New Evidence Changing Perioperative Practice
Outline of Lecture

Interactive cases based on 2011-2012 literature
Additional important journal articles
Preoperative checklists
Consultative medicine resources
Case 1 – Perioperative Risk

A 71 y.o. man is referred for preoperative evaluation prior to a colonic resection for an adenocarcinoma. He has known stable coronary artery disease (class II angina), type two diabetes mellitus on insulin therapy, and hypertension. He can walk four blocks without symptoms and perform ADLs. Medications are aspirin, metoprolol, amlodipine, insulin, and lisinopril. His creatinine is 1.4. What is his perioperative risk for MI and cardiac arrest?
Case 1 - Choices

A. 0.4%
B. 1%
C. 7%
D. 11%
E. 25%
Case 1 - Choices

A. 0.4%
B. 1% (based on new Gupta calculator)
C. 7% (based on old revised cardiac risk index)
D. 11%
E. 25%
**Gupta Perioperative Risk Calculator**

**ESTIMATE RISK OF PERIOPERATIVE MYOCARDIAL INFARCTION OR CARDIAC ARREST.**

<table>
<thead>
<tr>
<th>Age</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatinine</td>
<td>&lt;1.5 mg/dL, &gt; 1.5 mg/dL, unknown</td>
</tr>
<tr>
<td>ASA Class</td>
<td></td>
</tr>
<tr>
<td>Preoperative Function</td>
<td>Totally independent, partially independent, totally dependent</td>
</tr>
<tr>
<td>Procedure</td>
<td>Choose from 21 types of procedures</td>
</tr>
</tbody>
</table>

ASA 1 = Normal healthy patient  
ASA 2 = Patients with mild systemic disease  
ASA 3 = Patients with severe systemic disease  
ASA 4 = Patients with severe systemic disease that is a constant threat to life  
ASA 5 = Moribund patients who are not expected to survive without the operation

Gupta et al. Circulation 2011; 124: 381-387. Also QxMD for on-line calculator
## Comparison of Gupta and RCRI

<table>
<thead>
<tr>
<th></th>
<th>Gupta</th>
<th>Lee</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
<td>2011</td>
<td>1999</td>
</tr>
<tr>
<td><strong>Patient Numbers</strong></td>
<td>470,000 (NSQIP – 211 hospitals - 2007,2008 data)</td>
<td>4315 (one hospital)</td>
</tr>
<tr>
<td><strong>Measurements</strong></td>
<td>Age, creatinine, ASA class, procedure type, functional status</td>
<td>Presence of CHF, CAD, CKD, CVA/TIA, insulin-requiring DM, high risk surgery</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td>30 day MI and cardiac arrest*</td>
<td>Major cardiac morbidity and mortality**</td>
</tr>
</tbody>
</table>

*MI defined as ST segment elevation > 1 mm in 2+ contiguous leads, new LBBB, new Q in 2+ contiguous leads, or T > 3X upper limit of normal.

**Defined as MI, pulmonary edema, VF, cardiac arrest, complete heart block. MI with elevated CK-MB (>5%) or >3% with EKG ischemic changes.
<table>
<thead>
<tr>
<th>ASA Class</th>
<th>Physical Status</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Healthy</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Well-controlled mild systemic disease</td>
<td>DM, HTN, obesity, seizure disorder – all well controlled</td>
</tr>
<tr>
<td>3</td>
<td>Severe systemic disease with functional limitation</td>
<td>Angina pectoris, hx. of MI or CVA. CHF &gt; 6 months ago, DM with vascular problems, poorly controlled HTN</td>
</tr>
<tr>
<td>4</td>
<td>Severe systemic disease and a threat to life</td>
<td>Unstable angina. MI or stroke &lt; 6 months, severe CHF or COPD, uncontrolled DM or HTN.</td>
</tr>
<tr>
<td>5</td>
<td>Moribund and cannot survive without surgery</td>
<td>Ruptured AAA, pulmonary embolus, CNS injury with ICP increase</td>
</tr>
</tbody>
</table>
Activities of Daily Living

- Bathing
- Dressing
- Toileting
- Transferring
- Continence
- Feeding
## Types of Procedures

