy-progesterone (17-OHP), thyroxin stimulating hormone (TSH) & thyroxin (T4) measured after complete KMC (24 hr/day KMC). 17OHP and TSH decreased significantly over time. KMC did not interact with the pattern of physiological change. Maturation of the pituitary-thyroid axis and adrenal function is not compromised by KMC in healthy preterm infants. Complete KMC definition, RCT, Pituitary-Thyroid-Adrenal function, 17-OHP, T4, TSH., metabolism, PT, stress

Wheeler, J.L., Johnson, M., Collie L, Sutherland D, & Chapman C. (1999). Promoting breastfeeding in the neonatal intensive care unit. Breastfeeding Review, 7(2): 15-18. Forty-one infants watched during feeds for 21 days. Infants were 32-37 wks (M=34.21wks, MBW=2225.02g). On day 1, 22.2% BF while nude on breast (called KC); days 2-9 the % of babies in KC for BF dropped to 8.7%, 0% on days 10-14; and 18.2% on day 15 and no more after that. KC was not considered “necessary” on days 10-12 because infants were BF. Preterm, Near term, Descriptive longitudinal over 4 days, Breastfeeding

White, R.D. (2003). Individual rooms in the NICU – an evolving concept. Journal of Perinatology, 23, S22-S24. This is a review of the origins and rationale for single bedded NICUs by Robert White to started the idea in 1992 with an editorial. On page S22 KC is mentioned: “Some mothers are willing to nurse their baby, sing, talk ‘baby talk’, and provide skin-to-skin care in the most open of settings, and certainly some privacy can be provided with curtains or screens even in a multibed room….”. This article refers the reader to Graven for a review of the overstimulating effects.


Whitelaw, A., Heisterkamp, G., Sleath, K., Acolet, D., & Richards, M. (1988). Skin-to-skin contact for very low birth weight infants and their mothers. Archives of Diseases in Childhood, 63, 1377-1381. Pilot studies showed that stable infants as small as 700 g could be safely held in KC and mother and baby enjoyed the experience. Moms’ said “Now I feel he’s getting to know me,” “I feel like a mummy now.”. **TWO GROUPS Randomized controlled trial: 71 infants (<1500g BW, stable breathing, no O2 support, and could not have congenital anomalies, IVH, ventricular hypertrophy, and PVL). 35 moms (BW=1152 GA=29.10wks) gave adlib KC (swaddled holding for 1.4 hrs/day and KC mean of 36 mins/day from mean 16-61st day of life in KC group); 36(BW=1135, GA = 29.5 wks) gave swaddled holding (1.8 hrs/day from mean 1-66th day for controls). LOS of stay for KC =30 days, control = 37 days. Some twins kicked, but not necessarily simultaneously. At discharge mom asked about her confidence in looking after baby, being depressed, feeling detached, feeling supported in looking after baby, and if she thought baby would die. At 6 months PMA moms asked about feeling detached from baby, knowing what baby wants, if baby wants to be carried, is baby contented, mom feels annoyed with baby, baby is easier to look at than in hospital, support in looking after the baby, has baby’s behavior caught up , worried if something will still happen to baby. Parents kept 48 hour diary of sleep, feeds, holding, playing, crying to the nearest 15 mins. TcPo2 ↑ by 7mmHg in KC. No diff in visiting time, temp instability not a problem during KC, 6 kids in each group stopped study for apnea, nec,or sepsis during study but not necessarily during KC, no diff in questionnaires at discharge and 6 months, 67% of moms thought baby would die, 42% did not feel was theirs til baby was home. No diffs in 6 month sleeping (ke=13.6hr/day con=13.4 hr), feeding 2.5 hrs/day KC, con=2.5), being held (KC=3.0, con = 3.0 hrs/day), playing (4.5 hrs/day both grps) between grps. KC had 25 mins/day crying, con=38 mins/day(SIG difference in CRYING). BF duration in KC =9.2wks vs. 5.1 wks in controls (SIG) 17/31 (55%) KC moms lactated >6wks, 9/32 (28%) controls lactated >6wks(SIG), follow-up of infants given KC in hospital. Prolonged lactation and decreased crying at 6 months. **Preterm, RCT, BF, BF duration, crying, micropreemie, maternal feelings, infant pleasure, maternal empowerment/role development, twin KC, diary, sleep, play, visiting time, apnea, nec, sepsis, negative effect (6 stopped for apnea), length of stay, twin KC, crying. Micropreemie, ELBW, VLBW**

Whitelaw, A., & Sleath, K. (1985). Myth of the marsupial mother: Home care of very low birth weight babies in Bogota, Colombia. Lancet 1, (8439)May 25, 1206-1208. Descriptive report of how statistics were incorrectly calculated and thus, report a higher than actual reduction in mortality. This paper did much damage as many South American countries then abandoned KMC because they didn’t want to be associated with “bogus” science. Descriptive report, PT, mortality.


Wiberg B, Humble K, & deChateau P. (1989). Long-term effect on mother-infant behaviour of extra contact during the first hour postpartum. V. Follow-up at three years. Scand J Soc Med 17(2), 181-191. Primips who had 15-20 minutes of KC and suckling contact during first hour after delivery behaved differently, had longer duration of BF, expressed different opinions on childrearing practices at 36 hrs, 3, 12, mos as compared to controls. At three years control mothers reported that time with infant right after birth was insufficient, KC infants had earlier continence during the day, earlier stubbornness than controls, higher catecholamines (epinephrine, norepinephrine) levels in urine, and moms smiled/laughed more, were more encouraging, instructing than control moms. Articulated conflicts were more common in KC group and regardless of type of conflict, more conflicts were resolved in the KC group. Study differences were more pronounced for boy-mother pairs than girl-mother pairs. Denver Devl Screening was same in both groups. Fullterm, RCT, KCBF, Development, Early KC, Maternal behavior, Interaction, Catecholamines, Stress, cortisol

Widstrom, A-M, Lilja G, Aaltomaa-Michalias P, Dahllof A, Lintual M, & Nissen E. (2011). Newborn behaviour to locate the breast when skin-to-skin: a possible method for enabling early self-regulation. Acta Paediatrica 100(1), 79-85 DOI:10.1111/j.1651-2227.2010.01983.x. Descriptive study of the behavioural sequence that begins immediately after birth and terminates with grasping the nipple, sucking, and then falling asleep. 28 Full term infants videotaped immediately after birth. When birth crying stops, babies show a short period of relaxation, then successively become alert. They go through “awakening phase”, and “active phase” with movements of limbs, rooting activity and looking at the mother’s face, a “crawling phase” with soliciting sounds, a “familiarization phase” with licking of the areola, and a “suckling phase” and last a “sleeping phase.” Five factors related to time spent to locate the breast are “1. more number of looks at the breast 10-20 minutes after birth (p<0.0001), exposure to meperidine (p<0.0006). Early start of crawling (p=0.004), increased number of ‘soliciting sounds’ (p=0.0022) and performing hand-breast-mouth movements (p=0.0104) related to shorter time. Inborn breastfeeding reflexes are depressed at birth, possibly because of depressed sensory system. When the infant is given the option to peacefully go through the nine behavioural phases (1. Birth Cry (intense crying just after birth), 2 Relaxation (infant resting/recovering), No activity of mouth, head, arms, legs or body), 3 Awakening (begins to show signs of activity. Small thrust of head, up,down, side to side. Small movements of limbs and shoulders), 4. Activity (moves limb, head, is more determined in movements, rooting, pushing with limbs without shifting body), 5. Crawling (‘pushing’ that results in shifting body), 6. Resting (infant rests with some activity, such as mouth activity, sucks on hand), 7 Familiarization (infant has reached areola/nipple with mouth positioned to brush and lick areola/nipple), 8. Suckling (Nipple in mouth and sucks), 9. Sleeping (baby closes his eyes) when skin-to- skin with its mother - early optimal self-regulation occurs. This article is accompanied by the video: Skin to Skin in the First Hour After Birth: Practical Advice for Staff after Vaginal and Cesarean Birth which is a 40 minute video under the video section of this bib and it is by “The Healthy Children Project.” Full term, descriptive, breast crawl, BF, Birth KC, 9 steps. (NOT ON CHARTS AS OF 1/21/2011).

Preterm, Check to see if this KC study.

Widstrom A-M, Ransjo-Arvidson AB, Christensson K, Matthiesen AS, Winberg J, & Uvnas-Moberg K. (1987). Gastric suction in healthy newborn infants. Effects on circulation and developing feeding behaviors. Acta Paediatrica Scand, 76, 566-572. 21 healthy term infants were randomized into routine gastric suctioning after birth or no suctioning. Prefeeding behav was watched after dried, nude infant placed on maternal abdomen. 15 minutes after placement and inactivity, infant started rooting and spontaneous sucking and these reached maximal intensity at 45 minutes. First hand to mouth activity at mean of 34 minutes (R=32-36 minutes). At mean of 55+ minutes infant spontaneously found nipple and started to suckle. This is an organized feeding behavior and it unfolds in predictable way during first hours of life. Pictures of how infants spontaneously move up to breast to feed, saying baby has crawled by itself towards the nipple. 20 or 21 infants crawled to breast and spontaneously latched, one needed help latching on, and all moved toward the breast. Gastric suctioning disrupts this natural behavior. FULL TERM. RCT KC is part of routine care, birth KC, breast crawl, search behavior. This was first BREAST CRAWL REPORT.

Widstrom, A-M, Wahlberg V, Matthiesen A-S, Eneroth P, Uvnas-Moberg K, Werner S, & Winberg J. (1990). Short term effects of early suckling and touch of the nipple on maternal behavior. Early Human Development, 21, 153-163. All fullterm infants placed in KC immediately after birth and stayed there for 45 min. One grp was placed at breast for KCBF (Kangaroo Care and Breastfeeding) (n=32) within 30 minutes of delivery, other grp put in KC without being put to breast and then fed on postpartum ward (n=25). Only 6/32 sucked within 30 min of delivery at breast, but all infants who had touched or licked areola/nipple stayed with mother more, moms talked to them more, and maternal gastrin levels were lower before and after breastfeeding. Gastrin levels correlated with time the infant spent in the nursery rather than in KC: gastrin was higher the more time infant was left in nursery. Gastrin levels are controlled by vagal nerve. Thus, KC affects vagal nerve activity (maternal neuroendocrine functions) and therefore, maternal digestion and metabolism may also be affected by KC in early postpartum period. No change in prolactin levels before and after BF between groups. RCT, fullterm, KCBF, BF SEARCH BEHAVIOR, maternal behavior, gastrin, prolactin, breast crawl, birth KC, maternal metabolism, endocrine hormones, vagal nerve

Wieland C, Bauer K, Bisson S., & Versmold H. (1995). Skin-to-skin care with 38 preterm infants. Monatsschrift fur Kinderheilkunde 143(11), 1099-1103. 28 weeks gestation, mean Birth weight of 1110 grams, who got 30-60 minutes of KC just once on 10th day of life in pretest-test-posttest study of temperature, HR, SaO2. HR did not change from incubator to KC. RR did not change over first 30 minutes of KC session. Quasi-Exp, PT, HR, RR, SaO2, Temp. Not on charts yet, Get this


Wimmer-Puchinger B, & Nagel M. (1982). The importance of attitudes during pregnancy and early mother-child contact for breast-feeding behavior: An empirical study. In: Prill H, Stauber M (eds.) Advances in psychosomatic obstetrics and gynaecology, Springer Verlag, Berlin, pp. 482-487. In Austria, Primip mothers. KC got 15 minutes of KC at 1-2 minutes postbirth (n= unspecified, n for control unspecified, but N=95). Control babies were cleaned, dressed and held by mom. Third group babies cleaned, dressed, put to breast for 15 minutes immediately postpartum. Early KC groups resulted in BF for a mean of 98 days vs 36 days in control group. RCT, Fullterm, BF, Birth KC

newborn baby (pg. 217). Close body contact helps regulate temperature, energy conservation, acid-base balance, adjustment of respiration, crying and nursing behaviors. Baby regulates mothers attention to baby’s needs, initiation and maintenance of breastfeeding, energy economy and surge in maternal gastrointestinal homes. Review. Full term, Birth KC, breastfeeding, co-regulation.


Wise J. (1998). Hypothermia improves with skin-to-skin care. British Medical Journal, 317, p. 967. This refers to Christenson & Bhat et al, Lancet 1998 article vol. 352, p. 1115 of the study in Zambia of 80 low risk, hypothermic infants who were given KC. After 4 hours, 90% were in Neutral thermal zone for temperature vs. only 60% who were in an incubator in neutral thermal zone. REVIEW, Preterm, temperature, rewarming


World Health Organization, (1996). Care in Normal Birth: A Practical Guideline. WHO, Maternal Health and Safe Motherhood Programme, Division of Family Healthy, Geneva. This is a document that recommends several practices that would achieve healthy mother and child using the least number of interventions that are compatible with safety, such as monitoring labor progress with a partogram (Frieldman Curve), intermittent auscultation, provide emotional information to the mother, be a sustaining human presence, allow freedom of position and movement, respect woman’s choice of companions, include mother in decision making during labor and use of non-pharmacological methods for pain relief. The report says that as of 1996 and when these recommendations are not followed, birth is seen as a medical emergency rather than a normal physiological process with as few interventions as possible in the birth process. When the recommendations are not followed, negative birth experiences occur (pg. 2994). It also says and provides evidence supporting: we must change the belief that technology equals safety and the best practice. The recommendations are grouped according to the following: on admission, first stage, second stage, after the baby is born.

In the “after the baby is born” category, the very first recommendation is “The baby is placed skin-to-skin” (p. 2996.) the third one is “I was helped to breastfeed within one hour” and another is “I was asked about my experience of birth”. FT, guidelines, BIRTH KC, BF, maternal feelings, technology not always good. See also the Sandin-Bojo articles which tested how well Sweden has met these recommendations for 15 years.

World Health Organization. (2010). Packages of Interventions for Family Planning, Safe Abortion Care, Maternal, Newborn, and Child Health. Pp. 1-17. Available from WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland. Tel: +44 22 791 3264, fax: +44 22 791-4857; email: bookorder@who.int. In the newborn care chart, under the section Interventions at Home/COMMUNITY level, the 5th one is “Care of a small baby without breathing and feeding problems: frequent breastfeeding, skin-to-skin contact” (pg. ) Under “Interventions at FIRST LEVEL HEALTH FACILITIES, one of the bullets reads “Care of preterm/low birth weight without breathing problems: support for breastmilk feeding, Kangaroo Mother Care” and in the section “Interventions at REFERRAL FACILITIES it states “Management of a newborn with severe problems: general care of a sick newborn and specifically care for: preterm babies with breathing problems or unable to feed orally (includes provision of Kangaroo Mother Care.”pg. 15 PT, Guidelines, BF, respiratory difficulty/prob/distress. Not on charts as of 11/2010.

this population, requirements for safe KC (Setting, policy, staffing, mother’s willingness, equipment and supplied, and how to feed babies in KC), and practice guide (when to start, how to start, the KC position, length and duration of KC, KC at home). ISBN: 92 4 159035 1 Available from http://www.who.int/bookorders or from Marketing and Dissemination, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland (tel: +41 22 791 2476; Fax: +41 22 791 4857). **Preterm, Positions, Policy, and Breastfeeding, BF in KMC position**


World Health Organization (WHO), UNICEF, & Wellstart International. (2009). Baby –Friendly Hospital Initiative. Revised, Updated and Expanded for Integrated Care. Geneva, Switzerland. p. 1-237. Available from WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, Switzerland. Email: bookorders@who.int or on the WHO website (free). This is the course for being Baby Friendly that includes the grading criteria. In Section 1, Background and Implementation many statements are made about KC. On page 33, under Step3 to Inform all pregnant women about the benefits and management of breastfeeding, it states “The antenatal discussion covers the importance of breastfeeding, the importance of immediate and sustained skin-to-skin contact, early initiation of breastfeeding….” Out of the randomly selected pregnant women in their third trimester who have come for at least two antenatal visits: at least 70% are able to adequately describe what was discussed about two of the following topics: importance of skin-to-skin contact, rooming-in, and risks of supplements while breastfeeding in the first 6 months.” **STEP 4. Help mothers initiate breastfeeding within a half-hour of birth.** This Step is now interpreted as: Place babies in skin-to-skin contact with their mothers immediately following birth for at least an hour. Encourage mothers to recognize when their babies are ready to breastfeed and offer help if needed. The **Global Criteria for meeting Step Four are:** Out of the randomly selected mothers with vaginal births or caesarean sections without general anaesthesia in the maternity wards: At least 80% confirm that their babies were placed in skin-to-skin contact with them immediately or within five minutes after birth and that this contact continued without separation for an hour or more, unless there were medically justifiable reasons. (Note: It is preferable that babies be left even longer than an hour, if feasible, as they may take longer than 60 minutes to breastfeed). At least 80% also confirm that they were encouraged to look for signs for when their babies were ready to breastfeed during this first period of contact and offered help, if needed. (Note: The baby should not be forced to breastfeed but, rather, supported to do so when ready. If desired, the staff can assist the mother with placing her baby so it can move to her breast and latch when ready). If any of the randomly selected mothers have had caesarean deliveries with general anaesthesia, at least 50% should report that their babies were placed in skin-to-skin contact with them as soon as the mothers were responsive and alert, with the same procedures followed. At least 80% of the randomly selected mothers with babies in special care report that they have had a chance to hold their babies skin-to-skin or, if not, the staff could provide justifiable reasons why they could not. Observations of vaginal deliveries, if necessary to confirm adherence to Step 4, show that in at least 75% of the cases babies are placed with their mothers and held skin-to-skin within five minutes after birth for at least 60 minutes without separation, and that the mothers are shown how to recognize the signs that their babies are ready to breastfeed and offered help, or there are justified reasons for not following these procedures.” (pg. 34). **FT, PT, guidelines, breastfeeding, birth KC** Not on charts as of 7/20/09.

World Health Organization/UNICEF, (1989). Protecting promoting and supporting breastfeeding: the special role of maternity services. A joint World Health Organization/UNICEF statement. Geneva, Switzerland: World Health Organization. This is the original Baby Friendly Hospital Initiative, the way it was written for the world (the United States amended the statements [deleting skin-to-skin care] to make it easier to achieve in the U.S.). In 1999 the International Lactation Consultants Association [ILCA] adopted the revised steps that did not include skin-to-skin...
contact- see ILCA 1999 reference). The original document states “…80% of mothers in the maternity ward who have had normal vaginal delivery should confirm that within half-hour of birth they were given their babies to hold with skin contact for at least 30 minutes, and offered help by staff to initiate breastfeeding. At least 50% of mothers who have had caesarean deliveries should confirm that within a half hour of being able to respond, they were given their babies to hold with skin contact.” After producing this document in 1989, Baby Friendly started to be globally initiated in 1992. Ten items were in the BFHI, and item #4 pertains to KC: Relates recommendation the mothers have skin-to-skin contact and start to breastfeed them less than 30 minutes after birth. Review, birth KC, VEKC, BF, C/S, Guidelines

World Health Organization/UNICEF, (1992). Global criteria for the Baby Friendly Hospital Initiative. Geneva & New York: WHO/UNICEF. Spells out all baby friendly criteria, specifically #4 is about KC: “…80% of mothers in the maternity ward who have had normal vaginal delivery should confirm that within half-hour of birth they were given their babies to hold with skin contact for at least 30 minutes, and offered help by staff to initiate breastfeeding. At least 50% of mothers who have had caesarean deliveries should confirm that within a half hour of being able to respond, they were given their babies to hold with skin contact.” See also the UNICEF 1998 and Lazarov 1994 references for barriers encountered to implement these guidelines. Guidelines, BirthKC, VEKC, BF, Cesarean section, Baby Friendly.


World Health Organization [WHO]. (1998). Evidence for the 10 steps to successful breastfeeding (revised edition WHO/CHD/98.9). Geneva, Switzerland: Author. Presents all the evidence for each step, including Step 4. Also states that when a mother and her baby are skin-to-skin, the baby is exposed to the normal bacteria on the mother’s skin, which may protect the baby from becoming sick due to harmful germs. Fullterm, breastfeeding, infection.

