Hand Hygiene in Long-Term Care

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Presentation Outline

- Discuss the current perceptions of hand hygiene (HH) practices in long-term care facilities (LTCF)
- Identify challenges and knowledge gaps for implementation of effective HH programs in LTCF
- Provide examples of successful strategies for improving HH practices in LTCF
What is “long term care”

Long-term care is a variety of services that includes medical and non-medical care to people who have a chronic illness or disability.

- Long-term acute care hospitals
- Chronic ventilator care
- Rehabilitation facilities
- Skilled nursing facilities (SNF)/ Nursing homes (NH)
- Assisted-living facilities (ALFs)
- Hospice
- Home-based care / Senior day care services

http://www.medicare.gov/longTermCare/static/home.asp
Changing nursing home resident population

- In 2009, ~3.3 million residents received care in the 15,884 nursing homes in US
  - Primary source of admission are hospitals
  - Traditional custodial care shifting to assisted living

- From 2000 to 2009
  - 10% increase in the number of residents entering NHs;
  - 15% decline in nursing home beds/1000 residents of US population
  - Increasing proportion of individuals <65 years old receiving care in NHs
  - Growing post-acute care population as custodial care shifts to assisted-living and home-based care

Nursing Home Compendium 2010, CMS
Growing complexity in nursing home care

- Increasing post-acute care population
  - Growing medical complexity and care needs
  - Increasing exposure to devices, wounds and antibiotics
  - High prevalence of multidrug-resistant organisms

- Increased risk for infection transmission and acquisition
Table 3. Colonization with Antibiotic-Resistant Organisms in Nursing Home Residents in Device and Control Groups

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Positive, %</th>
<th>Crude OR</th>
<th>Adjusted OR (95% Confidence Interval)*</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Device Group (n = 100)</td>
<td>Control Group (n = 100)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methicillin-resistant <em>Staphylococcus aureus</em></td>
<td>55</td>
<td>29</td>
<td>3.0</td>
<td>.04</td>
</tr>
<tr>
<td>Vancomycin-resistant enterococci</td>
<td>9</td>
<td>9</td>
<td>1.02</td>
<td>.88</td>
</tr>
<tr>
<td>Ceftazidime-resistant gram-negative bacteria</td>
<td>24</td>
<td>5</td>
<td>6.2</td>
<td>.003</td>
</tr>
</tbody>
</table>

* Adjusted for age, functional status, Charlson Comorbidity Index, and residence. OR = odds ratio.
Challenges for infection prevention programs in nursing homes

- Limited resources and staff time dedicated to infection prevention
  - <30% of facilities have a full-time infection preventionist (IP)
  - <10% of infection preventionists have CIC certification

- Difficulty maintaining staff outreach and education
  - High levels of turnover among facility leadership and front-line staff (From 40-190% annually in LTCFs)
  - Decreased engagement of part-time medical staff

- Culture change movement to create “home-like” physical and social environment for residents

Smith, P. et al. ICHE 2008; 29(9): 785-814
Roup, BJ. et al. AJIC 2006; 34:122-27
Bostick JE JAMDA 2006;7:366-76
HH Knowledge and Practices among nursing staff in 4 nursing homes

- 330 Respondents: 57% Clinical nursing assist. (CNA); 29% LPNs; 13% RNs; 4% NP

## Observed HH-compliance in LTC settings

<table>
<thead>
<tr>
<th>Location</th>
<th>Facility description</th>
<th>Surveillance Period</th>
<th>Overall Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baltimore, 1997</td>
<td>Single 255-bed LTCF</td>
<td>1-month</td>
<td>4% in 189 opportunities</td>
</tr>
<tr>
<td>Canada, 2008</td>
<td>2 LTCF/ 17 units</td>
<td>Three 20 min blocks / unit</td>
<td>14.7% in 459 opportunities</td>
</tr>
<tr>
<td>Italy, 2008</td>
<td>Single 50-bed LTCF</td>
<td>29 periods, unknown duration</td>
<td>17.5% of 308 opportunities</td>
</tr>
<tr>
<td>France, 2011</td>
<td>8 facilities with geriatric care wards</td>
<td>2 weeks</td>
<td>61.5% of 1022 opportunities</td>
</tr>
</tbody>
</table>

Knowledge and perceptions of HH Guidelines

- Data from survey responses from 1,143 nursing home staff representing 17 facilities in 6 states
  - 1108 respondents classified: Nurses (34%), CNAs (33%), other HCWs (33%)

- 30% of respondents stated “would not change personal HH practices based on the 2002 HICPAC HH Guidelines
  - 20% reported the “guidelines were impractical”

- Only 29.6% scored >85% correct on a 19 question knowledge survey
  - As a group, nurses scored higher on knowledge questions than other groups
  - Those in the highest scoring group also have higher self-reported compliance with appropriate HH practices

Ashraf MS et al. ICHE 2010; 31(7):758-762
Reported barriers to HH compliance

- **Lack of access to appropriate HH supplies**
  - 16.2% lack of available sink; 27.5% lack of alcohol-based hand rub

- **No HH because of glove use**
  - 23% nurses, 17% CNAs, 26% other HCWs

- **Forgot HH because of workload**
  - 35% of nurses, 22% CNAs, 44% other HCWs

- **Lack of access to HH feedback or periodic education**
  - 55% never to rarely received personal feedback on HH practices
  - Other HCWs less often received periodic education on HH (86.8% vs. 92% of nurses and CNAs, p=0.03)