<table>
<thead>
<tr>
<th>Anorectal</th>
<th>Intestinal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aortic</td>
<td>Neck</td>
</tr>
<tr>
<td>Bariatric</td>
<td>Nonesophageal thoracic</td>
</tr>
<tr>
<td>Brain</td>
<td>Ob-gyn</td>
</tr>
<tr>
<td>Breast</td>
<td>Orthopedic</td>
</tr>
<tr>
<td>Cardiac</td>
<td>Other abdominal</td>
</tr>
<tr>
<td>ENT</td>
<td>Peripheral vascular</td>
</tr>
<tr>
<td>Foregut/hepatopancreato-biliary</td>
<td>Skin</td>
</tr>
<tr>
<td>GB/adrenals/appendix/spleen</td>
<td>Spinal</td>
</tr>
<tr>
<td>Hernia</td>
<td>Urologic</td>
</tr>
<tr>
<td></td>
<td>Vein</td>
</tr>
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</table>
Surgical Mortality Probability Model

- Estimate of non-cardiac surgical mortality at 30 days
- Three factors for analysis – ASA class, low/intermediate/high risk surgery, and emergency surgery
- Applicable at bedside

# Surgical Mortality Probability Model

<table>
<thead>
<tr>
<th>ASA Class</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0</td>
</tr>
<tr>
<td>II</td>
<td>2</td>
</tr>
<tr>
<td>III</td>
<td>4</td>
</tr>
<tr>
<td>IV</td>
<td>5</td>
</tr>
<tr>
<td>V</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedure Risk</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td>Intermediate</td>
<td>1</td>
</tr>
<tr>
<td>High</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emergency Surgery</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonemergent</td>
<td>0</td>
</tr>
<tr>
<td>Emergent</td>
<td>1</td>
</tr>
</tbody>
</table>
### Surgical Mortality Scoring System

<table>
<thead>
<tr>
<th>Points</th>
<th>Mortality %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.01</td>
</tr>
<tr>
<td>1</td>
<td>0.02</td>
</tr>
<tr>
<td>2</td>
<td>0.07</td>
</tr>
<tr>
<td>3</td>
<td>0.2</td>
</tr>
<tr>
<td>4</td>
<td>0.5</td>
</tr>
<tr>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>9</td>
<td>50</td>
</tr>
</tbody>
</table>
But, There’s a Catch

- Calculation of procedural risk requires use of the following websites:
  - [http://links.lww.com/SLA/A223](http://links.lww.com/SLA/A223) - low risk
  - [http://links.lww.com/SLA/A224](http://links.lww.com/SLA/A224) - intermediate risk
  - [http://links.lww.com/SLA/A225](http://links.lww.com/SLA/A225) - high risk
An 80 y.o. man with known coronary artery disease (stage II angina), stage III CKD and hypertension presents with a fracture of his right hip sustained by tripping over his dog. The dog was not injured. Lab reveals a hemoglobin of 8.7 and an hematocrit of 26. The orthopedic surgeon requests advice on blood transfusion perioperatively. At what hemoglobin threshold should this patient be transfused?
Case 2 – Transfusion Therapy

A. Hemoglobin < 7
B. Hemoglobin < 8
C. Hemoglobin < 9
D. Hemoglobin < 10
E. Symptoms only
Case 2 – Transfusion Therapy

A. Hemoglobin < 7
B. Hemoglobin < 8
C. Hemoglobin < 9
D. Hemoglobin < 10
E. Symptoms only
Adverse or No Effect of PRBC Transfusions

- Liberal (Hg < 10) vs. restrictive (Hg < 7) transfusion strategy in ICU showed no benefit.
  
  Hebert et al. NEJM 1999; 340:409-417

- FOCUS – Functional outcomes in CDV patients undergoing surgical hip fracture repair showed no benefit with Hg > 10 vs. Hg > 8.


- Single unit transfusions in OR are associated with increased mortality, poor wound healing, pulmonary and renal problems, sepsis, and overall morbidity.

FOCUS Trial

- 2016 patients with CDV risk factors or known CDV disease undergoing hip fracture repair
  - Mean age of 81
  - 63% with CDV disease
- Transfusion triggers
  - Liberal – Hg < 10
  - Restrictive – Hg < 8 or symptoms/signs of anemia
- Outcomes – death or inability to walk 10 feet at 60 days without help
- Results – no difference in the two groups
Transfusion of Minimal Blood in OR

- ACS-NSQIP database of 941,496 operations over four years in 173 hospitals
- 15,186 patients received one unit PRBCs intraoperatively
- Matched using 55 variables with patients not receiving PRBCs. (propensity adjusted)
- Why – immune suppression?, inflammatory mediators?