Worku H, & Kassie A. (2005). Kangaroo mother care: a randomized controlled trial on effectiveness of early kangaroo mother care for the low birthweight infants in Addis Ababa, Ethiopia. Journal Tropical Pediatrics, 51(2), 93-97. 62 LBW (<2000 gms, Mean birth weight of 1514 gms, mean GA =32.42 wks, 58% on IV, 34% on OX by nasal cath) in KC; 61 (1471 gm birth weight, 31.59 wks GA, 52% on IV, 37% on O2 by nasal cath) in conventional care. Started KC at 10 hours postbirth, other group enrolled at 9.8 hours post-birth. Exit from study was at 4.6 days KC, 5.4 days control; discharge within 1st 7 days of life was 91% of KC, 88% of controls, 22.5% KC and 38% of controls died during study, majority of death occurring during first 12 hours of life. Early KMC group had significantly better survival than conventional care infants in first 12 hours and after. More than 95% of moms said they were happy to care for their LBW babies in KC. Further study at community level is needed. PT, 3rd world, RCT, Early KC, Community KC, length of stay, mortality, maternal feelings of KC. CPAP

Yamada J, Stinson J, Lamba J, Dickson A, McGrath PJ, & Stevens B. (2008). A review of systematic reviews on pain interventions in hospitalized infants. Pain Res Manag 13(5): 413-420. Review of 1469 systematic reviews yielded only 11 that were high-quality reviews. KC holding was a non-pharmacologic intervention that was reviewed. More research related to single, repeated, and combined pharm + non-pharm interventions is needed. REVIEW. Pain, more research needed. NEED to get the whole thing and see more what it says about KC.

Yang SC & Chang YJ. (2006). The relationship between sleep/awake rhythm development and caregiving activities. Hu Li Za Zhi 53(4), 5-10. [Article is in Chinese]. Recognizing an infant’s sleep pattern is essential for caregivers who want to provide developmental care. This review article relates development of biologic rhythms, describes infant sleep wake states, discusses factors influencing sleep states (5 major factors are noise, light, environmental temperature, physical contact [including skin to skin or KC contact] with caregivers (including medical/noxious and comforting/non-noxious types of contact), and body position (mostly prone). Close body contact with parents is recommended as an intervention to improve infant sleep quality. (Boy, did they get that right!!?). Preterm, review, developmental care, sleep quality, sleep/wake states. Not in charts yet.

Yin Y, Wang R., Lee MM, & Yuh Y. (2000). Influence of kangaroo care and traditional nursing care on premature physiologic parameters (Chinese). Nursing Research (China), 8(3), 362-374. Observations of stable preterms 5 min before leaving incubator, 5,15,and 30 min after starting KC (30 min), and 5 min after return to incubator each day x 7 days. No diff in HR (157.7vs161.4), RR (47.6 vs. 48.9/min), SaO2 (by HP monitor)(96.2 vs 95.3%), and body temp (36.9 vs.37.0). Both seemed safe. **Preterm, quasi-experimental pretest-test-posttest, HR,RR,SaO2,Temp.**

Yin Y, Wang R., Lee MM, & Yuh Y. (2003). Mothers’ satisfaction: KC vs. traditional nursing care for premature babies (Chinese). J Nurs (China), 50 (2), 37-47. English abstract available: Preterms <2000 g and moms non-randomly assigned to traditional or KC care. No diff in mat satisfaction before test; both groups sig. Increased satis after 7 days of 30 min/day KC, but KC group increased satisfaction more (93.2 vs. 83.2, p<.001). Mothers are more satisfied with KC. **PT, Quasi-Exp, maternal satisfaction**

Zaichkin, J. (2011). About skin-to-skin care. A one page report of the benefits (warm, normalized breathing,better breastfeeding, bonding, etc) with some instructions about have only a diaper on the infant and that infant may tolerate it better if KC does NOT follow vital signs, diapering and feeds. There is nothing about duration of KC on this guideline for parents page that appears on [http://healthychildren.org/English/ages-stages/baby/preemie/Pages/About-skin-to-skin-care.aspx](http://healthychildren.org/English/ages-stages/baby/preemie/Pages/About-skin-to-skin-care.aspx) that is also found on the American Academy of Pediatrics Bright Future pages under the heading premature babies. **PT, Review, guidelines**

Zaichkin, J., & Weiner, GM. (2011). Neonatal Resuscitation Program (NRP) 2011: New Science, New Strategies. Neonatal Network 30(1), 5-13. Many changes, mostly that one has to read manual and take exam before going for training and training will be by simulation and videoing rather than lectures because they are tired of people coming totally unprepared. The change in relation to KC is that now it is SHOULD, rather than CAN. Pg. 10 states,”If the newborn is term, breathing, and has good muscle tone, the baby SHOULD STAY with his mother for routine care. (and the next sentence is in BOLD). **This includes the vigorous infants with meconium-stained amniotic fluid.** Dry and place the infant skin-to-skin with his mother, and cover with a dry blanket. Provide ongoing evaluation of breathing, heart rate, and color.” **PT/FT Guidelines**. Not on charts yet 2.2.2011

Zakarija-Grkovic, I., & Burmaz, T. (2010). Effectiveness of the UNICEF/WHO 20-hour course in improving health professionals’ knowledge, practices, and attitudes to breastfeeding: before/after study of 5 maternity facilities in Croatia. Croat Medical Journal, 51(5), 396-405. The was also reported in NYC at a big meeting and it says that teaching the 5 essential care of newborn components to 3rd world country community based and hospital based health professionals is well received and increases their knowledge of breastfeeding,some of their breastfeeding practices, and their attitudes toward Breastfeeding are improved. Now it has to be applied. **3rd world, breastfeeding, birthKC, implementation, knowledge, attitudes of staff.** Not on charts 2/17/2011.

Zambito, S., Leash, J, Baublitz, W. Eischer, C. Shenberger, M.J. Grim, R.D. (2010). Kangaroo Care: A solution to minimize mother and baby separation. *Journal of Obstetric, Gynecologic and Neonatal 39 (Supple 1)*, S109. Separation negatively affects maternal and newborn outcomes. At a 572 bed community teaching hospital with 3000 annual births, the first study was a pretest-posttest quasi-experimental design to educate Labor and delivery nurses about birth KC, how to do it and its benefits for term infant and they measured Implementation of Birth KC shortly after birth. They changed nursing policy by including a procedure for Birth KC, developed patient education brochures, scripted patient education encounters, and had mandatory nurse education conducted by 5 nurses. Staff education was a self-learning packet that required reading two articles about Birth KC. Learning was verified by completion of three written tests (one test for each article and one test for the policy piece). Each of the five leaders had to demonstrate Birth KC procedure to their group of staff nurses. Six weeks later, each leader met with the group to answer questions and address issues. A self-report survey was administered before and after the education. **38/44 L/D nurses participated and their**
age, years in nursing, years in L/D, and level of education were collected. Use of Birth KC increased after education.


**Duplicate of previous content S-z**


Uvnas-Moberg, K., Arn, I., Magnusson, D. (2005). The psychobiology of emotion: the role of the oxytocinergic system. International Journal of Behavioral Medicine. 12(2), 59-65. To survive, the individual must be adaptable. Effective adaptation is dependence on integrated psychophysiological systems. The brain play a role in these processes by transforming information into mental, behavioral and physiological responses. Thus, incoming information is linked to existing structures of emotions, values, and goals which vary based on past and present experiences (cites Magnusson 2003). One component is the stress systems (fight or flight) and another is oxytocinergic system which regulates calm, connection, underlying well being and socialization processes. Stress system works by activation of sympathetic nervous system and the catecholamines epinephrine and norepinephrine are released in response to demanding, harmful or threatening. When stress is sustained, corticosteroids are released from adrenal cortex in response to adrenocorticotropic hormone (ACTH) which is secreted by the pituitary. These chemicals prepare body for fight or flight. Fight or flight behavioral responses are arousal, anxiety, aggression, increased cardiovascular activity, elevated blood glucose levels. Then corticotrophin releasing factor (CRF) and vasopressin from hypothalamus and the brainstem norepinephrine system emanating from the locus ceruleus play regulatory roles in behavioral and physiological responses in the central nervous system (pg. 59). Pain, tissue damage, cold, hunger, environmental dangers and maternal separation are somatic triggers that activate stress mechanisms in the hypothalamus and brainstem and the emotional state of fear in amygdale (pg. 59), called the amygdale-hippocampal complex (pg. 60). The analogous wellbeing psychophysiological pattern is characterized by well-being, calm, positive social interactions, relaxation of muscles, decreased cortisol levels, decreased cardiovascular activity, enhanced activity in the GI tract promoting digestion and anabolism. The vagal, parasympathetic nervous system is activated and the hypothalamic-pituitary-adrenocortical axis and the sympatho-adreno-medullary system are shut down. Hypothalamic oxytocin plays an important role in the calm and connection pattern (pg. 60). The calm and connection pattern is triggered by calming physiologic stimuli such as nonnoxious somatosensory stimulation (touch and warmth) and by environmental and psychological triggers of analogous types. The psychophysiological pattern of calm and connection appear with some delay and are a lower balanced pulse rate and blood pressure, activating of the vagally controlled GI tract, promotion of digestion and storing.
of nutrients (weight gain). Growth and restorative processes are stimulated and energy is used for anabolic purposes than muscular and thermogenic activity. Reduced arousal and calm prevail and positive social interactions ensue as do a sense of wellbeing and relaxation. This is state of eustasis (pg. 60), “Oxytocin stimulates digestion, anabolic processes, as well as weight gain, growth, and healing.” (pg 61). Oxytocin is released in males and females and is produced in the hypothalamus and secreted from the posterior pituitary. Magnocellular oxytocinergic neurons project to posterior pituitary, amygdala, limbic, medullary and spinal areas. Oxytocin fibers reach t the amygdala, nucleus tractus solitarius (NTS), vagal motor nucleus, the LC, and the raphe nuclei of the brain stem. Release of oxytocin and number of oxytocin receptors is greater in females than in males. When baby suckles, oxytocin is released in amygdala to obliterate fear and act as anxiolytic, and stimulate social behavior – all occur in amygdala. Oxytocin also increases PAIN threshold and reduces plasma corticosterone levels which lass for 1-3 weeks after the end of treatment. Oxytocin acts as a hormone and a neuropeptide. Repeated administration of oxytocin induces long-lasting effects via a changed function in other transmitter systems (the (nor)adrenergic, cholinergic, serotonergic and opioid systems) (i.e. increased opioidergic activity lies behind prolonged elevation of pain threshold and enhanced α2 adrenoceptor function in the amygdala, hypothalamus, LC and NTS cause long term anti-stress effects (pg.61). The norepinephrine system emanating in the LC is strongly related to arousal, is inhibited by α2 adrenoceptor activation as is the function in the sympathetic nervous system, whereas parasympathetic tone is increased. Treatment with oxytocin attenuates arousal and stress levels and stimulates energy conservation. Oxytocin increases serotonin synthesis and changes cholinergic and dopamine transmission in the central nervous system. Also, learning deficits due to a high stress level are markedly improved by oxytocin treatment, and oxytocin has anti-depressant properties (pg. 61). Oxytocin is released in response to suckling, in response to labor, in response to nonnoxious touch in all parts of the body, in response to sex and massage, and during breastfeeding and by provision of a stable, calming, friendly, and supportive environment (that defines KC, doesn’t it?). Oxytocin levels in the plasma and cerebrospinal fluid rise in males and females. Oxytocin released in the hypothalamus and amygdala decrease the release of CRF, which is involved in fear and stress reactions. So oxytocin is health promoting (pg. 62). Stressful experiences in infancy reset the activity of the neuroendocrine system involved in stress so that stress reactions are more easily triggered for the rest of life and risk for cardiovascular and metabolic disease is increased. Brain imaging shows early stress (child abuse) alters the size of the hippocampus and amygdala – permanent brain changes related to high levels of anxiety and fearfulness. Rats with extra oxytocin as newborns have lower activity in HPA axes and lower blood pressure as adults and functional changes appear in the amygdala which plays a decisive role in emotionality. High amounts of maternal interaction during the first week of life have more oxytocin receptors in amygdala as adults and are less anxious and more interactive with offspring. Brain is influenced by oxytocin and changes are permanent and last a life time (pg. 63). FT, PT, Review, STRESS, PAIN, Healing, growth, long-term effects, emotion regulation, arousals, sympathetic and parasympathetic tone (HRV).


Uvnas-Moberg K, Widstrom AM, Nissen E, Bjorvell H. (1990). Personality traits in women 4 days postpartum and their correlation with plasma levels of oxytocin and prolactin. J. Psychosomatic Obstetrics & Gynaeology, 11, 261-273. The personality profiles of BF women differ from those of nonpregnant, nonlactating women of same age. BF mothers describe themselves as more open, more interactive, and calmer than nonpregnant, nonBF women. This temporary shift in personality begins a few days after delivery and lasts as long as BF is continued, and is in part dependent on KC after birth and is reinforced by BF. Full term, BF, Maternal personality. See also Nissen article. Get this one, we don’t have it.

Vaidya K, Sharma A, & Dhungel S. 2005. Effect of early mother-baby close contact over the duration of exclusive breastfeeding. Nepal Medical College Journal. 7(2), 138-140. 92 lactating mother-infant pairs were followed for six months to determine effect of perinatal factors on duration of exclusive breastfeeding. Early postpartum KC had powerful influence (p<.001) over duration of exclusive BF up to 4-6 month and was more significant than early initiation of BF (p<0.05). Mode of delivery had no effect on duration of exclusive BF. Recommends that a “few minutes of early postpartum KC and early initiation of BF to promote BF”. Fullterm, descriptive, exclusive BF, BF duration, birth KC? (Says early postpartum but until we get the article we don’t know if early postpartum = birth KC or later),
third world, 6 month follow-up.


Varner M. (2008). Editor’s Commentary (on Smith et al., 2008 The natural cesarean: a woman-centered technique). BJOG 115, 1042. The cesarean section rate is rising around the world and technicalization is resulting in many interventions. But interventions oppose Baby Friendly initiatives which are for healthy mothers and healthy babies but should be for cesarean moms and babies too. Beware that many intra-operative problems may arise, trials of labor should be offered too, and outcome and safety data need to be presented to justify widespread utilization of the technique. This is a controversial technique and constructive controversy is good for everyone and generally accelerates improvement in techniques and outcomes. Clinical trials are needed. Full term, birth KC, cesarean.


Jordemodern, 98(10), 315-319.


Weddig, J., Baker, S., Auld, G., & Horodynski, M. (2011). Improving breastfeeding initiation practices through online theory-based education. Journal of Obstetric, Gynecologic and Neonatal Nursing, 40(Suppl 1), S119. DOI: 10.1111/j.1552-6909.2011.01242.x A pretest-posttest experimental study (50 experimental and 45 controls) of subjects who did or did not complete the online educational course about Baby Friendly Hospital Initiative (assessing nurses’ knowledge, behaviors, skills, and attitudes related to breastfeeding initiation best practices. Nurse managers from 3 Colorado hospitals 12 months after nurses completed the online course were interviewed about changes that occurred related to breastfeeding initiation policies and best practices during the preceding year. Intervention group demonstrated an increase in Baby Friendly standards, positioning, milk transfer, managing breastfeeding difficulties, and use of supplementation compared with control group. Intervention nurses demonstrated little change in nursing behaviors related to skin-to-skin, first breastfeeding, latch and milk transfer, and documentation of evidence-based practices, but did change their behavior related to use of formula supplement. Managers indicated that hospital policy and procedures changed after nurses completed the online course in two hospitals. Policies allowed the environment of best practices to remain the ‘norm’ even as nurses or nurse managers were replaced. FT, BF, experiment, knowledge, practice, policies NOT ON CHARTS 6/17/2011

Wieland, Ch., Bauer, K., Bisson, K. & Versmold, H. (1995). Kanguruh-pflege bei 39 Frühgeburtenen. Monatsschr Kinderheilkd, 143:1099-1103. 39 spontaneously breathing preterms were given first 30 minute KC session on day 10. Rectal temp increased during KC by 0.23°C (p=<0.01). No other measures changed. Infants <1000 gram had significant increase in rectal temp. Of 16 infants with elevated FiO2 in incubator before KC, 13 needed FiO2 to be significantly increased (from 29% to 35%). Of 167 KC sessions, 7 were stopped due to busy nursery, 5 for baby restlessness, 4 for increasing apnea/bradycardia, 3 for hypothermia, one for infusion para, and one for rapidly increasing FiO2 need. “Over 90% of preterm infants remain clinically stable and normothermic. These results justify continuing KC” (p. 1100). PT, descriptive, HR, RR, FiO2, TcPO2,TcPCO2, SaO2, Rectal temp., apnea/bradycardia, restlessness

Winberg 2005.

**Foreign Languages**

The following research investigations of Kangaroo Care are reported in the 1990 UNICEF publication of the First International Conference on Mother Kangaroo Program, Bogota, 1990. The full text is available, free of cost, from UNICEF, 3 UN Plaza, N.Y., NY 10017. Also called Primer Encuentro Internacional-Programa Madre Canguro.

1. Martinez, H., Rey, E., Navarette, L., & Navarette, C.M. Mother kangaroo program at the Maternal-Infant Institute in
3. Correa, J.A., & Ramirez, H. Mother Kangaroo program at the Leon the 8th Clinic neonatal service at the Social Security Hospital in Antioquia, Colombia. p. 63-86.
4. Valencia, M.L., & Velez, J.D. Mother kangaroo program at the San Rafael Yolombo Hospital in Antioquia, Colombia, p. 87-90.
6. Restrepo, f., & Lopez, L.S. Mother kangaroo program at the General Hospital of Medellin, Colombia. p. 103-106.
7. Gaviria, M. Mother kangaroo program: Evaluation and implementation at the San Juan de Turbo Hospital in Antioquia, Colombia., p. 107-126.
9. Lopez, J.M. Experiences with the mother kangaroo method at the Joaquin Paz Borrero Hospital in Cali, Colombia. p. 133-142.
12. Aranda, R., & Morales, L. Mother kangaroo program at the University of San Simeon in Cochabamba, Bolivia. p. 177-200.
17. Martinez, J.C. Mother kangaroo program is a great opportunity for modern neonatal help. p. 255-260.
29. Borel J., B., Mayorga G, V., & Vado L., C. Alternate care for neonates weighing less than 1800 grams in the Bertha
Calderon Roque Women's Hospital, Managua, Nicaragua. p. 431-450.
31. Davanzo, R. Care of the low birth weight infant with the Kangaroo mother method in developing countries. p. 451-474.
32. Virgin, C. The kangaroo method brings the child back to its mother: Present and future in Denmark. p. 475-484.

Published Abstracts


Anderson GC, Burkhammer M, Morrison B., Ludington-Hoe, SM, Chiu, S-H. (2003) Skin-to-skin contact improves breastfeeding outcomes. Research SHOWCASE abstract # 346. Case Western Reserve University, April, 4, 2003, Cleveland, OH. Report of first 35 mothers who reported BF difficulties. KC was given before anticipated BF times and throughout BF for 3 consecutive Breastfeeds on Postpartum Day 1 and then again on Postpartum Day 2 prior to discharge from hospital. AT discharge, 80% were BF exclusively, 17% partially. 30 dyads completed one week followup: 20 were exclusively BF, 4 partially, 5 not BF, 2 lost to FU. 200 dyads followed up at 1 month postdischarge, and 11/22 exclusively BF, 4/22 partially, 5 not BF, 2 lost to FU. Fullterm, descriptive, BF at discharge, 1 week and 1 month of life.