- For most topics, CNAs had lowest self-reported barriers to HH compliance and “other HCWs” had highest

Ashraf MS et al. ICHE 2010; 31(7):758-762
Alcohol-based hand rub (AHBR) increased incidence of HH episodes in nursing home

- Self reported hand cleansing by 38 HCWs on 2 units
  - Intervention unit with installation of AHBR
  - Control unit soap/water
- No changes following 3 week education
- Following 12 week AHBR installation and training
  - Increased hand cleansing from ward baseline and compared to control ward

Mody L, et al. ICHE 2003; 24: 165-71
Efficacy vs. effectiveness of AHBR intervention in nursing home setting

- Demonstrated decreased hand colonization with AHBR compared to hand washing
- No change in unit infection rates between control and intervention wards (11 months following AHBR installation)

Mody L, et al. ICHE 2003; 24: 165-71
Implementing pocket-sized AHBR to improve HH compliance in 6 nursing homes, Hong Kong

- Cluster randomized study
  - Nurse staffing levels and resident-staff ratios similar between treatment and control
  - Greater proportion of disabled residents in treatment facilities

- Timeline:
  - 3 month pre-intervention baseline; 7 month post intervention follow-up

- HH compliance rates low in both pre/post-intervention time periods (25% vs. ~30%); no difference between groups
  - AHBR use increased in intervention facilities but hand washing decreased compared to control

Apparent reduction in infections causing hospitalizations despite modest changes in HH

- Identified resident infections resulting in hospitalizations
  - Reviewed hospital discharge summaries
- Significant reduction in incidence of infections in treatment facilities from pre-intervention baseline and control
  - No outbreaks occurred in any facilities during study period

Routine glove use vs. contact precautions as a strategy to reduce MDRO transmission in LTC

- Study conducted over 18 months on a 122-bed skilled nursing unit in an acute care hospital divided into 2 sections
- Section 1: Contact-isolation precautions (CIP) implemented for residents known to carry MRSA or VRE
  - No CIP implemented for extended-spectrum beta-lactamase (ESBL)-producing *E. coli* or *K. pneumomiae*
  - Single rooms or cohorting carriers together, not confined to their room
  - MDRO carriers only identified by clinical cultures; Staff were blinded to results of carriage screening
- Section 2: Routing glove use (RG) for all residents regardless of colonization or infection with MDRO
- MDRO acquisition assessed based on screening cultures
  - Admission, 5 point prevalence surveys, and transfers in/out of unit

Trick WE et al. JAGS 2004; 52: 2003-2009
No difference in MDRO acquisition events between routine gloves and contact-isolation

- 156 residents included in the analysis (74 in RG and 82 in CIP)
  - No significant differences in resident characteristics between the two groups
- No difference in carrier prevalence on first screening culture between two sections for most MDROs
  - MRSA (~21%), VRE (~17%); ESBL-producing *K. pneumoniae* (~16%)
  - Slightly more ESBL-producing *E. coli* on RG unit, 25% vs. 16% on CIP
- No difference in acquisition events between the two sections for MRSA, VRE, and ESBL
  - ~20% MRSA; ~24% ESBL-*E. coli*; and ~7% VRE
  - Trend toward decreased acquisition for predominant strains of ESBL-*K. pneumoniae*
Routine glove use may be as effective as contact-isolation precautions and with lower costs

- Observed 191 HCW-resident interactions in 19 periods
  - Glove use higher in RG section (61% vs. 44%)
  - HH performed more in RG section (57% vs. 36%)
  - No alcohol-based HH products were available during study

- Residents in CIP section spent “majority of day in their own room” compared to RG section (73% vs. 53%, p<0.008)
  - Contact precautions implemented for duration of resident stay (892 resident days in 18 months)
  - Estimate supply cost for CIP was 40% more than RG use

Trick WE et al. JAGS 2004; 52: 2003-2009
Does promotion of glove use have any negative consequence on HH compliance?

- 1 month observational study in 11 healthcare units serving elderly residents
  - 8 Nursing home units and 3 acute care geriatric wards
- Hand hygiene opportunities assessed
  - Before and after a single patient/environmental contact; and
  - Between each successive contact in a series
- Compliance with HH was subdivided into two groups
  - Proportion of all contacts with gloves (indicator 1): Contacts where gloves worn/ total contact observed
  - Proportion of contacts with unnecessary gloves (indicator 2): Contacts with gloves worn without blood/body fluid exposure/ total contacts with gloves worn
Relationship between HH compliance and glove use

- Observed 1252 HH opportunities among 848 contacts
  - Gloves worn in 39.2% contacts; Overall HH compliance was 59.5%
- Significant correlation between HH compliance and glove use indicators: Positive for indicator 1; Negative for indicator 2

Eveillard M et al. AJIC 2012; 40: 387-388
Opportunities for further research and evaluation of HH in LTC settings

- Further assessment of the effectiveness of increasing HH compliance on reducing infections and their complications
- Promotion of appropriate glove use without unintended reductions in HH compliance
- Understanding true risk of pathogen transmission from varying levels of contact between staff and residents in residential care environment
  - Tailoring HH guidance to address the non-clinical interactions among residents, staff and visitors
  - Defining role of resident HH on prevention of infection transmission
- Improving and sustaining staff HH practices through educational and system-level interventions
- Optimizing HH monitoring and feedback programs
Thank you!

Email: nstone@cdc.gov with questions/comments

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333
Telephone, 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov Web: www.cdc.gov

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