<table>
<thead>
<tr>
<th>N=11,855</th>
<th>No Transfusion</th>
<th>Transfusion – 1 unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality (%)</td>
<td>5.2</td>
<td>6.1</td>
</tr>
<tr>
<td>Wound Problems</td>
<td>9.7</td>
<td>11.4</td>
</tr>
<tr>
<td>Pulmonary</td>
<td>11.7</td>
<td>15.3</td>
</tr>
<tr>
<td>Renal</td>
<td>5.5</td>
<td>6.8</td>
</tr>
<tr>
<td>Sepsis</td>
<td>8.2</td>
<td>10.6</td>
</tr>
<tr>
<td>Morbidity</td>
<td>30.1</td>
<td>34.2</td>
</tr>
<tr>
<td>LOS</td>
<td>10.3</td>
<td>11.8</td>
</tr>
</tbody>
</table>

A 71 y.o. man with stage III CKD (creatinine 1.8) and hypertension is found to have a 5.5 cm abdominal aortic aneurysm on routine ultrasound screening. He is currently on amlodipine, aspirin, and lisinopril. Blood pressure is 138/88. His lipid profile reveals an LDL of 98, TG 146, HDL 35, and TC of 162. Should he be placed on a beta blocker and/or statin in preparation for surgery?
Case 3 – BB, statin use in vascular surgery

A. Add beta blocker and statin
B. Add beta blocker only
C. Add statin only
D. Add neither agent
Case 3 – BB, statin use in vascular surgery

A. Add beta blocker and statin
B. Add beta blocker only
C. Add statin only
D. Add neither agent
Auerbach’s Assessment of BB Use Perioperatively

- 1995-2005 – “Come on in, the water’s fine.”
- 2008-present – “Everybody, get out of the pool.”

Pros and Cons of BB Therapy

- **Indications for beta blocker** - Circulation 2009; 120:2123-2151
  - Class 1 – current BB use
  - Class IIa - vascular surgery or intermediate risk surgery at higher risk due to CAD, cardiac ischemia on testing, or presence of 2+ risk factors (e.g., CAD, CKD, CHF, DM-insulin, CbVD).
  - Class IIb – vascular surgery or intermediate risk surgery with only 1 risk factor other than CAD, vascular surgery with no risk factors

- **Contraindications for beta blocker**
  - POISE study Devereaux et al. Lancet 2008; 371:1839-1847
Pros and Cons of BB Therapy

- **POISE study**
  - Perioperative Ischemia Evaluation Trial
  - 8331 patients with likely ASCVD
    - Non-cardiac surgery and > 45 y.o.
    - CAD, PVD, stroke, CHF admission, major vascular surgery, or 3+ of: IT/IP surgery, CHF, TIA, DM, Creatinine > 2, age > 70, urgent surgery
  - Immediate preoperative metoprolol
    - Metoprolol XL 100 preop and postop and then 200 mg/day
  - Reduction in MI but increase in stroke and mortality (3.1% vs. 2.3%)

- **Poldermans Effect**
  - Major contributor to beta blocker use with DECREASE studies
Pros and Cons of BB Therapy

- Prominent Dutch Cardiovascular Researcher Fired for Scientific Misconduct in November
- Problems with DECREASE II, III, IV, VI
  - Improper consent
  - Failure to follow protocol
  - Fabricated data
Statin Use

- 2292 patients total
- 47% reduction in perioperative MI; NNT-23
- 44% reduction in atrial fibrillation in cardiac surgery. NNT-6
- Reduction of 32% in length of stay
- Meta-analysis mostly cardiac and vascular surgery – 13/15 studies. Only non-vascular were the Dutch group.

Conclusions about Beta Blockers and Statins

- Continue beta blockers and statins perioperatively.
- Add statins if statin-naïve and undergoing vascular or cardiac surgery.
- Consider beta blocker if cardiac ischemia on perioperative testing.
A 66 y.o. man with known coronary disease, T2 diabetes mellitus, a TIA, and hypertension is scheduled for a carotid endarterectomy. He is able to walk four blocks without chest discomfort. Medications are aspirin, insulin, atorvastatin, metoprolol, and lisinopril. A preoperative EKG shows only LVH. An EKG obtained routinely postoperatively showed ST depression in the inferior leads. Troponin was elevated. What is the chance of death at 30 days?
Case 4 – Perioperative MI Surveillance

A. 2%
B. 5%
C. 10-12%
D. 20-25%
E. 40%
Case 4 – Perioperative MI Surveillance

A. 2%
B. 5%
C. 10-12%
D. 20-25%
E. 40%
Guidelines from AHA - 2007

- Postoperative surveillance unnecessary if low risk patient with low risk surgery
- If intermediate or high risk with known or suspected CAD having an intermediate or high risk procedure, check EKG at baseline, immediately after procedure and daily for two days. Also check troponins.