Anderson GC, Chiu S-H, Morrison B, Burkhammer M, Ludington S. 2003. Skin-to-skin care for breastfeeding difficulties postbirth. Paper presented at Midwest Nursing Research Society, Grand Rapids, MI, Feb. 2003. Report of first 35 mothers who reported BF difficulties. KC was given before anticipated BF times and throughout BF for 3 consecutive Breastfeeds on Postpartum Day 1 and then again on Postpartum Day 2 prior to discharge from hospital. AT discharge, 80% were BF exclusively, 17% partially. 30 dyads completed one week followup: 20 were exclusively BF, 4 partially, 5 not BF, 2 lost to FU. 200 dyads followed up at 1 month postdischarge, and 11/22 exclusively BF, 4/22 partially, 5 not BF, 2 lost to FU. Fullterm, descriptive, BF at discharge, 1 week and 1 month of life.
Anderson, GC, Chiu S-H, Pagliotti F. (2000). Pretest-test-posttest randomized controlled trial: Effect of early Kangaroo (skin-to-skin) care on toe temperature in preterm infants. 23rd Midwest Nursing Research Society meeting. N=100 KC time was between 15-150 min; control holding time was 15-90 min and was swaddled holding. Toe temp recorded every 15 minutes. Mean temp was 31.5 (baseline), 32.4(pretest), 33.4(test) and 33.0(posttest) for KC and 32.9 (baseline)32.6 (pretest),32.6 (test),32.5 (posttest) for controls. **RCT, toe temp.**

Anderson GC, Chiu SH, Pagliotti F, Dowling D. (2001). Early kangaroo (skin-to-skin) care: Effect on toe temperature (Vascular perfusion) in preterm infants. Proceedings of Midwest Nursing Research Society meeting, Cleveland, OH, April 2001. Toe temp rose from 32.6 (prekc) to 34.2 (KC) and dropped to 33.9 (postkc), suggesting possibility of increased vascular perfusion of internal organs in 31 preterms. **RCT, Toe Temp.**


Anderson GC, Morrison B, Ludington-Hoe SM, Burhammer M.D. (2002). Closing the gap in health disparities with skin-to-skin care for breastfeeding difficulties. 29th Annual meeting of the American Academy of Nursing. Oct. 31-Nov. 2, Washington, DC. An exploratory study of 50 moms who were supposed to get 1.5-2 hrs of KC before BF, but could not administer KC because of interruptions (9-19/hr) during postpartum day 1 with fullterm moms. **Fullterm**


Bauer K, Pasel K, Versmold H. (1996). Chest skin temperature of mothers of term and preterm infants is higher than that of men and women. Ped Research, 29(4) Pt. 2, p. 195A. Recorded mean chest skin temperature of 10 women with prematurity infants, 10 women with term infants, and 10 men. Chest skin temperature increased with postnatal age and was significantly higher than that of men. Axillary temps were same in all groups and did not change over time. Chest skin temperatures of women is 1°C higher than in men.


Charpak, N., Figueroa, Z., Ruiz, J.G., & Charpak, Y. (1997). Kangaroo mother versus traditional care for newborn infants (<2000 grams). A randomized controlled trial. Pediatric Research, 41(4), Pt. 2, 192A. 382 KC started KC upon discharge and practiced it 24 hours/day. 364 infants in incubators in minimal care unit in hospital were compared to KCs at term, 3, 6, 9, 12 months. No differences in growth, developmental indices, or in length of breastfeeding beyond 3 months (at 3 mos, more KC breastfeeding than controls. Also no difference in infection.


Chiu S-H, Anderson GC. 2001. Quality of the maternal-infant relationship during the first year. Midwest Nursing Research Society Annual Meeting, Cleveland, OH, March 2-5, 2001. Maternal infant interaction at 6 months using NCAST Feeding and Teaching Scales on 53 dyads who received early, as often, and for as long as possible KC during hospitalization who were 32-36 weeks GA were tested. No differences found. RCT.


Chwo, Miao-Ju, 2000. Early kangaroo care for 34-35 week preterm infants: Effects on temperature, weight, behavior, and acuity. Presented at Biennial Convention of the 12th Biennial International Congress of Infant Studies, Brighton, England, July 2000. 34 healthy preterm infants in TAIWAN were randomly assigned before first feed. KC was done during BF, controls were clothed and wrapped and held that way for one hour, three times a day during feedings. KC had higher TYMPANIC temps, more quiet sleep, more inactive awake, less drowsiness, less crying. No diff in weight loss or acuity (LOS). PT, RCT, temp, sleep, wght, length of stay.


Feldman R, Eidelman AI, Weller A, Sirota L. (2001). Mother-infant skin-to-skin contact promotes self-regulation in premature infants: Sleep-wake cyclicity, arousal modulation, and sustained exploration. Society for Research in Child Development biennial meeting, April 2001. Following KC, infants showed more organized sleep-wake cyclicity at term age, spent more time in quiet sleep and in alert wakefulness. KC has + longterm effect on infant’s arousal regulation and attention as expressed by more organized sleep-wake cyclicity, more adaptive responsiveness to environmental stimuli, improved m-I attention and exploratory skills.


Hales D, Kennell J, Klaus M, Mata L., Sosa R, Urrutia J. 1975. The effect of early skin-to-skin contact on maternal behavior at twelve hours. *Pediatric Research, 9*, 259. 9 Guatemalan mothers gave KC for 45 minutes once episiotomy repair complete and in recovery room under heat panel and then to nursery til 12 hours old; 10 controls got to see swaddled infant 12 hours later. At 12 hours postbirth, KC moms did more fondling,kissing, en face looking, looking, and talking to baby but not more caretaking. RCT FULLTERM Maternal Behavior, attachment behaviors. Abstract only.


Herzenstiel G. 2000. Introduction of KMC in Malawi, East Africa; An example of successful implementation of KMC in a 2nd/3rd level hospital in a country without resources. Presentation at 3rd International KMC congress, Jakarta, Indonesia, Nov. 22-25, 2000. Zomba Gen Hospital cares for 4500 newborns/yr, 20% are Preemies. This is report of how to implement KMC by building a K ward with 12 beds.

Hsieh, Y-H, & Huang, M-C. 2000. Preliminary study of KC for preterm infants: Effect on parent-infant relationship. Unknown presentation site. Write to author at Yu-Hui Hsieh, No. 539, Jong-Shiaw Rd, Chia-Yi City 600, Taiwan, ROC. 16 parents with KC experience completed 8 item open ended questionnaire to express experience with KC. KC decreases parents’ anxiety, increases self confidence in caring for infants, and promotes relationship. See manuscript in J. Nursing Research (china) listed under foreign languages for full report.

Kojasuta, C. 1995. Effect of early skin-to-skin contact on maternal-infant bonding in different pain management groups. Masters Thesis abstract, CWRU. 120 mothers in four groups: KC + epidural; KC+ IM/IV; control + epidural; control + IM/IV. Given KC for 10 minutes within 30 min of birth. Two hours postpartum moms interviewed about bonding. In epidural group, KC moms had higher bonding score than controls; in IM/IV group, no different in bonding. FULLTERM, pain


March 2003. 30 neonates randomized to 30 min of KC before Hepatitis Vaccine injection or bassinette. Infants rotated to supine position in KC for shot in thigh, post injection infants rotated back to prone KC. HR, behavioral state, crying time measured preinjection, during injection, and post. FULL TERM, pain. This abstract won 2nd place in the Best Abstract category.

Leon-Mendoza, S de. 2000. Impact of KMC on survival of LBW neonates. Presentation at 3rd Internl KMC Congress, Jakarta, Indonesia, Nov. 22-25, 2000. All neonates <2001 gm got KMC and breastmilk feeds only. Discharged in KMC once fully BF and 3 days of wt gain. Compared one yr of KMC to previous yr stats: Sig. More survival of infants <1000gm (0 vs 7%), <1250 gms (11 vs 16%), <1500 gms (20 vs 26%), <1750gms (45 vs 51%) but not for 1750-2000 g (68 vs 68%).


Ludington, S.M. 2000. EEG-basd sleep before and during Kangaroo care. Presentation at the 12th Biennial meeting of the International Congress of Infant Studies, Brighton, England, July 2000. Data from 10 subjects shows that quiet sleep doubles, active sleep drops, delta brushes increase and indeterminate sleep does not change. Intensification of sleep is seen in KC.


Martinez, LYL. 2000. KM program in the civil hospital of Guadalajara. Presentation at 3rd Intern KMC Congress, Jakarta, Indonesia, Nov. 22-25, 2000. 325 LBW given KMC. Many morbidities still found, but KMC improved interaction and bonding, hospital stay was shorter, reduced nosocomial infections, and hospital costs. Infections, cost.

in a randomized controlled trial. Presented at Midwest Nursing Research Society Annual Meeting, Cleveland, OH, March 2-5, 2001. Conducted Bayley at 18 months corrected age on 50 infants. RCT

Narayana I, Bambroo A. 2000. Alternate methods of feeding LBW infants during the transition to BF. Presentation at 3rd Intl KMC Congress, Jakarta, Indonesia, March 22-25, 2000. This is a comparison of the paladai to cup and bottle feed, and only a reference is made to KMC, saying paladai can be used with KMC.


Punthmatharith B, Anderson GC. (2001) Randomized controlled trial of early Kangaroo care: Effects on maternal feelings, maternal-infant interaction, and breastfeeding success in Thailand. Proceedings of Midwest Nursing Research Society Meeting, Cleveland, OH, April 2001. 196 fullterm newborns (97 KC, 99 control) randomly assigned to KC 60 min. postbirth and continued ad lib for two days or until discharge; control moms held swaddled infant adlib. On day 2 postbirth, no sig diff in MIBQ, IBS, H&H Lactation Scale; but Bonding Observation Check List was sig between groups.041. One month postbirth KC had high Attention and Connection to Infant (a subscale of Mat-Inf Bonding Questionnaire). No sig diff in BF successes. KC might have weak effect on Mat-Inf Bonding. Fullterm RCT BF, bonding, BF success.

Rate AB. 2000. Parents’ experiences of providing KC to their preterm infants. Presentation at 3rd INTNL KMC Congress, Jakarta, Indonesia Nov. 22-25, 2000. Phenomenology study of interviews of maternal and PAT KC showed 6 themes; Premature birth experience, Kangaroo care unit/living in, what KMC meant, being informed, strength and support. Done a Groote Schuur Hospital. PAT KC, qual.study


Rojas, M.A., Kaplan, M., Mayes, L., Sherwont, E., Quevedo, M.E., Ehrenkranz, R. (1998). Extended traditional holding (*TH) and skin-to-skin care (SSC) for newborn infants ≤ 1500 GRAMS. A randomized controlled trial. Results of an interim analysis. Ped Res 43(4), Part 2, 191A. This team at Yale University had parents hold 45 infants up to 4hrs/day, twice a day until infant was 2000 gms or discharged. TH was wrapped and held supine; SSC was wearing only diaper, prone at 45° incline. No sig diff in daily caloric intake, rate of wt gain, or incidence of positive cultures (even tho TH had 6 cases of sepsis; KC had 3 cases of sepsis). No deaths in either group. RCT with M & SD, WGT, Calories, Sepsis, mortality.

Rojas MA, Kaplan M, Quevedo M, Sherwonit E, FoSter LB,Ehrenkranz RA, & Mayes, L. 2003. Somatic growth of preterm infants during skin-to-skin care versus traditional holding: A randomized controlled trial. J Dev Behav Pediatr 24(3), 163-168. Traditional swaddled holding of 4 hrs per time, two times per day. No difference in weight nor in length, but some difference in head circumference in SSC and SSC may increase successful BF. PT, RCT, Weight, length, head growth, BF, LOS.


Shiau, S.H. (1999). The effect of Kangaroo Care on sleep and crying of healthy fullterm newborns. Nursing Research (China), 7(3), 198. RCT measured effects of KC on days 1-2 postbirth. 44 mother infant dyads, Anderson Behavioral state Scoring System measured state recorded once every 24 hours for first 3 days postbirth. Sign decrease in crying in KCers on Days 1 and 2 and within 3 days, significant increase in infant sleep on Days 1-3 and within 3 days, Sgi decrease in wakefulness in KCers on Day 3 and within 3 days. KC had positive effects and should be incorporated into standard care of fullterm newborn. RCT, fullterm, sleep, crying, wakefulness. No on charts yet.


Shiau, S-H Hwang. 2000. The effects of kangaroo care on breastfeeding status and breastfeeding duration of fullterm newborns from Day 3 after delivery to one-year of age. Paper presented at 12th Biennial International Congress of Infant Studies in Brighton, England July, 2000. 52 RCT to early KC (start at 4 hrs postbirth, 8 hrs/day x 1,2,3rd days of life) control had no rooming in dyads in study. More KC dyads BF longer and at one year, and have better BF status using Index of Breastfeeding Status. RCT, FULLTERM, BF


Swinth JY, Anderson GC, Hadeed AJ. 2003. Kangaroo (skin-to-skin) care with a preterm infant before, during, and after mechanical ventilation. Neonatal Network, 22 (6), 33-38. Case study of 33 wk GA infant who required supplemental O2 at 2 hrs postbirth and with no improvement started KC at 18 hrs of age for 1.25 hours, and then two hours later for another3.5 hrs. AT 45 hours of age infant was intubated and then got more KC before extubation at 90 hrs postbirth. KC given before, during and after ventilation and it assisted in recovery from respiratory distress, fostered maternal relaxation, and minimized maternal stress. PT, VENT KC, Resp. distress, Maternal relaxation, Maternal stress, SaO2, FiO2


Swinth JY, Anderson GC, Hadeed AJ. 2003. Kangaroo (skin-to-skin) care with a preterm infant before, during, and after mechanical ventilation. Neonatal Network, 22 (6), 33-38. Case study of 33 wk GA infant who required supplemental O2 at 2 hrs postbirth and with no improvement started KC at 18 hrs of age for 1.25 hours, and then two hours later for another3.5 hrs. AT 45 hours of age infant was intubated and then got more KC before extubation at 90 hrs postbirth. KC given before, during and after ventilation and it assisted in recovery from respiratory distress, fostered maternal relaxation, and minimized maternal stress. PT, VENT KC, Resp. distress, Maternal relaxation, Maternal stress, SaO2, FiO2


Syfrett EB, Anderson GC, Behnke M, Neu J, Hilliard ME. (1996). Very early kangaroo care beginning at birth for healthy preterm infants and mothers who chose to breastfeed: Effect on outcomes. Paper presented at the workshop on the kangaroo mother methods for low birth weight infants. World Health Organization. Maternal-child health collaborating center, Trieste, Italy. This is the same as the 1993 abstracts, and no paper was published of this report.


All abstracts from the 2nd WHO KC Network meeting in Bogota, Nov. 1998 are now available on the Kangaroo care website at Javeriana listed under websites on this bib at the end.

TEXTBOOKS SPEAKING TO KC:

Beck D, Ganges F, Goldman S & Long P. 2004. Care of the Newborn. Reference Manual. Washington, DC: Save the Children Federation. Available through Saving Newborn Lives, Save the Children, 2000 M Street NW Suite 500, Washington, DC20036 or at www.savethechildren.org. Under chapter 5: Care of Low Birth Weight Babies, on page114 onward, in each “Decision making chart for LBW babies, All LBW, 1500-2500 grams, <1500 grams” the guidelines are to “Keep the baby warm by continuous skin-to-skin contact”(page 115) or “Put the baby skin-to-skin with the mother as soon as possible.”(pg. 114). On page 118 a full section entitled “Skin-to-skin or Kangaroo Mother Care” begins, with charts on how KMC helps mothers and babies, components of KMC, how to wrap the baby and mother, how to advise the KMC mother, Breastfeeding the LBW baby in KMC, and Fathers can also help with skin-to-skin contact.” They retrieved much of the information from www.kangaroomothercare.com.

desires skin-to-skin contact with her infant, they should be swaddled together under a warm blanket.”


Hale, T.W., & Hartmann, P.E. (Eds.) 2007. Hale and Hartmann’s Textbook of Human Lactation. 1st Edition, Amarillo, TX: Hale Publishing. In Prime, D.K., Geddes, D.T. and Hartmann, P.E. Chapter 9: Oxytocin: Milk ejection and maternal infant well-being, pages 141-155 under the section title Circulating Oxytocin and Parturition, it says “Oxytocin is the driving force for parturition in animals and humans. And this connection, it has been shown that women who deliver vaginally have more oxytocin pulses and a significant rise in prolactin compared to women delivered by cesarean section. Therefore, the second stage of labor may be important in coordinating these oxytocin pulses which may also be influenced by the timing of the infant’s first breastfeed, an event that is often delayed at a cesarean birth (Nissen E, Uvnas-Moberg, K, Svensson K, Stock S., Widstrom A-M, Winberg J. 1996. Different patterns of oxytocin prolactin but not cortisol release during breastfeeding in women delivered by cesarean section or by the vaginal route. Early Hulman Development, 45: 103-118.). It is now becoming more widely recognized that the interaction of the mother and baby soon after birth can be very important for the regulation of infant physiology and behavior such as infant crying, temperature, and respiration as well as the initiation and maintenance of breastfeeding (Winberg, 2005).” (pg. 146) In Chapter 15: Breast feeding, birth spacing, and family planning by M Labbok, pg 305-318, has a section on KC under the section entitled “Is What is Best for the Child Also Best for Fertility Suppression?” page 308, “Immediate contact, skin-to-skin, is key to early initiation of breastfeeding, lactation, and infant homeostasis, including thermal regulation. The immediate onset of feeding postpartum is associated with survival in all mammalian species while humans have sought substitutes for the nutritional components of milk, the risks of NOT FEEDING COLOSTRUM, the first milk, richest in immune factors, remains for humans as well (Edmond, K, Zandoh, C., Quigley, M., Amenga-Etego, S., Owusu-Agyei, S, Kirkwood B., 2006. Delayed breastfeeding initiation increases risk of neonatal mortality. Pediatrics, 117(3), e380-e386.). Based on a study of 10,947 infants in sub-sahara Africa, there was a clear dose response in that the risk of neonatal mortality increased with longer delay in initiation of breastfeeding from one hour to day 7. Late initiation after day 1 was associated with a 2.4 fold increase in risk of mortality. The effect was similar when the model controlled for infants at high risk or experiencing a death in the first week they also found the risk of neonatal death was four fold higher in children given milk-based fluids or solids in addition to breastmilk. They concluded that 116% of neonatal deaths could be avoided if all infants were breastfed from day one and 22% of the deaths could be avoided if BF started within the first hour. These same patterns of early contact and feeding, and frequent feeding as indicated by infant hunger cues are the patterns most likely to delay fertility return.” Pg. 308. PT, FT,Birth KC, VEKC COLOSTRUM, BF, Mortality, Not ON charts 12/18/2011

Kenner C, Lott JW (Eds.). Comprehensive neonatal nursing: A physiologic perspective has a chapter: Holditch-Davis D Blackburn ST, Vandenberg K. Newborn and infant neurobehavioral development. St. Louis, Saunders, pp 236-284, has a recommendation to use KC.


Kenner C & McGrath JM (Eds.),(2010) Developmental Care of Newborns and Infants: A Guide for Health
professionals. (2010). Now contains a full chapter on Kangaroo Care as Developmental Care written by Ludington-Hoe SM.

Mattson S, & Smith J.E. (2004). Core Curriculum for Maternal-Newborn Nursing. 2nd Ed. St. Louis, MO: Elsevier Saunders. On page 423 in chapter 16 by N.D. Cheffer “Adaptation to extrauterine life and immediate nursing care” lists KC as a means of achieving a neutral thermal environment for the fullterm newborn, stating “Kangaroo care: direct skin-to-skin contact by placing the infant against the mother’s skin to provide thermal support.” That’s all I can see as to a reference to skin-to-skin contact or KC for fullterm infants in the entire book. FULLTERM, temperature.

Merenstein G.B., Gardner, S.L. (2002). Handbook of Neonatal Intensive Care. 5th Edition. In Chapter 12: Pain and Pain Relief on page 210 “skin-to-skin contact (Kangaroo Care) between mothers and healthy newborns during heelstick is a potent analgesic intervention that reduces cry (by 82%), grimace (by 65%), and heart rate.” And in Chapter 13, The Neonate and the Environment: Impact on Development by Gardner SL and Goldson E. There is a whole paragraph and Box 13-3 called “Benefits of Kangaroo Care/Skin-to-skin contact” that lists parental and numerous neonatal benefits of KC. Review, pain, full term, cry, HR

Riordan, J., & Wambach, K. (2010). Breastfeeding and Human Lactation, 4th Ed. Sudbury, MA: Jones and Bartlett. On page 216 of chapter 7: Under section of Early Feedings, there is a statement that “Following a vaginal birth the infant should be dried and placed on the mother’s abdomen, or in case of cesarean birth, on her chest (and shows picture of baby on abdomen). Mother and father have their first bonding experience with the new baby and it is usually very emotional. If the perineum needs to be repaired it can be done while the baby is skin to skin. The baby is placed on the mother’s breast and gently encouraged to seek out and grasp his mother’s nipple. Early (in the first hour after birth) and frequent breastfeeding are encouraged for optimal functioning of both the infant and the mother because it colonizes the infant with protective bacteria, the infant’s sucking causes uterine contractions, helps in expulsion of placenta and helps control maternal blood loss, mothers will BF for longer duration, etc.” and “Breastfeeding and skin to skin contact colonizes harmless bacteria to protect the infant from pathogenic bacteria including MRSA. The colonization rate of MRSA in the mouth of LBW infants could be lowered by spreading the mother’s breastmilk over and into the mouth of such an infant immediately upon entrance to the NICU.” (pg. 216-217). In Chapter 7 (J. Riordan and K. Hoover, Perinatal and Intrapartum Care), on page 222-223, it has a whole section entitled Skin-to-Skin (Kangaroo) Care. States that infants do not have hypothermia and that even twins can be held in KC without hypothermia, and KC is now recommended for all babies and it was previously just recommended for preterms. She states risks of NOT USING KC: shorter duration of exclusive Breastfeeding, more maternal stress with less satisfaction with breastfeeding, greater stress of being born in the baby, demonstrated by high vasoconstriction in the periphery and more crying, less desire by mother to hold her infant (Anderson, 2004), less ability of baby to smell maternal milk scent (Marlier & Schaal, 2005), longer hospital stay in preterm babies (Rainbaut, Saliba & Porter, 2007), greater pain and more crying during procedures (Johnston, 2003). In chapter 13 (Breastfeeding the preterm infant. N.M. Hurst & Paula P. Meier authors, page of chapter 425-470) on page 436-437 the section entitled Skin-to-Skin Care deals with preterm infants, the duration of BF is higher for KC infants than incubator infants. KC moms have significantly greater milk volume between 2 and 4 weeks of life (Hurst et al., 1997), KC holding triggers production of milk antibodies to specific pathogens in the infant’s environment through mechanisms in the enteromammary pathway. Additionally, KC is positively correlated with improved maintenance of milk expression, as evidenced by continued pumping frequency (Lau et al., 2007). Mothers whose infants are in KC report noticing their infant’s rooting and mouthing movements and moving toward the nipple during KC (Hurst et al., 1997). Directly following KC, moms noted that they could feel the milk ejection, leaking, and expressing higher milk volumes; Nasal oxytocin prior to pumping does NOT increase milk production (p. 436, Fewtrell et al., 2006). Apparent effects of release of exogenous oxytocin produce positive social interactions (Uvnas-Moberg, 1997; 1998). Oxytocin is released by pleasant stimuli such as warmth, touch, and odors and it can become conditioned to emotional states and images. Conditioning of this response is harder for the preterm mother and is usually conditioned by walking into NICU, using breast pumps, dealing with hospital situations, so KC ameliorates these forces effects on oxytocin release (Feldman, et al., 2002). There is no scientific reason to restrict the duration of skin to skin care unless the infant becomes physiologically unstable while on the mother’s chest” (g. 436).
“Typically a skin to skin session is terminated on the mother’s availability rather than infant criteria. The position of the infant in skin to skin care is important to maintain physiologic stability and recliners are ideal in achieving this position. The infant should be placed upright between the mother’s breast with the side of the infant’s face placed against the internal surface of one breast (and shows figure 13.3 which shows the recliner at 45-65 degree angle from the floor.) A mirror is positioned to allow the mother to see her infant’s face and is helpful during these sessions. Skin to skin sessions of two or more hours are ideal (pg. 437). And it is not uncommon for infants to display behaviors that suggest autonomic instability when returned to the incubator following skin to skin care (Kirstin, Bergman, & Hann, 2001). Chapter 24, The Cultural Context of Breastfeeding, pages 799-816, on page 808 it says under Infant Care “Swaddling or bundling is an ancient practice….In parts of the world that do not have intensive care nurseries, premature infants who are clinically stable go directly to the mother as early as 2-3 hours after birth by being held in an upright position, skin to skin between their mother’s breasts, they are kept warm (Anderson, Marks, Wahlberg,1986; Anderson, 1992). This practice has spread to intensive care units worldwide in many countries and is now known as Kangaroo Care.”

BF, oxytocin, pleasant touch, scent, milk production, BF, BF initiation, maintenance, programming of oxytocin

Verklan TM, Walden M (Eds.) 2004. Core Curriculum for Neonatal Intensive Care Nursing. St. Louis, MO: Elsevier. On page 68 it states “13. Provide Kangaroo Care (skin-to-skin) time if mother desires” as a nursing intervention for mothers with perinatal substance abuse. On page 243-244 it says that “therapeutic touch may include: Kangaroo Care, or skin-to-skin holding. NICU parents perform skin-to-skin contact with their diaper-clad infant who is resting prone and semi-upright against the mother or father’s barechest covered by a blanket. Warmth, rise and fall of the chest, tactile sensation of skin-to-skin, smell of parents, and maternal breast, and the parent’s tender, quiet, vocalizations, breathing sounds, and heartbeat comprise the sensory modalities stimulated during KC. This provides low-intensity stimulation to the earlier developing senses and is most appropriate for the nicu infant. It has controversial use with extremely premature infants during acute illness phase. Maintaining physiologic and behavioral stability during transfer from bed to parent and back remains a challenge.” It lists positive physiologic benefits (pg. 243) and positive developmental benefits on page 244. Review, PT, Substance Abuse, transfer, micropreemie


Vergara E.R., Bigsby, R. (2003). Developmental and Therapeutic Interventions in the NICU. Baltimore, MD: Brookes Publ. On page 25, 199-208, 234, 235 the authors, occupational therapists, talk about KC as part of developmental care to promote sleep, breastfeeding, maternal infant contact etc. This is an interesting book for occupational and physical therapists. Book has good tips for easing the transition to home too.

Wilson-Clay, B., & Hoover, K. The Breastfeeding Atlas, 2nd Edition. (2002). Austin, TX: LactNews Press. On page 144 there is a picture of Kangaroo Care with full term infant, and on page 146 she describes the picture in a whole paragraph: A mother holds her premature baby skin to skin. Skin to skin holding, known as KC or KMC, is beneficial to both mother and baby. For babies experiencing difficulties learning to latch onto the breast, skin to skin holding has been known to help. The parents enjoy this special closeness with their baby, and it helps to increase the mother’s milk supply (Hill PD, Aldag JC, Chatterton RT, 1999. Effects of pumping sly on milk production in mothers of non-nursing preterm infants. J Hum Lact 15(3), 209-216.) Babies settled into a deeper sleep, cry less, and have more rhythmic breathing, more stable heart rates, and are kept warm by their parents. Premature babies are discharged from the hospital sooner and are healthier six months after discharge compared to babies who did not receive this care (Kirstin, Bergman, and Hann, 2001)

VIDEOS/Media

Advances in Neonatal Care. (2011). The December issue has a picture of a mother and preterm baby in KC and the mother is holding a mirror so she can see her infant and is smiling as she watches him sleep. Advances in
Neonatal Care. Vol. 11 #6. Cover. On the contents page, it says “Catherine, Linda Carter of Des Moines, IA portrays a quiet moment of kangaroo care between a mother and daughter for the NANN 2010 Faces of Neonatal Nursing Photo Contest. PICTURE on COVER


Barbier, D., & University of Louisville University Hospital Center for Women and Infants. (2010). Jumping into Kangaroo Care. A comprehensive educational toolkit with KC policies for Labor/Delivery, Postpartum, and Newborn Nursery Units. University Hospital. Available from: Denise Barbier, 34 Hill Road, Louisville, KY 40204, 502-458-2324.or by email at deniseba@ulh.org. Disc 1 is a DVD that contains “everything you need to know to implement Kangaroo Care, from prenatal visits to patient discharge. Disc 2 is a CD ROM that contains instructor guide, participant guide, sample hospital policies, research references, patient education brochures, national and international policy statements and other supportive materials. The program is designed to promote KC in the delivery room and throughout the hospital stay in order to increase the number of infants who are breastfed upon discharge. BF rates at University of Louisville Hospital rose from 45% to 64% in 7 months when new mothers were encouraged to be skin-to-skin with their healthy full term infants immediately after birth. KC is a simple and effective way to increase the number of newborns who are breastfed and, as a result, will increase the number of mothers and their infants who enjoy the significant health benefits of breastfeeding. Disc one is BEAUTIFULLY DONE And all safety precautions are incorporated and all ten chapters are easy to follow, shows Paternal KC, and mentions KC in recovery room after cesarean and has lovely interviews with parents. THIS IS A GREAT FILM!!!!. Birth KC, BF, antenatal KC, PP KC. TOOLKIT Not on Charts in 11/2010.

Bigelow, A. (2010). Enhancing Baby’s First Relationship. A DVD that has two parts: 1) A parent’s guide for skin-to-skin contact with their infants (20 minutes), and 2) Results from a study on mother-infant skin-to-skin contact (28 minutes). The second part is the study by Dr. Bigelow about the KMC fullterm infants having better still face reactions at an earlier age than non-KMC fullterm infants. The films can be viewed at www.mystfx.ca/InfantSkinToSkinContact. FT, Developmental care, developmental outcomes. Not on charts 4/28/2011

Bergman, J. (2011). Hold Your Premie. For a video preview of this book go to http://www.youtube.com/watch?v=_0w8Lhekbo0 (only zeros used in the url). The 29-minute video can be ordered from orders@geddesproduction.com ($59.00 US) and the book can be ordered from same site ($39.00 US). Carefully watch this youtube presentation because when SML watched it April 12, 2011 she noticed that the breastfeeding baby was not in KC. The video shows KMC with premature infants who are moved into KMC by sitting transfer technique. This film shows KMC with ventilated infants and also shows KMC with full term infants. The verbal content is excellent and this video covers what parents need to know about KMC, especially with premature infants. The film includes brain development and KMC’s effect of switching brain operation from that of stress to one of safety and contentment. Cesarean KMC is shown after the mother is in recovery. This is the most comprehensive film of KMC for prematures that is available as of 2011. Please note that sitting transfers are conducted without any developmental care precautions (i.e. placing a blanket under the infant before the transfer and wrapping it around the infant for transfer to prevent flailing arms and stress responses. The DVD video is 29 minutes long and can be ordered from www.geddesproduction.com as of August 5, 2011.

Bergman, N. (2000). Kangaroo Mother Care: Restoring the Original Paradigm for Infant Care and Breastfeeding. U.S. $45.00 Available from Dr. Nils Bergman, 8 Francis Rd, Pinelands, 7405, South Africa or by email at bergman@xsinet.co.za or by calling 27-21-531-5819. (60 minutes). See Bar Yam, N.B., 2002. Kangaroo mother care: Restoring the original paradigm for infant care and breastfeeding. J. Human Lactation, 18 (3), 289 for a review of this film. PRETERM

Bergman, N. (2001). Kangaroo Mother Care: Rediscover the Natural Way to Care for your Newborn Baby.
Bigelow, A. (2010). Enhancing Baby’s First Relationship. A Parent’s Guide for Skin-to-Skin Contact with Their Infants (Disc One) and Results from a Study on Mother-Infant Skin-to-Skin Contact (Disc two). This has two discs, the first is 20 minutes long and explain KC as a method of caring for newborn term infants and explains the benefits of KC. The second disc is 28 minutes long and explains the method and results of Dr. Bigelow’s Still Face test of fullterm infants who got KC at birth and throughout the birth hospitalization vs. fullterm newborn infants who did not get KC at all, and of course the KC infants were advanced in their responses to still face. For this study, see Bigelow reference in the reference list of studies and see also Neu et al., 2010 for her still face study results. Available through Dr. Ann Bigelow, St. Francis Xavier University, PO Box 5000, Antigonish, Nova Scotia, B2G 2W5, CANADA. TERM


Children’s Hospital St. Louis. (2010). The Empower Program: For Parents of Premature Babies less than 30 weeks gestation. The DVD is 48 minutes long, consists of three parts: Getting to Know You: Parenting your Premature Baby (20 mins), Developing a lifelong relationship between you and your baby through touch and holding (12 mins), and Supporting Your Preterm Baby as you Parent in the NICU: Infant Massage and PO Readiness (16 mins). The DVD is accompanied by a notebook for parents to complete entitled “My Journey in the NICU” and parent copies of the Empower Program DVD. Distributed by Dandle Lion Medical, 22 Shelter Rock Road, Danbury, CT 06810 or www.dandlelionmedical.com. The brochure has 3 pictures, one of Kangaroo Care and the other of TERRIBLE SEMI-KC because the mother is wearing a rather fully-covering bra and the baby has nothing across his back and no head covering.

Colson, S. (2009). Biological Nurturing™ Laid back breastfeeding and Biological Nurturing (Video 1 from 2009) and Laid Back Breastfeeding for Mothers (2011 dvd). NOT KC VIDEOS. The first is a 60 minute video and the second is a 28 minute video on DVD of several chapters (so it can be a shorter film easily) that discusses and shows pictures of her biological nurturing position which is semi-reclined with the infant on the mother’s chest and how this position facilitates expression of the innate infant reflexes (basically the same as in the Neonatal Behavioral Assessment Scale developed by T.B. Brazelton) and she says the infant does NOT have to be in skin-to-skin contact. She says this position is a hormone enhancing environment conducive to the expression of the innate behaviors. The videos are now available on DVD and costs 39.95 and are available in English, Spanish, and French. Both are Available from Geddes Productions at www.geddesproduction.com. Or Geddes Productions, POBox 41761, Los Angeles, CA 90041-0761 faxL 323-257-7209. For more information about Suzanne Colson and the certification in her procedure that she offers, go to www.biologicalnurturing.com.

Creative Therapy Consultants. Has two films about KC in the NICU. See Waitzman, Kara Ann below.

Dandle-LION Webinar, (2011). ”Creating a Culture of Consistency for Skin-to-Skin Care in the Neonatal Intensive Care Unit.” By Kara Ann Waitzman, OTR/L, CIML, Developmental Specialist at Miami Valley Hospital in Dayton, Ohio, a 60 bed single-bedded room NICU that has been sporadically practicing KCas for 15 years as of 2010. You can go online and watch the presentation for one hour and then take the simple test and get one continuing education unit for free (Go to www.dandlelionmedical.com. For more information, contact Cathy Bush at cathybush@dandlelionmedical.com or at cathybush@gmail.com or 4-1511-dandle@aweber.com. Dandle-LION Medical, 22 Shelter Rock Lane, Danbury, CT 06810, Phone : 203-791-9000; fax is 203-792-5581. You go to the
dandleLION website at 4-15-11 etc given above and then click on the name of the program, and watch it. This is a beautifully done webinar for NICU Kangaroo Care with preterm Infants. As Ms. Waitzman says, “Kangaroo Care is not icing on the cake, it is the CAKE!” S. Ludington accessed this August 18, 2011 and 1/29/2012 and it worked fine. See also Waitzman below for her two DVDs that are available in 2012.

Dougherty (2008). $105.00 interactive CD on Kangaroo Care as practiced in Canada with infants 23 weeks and up, so many of the guidelines are appropriate to infants under 28 weeks, but not for infants older than 28 weeks. This takes about 30 minutes to complete, you answer questions, listen to nurses’ comments about KC, many helpful pictures of transfer technique (watch for flailing arms and uncovered infants, however), and read about mother’s responses. Beautifully done, easy to complete, comprehensive for families and staff. An engaging, succinct, never boring presentation. Available through AnglersThree at www.e-ducationalsolutions.com.

Gloppestead, K. (1987). From Separation to Closeness: Parent’s Experiences with Closeness. Available in English or Norwegian from Kari Gloppestead, Dept. of Pediatrics, National Hospital University of Oslo, Pilestredet 32, 0027 Oslo 1, Norway (25 minutes) $140.00 Shows parents doing KC with ventilated infants long before anyone thought this was possible. VENTILATED KC

Health-Info, Video Vital AS. (2010). Breast is Best. 7 minute trailer and a 45 minute video that shows a cesarean birth and infant is diapered and dried when given to the mom for KC in the OR. Baby and Mom are transferred to Recovery in KC. Shows father doing KC with infant too. And then it shows the infant in recovery room going through stages and spontaneously latching on. Instructions about breastfeeding are welldone and have good visuals to show how to position the breast and the Montgomery tubercles that release amniotic scent. This video is shown in the blog. Available from Health-Info Video Vital AS, PO Box 5058 Majorstua, 0301 Oslo, NORWAY or from HEALTH-INFO@videovital.no FT, C/S birth and Birth KC and BF in recovery


INJOY VIDEOS (2009). The Essential Primer on Preemies. Your Premature Baby. Vol 1 covers defining prematurity, preemie appearance and behavior, the NICU and its equipment and common medical problems. Vol. 2 is “interacting with and feeding your baby” and includes communication and touch, Kangaroo Care how to and benefits, feeding and taking care of you and there is a Vol. 3 on Going Home, but the ad shows a picture of KC and says “Promotes Kangaroo Care.” There is a total of 2 minutes devoted to Kangaroo Care.

Kangaroo Care in Serbia (2012). A new video showing how KC is implemented in the NICU at the Institute of Neonatology of Servia can be seen at http://youtu.be/jcb1BJP8Bso. It is about 8 minutes long and shows an interesting method of practicing Kangaroo Care.


March of Dimes. (2012). The March of Dimes is changing its CLOSE TO ME program to help mothers of infants in the NICU have better experiences If you read Cooper 2007 article, it says that 95% of mothers interviewed thought that Kangaroo Care was the best thing they could do in the NICU, so MOD is upgrading its Close To Me program to emphasize Kangaroo Care more and has produced this video:

MBCSpecial (Korea) (2011, August 19). The Miracle of the Mother’s Chest. This was a one hour film contrasting the Korean routine of parents visiting their preterm infants for only 30 minutes per day, once per day, and not being allowed to hold the infant until his temperature is stable. The special startswith the story of Kate Ogg and
Jamie Ogg who was declared dead in Australia. After “resuscitating” Baby Jamie, he was taken to the NICU in Australia and put in an incubator and it was 9 days later before they would let the mother kangaroo baby Jamie. She kangaroed his sister, Emily, at day 6 of life and they were born at 27 weeks GA. And they first experienced shared KC at 7 weeks of life. (Why so slow?) (pag. 9 of English Transcript of the special). Then Ms. Ogg said, “And when we KC, it was just the most wonderful thing.” Then it goes back to comparing the Ogg baby to two infants in Korea who are not getting KC and parents are only allowed to touch through incubator doors and father says “The fact that there is nothing I can do is what hurts the most” (pg. 11 of transcript). When they start KC in Korean hospital, parents can only do it for 30 minutes (WHAT IS THE RATIONALE for THIS?). Then it shortly shows the newborn nursery at Riverside Methodist Hospital in Columbus, OH and how there are no babies there because they are all with their mothers. And then they go to a new mother who is doing KC in postpartum and to another woman who is giving KC to her cesarean birth daughter and the father said “Oh, I love it(KC)” and the film ends going back to the Korean nursery where one on preterm infants has a celebration of her 100 days of life and everyone is happy. They give a shot, but not in KC, but put baby in KC after the shot for maternal comforting. The infant goes for retinopathy of prematurity surgery and recovers swiftly and the mother attributes it to 50 days of Kangaroo Care. THE END. No birth KC, no pictures of RBC preterms other than one baby. This show was a big success, so they are filming another for October, 2011. PT, FT, Korean standards. Not on Charts 9/18/2011.