POISE Surveillance and Data

- PeriOperative Ischemic Evaluation trial
- 8351 patients > age 45 with CDV risk factors undergoing noncardiac surgery
- EKG at 6 and 12 hours and on days 1,2,3,30.
- Troponins at 6 and 12 hours and on days 1,2,3
- MI defined as elevated troponin plus one of the following: symptoms, Q waves or STT waves changes in 2 contiguous leads, coronary intervention, or imaging compatible with MI
MIs in POISE

- 415 patients (5%) with MI
- Only 34.7% with symptoms
- Q waves in only 12.3%
- 74% of MIs occurred within 48 hours of surgery
- 11.6% died within 30 days; 2.2% of non-MIs died
- 697 patients with isolated elevated troponins
- Troponins > 3.6 X nl associated with increased mortality
A 55 y.o. woman with type 2 diabetes mellitus, hyperlipidemia, and hypertension is admitted for an open cholecystectomy. Her current medications are metformin 1 gram bid, glipizide 10 mg bid, and pioglitizone 30 mg/day along with hydrochlorothiazide, aspirin, simvastatin, and benazepril. Hemoglobin A1C two weeks ago was 8.2. How should her diabetes be managed in the hospital?
A. Sliding scale insulin ac and hs
B. Basal –bolus insulin with glargine and lispro (added when eating)
C. Resumption of her oral medications once diet is tolerated
D. Intensive insulin therapy using IV insulin
E. NPH insulin every eight hours
A. Sliding scale insulin ac and hs
B. Basal –bolus insulin with glargine (fasting) and lispro (added after eating)
C. Sliding scale insulin with resumption of her oral medications once diet initiated
D. Intensive insulin therapy using IV insulin
E. NPH insulin every eight hours
Perioperative Glucose Management

• **RABBIT** -2
  - Randomized study of basal-bolus insulin therapy in inpatients with T2DM undergoing surgery
  - Total daily dose of 0.5 units/kg with half as glargine and half as short-acting insulin pre-meals.
  - TDD of 0.3 units/kg if age > 70 or creatinine > 2.
  - Control group with SSI alone
  - Composite outcome (wound infection, pneumonia, bacteremia, respiratory failure, AKI) better in basal-bolus group – 8.6% vs. 24.3%
  - Severe hypoglycemia – 3.8% of basal-bolus group
  - Mean daily glucose 157 in basal vs. 176 with SSI
Perioperative Glucose Management - Guidelines

- Intensive insulin therapy no longer recommended due to increased hypoglycemia and no improved outcomes (e.g., NICE-SUGAR)
- Target glucose 140-180 for both unit and floor patients – ADA, ACP

A 62 y.o. man is admitted for total hip arthroplasty. His record indicates the presence of heparin-induced thrombocytopenia during a hospital admission six months ago. What one of the following agents is contraindicated for DVT prophylaxis? Comment also on duration of prophylaxis and whether dual prophylaxis with both an antithrombotic agent and compression should be used.
Case 6 – DVT Prophylaxis

A. Enoxaparin
B. Fondaparinux
C. Dabigatran
D. Rivaroxaban
E. Warfarin
F. Aspirin
Case 6 – DVT Prophylaxis

A. Enoxaparin
B. Fondaparinux
C. Dabigatran
D. Rivaroxaban
E. Warfarin
F. Aspirin
Surprises from 2012 Chest Guidelines

- Aspirin (160 mg/d) can now be used for DVT prophylaxis in orthopedic cases, but LMWH is agent of choice.
- Prophylaxis must be used for 10-14 days, but 35 days is ideal for THA, TKA, and HF.
- Dual prophylaxis with antithrombotic and external pneumatic compression – (battery-powered 18+ hrs/day) is recommended.
Further Surprises

- In patients with a drug-eluting coronary artery stent who require surgery within six months, continue the antiplatelet agents perioperatively.
- Aspirin should be continued perioperatively if patient is moderate to high risk for a CV event.
- For patients receiving heparin with HIT risk of < 1%, no monitoring of platelet count is needed.