Miller School of Medicine, University of Miami, Florida, (2012). Dr. Ludington did a three day consultation at the Miller School of Medicine to help the doctors and the staff of Jackson Memorial Medical Center get on board with Kangaroo Care and one of her presentations was filmed and is available at http://pediatrics.med.miami.edu/documents/What_in_the_future_for_kangaroo_care. pdf

Morrison, B. (2007). Kangaroo Care: A Crash Course. This is a 4 hour DVD of a presentation of the terminology, benefits, and physiology of Kangaroo Care for Full Term infants and a touch of preterm KC too. Available for $150.00 from from Precious Image Creations, Inc. 6650 Sugarloaf Parkway, Suite 800, Duluth, GA 30097, info@preciousimagecreations.com , phone : 866-979-4320, FAX is 770-979-7037

Lee, Nikki. (2010). Kangaroo Care: A crash course review for ILCA. Available at www.ILCA.org. The DVD includes everything, had home movie quality and some of the citations are difficult to see, but NONE of that matters!. This is a tour de Force as one is taken through research, benefits, physiology, hormones, policies, positions, practice, long term effects and implementation of KC.

Morrison, B. (2007). Kangaroo Care: An Overview. This is a 40 minute DVD of the effects of Kangaroo Care for full term infants. Nikki Lee (2010) of ILCA has reviewed this film very positively “Dr. Morrison makes the film come alive” and recommends it for health professionals and consumers. The benefits, physiology of kangaroo care are accompanied by wonderful photographs and excellent references for conveying the evidence-base behind this practice. The review is available from www.ILCA.org and the video is available for $75.00 from Precious Image Creations, Inc. 6650 Sugarloaf Parkway, Suite 800, Duluth, GA 30097, info@preciousimagecreations.com , phone : 866-979-4320, FAX is 770-979-7037. Or www.preciousimagecreations.com

Morrison, B. (2007). Kangaroo Care: Nature’s Best for Your Baby (for Parents). Thi is a 26 minute DVD of Dr. Morrison presenting a powerpoint talk at a hospital. She presents research evidence concerning the benefits of Kangaroo Care (fewer infections, more stable respirations and cardiac functioning, less crying, social advances and maternal empowerment and better breastfeeding, as well as higher confidence and competence. KC at birth is also emphasized. This DVD focuses almost solely on the mother but mentions other family members too. This is NOT a how-to film, but is very educational with the knowledge that may persuade mothers and families to use Kangaroo Care. Available for $45.00 from Precious Image Creations, Inc. 6650 Sugarloaf Parkway, Suite 800, Duluth, GA 30097, info@preciousimagecreations.com , phone : 866-979-4320, FAX is 770-979-7037

Para, Susan (2011). ILCA Print and Multimedia Reviews. Ms. Lee states that this video is heavy on the research and science and has very little demonstration of how to use KC, but that doing so increases the number of infants BF and longer BF durations. Dr. Morrison stresses the first two hours postbirth rather than the first hour postbirth. She recommends this video for in service education, even though the stated audience is for parents. Review
available from www.ILCA.org

Morton, J.A. (2003). A Premie Needs His Mother. Available from Videotransform, Palo Alto, CA whose website is www.breastmilkssolutions.com. Cost is $125.00 and you can email the author, a Clinical Professor of Pediatrics, School of Medicine, Stanford University at jamorton@vermotel.net. Comes in two parts: Part 1: Benefits of BF which is best for prenatal viewing. This section includes how to pump your breasts. Part 2: Learning to BF-Coming Home to be viewed after birth and talks about transition from tube to breastfeeding. History and integration of KC into care is shown with paternal KC in NICU and at home, while the father is vacuuming. The challenge to return to work is also included. 60 minute video. Good review of it by Out, C.(2003). Review of “A Premie Needs His Mother” in J. Perinatology, vol. 23, p. 88-89.


Presbyterian Hospital of Plano, TX.(2006). A Parent’s Tender Touch: Caring for your baby in the NICU. Informative DVD for parents that presents practical ways for them to help their baby from developmental perspective. Parental involvement demonstrated through KC, importance of maternal scent, swaddled bathing, reading baby’s cues, breastfeeding, and preparing for discharge. 24.95 Checks payable to Presbyterian Hospital of Plano, phone 972-981-3788 (fax is 972-981-3787).


Righard, Lennart. (1995). Dr. Lennart Righard’s Delivery Self-Attachment. This 8 minute video shows a newborn’s ability to crawl up to the breast and attach himself unassisted, and reflects the study published in The Lancet, 1990, vol. 336, p. 1105-1007. Sucking was improved with unassisted latch. Available from www.geddesproduction.com or by mail to Geddes Productions, PO Box 41761, Los Angeles, CA 90041.


Shigeta, Yoshiro (2001). Kangaroo Care in Japan. NHK Japan Broadcasting Corp. 2-2-1 Jinnan, Shibuya-ku, Tokyo, 150-8001, JAPAN. Tel: 81-3-5455-3358.

Smillie, C. (2010 ). Baby-Led Breastfeeding …The Mother-Baby Dance. This is a 16 minute long video on DVD that shows older fullterm infants doing the breast crawl and latching on well. After the original 16 minute film there is an hour of additional material, like the basic benefits of Kangaroo Care and how to help mothers do Kangaroo Care and a few cases that Dr. Smillie has had in her career as a pediatrician about infants who benefitted from Kangaroo Care. Film is in English, Spanish, Italian, Chinese, Dutch, German, and Japanese. Available from Geddes Production for $40.00.

Storkstories. (2010). THIS is THE SAME AS Health-Info VIDEOVITAL but how it should be cited is unclear. This is a 7 minute trailer of KC during Cesarean birth and it is free to all who bring it up on http://obnurse35yrs.wordpress.com/2010/0603/skin-to-skin-minutes-after-cs-in-the-or-speaking-up-and-making-it-happen/. When you go to the Health-Info information above you will learn how to order the full 45 minute film.

The Healthy Children Project. (2010) “Skin to Skin in the First Hour After Birth: Practice Advice for Staff”
after Vaginal and Cesarean Birth”. Authors are Widstrom, A-M, Svensson, K, Brimdyr K (daughter of Karin Cadwell). 40 minute film divided into three sections: Section 1 reviews the importance of skin to skin in the first hour and shows examples of newborns in the 9 stages of the first hour after birth. Section 2 offers practical advice for staff after a vaginal birth. This section follows a vaginally born baby thought the 9 stages of the first hour. Section 3 offers practical advice after a cesarean birth. This section follows a cesarean born baby through the 9 stages of the first hour. $39.99 from www.healthchildren.cc or by calling 508-888-8044. I think the BEST way to get this, though, is to go to www.healthed.cc which is the book store for Healthy Children Project for promotion of breastfeeding. On this site you will see Health Education Associates, Inc. presents several materials on Skin To Skin in the First Hour: A Suite of Materials. Healthy Children is a non-profit education institution to improve child health outcomes, offer evidence-based training programs in the US and internationally about Healthy Children. Health Education Associates, INC is the book store for Healthy Children Project and the address for Health Education Associates, Inc is 327 Quaker Meeting House Road, East Sandwich, MA 02537, toll free number is (888) 888-8077 from 9-4 Monday-Friday and FAX is (508) 888-8050 and website is www.healthed.cc See ALSO HEALTH EDUCATION ASSOCIATES, Inc. nect

HEALTH EDUCATION ASSOCIATES, INC. Skin-to-skin in the First Hour After Birth: Practical Advice for Staff after Vaginal and Cesarean Birth. Authors are Widstrom A-M, Svensson K, & Brimdyr K. (2010). This is a 39 minute video intended to assist staff in providing Birth KC to the full-term newborn in the first hour after birth. The video has 3 sections: Importance of skin to skin and examples of the baby’s 9 stages during the first hour, practical advice for staff after a vaginal birth, and practical advice for staff after a cesarean birth. Picture of vaginal and cesarean birth KC are included. Cost is $39.00. Available from Health Education Associates, Inc. 327 Quaker Meeting House Road, East Sandwich, MA 02537, 888-888-8077 from 9-4 Monday thru Friday and Fax is 508-888-8050. This DVD has a handout (The First Hour After Birth) of 2 pages with 100 copies on a tear-off pad that clearly explains the nine observable newborn stages that occur when a baby is in skin to skin contact after birth. These stages happen in a specific order and innate and instinctive for the baby. On the second side, the section entitled “Benefits for Babies” relates “Regardless of how you are feeding your baby, your baby can benefit from skin-to-skin contact. Babies are warmer, calmer, can hear their mother’s heartbeat, heart and breathing rates are normalized, milk supply can be improved, other family members can hold and bond with babies through skin-to-skin holding too!” 100 sheets cost $14.00. Available from Health Education Associates, Inc. 327 Quaker Meeting House Road, East Sandwich, MA 02537, 888-888-8077 from 9-4 Monday thru Friday and Fax is 508-888-8050 and phone is 508-888-8044. Or you can order from www.healthed.cc

The Healthy Children Project. (2011). The Magical Hour: Holding Your Baby Skin to Skin for the First Hour After Birth. The magical hour is a breathtaking DVD aimed as prospective parents. Parents who experience KC at birth share their thoughts and feelings about it. Authors are Brimdyr K, Widstrom A-M, Hanson, L.A. This DVD is 30 minutes long and costs $39.00 US dollars from www.healthed.cc and for address and fax and phone look at the citation just above. SEE ALSO HEALTH EDUCATION ASSOCIATES, INC next.

HEALTH EDUCATION ASSOCIATES, Inc. The Magical Hour: Holding Your Baby Skin-To-Skin for the First Hour After Birth. Authors are Brimdyr K, Widstrom A-M, & Hanson, L.A. (2011). This is a 30 minutes DVD aimed at prospective parents. It will inspire parents and make them think seriously about KC at Birth, which is crucial to establishing BF and creating a priceless bond between mother and newborn. Parents who have experienced Birth KC share their thoughts and feelings about this magical first hour of life and what it meant to them and their child. It gives parents a realistic view of what it really means to spend that first hour in direct uninterrupted contact with the new life they have been given. Cost is $39.00. Available from Health Education Associates, Inc. 327 Quaker Meeting House Road, East Sandwich, MA 02537, 888-888-8077 from 9-4 Monday thru Friday and Fax is 508-888-8050. Or order from www.healthed.cc

This DVD can be accompanied by 100 copies of a 2-page handout for parents called “How to Hold Your Baby Skin To Skin” Tear Off Pad. It is a double-sided tear-off pad which explains the benefits of holding your baby skin to skin in the hospital for healthy, term babies, the special care nursery and at home. Available from HealthEducation Assoc., Inc. 327 Quaker Meeting House Road, East Sandwich, MA 02537, 888-888-8044 from 9-4 Monday thru Friday and Fax is 508-888-8050. Or order from www.healthed.cc 100 Sheets cost $14.00.
The Healthy Children’s Project. (2010). Breastfeeding: Baby’s Choice, an 8 minute film of the 9 stages to breastfeeding in the first hour of life. Natural instinct to search for and find the mother’s breast is shown. $39.00 and available from www.healthed.cc. Look for phone numbers and address in the first citation of The Healthy Children Project in this list. See also Health Education Associates, Inc. Next.

Health Education Associates, Inc. Breastfeeding; Baby’s Choice. This 8 minute DVD demonstrates the newborn baby’s natural instinct to search for and find the mother’s breast. A baby is followed during the first hour of life and it shows a variety of explicit behavior such as looking, listening, touching, and talking while exploring life outside the womb. This DVD includes the role of the father. Cost is $39.00 and is available from Health Education Associates, Inc. 327 Quaker Meeting House Road, East Sandwich, MA 02537, 888-888-8077 from 9-4 Monday thru Friday and Fax is 508-888-8050.

This DVD can be accompanied by a sheet entitled An Easy Way to Get Started at Breastfeeding; Skin to Skin and Breastfeeding in the First Few Hours. It is a 5th grade pamphlet that describe infant self attachment and the importance of skin to skin contact in the first hours after birth. Illustrations with step by step narrative to prepare pregnant women and their labor coaches of what factors help/hinder early breastfeeding. Also lists the benefits of colostrums, discusses flat and inverted nipples and milk supply. 1-24 are $1.00 each; 25-149 are .49 cents each, and 150-499 are .45 cents each, and 500-2400 are 40 cents each. Available from Health Education Associates, Inc.

UNICEF. (2007). Breast Crawl. Initiation of Breastfeeding by Breast Crawl. A 12 minute film of a full term newborn being placed WET and HAIR WET on his mother’s chest and we watch as he crawls over toward the breast, performs pre-feeding behaviors, and then latches on spontaneously. This film is relatively good to watch, and you can see how infants in a tropical environment (INDIA) undergo Birth KC. Available on the website www.breastcrawl.com for free or you can get this film from UNICEF Maharashira, 19, Harish Enterprises, Parsee Panchayat Road, Andheri (E), Mumbai, INDIA 400069, unicef.or/india or email is mair@unicef.org and telephone is +91-22-28269727


Waitzman, Kara Ann. (2012). Because more than 1000 people saw her dandelion webinar, Ms. Waitzman created a company called Creative Therapy Consultants and she has developed two DVDs for health professionals to use. The first DVD is called “Skin-to-Skin for Health Care Providers” and is intended for staff in the Neonatal Intensive Care Unit/Special Care Unit. The DVD reviews the benefits of KC, research evidence for the benefits, role delineation of nurses, special considerations, and step-by-step procedure for transferring the preterm and the ventilated preterm from incubator to mother using both standing and sitting transfers. The second video is for parents of infants in the NICU/Special Care Unit and it is entitled “Skin-to-skin for Parents” and relates benefits of KC, special considerations, and shows step-by-step process of standing and sitting transfer with arrows pointing to bad technique (i.e. flailing arms and failure to cover infant and contain arms). To order go to jan@infantdriven.com. To view a samples of these two videos go to http://www.creativetherapyconsultants.com/skin-to-skin-holding. Each video costs $48.00 and if you buy the set it costs $67.00 (shipping is $6.00 additional) and there are discounts for bulk purchases. She takes visa and mastercard. Creative Therapy, 8540 Wild Cat Road, Tipp City, OH 45371, ph: 855-CTC-NTMC, Fax:937-667-7426

This is an 8 minute video DVD that shows a fullterm infant being placed on the mother’s belly and then tracks the 9 stages of an infant’s behavior during the first 90 minutes of life as the infant recovers from birth, becomes active, looks at mother, exhibits pre-feeding behavior, moves toward a breast and then lunges and then latches on successfully and the sequence ends with infant and mother falling asleep due to satisfaction and oxytocin release. In North America, it is available from Health Education Associates, Inc. 327 Quaker Meeting House Road, East Sandwich, MA 02537, phone 508-888-8044; fax is 508-888-8050, or from www.healthed.cc//info@healthed.cc

PROTOCOLS

Protocols are published in the following journal articles:

Anner, J. (1994). See this on the Lay literature list. The protocol is from UCSF and is on page 16, and 17.


Children’s Hospital, 300 Longwood Ave., Boston, MA 02115 (617) 355-6000. Ms. Ann Coangula is the Nurse Manager and they have “Guidelines for Kangaroo Care for 7 North: Newborn Intensive Care”. It lists eligibility and exclusion criteria and requires doctor order. The protocol and documentation to follow are included.


Drosten-Brooks. F. 1993 in MCN on page 253 has elements of a protocol with any infant, not just those ventilated.

Evanston Hospital, 2650 Ridge Ave., Evanston, Ill. 60201. Protocol lists criteria, implementation, guidelines for transfer, including transfer of intubated infant, and documentation. Mechanically ventilated.


Martin Luther Hospital-Anaheim, Ca. Neonatal Intensive Care Kangaroo Care Policy # NIC302.9 (3 pages) Neonatal Intensive Care Unit, Martin Luther Hospital-Anaheim, 1830 W. Romney Dr., Anaheim, CA 92801-1854.


The JOHNS HOPKINS HOSPITAL protocol can be obtained from Dr. Ludington, as can the Univ. of
Maryland Medical System protocol.

Saginaw General Hospital. Clinical Practice Guidelines for Kangaroo Care. Saginaw General Hospital 1447 N. Harrison St., Saginaw MI 48602

St. Agnes Medical Center, Protocol for Kangaroo Care. Write to Ms. Sheri Fogarty, Neonatal Intensive Care Unit Nurse Educator, St. Agnes Medical Center, 900 Caton Ave., Baltimore, MD 21229 (410) 368-2630.

St. Joseph’s Hospital, PO Box 4227, Tampa, FLA 33677-4227 has “Protocol: Kangaroo Care” with assessment, reportable conditions, safety, care, consult, patient instruction and documentation guidelines included.

St. Mary’s Hospital Med Ctr., Infant ICU,707 S. Mills St. Madison, Wisconsin 53715-0450. Includes list of inclusion and exclusion criteria.

St. Mary’s Hospital, 901 45th Street, West Palm Beach, FL. 33416-4620. Includes purpose, description, procedure, parent readiness, implementation, and documentation.

Sarasota Memorial Hospital NICU, Ms. Deborah Hanson, RNC, 1700 S. Tamiani Terrace, Sarasota, FL 34239-3555


PAMPHLETS


Childbirth Graphics. (2012). Kangaroo Care Tear Pad. Kangaroo care is a special type of infant care that mothers and fathers can provide by holding their babies skin-to-skin. Explains what kangaroo care is, its benefits for babies and parents,when to starat kangaroo care, and how to provide kangaroo care . English on one side, Spanish on the other. 100 sheets per pad. Item number AT52608 page 30 of 2012 catalog, $17.50 per 100 sheets (if you buy fove ore more pads the cost is $16.60 per pad. (Add $10 shipping cost for orders up to $50.00) Order from ChildbirthGraphics.com or call 855-510-6730 or fax to 888 977-7853. Childbirth Graphics PO Box 21207, Waco, TX 76702-1207

Hillcrest Hospital. 2009. Kangaroo Care. This faily pamphlet is two pages long, and contains sections entitled What is KC? How did KC come about? What are the benefits of KC? Why does KC work?and How to Get Started (hold for at least one hour or more four or more times per week. During KC let your baby rest. This is not a time to play with your baby.” Available from Hillcrest Hospital, A Cleveland Clinic Hospital. Center for Women and Children Family Maternity Center, 6780 Mayfield Road, Mayfield Heights, OH 44124, or by calling the Lactation Consultants at 440-312-5332.
A concept paper is called SOFT Concept Paper. This one page paper gives step-by-step recommendations for healthy

Larimer, Kristanne  1401 Washington St., #18, Canon City, CO 81212. Has wonderful pamphlet for parents, done in part by parents of formal premies, and it tells what KC is all about and how to do it with ventilator infants and all others, even those of OSCILLATING Ventilation.

Lawn, J. (2011). Kangaroo Mother Care: The Benefits for Your Full Term and Premature Baby. Washington, DC: Save the Children. Available from www.themiracleofkangaroomothercare.com. This is a 2 page pamphlet sort of thing available from the SAVE THE CHILDREN organization in Washington DC and it relates how KMC works for a premature baby (KMC will help himi grow and develop faster compared to other premature babies who do not receive any KMC. But what is KMC and what’s in it that helps both full term and premature babies? Its like holding a baby in a pouch, but you position the baby on your chest near the middle of your bosoms, Holding your newborn baby in this kangaroo position makes it possible for skin to skin physical contact and breast feeding, the two essential components that make KMC work wonders for your full term or premature baby. Skin to skin physical contact and breastfeeding in KMC is beneficial for your baby as it hastens your baby’s growth and development by 1) Regulating your premature baby’s bodily temperature (With KMC, your own bodily temperature helps keep your baby warm) or will also cool them down. Your temperature adjusts to what your baby needs. Thus your temperature could drop and adjust to those of your baby’s. This is known as thermal synchronicity. With this, his/her condition will stabilize and his/her breathing and heart rate are more regular. 2) Promoting the special bond between you and your newborn baby (feelings of safety and security are promoted through KMC, making him/her less stressed and promotes sleep. 3) Giving your baby the right nutrients from your breast milk. Your breast milk has all the right nutrients to meet your newborn’s needs. Your breast milk protect your baby helping them to ward off infections. Breast milk is loaded with nucleotides that are crucial for your baby’s brain development while colostrums provides antibodies that help boost your baby’s immune system.” (page 2) Because you position your infant between your bosoms, he/she can smell your milk and this triggers an instinctive feeding and self-latching. Freeing you baby breast milk give his/her the nourishments they need and this hastens weight gain to almost 30 grams per day as compared to preemies cared for in incubators. Remember, KMC is for every baby and every MOM and DAD no matter what your location in the world. Pamphlet PT, FT. NOT on Charts 7.21.2011. See also pamphlets, Lawn citation.

Loma Linda University Medical Center (2011). Loma Linda, CA: Perinatal Services Network. Has several items available to help you implement BIRTH KC. Each is available for you to secure and use by contacting Perinatal Services Network of Loma Linda University Children’s Hospital, 11285 Mountain View, Suite 39, Loma Linda, CA 9235, phone: 909-558-3364; Fax: 909-558-3365 and the website is www.llu.edu/llumc/psn OR you can see these materials, which also come in Spanish, by going to http://lomalindahealth.org/medical-center/our-services/perinatal-services-network/for-health-professionals/about-us/media-guide.html. Accessed 9/10/2011. These materials are not for promotion of any particular outcome other than bonding and they relate that there is a special time right after birth for mother and father to be alone with their baby for bonding. These materials do NOT provide any effects or benefits of KC to anyone.

1) A brochure called Skin-to-Skin Care. A gift only you can give your baby This is a trifold pamphlet that explains S (Skin-to-skin care), O (open eye –to-eye), F (Fingertip Touch), and T (Time together) for parents and it has a lovely picture of a full term newborn in kangaroo care. It says talk to your baby, put it on your heart, talk to your baby, spend time with him.

2) A flyer called Ready to Love. Your baby is most comfortable skin-to-skin with you. This flyer starts with “Skin-to-Skin Care. Talk to your baby. Your newborn can hear your voice and will lift its head to look at your face when you speak. S is for skin-to-skin, O is for open eye-to-eye, F is for Fingertip touch, and T is for time together. Capture these magical moments with your newborn. Ask your visitors to delay their visit until you have shared this first hour together.” THERE IS NO MENTION OF ANY EFFECTS OR BENEFITS OF KC, just encouraging having skin-to-skin time together right after birth.

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3) A concept paper is called SOFT Concept Paper. This one page paper gives step-by-step recommendations for healthy

newborns in the first two hours of life.

4) A POSTER called *SOFT* that shows each of those letters in a box running across the horizontal poster (no pictures, just words) and underneath each letter is what it stands for, i.e. S Skin-to-skin with your baby; O open eye-to-eye with your baby, F fingertip touch of your baby, and T time together with your baby.

Ludington-Hoe, SM. Kangaroo Care for Your Infant. A four –fold pamphlet for parents of premature and fullterm infants that explains KC, how long it should be done, what baby and mommy should wear, why it should be done, how often it should be done, how to tell it is successful (vital signs as well as weight gain signs, for example), and how to do KC at home, safe KC (prevent falling out or over), 24/7 KC, and use of wraps to hold baby in. Free to all, may be used any way you want with attribution. Available from Susan.ludington@Case.edu. Send your mailing addresses because there are only hard copies available.

Martin Luther Hospital Anaheim. Patient Information Sheet (in English and in Spanish) Neonatal Intensive Care Unit, 1830 W. Romney Dr., Anaheim, CA 92801-1854.

Ohio Department of Health. “Hold Me Mom”. This is about skin-to-skin care after birth. Columbus, OH Warehouse #397.23. This is a free index-sized card to give to every new mother BEFORE birth because it instructs her to tell her health professional she wants to hold her baby skin-to-skin right after birth.

Promina Cobb Hospital Special Care Nursery, 3950 Austell Road, Austell, GA 30001. (404) 732-4414 Fa: (404) 732-4421. Ms. Pat Beckett, RNC, Dept. Manager of Special Care Nursery.

Robles, M. (2004) Kangaroo Care: A Pocket Guide to KC. Available from www.unmanitoba.ca/womens_health/kangaroo.htm. This is a pamphlet from the Univ. of Manitoba Dept. of OB,Gyn,Reprod. Sciences, Women’s Hospital in Manitoba, Canada. It covers, What is KC? Why KC? Where is KC practiced? Who can KC? When can KC be initiated? (Policy is “stable babies who are less than 1500 grams and breathing on their own. Babies needing O2 OR CPAP may also be eligible. Cardiorespiratory monitoring and oximetry may be continued during KC. Bedside nurse will be nearby to monitor the infant as necessary.” How do you do KC? And concludes with some maternal comments on KC. They did a similar pamphlet in 2000 that was excellent too.

**University Hospitals of Cleveland** has a one page Patient Information Sheet PI-223-Kanagaroo Care (Skin-to-Skin) available from http://intranet.uhhs.com/files/patientinformationsheets/pi-223.pdf

Wesley Medical Center of Wichita, Kansas has a one page patient information sheet entitled WELCOME YOUR BABY WITH A HUG!. It goes on to say, “Hold your baby skin-to-skin for one hour after birth. Benefits of skin-to-skin immediately after birth: keeps your baby warm, paces heart rate and breathing, calms the baby, increases your confidence as a parent, provides the time you need to get to know your baby, decreases the risk of infection, baby cries less, speeds up recovery time after childbirth, enhances breastfeeding success, feedings on demand increase, resulting in better weight gain and stable blood sugar, stimulates brain development. Skin-to-skin means holding your baby with only a diaper and hat on against your bare chest, covered by two receiving blankets. Information taken from Moore ER, Anderson GC, and Bergman N. Early skin-to-skin contact for mothers and their healthy newborn infants. (2007) Cochrane Database of Systematic Reviews. Issue 3, 1-63.” The sheet has a lovely picture of mother with full term newborn in her arms.

**RELATED ARTICLES**

Abrams R, Caton D, Calpp J, Barron D. 1970. Thermal and metabolic features of life in utero. Clinical Obstetrics and Gynecology, 13, 549-564. This article reports the warm environment of the womb and Silverman suggests that the warm temp of baby in KC might be advantageous; perhaps surfactant production proceeds more rapidly at the fetal-like temperatures, and less apnea when warm than cold. >Apnea, surfactant, temp

Craig, A.D., Chen, K., Bandy, D., & Reiman, E.M. (2000). Thermosensory activation of insular cortex. Nature Neuroscience 3, 184-190. Warmth conveyed to the skin is a pleasant experience as this message is sent to the limbic area of the brain, seat of emotional, affiliative, love behaviors, and where hormonal responses (i.e. oxytocin) originate.

**Brain studies**

Kennell, JH, Jerauld R, Wolfe H, Chesler D, Kreger NC, McAlpine W, Steffa M, Klaus MH. 1974. Maternal behavior one year after early and extended postpartum contact. Developmental Medicine & Child Neurology, 16, 172-179. Moms given swaddled holding in 1st Postpartum hour had more attentive behavior toward infant during physical exam at one year than controls – but all other maternal behaviors were similar at one year. Ringler did FU at 2 years and found early contact moms had different (better) speech patterns (Ringler NM, Kennell JH, Jarvella R, Navojorsky BJ, Klaus MH 1975, Mother-to-child speech at 2 years – effects of early postnatal contact. Behavioral Pediatrics 86, 141-144). **Full Term, RCT, Maternal Behav RCT**

Liu D., Diorio J, Day JC, Francis DD, Meaney M. (2000). Maternal care, hippocampal synaptogenesis and cognitive development in rats. Nature Neuroscience, 3(8): 799-806. A direct relationship between maternal behavior and hippocampal devel is present: rat pups who had high levels of licking, grooming and nursing showed increased expression of NMDA receptor subunit and brain-derived neurotrophic fact BDNF mRNA, increased cholinergic innervation of the hippocampus and enhanced spatial learning and memory.

Olausson H, Lamarre Y., Backlund H, Morin C, Walllin BG, Starch G, Ekholm S, Strigo I, Worsley K, Vallbo AB, Bushnell MC. (2002). Unmyelinated tactile afferents signal touch and project to insular cortex. Nature Neuroscience 5(9), 900-904. Human hairy skin has dual tactile innervation: fast-conducting myelinated afferent fibers, and slow conducting unmyelinated (C) afferents that respond to light touch, creating the sensation of pleasant touch. These fibers activate the insular cortex (LIMBIC system), but not the somatosensory areas S1 and S2. C touch afferents is a system for limbic touch that may underlie emotional, hormonal, and affiliative responses to caress-like, skin-to-skin contact (emotional aspects of touch). Gentle, caressing skin-to-skin touch, especially on arm and in palms, is pleasant experience.


**Co-sleeping/Co-bedding**


Mace S. 2006. Where should babies sleep? *Community Practice* 79(6), 180-183. Review article of some of the most relevant research about co-sleeping. Three main areas are reviewed: sleep position, maternal smoking and alcohol consumption, and breastfeeding. Recent concerns highlighting sofa sleeping are presented too.


National Association of Neonatal Nurses (NANN) Board of Directors (2012). Cobedding of twins or higher-order multiples. Position Statement #3053, Nann Board of Directors July 2011, Advance sin Neonatal Care, 12(1), 61-67. I am surprised to see that no reference is made to McKenna’s work at all, even though his work is the CLASSIC in this field. The recommendations are that further research is needed, parental input should be sought, nurses should know about AAP 2011 (Dec,2011) updates on safe sleep environment and educate parents and model safe sleep environments. Underlying principles of cobedding may be reasonable and research is limited Current body of knowledge remains insufficient to permit endorsement or rejection of cobedding.

National Association of Neonatal Nurses (NANN) Board of Directors. (2008). Cobedding of Twins or Higher-Order Multiples. Position Statement #3045. Advances in Neonatal Care 9(6): 307-313. This is statement that more RCTS are needed about co-bedding and that sleep practices in NICU are closely associate with sleep practices at home and nurses should transition hospitalized infants to sleeping on the back and be sure parents know this recommendation for home care of their infants. NOT KC, but CO BEDDING IS SKIN TO SKIN CONTACT IN SOME CASES,. Not on any chart because it is not KC article.


Richard CA, Mosko SS. 2004. Mother-infant bedsharing is associated with an increase in infant heart rate. Sleep. 27(3), 507-511. HR recorded in 15 infants in bed sharing night vs solitary night. 8 infants routinely bedshared with mother the other 7 slept alone. Fullterm infants at 11-15 weeks old. HR is lower when solitary sleeping. Infant temperature was significantly the cause (by regression analysis), and HRV was higher during solitary sleeping than bed sharing in QS and AS and REM sleep. Increased sympathetic activity in states 3,4 (drowsy and awake) and in REM sleep due to temperature. Sensory differences account for some physiologic differences between infant sleep in the two conditions. FT: HRV, Temp, HR


Touch SM, Epstein ML, Pohl CA, Greenspan JS. 2002. The impact of co-bedding on sleep patterns in preterm twins. Clinical Pediatrics (Phila), 41(6), 425-431. 12 hrs preCB and 12 hrs of CB cardiorespiratory recording. 22 CB infants (11 sets of twins) at 31.8wks GA studied at 33.5 wks corrected age. # of central apnea decreased (57 pre CB, 18 CB) with CB, no diff in Bradys, PB, No temp instability, no increase in O2 requirements during CB. Decrease in central apnea probably due to more frequent arousal by twin. RCT, Apnea, Brady, PB, temp, oxygen requirements.


REFERENCE TO KANGAROO CARE
______, 1995. Appropriate technologies can help make motherhood safer. Safe Mother, 18, 4-8. Review of available technologies and KC is one that is identified as keeping the infant warm against the mother’s skin and is recommended. Review. Temperature.

Als, H, Gilkerson L. Developmentally supportive care in the neonatal intensive care unit. 1995. Zero to Three, 15(6): 1-10. This has one small paragraph on "Opportunities for skin-to-skin holding" on page 5 saying that these opportunities are regularly provided as a part of developmental care. Developmental Care.

Anand, KJS, & Scalzo, FM. (2000). Can adverse neonatal experiences alter brain development and subsequent behavior? Biol Neonate, 77, 69-82. Repetitive pain, sepsis, maternal separation in rodents and other species have been associated with multiple alterations in the adult rat brain. He proposes that NMDA receptor activity from maternal separation leads to increased apoptosis in multiple areas of the immature brain, and exposure to repetitive pain may cause excessive NMDA activation resulting in excitotoxic damage to developing neurons. On pg. 72 “kangaroo care may provide additional physiological and neurodevelopmental benefits in critically ill neonates.” Pg 73 “Improved clinical and neuromaturational outcomes have resulted from developmentally supportive nursing care and “KC” in preterm infants” and cites Ludington and Swinth, 1996.


Aucott S., Donohue PK, Atkins E., Allen MC. 2002. Neurodevelopmental care in the NICU. Mental Retardation and Developmental Disabilities Research Reviews, 8(4), 298-308. On page 304 are 1.33 columns of KC, mostly citing the Conde-Agudelo 2002 Cochrane Review. Says that parent disenfranchisement is biggest NICU problem, and KC corrects this on page 304. There is a whole column devoted to KC history (very brief) and outcomes of the 2002 Conde-Agudelo meta-analysis. Review

Bakewell-Sachs, S., Blackburn, S. 2003. State of the Science: Achievements and challenges across the spectrum of care for preterm infants. J Obstet Gynecol Neonatal Nursing, 32 #5, 683-695. On page 688 it states “Many developmental strategies were implemented before undergoing adequate scientific testing. More research is needed, but the evidence base is growing for interventions such as cycled lighting, kangaroo care, nonnutritive sucking, containment, touch, and positioning, due in large part to the work of nurse researchers”.

nursery planning and design. Neonatal Network 22 (4), 27-34. On page 28 it states: “Also in the early 1990s several articles were published documenting the benefits of skin-to-skin(kangaroo) care, and/or the first time in many nurseries, parents were encouraged to participate in the care of their preterm infant.” And “Privacy became limited; movable screens were used to give a sense of privacy for breastfeeding mothers and for parents providing Kangaroo Care.” They have drawing of KC in a single-room on page 31. PT. Not KC study per se.

Christensson Bhat et al. 1995


Feldman R, Eidelman AI. (1998). Intervention programs for premature infants. How do they affect development? Clinics in Perinatology, 25(3): 613-626. This review article states that “Kangaroo Care is suggested as the intervention that most logically meshes the premature infant’s need to develop state regulation while facilitating sequential sensory development and promoting mother-infant attachment.


Freda, M.C. 2003. Nursing’s Contribution to the literature on preterm labor and birth. J Obstet Gynecol Neonatal Nursing, 32(5), 659-667. On page 664 she writes “Another intervention for the preterm infant that has been studied often by nurses is skin-to-skin care or kangaroo care (KC). It is thought that this intervention decreases neonatal energy expenditure and promotes infant growth. Ludington-Hoe et al. (1999) found that beginning in the delivery room, KC could be done safely and that infants’ temperatures rose rapidly to the thermoneutral range while the infants were receiving KC. They concluded that KC was conducive to recovery from birth fatigue in 34- to 36-week preterm infants. Chwo et al (2002) randomly assigned preterm infants to groups, those receiving KC and those not receiving KC, and found that infants receiving KC had higher mean tympanic temperature, more quiet sleep, and less crying than those who did not receive KC. In one survey of 537 NICUs in the United States (Engler et al., 2002), 82% of the NICUs were practicing KC. Enlger found that nurses perceived some barriers to its use, such as has lack of scientific knowledge about whether KC care was appropriate for all neonates, as well as some nurses’ concerns about infant safety.” Then it goes on for another whole paragraph relating Gene Anderson’s case studies, saying KC has positive parental and infant outcomes with a depressed mother, when begun within 4 hours of birth in an NICU, for twins and adolescent parents, for adoptive parents, for triplets and a mom with pre-eclampsia.


Hackman, PS. 2000. Recognizing and Understanding the Cold-Stressed Term Infant. Mother-Baby Journal, 5(4), 10-16. On page 13 there is one paragraph that says “A neutral thermal environment can be achieved by using skin-to-skin contact, a radiant warmer…” and that “the use of this technique has several advantages, including stabilizing vital
signs and temperature, promoting bonding between infant and parent, and improving lactation.”

Harrison, L. (1997). Research utilization: Handling preterm infants in the NICU. Neonatal Network, 16(3): 65-69. On page 66 & 67 she discusses Kangaroo Care and its benefits. On page 68 she states more research is needed to answer the question: When is it safe to initiate KC for preterm infants? She says KC is gentle human touch, not the stressful type of touch subject to minimal handling protocols.


Hill ST, Shronk LK. (1979). The effect of early parent-infant contact on newborn body temperature. JOGNN Nursing Sept/Oct. 1979, 287-290. This was study comparing 50 dried, wrapped fullterm infants in parental arms to 50 dried, wrapped infant under radiant warmer just after birth. No differences in temperatures. Swaddled vs radiant warmer. Is this KC? Experimental, FT,


Kovach, A.C. (2002). A 5-year follow-up of hospital breastfeeding policies in the Philadelphia area: A comparison with the ten-steps. J Human Lactation, 18(2), 144-153. On page 145 they list a question in their survey of 35 Philadelphia hospitals, “Are babies’ temperatures stabilized skin-to-skin with the mother rather than under radiant warmers?” and on page 150 report: “only 3 hospitals(9%) regulated a baby’s temp skin to skin and 11 (31%)reported doing this sometimes. When asked about skin to skin contact following delivery, most hospitals placed babies skin to skin with their mothers all or most of the time (10 or 29%) or sometimes (14, 40%). Some hospitals did the APGAR score while the baby was skin to skin with the mother all or some of the time (n=10,29%).”(150). KC FOR WARMING INFANTS, BIRTH KC, Fullterm

McCain G. 2003. Evidence based practice for neonatal nursing. Neonatal Network 22 (6), 5-6. On page 5 she states "early Skin-to-skin contact beween mother and newborn has a positive effect on BF at 1 and 3 months after birth (citing Anderson et al, 2003 Cochrane review results). She says evidence supports adoption of skin-to-skin care, but nurses must first be educated about the benefits of the practice and then develop a guideline or protocol.

Meier P, Engstrom JL, Mingoletti SS, Miracle DJ, & Kiesling S. 2004. The Rush Mothers’ Milk Club: Breastfeeding interventions for mothers with very-low-birth-weight infants. J Obstet Gynecol Neonatal Nursing 33 (2), 164-174. On page 166: “Evidency based nonpharmacologic techniques to help preent low milk volume, such as pumping at the infant’s bedside, skin-to-skin care, and suckling at the emptied breast, are routinely employed by bedside nurses. PT, implementation evaluation, BF.

Mellien, A.C. (2001). Incubators versus mothers’ arms: body temperature conservation in very-low-birth-weight premature infants. JOGNN, 30(2), 157-164. Has a big review of KC literature, but this is a study of clothed mothers holding swaddled infants close. Axillary temps did not differ between incubator and holding in VLBW infants. VLBW, SWADDLED HOLDING./


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KC is best for warming and rewarming and for BF. **FULL TERM, recommends KC**


Perlman, J.M. 2003. The genesis of cognitive and behavioral deficits in premature graduates of intensive care. *Minerva Pediatrics* 55(2), 89-101. Increased survival has led to deficits into school age and adolescents. One cause of deficits is prolonged hospitalization and the stress that it causes. The stress can be minimized by positive maternal-infant interactions. Positive interactions enhance neurobehavioral development. KC is recommend as a positive parent infant interaction and related to improved neurodevelopmental outcome.

**Review, development**

Stevens BJ, Franck LS. 2001. Assessment and Management of Pain in Neonates. *Pediatric Drugs* 3(7), 539-558. On page 546 it refers to KC, saying it has “improved survival, increased the incidence and duration of breastfeeding, resulted in improved respiratory and temperature control, and enhanced maternal-infant interaction.” However, only 1 study has investigated KC as a pain management strategy during acute painful stimuli…given the encouraging results of this study, further investigation of this technique as a potential source of analgesia in human neonates is most certainly warranted.”

Stevens BJ, Yamada J, Ohlsson A. 2001. Sucrose for analgesia in newborn infants undergoing painful procedures. *Cochrane Database Systematic Reviews, #4*, CD001069. “The use of repeated administrations of sucrose in neonates needs to be investigated as does the use of sucrose in combination with other behavioural (facilitated tucking, kangaroo care) and pharmacologic (morphine, fentanyl) interventions.”