A 78 y.o. woman with mild dementia due to Alzheimer’s disease is admitted following a fall resulting in a right intertrochanteric hip fracture. Her other medical problems include stroke with mild right hemiparesis, glaucoma with poor vision, hearing loss, and anemia attributed to chronic disease. She will likely require opiates postoperatively to control pain. What is the most effective method to reduce the incidence of delirium?
Case 7 – Delirium Management

A. Olanzapine
B. Donepezil
C. Haloperidol
D. Family or geriatric team intervention
E. Rivastigmine
F. None of the above
Case 7 – Delirium Management

A. Olanzapine
B. Donepezil
C. Haloperidol
D. Family or geriatric team intervention
E. Rivastigmine
F. All of the above
Mechanisms of Delirium

Figure 1. Factors Contributing to Changes in Neurotransmitters, Leading to Delirium

\( \downarrow \text{ACH} = \text{Neuronal Excitability} \)
- Anticholinergic drugs
- Age/dementia
- Hypoxia
- Anemia
- Hypotension
- Poor nutrition
- Infection
- Surgery
- Alzheimer’s disease

\( \uparrow \text{DA} \rightarrow \text{Release of ACH} \)
- Drugs: dopamine agonists
- Infection
- Surgery
- Age/dementia

Mechanisms of Delirium Neurotransmitters

\( \uparrow \text{Cortisol & Beta-Endorphins} \)
- Exogenous glucocorticoids
- Disruption of circadian rhythm

\( \downarrow \text{GABA} = \text{Neuronal Excitability} \)
- Benzodiazepines
- Alcohol withdrawal

\( \uparrow \text{Serotonin} \)
- Antidepressants
- Infection
- Hepatic encephalopathy

\( \text{ACH: acetylcholine; DA: dopamine; GABA: gamma-aminobutyric acid.} \)
\text{Source: References 1, 7-11.} \)
Risk Factors for Delirium

- Advanced age
- Dementia
- MAP < 90 preop
- High doses of opiates
- Hematocrit < 28
- SaO2 < 95
- Sensory deprivation
- Low albumin
- Infection
- Dehydration
- Foley and restraints
- Psychiatric disease
- Type of surgery
Consequences of Delirium

- Increased length of stay
- Possibly increased mortality
- Possible harbinger of stroke
- Increased admissions to nursing homes
- Poor functional outcomes (e.g., walking)
- Increased medical costs
Diagnosis of Delirium - CAM

- **Acute onset and fluctuating course**
  - Evidence of acute change in mental status from baseline
  - Abnormal behavior fluctuates during the day

- **Inattention**
  - Difficulty focusing attention, is easily distractable, or has trouble keeping track of what is said

- **Disorganized thinking**
  - Thinking disorganized or incoherent, rambling or irrelevant conversation, unclear flow of ideas, or unpredictable switching in subject

- **Altered level of consciousness**
  - Level of consciousness is less than alert (may be hyperalert, lethargic, stuporous, or comatose)

Diagnosis requires first two criteria plus one of the second two.
Haloperidol Trial

- 457 patients in China
- All over age 65 with noncardiac surgery
- Randomized, prospective, double-blinded
- Exclusions – schizophrenia, parkinsonism, cholinesterase inhibitor, coma, profound dementia, NSR, QTc > 460-470 msec
- Haloperidol – 0.5 mg IV bolus followed by 0.1 mg/h for 12 hours
- CAM used daily to determine delirium
- Endpoints – delirium within 7 days (primary), safety of haldol, time to onset of delirium, delirium free days, LOS in ICU, other postoperative complications, all-cause 28 day mortality

Results of Haloperidol Trial

- 15.3% with delirium in haloperidol group vs. 23.2% in the placebo group
- LOS in ICU – 1.7 hours longer for placebo
- Overall LOS – no difference
- Mean onset of delirium occurred later in the haloperidol group
- Nondelirium complications occurred in 17.9% of haloperidol patients and 21.1% of placebo
Multidisciplinary Geriatric Consultation Trial

- 171 patients over age 65 with hip fracture in Belgium
- Exclusions included polytrauma, moribund, pathological fracture, deafness
- Team – geriatrician, nurse, SW, OT, and PT
- Not blinded, but randomized based upon bed availability in two wards; blinded as to outcomes. No difference in pre-intervention characteristics
- Outcomes – presence and severity of delirium by CAM on days 1, 3, 5, 8, 15; survival at one year