Whitby C., de Cates, C.R., Robertson, NRC (1982). Infants weighing 1.8-2.5 kg: Should they be cared for in neonatal units or postnatal wards? *The Lancet, 1* (Feb. 6, 1982), pp 322-325. Infants without problems do well in cot care in regular postnatal wards, similar to the very early Kangaroo Care studies.


**Kangaroo Care Stories/ Comments from Users**

Hartmann, Laurie, Deaconess Hospital, Newburgh, Indiana: We have been using wraps for kangaroo care since August 2009 and have given some to moms to take home. There have been no safety issues with the wraps we use, and they were very effective on increasing the time spent in skin-to-skin care. Moms are still wearing their babies skin-to-skin when they return for follow-up 2 weeks later. The hospital experiences more effective breastfeeding. Babies are happier and we see a decrease in crying of 80%. Babies rest much better than when babies were swaddled.
with a pacifier. Mothers are afraid that they are unable to care for their babies. So, we teach moms that have everything their baby needs. When mom holds her baby she gains confidence to be a mother. Moms find getting babies to latch is easy. To breastfeed we shift the baby’s bottom from upright in KC to an angled position in KC and the baby will begin to root. As the baby does the woodpecker dance, the baby will latch on to the breast naturally. We encourage moms to hold their baby 20 minutes before anticipated feeding if they are not already holding skin-to-skin. This makes breastfeeding simple. Not all moms want to undress the baby all the time for skin-to-skin, so they use the wrap with clothed baby and we find good results even with the baby clothed. (Contact Sylvia Houston, CKC, at 770-979-4320 or sylviah@preciousimagecreations.com or www.preciousimagecreations.com for more information.

Lay Publications/ TV Shows/Radio

______. August 29, 2007. ALL MY CHILDREN, a soap opera in USA daytime television had this episode in which ZaK was doing KC with Ian, her premature son.


------. (1997) Bare hugs: Skin-to-skin snuggling aids preemies. Prevention Magazine, June 1997, pg. 40-41. Quote the findings of a study of 50 moms, 25 who held infants in KC for 10 minutes each day and 25 who held swaddled infants. Better VS and higher O2 and more stable milk supply were in the KC group. Citation not provided.


American Baby. (2010). Kangaroo Care and Beyond. American Baby, Winter 2010, p. 2. This article says that KC isn’t just for preterm infants and that Susan Ludington is “a dynamic, engaging speaker” who urged all listeners to advocate for at least an hour of skin to skin contact beginning within one minute of birth for all the mothers and babies in their care. Mentions that mother’s breasts heat up and that the sleep in KC is better than sleep anywhere else.

Anner, J. (1994). Kangaroo care: A father’s story of caring for his premature daughter. Childbirth Instructor Magazine, Spring 1994, pg. 12-17. He reports that to him “Kangaroo Care was the greatest thing that could have happened.”


Bassi J. 1995. Award-winning kangaroo care: Skin-to-skin contact creates gentle communication Mount Sinai Medical Center and Miami Herald Medical Reports. January 1995. Reports on Dr. Patricia Messmer's study of physiologic stability in kangaroo care preterms.


Fischman, J. (1999). Taking a Cue from Kangaroos. US News & World Report, June 7, 1999, pg.66 This is an easy to read, one page report of KC in USA.

Funderburg, L. 2000. Saving Jason. LIFE. Collector’s Edition, May 200, pg. 49-62. Shows pictures of KC at Children’s Hospital of Philadelphia and all the pictures show really naked KC, not with the back covered to prevent heat loss. Good article for mothers to read about KC.


Kim, Minyung. (2011, August 19), “Kangaroo Care” Korean TV special on Kangaroo Care for Premature and Term Newborns showing a live full term birth where infant was put straight into Kangaroo Care and remained there until the nurse moved the baby to the football hold (lateral skin-to-skin contact and NOT THE WAY TO DO IT) and then kept manipulating the baby’s head to get him to latch on (No BABY-LED LATCH or Hands OFF BF or BIOLOGICAL NURTURING approach in this demonstration!!!). Also showed a very low birth weight infant on a ventilated being KCed by his mother.

Kimi, Minyoung, (2011, October???) UMB Korean TV special to follow up what was done August 19, 2011 above.


Kuhn & Kuhn, in January 2011 issue of J Human Lactation (reviewed above). This is lay pub of how KC helps BF.

Lee, E. 2009. Moment of Science: Kangaroo Care. National Public Radio, Oct. 12, 2009. This was about temperature, HR and breathing pattern, contentment and brain maturation and patern effects on infant as result of KC.

Madkour, R. 2010. Marsupial mothering. New Mom looks to kangaroos for parenting inspiration. Santa Barbara News Press, Wednesday, January 20, 2010. Pg. D7. Mother reports that when she took her swaddled baby out of incubator to hold, he lost body heat and then she was afraid to hold. After hearing about KC, she said she’d “found a way to be useful.” Liza Coopoer, the national director of the march of dimes Family Support Program said “Kangaroo care, to me, is the first gift you can give your baby in the NICU and its one of the greatest gifts the staff can give to parents in the NICU. Mom wrote: “Kangarooing turned out to be quite lovely. I am glad to have had (KC) as a comforting experience during an uncertain and scary time.”
Mettler, L. 2001. Kangaroo Care. Help for Preterm Infants and Hope for their Parents. Baby Years, Sept. 2001. This is a general article with many references to Dr. Ludington and her book and how to give KC to premature infants. Copy available from lynmaddox@mindspring.com

Moriarty C. (2007). Love story. It takes a while for your relationship to unfold. Don’t worry if you don’t feel an instant connection. American Baby, Sept. 2007, p. 62-64. In this article it offers some suggestions for moms who don’t feel bonded with their newborns right away. The first one is “Try skin therapy. Holding a baby who is clad only in a diaper next to your bare breast –known as kangaroo care- can boost the bond between mothers and babies. Jennifer Pote, a mom in New Preston, Connecticut was introduced to this skin-to-skin contact soon after her son’s birth when he was rushed to another hospital for a respiratory problem. ‘It was 36 hours until I could hold him,’ says Pote. ‘I didn’t feel bonded to him right away.’ When they were reunited, the neonatal intensive care unit suggested she try kangaroo care, which helped relieve tension for both Pote and her son. … Krystyna Toczylowski of Hackensack Medical Center in Hackensack N.J. says “Full term babies also benefit from kangaroo care. Try it if your baby is having trouble nursing or sleeping or is irritable. It takes 15 minutes for baby to begin reaping benefits.” (pg. 63-64). PT, FT, stress, crying

Norton, D. (1995). Kangaroo love for prem babies. Living and Loving, September 1995. 133-135. This is the story of triplets born at 27 weeks. Parents, mother and father, gave Kangaroo Care after Nils Bergman told them about it. Mother said “The skin-to-skin contact made them feel so much more like MINE!” (pg. 134). The babies seemed to find it soothing and reassuring and inevitably went to sleep. Nurses found that body temperatures were maintained and there was no deterioration in their oxygen levels” (pg. 134). Peter (the father) complained that even the tiniest infant had a monkey-like tendency to grip his chest hairs! (pg 134).


Siegel-Itzkovich, J. (2000). For tiny prematures, a pouch is home sweet home. The Jerusalem Post, Sunday, July 16, 200, Health Section, page 17.


**Notable Presentations**


RESEARCHERS

Gene C. Anderson, R.N., Ph.D., FAAN  
Professor Emerita  
Case Western Reserve University School of Nursing  
Cleveland, OH  gene.anderson@case.edu  
2002-2003: Studying the effect of KC placement 1-1.5 hours before a feeding on improving breastfeeding outcomes in fullterm newborns in women who report breastfeeding difficulty.  
2004-2006 Studying the breastfeeding behavior in fullterm newborns who spontaneously awaken for feeds or are aroused by others for feeds.

Bergman, Nils.  Family physician in South Africa who did a study in Zimbabwe and now runs a maternity hospital where KC is practiced regularly for all fullterm newborns. Recently completed randomized controlled trial of KMC beginning at birth in preterm infants.  www.kangaroomothercare.com

Best, Paige.  Fall 2001 Doctoral student at Johns Hopkins University School of Public Health. She is studying infant care practices in Bangladesh, identifying how rural mothers recognize prematurity and then how they care for them to prevent hypothermia. Second phase of study will be to teach practices to avoid hypothermia, including KC and use of tempadots (if baby is warm enough, the tempadot shows a smiley face) to insure warmth. Will try to teach KC to them too.  pbest@jhsph.edu

Bigelow, Ann.  July 2002 got approval to study maternal infant interaction in the newborn period, 1 month, 2, and 3 months postbirth.  KC grp will KC 6hrs/day for 1st month beginning KC within 1 hour of birth.  Salivary cortisol at birth and 1 month and measuring developmental outcomes.  Contact her at abigelow@stfx.ca

Browne, Joy R.N. Ph.D.  
Children’s Hospital of Denver  
Email: Browne.Joy@tchden.org (Browne, Joy)  
They conducted research on the physiologic disorganization associated with transfer into and out of kangaroo care (Neu et al., Nursing Research, August 2000) and has wonderful article on the meaning of KMC to parenting published in 2005.

Cattaneo, Adriano.  As of 2008, he really is moving out of KC research, but is an excellent resource  
Unit for Health Services Research and International Cooperation  
Instituto per l’Infanzia, Vil dell’Istria 65/1, 34137 Trieste, Italy  
Phone; +39 040 3785 236; Fax: +39 040 3785 402, Email: cattaneo@burlo.trieste.it

Chia, Pauline, 3083, Australia.  Studying nurses attitudes toward KC.  Home address is 1 Brockhampton Drive, Singapore 559095.  Email: chiasioktin@hotmail.com

Cleary, Gerard D.O.  
Division of Neonatology  
Abington Memorial Hospital  
1200 Old York Rd.  
Abington, PA 19001-3788  
In 1997, conducting a randomized controlled trial of KC with intubated infants and those receiving oxygen support by cannula. Looking at physiologic outcomes.  See his article in J. American Osteopathic Association, vol. 97 #8, p. 457-
Clifford, Patricia-See Clifford & Barnsteiner, 2001 citation.
Children’s Hospital of Philadelphia. (215)-590-3083
They are studying 1-2 hours of KMC with ventilated infants as young as 23 weeks and as small as 550 grams testing weight. Doing chart control comparison, looking at HR, RR, SaO2, and temp. Results to date show no difference between KC and chart review infants. I spoke with her in Fall 1997 and she was getting ready to write her results of 9 infants studied as of Nov. 1997.

Chiu, Shiu-Huey, RN, Ph.D.
Asst. Professor of Nursing
University of Akron School of Nursing
Akron, OH. Randomized controlled trial of Kangaroo care with FULLTERM infants. Effects on maternal anxiety, breastmilk maturation, breast engorgement, and breastfeeding status.

Cong, Xiaomei,. RN, Ph.D.
Assistant Professor of Nursing
University of Connecticut in Storrs, CT
She investigates KC’s effectiveness in reducing pain. Has funded grants for this topic in 2010.

Cooper, Sharla, RNC, NNP, MSN. 3247 Woodview Rd. S.W. Roanoke, VA 24018. Email is scooper@runet.edu

DeMarco, Patrice
79 Beach Rd.
Shelburne, VT 05482
In Dec. 2000 starting a study of KC on serum values (glucose etc.) in fullterm neonates.

Dutcher, Janet F., RNC, NNP, MN
134 Kirkcaldy Drive
Elkton, MD 21921
410-620-0948
In 1997 she conducted a survey of nurses attitudes toward KC in the United States. She wrote a wonderful paper, but it has not reached publication yet. Contact her directly.

Ellett, Marsha L., DNS, RN – I think she has abandoned her KC and colic studies through the internet as of 2008
Asst. Profs Nursing
Indiana University School of Nursing – Pediatric Gastroenterology
1111 Middle Drive
Indianapolis, IN 46202
317-274-0051  Fax is 317-274-4928  email is mlellett@iupui.edu
Feb. 2001 she is conducting an internet research study of mothers who use KC to help with colic. It is called the Infant Colic Study. You can learn of hstudy at http://www.iupui.edu/~nursing/research/infantcolic.html. Dec. 10, 2002 update: has enrolled only two subjects who completed protocol. Moms keep record of infant state for 3 days and then they KC at first sign of colic. “In both babies the amount of crying time was greatly decreased and the amount of quiet sleep was greatly increased. Parents who quit mid study report that kangarooing helped decrease crying.” She is now trying to local access to get more subjects.
Farley, Teresa MSN, CPNP
Developmental Pediatric services
8210 Walnut Hill Lane, suite  604
Presbyterian Hospital
Dallas Texas 75231
(214) 345-4156
Fax:  214-696-3014

In 1995 started a study of HR, RR, SaO2 and temperature during transfer into and out of KC and during KC and rest periods with ventilated preterm infants.

Gloppestad, Kari –  Retired in 2009
Gaustadun 101
0372 Oslo, Norway

Goubet, Nathalie, Ph.D.
Dept. of Psychology
Gettysburg College
Ph: 717-337-6148
Fax 717-337-6172  email: ngoubet@gettysburg.edu
Beginning work Sept. 2000 for two years in the states to study olfactory learning in preterm newborns who have KC and to measure pain responses during KC.

Hanson, Deborah  email: nphanhand@hotmail.com. Began in June 1999 studying end tidal CO2, tidal volume and minute volume of KC vs. incubator condition in ventilated infants.  Also has experience with KC for dying babies.

Harris, Judy, June 2006. She is part of a Bachelor of Science in Nursing group of students working on the evidence base for Kangaroo Care practice with 32-36 week infants, particularly interested in heart rate, respiratory rate, oxygen saturations, and temperature outcomes. Carole Kenner’s response to her inquiry revealed that Cindi Acree (Cindi.Acree@cchmc.org) at Cincinnati Children’s Hospital did a similar review in 1991 and found that HR, RR, SaO2 and temps were better during KC. Judy Harris can be reached at Judy-Harris@ouhsc.edu

Harrison, Tondi.  2010 begins work on KC to help infants with congenital heart defects.  She can be reached at:
Tondi Harrison, Ph.D., R.N., CPNP
Nurse Researcher at  Nationwide Children’s Hospital in Columbus, OH.

Henderson, Pamela Green  CNS/NNP
Neonatal Intensive Care Unit.
Women’s College Hospital
Toronto, CANADA
Email: nprd@ftn.net or phone: 416-323-6400 ext. 4568
Doing research on  KC with ventilated infants in Fall, 1998

Holditch-Davis, Diane (working with RoseMarie White-Traut)
University of North Carolina, Chapel Hill
March 2005 submitted R01 grant to compare KC versus the Ruth Diane Rice massage technique as interventions for VLBW.  Mothers will do KC in NICU and continue at home for 2 months or the Rice Massage Technique.  380 mothers in three groups: KC, Massage, Attention Control. Outcomes are infant health and development (length of stay, growth, occurrence of health problems, and BAYLEY II), maternal well being (depressive symptoms, posttraumatic stress symptoms, worry about child health, parenting stress), maternal-child relationship (interaction videotapes, HOME, maternal perception of child vulnerability)  Cost-effectiveness of interventions will be studied too. Study to begin Jan 2006 and run for 5 years
Johnston, C. Celeste (Retired, 2010)  
Assoc. Professor, School of Nursing  
McGill University  
3506 University St.  
Montreal QC H2X 3PY  
phone: (514) 398-4157  
Fax: (514) 398-8455  
email: md28@musica.mcgill.ca  

Kelin, Lisa, R.N.C., MSN.  
Clinician III, FCC  
Inova Hospital for Women  
3300 Gallows Rd.  
Falls Church, VA 22042-3300  
Home: 703-264-8943  
Began a study with 58 FULL TERM INFANTS who require rewarming when more than 90 minutes old. Kangaroo Care was compared to radiant warmer for efficacy in rewarming, using axillary temps. Preliminary data on 4/10/99 show that KC is as good as radiant warmer when continued for 90 minutes to bring babies from 97.1 –97.5 F back to neutral thermal zone.

Lee, Juhyun  
Doctoral Student, School of Nursing Johns Hopkins University  
525 N. Wolfe Street, Baltimore, MD 21205-2110  
(410) 467-4477; email is jleej@jhmi.edu  
Fall 2000 she is starting study of KC’s efficacy in increasing breastfeeding in preterm population, and changes in quantity and quality of milk, and immunological markers.

Ludington, Susan M., CNM, Ph.D., FAAN  
Professor and Walters Chair of Pediatric Nursing  
Case Western Reserve University, FP Bolton School of Nursing  
10900 Euclid Ave. Cleveland, OH 44106-4904  
office: (216) 368-5130  
email: Susan.ludington@case.edu  
Has studied effect of KC during phototherapy on bilirubin profiles, effect of one hour of KC with ventilated preterms on pulmonary function test outcomes, and general physiologic outcomes. Now she is funded (2002-2005) to study effect of 3 hours of KC on EEG measures of sleep and is piloting a study of effect of KC on pain responses.

Maastrup, Ragnhild.  
The Knowledge Centre for Breastfeeding Infants with Special Needs/NICU  
Rigshospitalet 5023  
Blegdamsvej 9  
DK-2100 Copenhagen, DENMARK  
Phone: +45 35 45 08 33  
Email: ragnhild.maasstrup@gmail.com or ragnhild@maastrup.dk  
Studies very low birth weight infants in KC and has first publication in 2010 with Greinsen G.

Martin, Jackie B. DNP, RN, NNP-BC, CCNS,
Mercer, Judith Melson, RN, CNM, Ph.D. (July 2010) beginning a pilot study of late cord clamping simultaneous with University of Rhode Island, School of Nursing KC in preterm or full term infants. She has RO1 for this study from NIH-NINR Contact at jmercer@ds.uri.edu

Miltersteiner, Aline da Rosa, Pediatria Fisioterapia
Clinica Vita Di Bambini
Rua Julio de Castilhos, 1051 sala 43
Caxias do Sul, BRASIL
Phone: 011-country code-54-228-3854
vitadibambini@terra.com.br or alinemilt@terra.com.br

Moore, Elizabeth R.N, Ph.D.
161 Clifftop Drive
Hendersonville, TN 37075
Phone: 615-824-7054
In August 1998 she submitted an NINR NRSA to examine the effects of KC with FULLTERM infants beginning immediately at birth and continuing for two hours on breastfeeding performance. BIRTH KC. Finished study in December 2004. Published in Gene Anderson in 2007 and does Cochrane reviews.

Mora, Lucila R.N., BSN, 1421 Clement Street
San Francisco, CA. 94118 (415) 750-1463 email: lmora@itsa.ucsf.edu
Doing some sort of Kangaroo Care research as part of her ms degree at UCSF.

Morrison, Barbara, RN, Ph.D., FNP, CNM
Assistant Professor Ursuline School of Nursing
3714 Normandy Road
Shaker Heights, OH 44120
BMorrison@Ursuline.edu She is the FULL TERM KC researcher, especially as KC relates to breastfeeding outcomes. (216) 491-8122.

Madalynn Neu, RN, Ph.D., / April 2002 received K award to study 3 sessions over an 8-wk period of KC holding vs. swaddled holding and measuring vagal tone and salivary cortisol levels of mothers and babies during the three sessions.

Alma Ohl, RN, NNP student
4300 Stratford Drive
Center Valley, PA 18034
Home: (610)-282-4692
In Spring 1999 she will be conducting a master’s thesis study to measure maternal empowerment during Kangaroo Care.
She recommends a listserve on the email that targets nursing research and reports KC studies: listserve@listserve.Kent.edu. Type in SUBSCRIBE NURSERESSUSAN and send.

Ortman, Bethany : See Schmidt, Catherine below

Jacqueline Page, BScN, MHSc, NNP
and Renee-Louise Franche, Ph.D. Dept. of Psychology
Ottawa General Hospital
501 Smyth Rd.
Ottawa, ONTARIO
Canada K1H 8L6
Page: 613-737-8039
613-737-8943
Franche: 613-737-8651
Premature infant's physiologic response (50 ventilated preterms- looking at HR, RR, SaO2, and vent settings) and Maternal stress. Infant stress measured by physiologic homeostasis.