What the Geriatric Team Did

- Preoperative geriatric assessment
- Identification of comorbidities
- Targeted recommendations to “traumatologist”
- One follow-up visit to reinforce recommendations
- Care in both groups – preoperative evaluation, EKG, PT, anticoagulation, nonopioid medication, hip X-ray postop.
<table>
<thead>
<tr>
<th></th>
<th>Geriatric Intervention</th>
<th>No intervention (Control)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence of delirium</td>
<td>37.2%</td>
<td>53.2%</td>
</tr>
<tr>
<td>Survival at one year if delirium</td>
<td>71.4% (NS)</td>
<td>68.3% (NS)</td>
</tr>
<tr>
<td>Differences in care</td>
<td>OT 69.1% and opioid use 91.5%</td>
<td>OT 41.6% and opioid use 75.3%</td>
</tr>
</tbody>
</table>
A 58 y.o. woman with hypertension and coronary artery disease is evaluated preoperatively prior to a laparoscopic cholecystectomy. She is taking aspirin, metoprolol, and HCTZ. Her surgery is scheduled for 11 a.m. in one week. You tell her to take her medications the morning of surgery with small sips of water. However, she asks about taking her usual morning coffee fix that day about 7 a.m. What do you advise?
A. Drink Mountain Dew since it has caffeine and is a clear liquid
B. Eat a full breakfast at 7 a.m. since gastric emptying will occur prior to 11 a.m.
C. NPO except medications starting at midnight
D. Take oral caffeine (100-200 mg) with a few sips of water along with her morning medications
E. Drink the coffee black
A. Drink Mountain Dew since it has caffeine and is a clear liquid
B. Eat a full breakfast at 7 a.m. since gastric emptying will occur prior to 11 a.m.
C. NPO except medications starting at midnight
D. Take oral caffeine (100-200 mg) with a few sips of water along with her morning medications
E. Drink the coffee black
ASA 2011 Guidelines

- Take a history to detect GERD, dysphagia, GI motility abnormality, and diabetes
- Take clear liquids from 2-4 hours preoperatively – water, fruit juice without pulp, carbonated beverages, clear tea, and black coffee. No alcohol!
- Fast for six hours after intake of milk or a light meal (toast and clear liquid)
- Fast for eight hours after a fatty meal
ASA 2011 Guidelines

- Taking clear liquids 2-4 hours preoperatively actually reduces gastric volumes and increases gastric pH over strict fasting.

- Do not routinely add any medications to block gastric acid secretion – H2B, prokinetics, PPIs, antacids.

- Diabetes and delayed gastric emptying are not addressed. European Society of Anesthesiology states same rules apply.

Other Important Papers

Summary of New Literature

- Use Gupta or Glance calculator to judge perioperative risk.
- Use 8 hemoglobin as transfusion threshold even in cardiovascular patients.
- Use statins with cardiac and vascular surgery and continue aspirin whenever possible.
- Perform post-op MI surveillance with troponins in CAD patients.
- Manage most diabetics with basal/bolus insulin.
- Use 2012 Chest guidelines for DVT prophylaxis.
- Try to prevent delirium in high risk patients using geriatric and possibly pharmacological interventions.
- If the operative team permits, encourage clear liquids 2-4 hours preoperatively.
Preoperative History - Summary

- Anesthesia and ADLs—personal and family history
- Bleeding History
- Corticosteroid Use — within one year
- Drug Use — include herbals
- Exercise Tolerance
Preoperative Assessment - Summary

- Cardiovascular – Gupta or Glance scale, AHA algorithm, postoperative MI surveillance
- Pulmonary – Gupta respiratory failure and pneumonia assessment, smoking cessation, DVT prophylaxis
- Endocrine – DM management, adrenal assessment and supplementation
- Hematology – platelets > 50,000, INR < 1.5, hemoglobin > 7-8
- GI/Hepatology – MELD or Child-Pugh scales
Preoperative Assessment - Summary

- Rheumatology – C-spine stability, cricoarytenoid dysfunction, Raynaud’s management
- Nephrology – dialysis timing, electrolyte and fluid corrections
- Infectious Diseases – Endocarditis prophylaxis (high risk cardiac lesion and high risk procedure)
- Neurology – AED level, delirium prevention, specific disease management
- Pharmacology – medication management in setting of NPO status
Resources

- Mauck KF. New recommendations in perioperative medicine. MTP 093 at American College of Physicians Internal Medicine 2012.
- http://www.uthsc.edu/Internal/ - Syllabi/Journal Club