Pratomo, Hadi, MPH, Dr.P.H.
Perinasia, Perumpulan Perinatologi Indonesia
Jl. Tebet Utara IA/22
Jakarta 12820, Indonesia
Phone: (62)(21)828.1243
Fax: (62) (21) 828-1245 or 830-6130
PO Box 8163 JKSTT 12820
Dr. Pratomo and his group have just (nov. 1998) completed two studies on KC in their country.

Prochnik, Marta- Brazilian researcher following outcomes of the national program for KMC in Brazil
Rua Cap. Cesaar de Andrade 40c01
22431-010 Rio de Janeiro, Brasil
prochnik@bndes.gov.br

Rapisardi, Gherardo – does work in Italy with Dr. Pignotti. Can be reached at gherapi@dada.it

Rinehart, Peggy C. MSN, APRN, NNP-BC 3/6/2011
Instructor, Bluegrass Community and Technical College
470 Cooper Drive
Lexington, KY 40506-0235
Phone: 859-246-6250
Fax: 846-246-4697
Peggy.rinehard@kctcs.org
Ms. Rinehart is working toward her DNP degree and wants to measure maternal stress at intervals throughout the NICU course using cortisol and the Parental Stressor Scale and fingertip temperature monitoring during KMC.

Roberts, Kathryn, R.N., Ph.D.
Professor of Nursing, School of HECS, Faculty of SITE
Northern Territory University
Darwin, Northern Territory, Australia 0909
Office: (089) 46-6071
Fax: (089) 46-6595 email: kay.roberts@ntu.edu.au

Cindy Roller, R.N., MSN. Doctoral student of Gene Anderson’s at Case Western Reserve who was NRSA funded in Fall 1997 for phenomenology study of the meaning of Kangaroo Care to teenage mothers. This was in 2002.
Margie Sanford, R.N., BSN  
Neonatal Intensive Care Staff Nurse  
Kadlec Medical Center  
333 Swift Ave.  
Richland, WA 99352  
email: msanford@mail.wsu.edu  
Studying nursing factors affecting utilization of KC research results.

Schmidt, Catherine (And Ortman, Bethany). 20 Ashbury Court, Dahlonega, GA 30533 email: clschm1353@ngcsu.edu. Two physical therapists who evaluated long term effects of KC and found no differences in mental and motor functioning in their work at North Georgia College and State University, Dept. of Physial Therapy. Abstract appears in A.J. Physical Therapy, 2000.


Sloan, Nancy L.  2005. Doing KC at community level in Bangladesh. Contact her at Nancy.Sloan@tufts.edu  
Community KC. (N.B. She left Tufts in 2006 so her address has changed.

Sandra Smith, University of Utah. email: SLeeSmith@msn.com. Doing a study looking at RR, SaO2, FiO2 and heart rate variability of ventilated preterm infants before, during, and after Kangaroo Care. Dissertation finished in spring 1999- expect results soon. Early indications are that KC is infant temperature rises and that SaO2 might fall. Study was finished June 1999 and is being reported on Feb. 16, 2000 in Salt Lake city.

Svoboda, Mary Libby  Manager, Community Education, (We call her Libby)  
University Hospitals, MacDonal Women’s Hospital, Center for Women’s Health  
3909 Orange Place Drive Suite 4100  
Orange Village, OH 44122  
Phone: 216-595-5355  
Fax: 2160595-5357.

Skurow-Todd, Kami.  MSN, RNC-NIC  Interested in Congenital Heart Defect KIDS and KC/  
Clinical Research Nurse coordinator  
Childrens National Heart Institute  
Childrens National Medical Center  
111 Michigan Ave. N.W.  
Washington, DC, 20010  
Office 202-476-3505; fax is 202-476-3811  
KSkurow@childrensnational.org

Wallig, Amy NNP MS, Kathy Leef RNC MS, Susan Imam NNP MS, and Robert Locke DO  
Medical Center of Delaware  
4755 Ogletown-Stanton Road  
Newark, DE 19718  
Amy Wallig phone:302-733-2396  
Susan Imam phone: 302-733-4387 Page Op:302-733-1900 beeper 2431  
This Medical Center of Delaware is a complete NIDCAP unit with several NIDCAP certified staff RNs and they are
doing a study of ventilated KMC with a 15 minute pretest, KMC, 15 minute postest of non-invasive pulmonary function testing: SaO2, HR, RR, temp, resistance, compliance, pCO2, pO2. Length of KMC unknown. Study was up and running with 4-5 ventilated preterms at any time in their nursery in Fall 1997.

Wallin, Lars RN, Ph.D.
Post Doctoral Fellow, Faculty of Nursing in 2004-2005
University of Alberta
5-112 Clinical Sciences Bldg.
Edmonton, Alberta
Canada T6G 2G3
(780) 492-8475, Fax = 780-492-6186
email: lars.wallin@ualberta.ca
See his paper published in 2005. He studies best methods to implement evidence and is conducting randomized controlled trial of facilitation toa change group versus usual method of quality improvement for implementing change.

Zeilinger, Terry doing data collection of age, wgt, FiO2 and SaO2 before and during KC, along with length of session and skin temp range. Martin Luther Hospital-Anaheim, 1830 W. Romney Dr., Anaheim, CA 92801-1854.

OTHER NOTABLES IN KANGAROO CARE WORK
Christensson, Kyllike NMTD.Dr. Med. Sc. Karolinska Institutet, Dept. of International Health and Social Medicine, S-171 77 Stockholm, Sweden Phone +46 6 728 77 88; Fax: +46 8 31 15 90; email: Kyllike.Christenss@Phs.Ki.sc

Fundacion Canguro, Carrera 7 No.46-20, Apto. 2001, Bogota, Colombia. Telephone: +57 1 221-5572; email: herchar5@colomsat.net.co

Wahlberg, Vivian. Nodiska Halsovardshogskolan, The Nordic School of Public Health, Box. 12133, S-402 42, Goteborg, Sweden

WEBSITES FOR KANGAROO CARE
www.kangaroocareusa.org is the website for the United States Institute for Kangaroo Care. This website provides information on videos, pamphlets, educational materials and courses and consultation about kangaroo care/kangaroo mother care for full term land preterm infants. The organization’s non-profit status is pending and membership is $50.00 per year and the website is the site for RESOURCES for education and practice of KC/KMC/skin-to-skin contact in the USA. The Director is Susan M. Ludington-Hoe. The website will be up and running October 1, 2011.

1. The United States Institute for Kangaroo Care is developing their website at www.KangarooCareUSA.org and has an email in place: USIKC2010@gmail.com. Email them for information and they check for emails at least 3 times/week. This a resource center, telling you where to get chairs, videos, and making arrangements for speakers and customized speaking needs as well as consultations and instruction on the floors and units where KMC is found.

2. The Kangaroo Foundation, called Fundacion Canguro, maintains an active website that includes many articles and updated references. The website is maintained by Dr. Natalie Charpak. It can be accessed at herchar5@colomsat.net.co Or through kangaroo@javeriana.edu.co

3. Krissanne Larimer has a website for KC and the KC bib is available off this web site. The site is http://http://www.geocities.com/roopage and a list of Dr. Ludington’s outcomes chart is at http://www.geocities.com/roopage/kcresearch.html.
Krisanne Larimer also has another web site, and the document on it is Kangaroo Care Benefits.

4. www.pathfinder.com/NY1/living/health/kangaroo_baby_care  This is New York city health site that reports where one can get Kangaroo Care in New York City and its outcomes. A very brief site.

5. KangarooCare@aol.com  has some articles that you can request and the articles have been written by Nils Bergman.

6. Kangaroo@javeriana.edu.co  is a major KC Network email that is maintained by the Bogota group. It has many updates and should be checked regularly. It published as version of Dr. Ludington’s KC bib. This site is maintained by Natalie Charpak and Natalie Charpak’s email is herchar5@colomsat.net.co

7. Kcare@yahoogroups.com  has Dr. Ludington’s and Dr. Andersons’ bibs on it. A Jan.29, 2010 note from Pat somewhere in the world says that this website is being used for dating now and it should be shut down. The new KMC group can be found in #7.

8. http://health.groups.yahoo.com/group/Kangaroo-Mother-Care/  is the website that has replaced #6 above as of Jan. 2010

9. http://fpb.case.edu/KangarooCare/biblio.shtm  is the website that contains updated annotated bibliography of all publications about KC in the world that are known by Susan Ludington.

10. http://preemienews.com  is a website that in July 2000 had an article on KC that reports the opinion of several doctors and developmental specialists on KC and all opinions are positive.

11. 1998 BBC. “Kangaroo Care Counters the Cold.” This is a summary of Christensson’s 1998 article in the LANCET. http://news.bbc.co.uk/hi/english/newsid_184000/184480.stm


13. 2003 Bergman, Nils. Kangaroo Mother Care website, listing his tour dates, the KMC Shop with videos, postcards, Kangacarrier Shirts for sake, and reference list. Go to www.kangaroomothercare.com

14. March of Dimes in 2005 started a prematurity campaign and developed a website that has much about the good of Kangaroo Care in it. Go to: www.marchofdimes.com/prematurity to see what they have.

15. NICU web page http://vuneo.org-KangarooCare

16. India has a big initiative on Kangaroo Care and has its own website, http://www.kmcindia.com  and it has content, overview of KC effects, and the goals to educate everyone in the country about KMC to improve its usage. Added 8/24/2007

17. @MothersUtopia@Laura_Keegan. OR through www.obnurse35yrs.wordpress.com/tag/skin-to-skin/ This is a website that is promoting Kangaroo Care right after birth with every cesarean section. Mothers tell their stories here and it recommends that they go to see the HEALTH-INFO video which has a trailer that was posted on facebook. Accessed 9/11/2011.

18. http://www.breastcrawl.org  is the website to see a video of a fullterm newborn bieng placed between breasts and
choosing which nipple to move towards and latch onto. The video is from India and the infant remains wet the whole time several health professionals stand around and no cover on the baby’s back, no drying off, no head cap, not a good example of thermoregulation, but the baby does move toward the nipple and latch on. Added 8/14/2007


20. http://www/jjpi.com. This is the Johnson & Johnson Pediatric Institute website and in 2002, Johnson & Johnson produced a book for pediatrics and health professionals to disseminate for free that was called, “Skin-to-Skin: The Mother-Baby Package.”

21. Kangaroo Care LINKEDIN Professional Group for KC discussions. Contact the moderator Yamile Jackson yamile@nurturedbydesign.com. Yamile is a Ph.D. Industrial Engineer who is a Certified Kangaroo Caregiver (2010).

22. www.themiracleofkangarooomothercare.com. This website relates information on accessing the Roos T, and Roos N online book entitled The Miracle of Kangaoro Mother Care. Rare Inspirational Stories of Infant Survival for Every Parent and Every Baby. See Roos citation in first section. This website also gives access to the “Kangaroo Mohter Care: The Benefits for Your Full Term and Premature Baby.” 2-page pamphlet/information sheet that is listed in the main section of the bibliography under Lawn, J. (2011) and also under the Pamphlet section as Lawn, J. (2011).

23. DrBarbCNM.com This is a website that advertises the three CDs of Dr. Barbara Morrison giving talks about Kangaroo Care with full term infants that can be purchased. Her 2007 talk, Kangaroo Care: Nature’s Best for your Baby, which is 20 minutes long, is available for $25.00.

24. www.healthed.cc This is the website for getting pamphlets about KC with full term infants (one is called How To Hold Your Bay Skin-to-Skin and the other is called The First Hour After Birthy: A Baby’s 9 Instinctive Stages.

HOSPITALS with Seasoned, Active Programs of KC (This list is very old. Many places have active KC in 2011)

WASHINGTON
Kadlec Medical Center, 333 Swift Ave., Richland WA 99352
RN: Mrs. Joan Swinth MD: Anthony J. Hadeed

Pennsylvania
Thomas Jefferson University
NICU: (215)-955-8346

MARYLAND
Anne Arundel Medical Center
Franklin Square Medical Center
RN: Ms. Wood

GEORGIA
Memorial University Medical Center – has had KC in NICU since 1995.
Savannah, GA
Contact Christa McLaurin, RNC-NIC at cmclau2@aol.com

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NIPPLE LEAKAGE CONTROL METHODS

- Prolac Inc. has created BLIS (breast milk leakage inhibitor system) which is a soft plastic shield that keeps the nipple dry and limits bacterial growth.

Self Stick breastpads are useful. Two brands are available:

- Lansinoh disposable nursing pads, 60 pads to a box. Manufactured by Pigeon Industries (Thailand) Co., LTD. Distributed by Lansinoh Laboratories, Inc. 599-B Oak Ridge Turnpike, Oak Ridge, TN 37830 (800-292-4794) or www.lansinoh.com or

- Soothies Available through Puronyx, 990 Park Center Drive, Suite E., Vista CA 92083. 800-944-4006 or 760-597-1460, Fax: 760-597-1466, www.puronyx.com or www.soothies.com


KANGAROO JEWELRY:
Sterling Silver Kangaroo necklaces, earrings and bracelets are available from Anu Chitrakar, 3012 Wedgewood Way, Louisville, KY 40220, phone 502-459-6198.

WRAPS/CARRYING DEVICES and CHAIRS:

Carrying Devices -

Nils Bergman has a carrying device that includes a blouse that is available from his website (See under websites, 2000, Nils Bergman).

Jensen, Daniela She has developed a wrap and shirt all in one for KC in the hospital and at home. Contact djensen62@gmail.com for more information. Wrap/shirt is available in 2012.

Joey Jacket™. A jacket and wrap all in one to facilitate Kc with premature infants who have many lines still attached to them. Contact Sarah Alice Wyndham RN, at bamboo62@gmail.com. (new in 2012)

Kam Care Design. This company makes wraps for carrying the infant in KMC and these wraps are used throughout Sweden. The owner is Karin Holmgren, and the address of the company is Lagerhyddsvagen 2, Hus 38, S-752 37 Uppsala, Sweden. Phone is +46(0)76 834 23 32 or +46(0)76-811 00 63 and email is info@kamcaredesign.se and url is www.kamcaredesign.se

KanGuru wraps, pouches, and incubator transfer units. Wraps cover the mother’s entirely so she can continue the infant in KC and infant can go to breast to feed without being moved and without having mother exposed, no matter how many people come to visit her or interrupt. Wraps come in micropreemie size (with extra support for small infant’s head), preemie (1000-2500 grams or 2-5 pounds), and fullterm size (5-8 pounds). Contact Susan Sczentmikllosky 330-527-2623 in Hiram, OHIO

Kanguruproducter, is a lovely little pouch for preemies from Scandinavia. Address is 4570 Hjortshog, 260 34 Morarp Country:?? Tellophone: 042/23 50 22 (kvalistid), postgrio: 456 98 80-0

Nurtured by Design, Inc. (formerly Zakeez, Inc.) This company makes a hand that you can leave to caress the infant.
in the NICU when Mom is not there called The Zaky. It also makes a KC tube top wrap called The Kangaroo Zak that is sterilized and comes in Size 1 (small, medium, large) or Size 2 (XL, 2XL, 3XL). Both products cost $49.95 each and they offer discount for hospitals, certified Kangaroo Care Givers, and NICU families. These were designed by a Ph.D. (Yamile) who had a premature infant and learned to make these items to use with her own baby. Contact Nurtured by Design, INC, PO Box 3276, Sugar Land, TX 77487. Phone is 800-618-9259, fax is 800-316-9259, from overseas call +1-281-240-9259. Email orders at orders@nurturedbydesign.com and website is www.nurturedbydesign.com

Nurtured by Me, Ellen Shatzkin, 53 Beverly Rd. White Plains, NY 10605, (914) 328-2226 or (914) 686-3203. This is an elaborate blouse and pouch. $65.00

Parish, Hope In 2012 she has created a wrap that accommodates both preterm and fullterm infants and mothers can wear it under regular clothing. Contact Hope Parish at eem3@me.com (new in 2012)

Precious Image Creations, Inc. This company makes many different carrying devices for hospital use. They make a Baby Girdle (#8050) that is to be placed under the mother just prior to birth and it is a very simple to use wrap for Birth Kangaroo Care. For Postpartum use they have a blouse and wrap all in one so infant is held snuggly and mother can breastfeed and do Kangaroo Care without any exposure. In 2010 she has a new wrap for KC at birth and a wrap for holding the infant in KC while pumping from both breasts. Contact www.preciousimagecreations.com for prices and full line of products.

Dr. Elise Van Rooyen makes a simple carrying device that is used in all northern province hospitals of South African. It is machine washable, wraps easily, comes with good instructions, and is available for $10.00 from S. Ludington, Bolton School of Nursing, 10900 Euclide Ave., Cleveland, OH 44106-4904. email her at susan.Ludington@case.edu to order.

Snug-a-Roo. Quilted carrier for preemies (turn down center flap for KC). Has 2 pages of instructions (806) 795-8775.

CHAIRS FOR KANGAROO CARE-
La Napoule or La Fuma Lounge Chair (it goes by both names) or Zero-Gravity loungers. Folds to 7” for easy storage, and mothers can sit in these all day without episiotomy discomfort. All movement control is from legs, not arms and moms love this chair and can stay in it for 24 hours without fatigue, discomfort, or episiotomy pain. This is the one they use in Europe and it works well, folds up into extremely little space and is easy to move about. Comes in white, black or dark green. This can often be bought in Patio and Pool or Boat shops. Or you can order it from

1) Hammacher-Schlemmer, item # 27821D in the SKYMALL catalog is a DESIGNER MESH or PADDED SUNBRELLA ZERO-GRAVITY RECLINER for $99.00. Call 1-800-sky-mall (1-800-759-6255). Or go to www.SkyMall.com. This price as of 10/10/2010.
2) Plow & Hearth, item #2087A (The Original La Fuma) for $179.95 in the SKYMALL catalog, 1-800-759-6255 or www.SkyMall.com. Plow and hearth has an extra wide (2 inches) and longer (3 inches) one as well and it is called the extra large chair. They also have one with extra padding on top of the mesh. Extra large chair is $209.95 (item #2490) These are all on page 63 of the February 2005 catalog. Comes in Green, blue, or black.
3) Frontgate is also selling the Zero Gravity chair in yellow, white, or beige. Item # 14225A $179.00 each (or two for $169.00 each) on page 20 of February 2005 SkyMall catalog. Call 1=800=759-6255 or www.skymall.com
4) Bed Bath and Beyond sells the Zero Gravity Chair for $49.99 in the spring and summer months. The brand they sell is the Sarasota Breeze
5) Ollies Discount started selling the Sarasota Breeze Zero Gravity Chair in May 2011 for $39.99 each.

4/11/2008 I just saw the La Fuma/La Napoule chair at COSTCO yesterday for $88.00. The chair they have there is called the Fabric Lounger and is available from CWC, PO BOX 34535, Seattle WASHINGTON, 98124-1535, ask for item # ITM ART 306122. Many places like Bed BATH and Beyond, and patio shops sell the chair as a ZERO
GRAVITY LOUNGER. Be sure it is well made and not a cheap rip off of the La Funa chair which lasts years.

*The Kangaroo Care Chair* comes with 10 year warranty. Looks like regular padded chair. Get it from [www.ioahealthcarefurniture.com](http://www.ioahealthcarefurniture.com) or write to Mr. Fabio Delmestri, Executive Vice President, IoA Healthcare, 829 Blair Street, Thomasville, NC 27360. Phone 336-475-7106 or Fax 336-476-3016.

**FOUNDATIONS**

Fundacion Canguro  
Calle 56A #50-36  
Bloque A13, Apto 416  
Pablo VI Azal, Bogota, COLOMBIA  
Tel-fax: 57-1-221-0731  
Tel: 57-1-608-3917  
Home page is [http://kangaroo.javeriana.edu.co](http://kangaroo.javeriana.edu.co)  
OR Jan 2012: [www.fundacioncanguro.co/es/profesionales.html](http://www.fundacioncanguro.co/es/profesionales.html)  
You can email Natalie Charpak at herchar5@colomsat.net.co or ncharpak@programacanguro.org

The KC mailing list is a forum to seek and exchange information on KMC. To subscribe to the KMC email list of notices about Kangaroo Care, just go to the website and sign up in the upper left corner.

**Literature Thoughts:**
