Preventing *C. difficile* in the Long Term Care Setting

Illinois Campaign to Eliminate *Clostridium difficile*

Teaming Up to ICE *C. diff*

Regional Workshop

July 2012
Disclosure and Disclaimer

• Speakers have no financial disclosures or conflict of interest related to this presentation
• The opinions, viewpoints and content presented may not represent the position of the Illinois Department of Public Health or any of its programs or Telligen
Healthcare Surveillance Needed in 2012

Long term acute care hospital

Long term care facility with ventilator and psychiatric patients

S. Gerber 2011

Long term acute care hospital
Session Overview

- IDPH survey of CDI prevention practices
- Key prevention measures*
  - Hand hygiene
  - Contact Precautions
  - Environmental cleaning
  - Accurate diagnostic testing and rapid reporting of results
  - Antimicrobial stewardship
  - Inter-facility communication of CDI risk factors at transfers of care

- Case scenario

IDPH CDI Prevention Practices Surveys, May 2012

• Separate surveys administered to LTCFs and hospitals enrolled in ICE C. diff campaign by May 2012

• Number of respondents:
  – 66 LTCFs
  – 81 Hospitals
<table>
<thead>
<tr>
<th>SURVEY QUESTION</th>
<th>YES N (%)</th>
<th>NO N (%)</th>
<th>DO NOT KNOW N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility has a mechanism to identify, at admission, residents previously infected or colonized with <em>C. diff</em> [N=63]</td>
<td>46 (73)</td>
<td>16 (25)</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Our facility performed housewide surveillance for <em>C. diff</em> infections among residents [N=62]</td>
<td>49 (78)</td>
<td>13 (21)</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Our facility performed targeted surveillance (e.g., on specific units) for <em>C. diff</em> infections among residents [N=62]</td>
<td>38 (61)</td>
<td>22 (36)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>CDI rates tracked over time to identify trends (e.g., monthly rates, quarterly rates, annual rate) [N=63]</td>
<td>48 (76)</td>
<td>14 (22)</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Created CDI summary reports (e.g., trends, policy adherence rates) [N=63]</td>
<td>36 (57)</td>
<td>26 (41)</td>
<td>1 (2)</td>
</tr>
</tbody>
</table>
Why do surveillance?

• Monitor what is happening so you know when something is not ‘normal’
• Identify areas to target for improvement
• Timely response to protect the health of residents
• Save money by reducing infections
Recommended Practice (APIC)

- Assess population
- Select measures
- Use definitions
- Collect data
- Calculate rates
- Risk stratification
- Report and use information

Developing a surveillance plan

- How will I define *C. difficile* events in my facility?

- Potential criteria include:
  - Clinical symptoms of **gastroenteritis** including new or acutely worsening diarrhea associated with abdominal upset, nausea, loss of appetite
  - **Fever** and **elevated WBC counts** may also be present
  - **New antibiotic starts** for suspected CDI
  - **Positive lab** identifying *C. difficile* toxin in stool specimen

- Focus only on positive laboratory events may increase consistency and ease of surveillance

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Division of Healthcare Quality Promotion, Center for Disease Control and Prevention
Developing a surveillance plan

- Proposed definition of LCF-onset, incident *C. difficile* HAI event:
  - Positive lab specimen obtained from residents in the LTCF
  - Specimen obtained **on or after Day 4** from date of admission
  - Resident will not have had a prior positive lab for *C. difficile* in the prior 8 weeks from the time of the current lab event

- In order to capture these events, there must be a way for the facility to obtain all results of stool specimens tested for *C. difficile* from their residents

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Developing a surveillance plan

- How will I report my *C. difficile* incident case rates?
  - Numerator (x): # incident infections
  - Denominator (y): Number of resident days in the facility
  - Standardized by a constant (k) so the rates are comparable

\[
\text{Rate} = \frac{x (\text{number of infxs})}{y (\text{residents at risk or "resident days"})} \times k \text{ (constant)}
\]

- Calculate your rates using the same time period for the numerator and denominator (e.g., each month, or each quarter)
- For *C. difficile*, the reporting constant (k) = 10,000
Developing a surveillance plan

- What additional information might be informative in understanding your CDI incident rates?
  - Are the cases clustering in one unit or location?
  - Are the rates of *C diff.* infections higher in recent admits from the hospital (post-acute care) vs. long-stay residents?

- Stratifying your rates by location or by resident services to help understand the way CDI presents in your facility

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Reporting HAI rates over time

LTCF-onset *C. difficile* incidence rates by month

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Linking prevention efforts to surveillance data

- What are the **process measures** that can impact *C. difficile* transmission and infection in my facility?
  - Hand hygiene
  - Rapid identification and isolation of symptomatic individuals
  - Adherence to contact precautions when residents have active infection with *C. difficile*
  - Good environmental and equipment cleaning practices
  - Antibiotic stewardship

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Linking prevention efforts to surveillance data

LTCF-onset *C. difficile* incidence rates by month

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### IDPH CDI Prevention Practices LTCF Survey, May 2012: *IC Culture*

<table>
<thead>
<tr>
<th>SURVEY QUESTION</th>
<th>ALWAYS N (%)</th>
<th>OFTEN N (%)</th>
<th>SOMETIMES N (%)</th>
<th>RARELY; NEVER N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private room used for patients with CDI [N=63]</td>
<td>YES 36 (57)</td>
<td></td>
<td></td>
<td>NO 27 (43)</td>
</tr>
<tr>
<td>Hand hygiene policy adherence measured in at least 1 unit [N=62]</td>
<td>16 (26)</td>
<td>26 (42)</td>
<td>17 (27)</td>
<td>3 (5) 0 (0)</td>
</tr>
<tr>
<td>Compliance w/ appropriate environmental cleaning practices monitored by IP staff [N=62]</td>
<td>11 (18)</td>
<td>18 (29)</td>
<td>21 (34)</td>
<td>8 (13) 4 (7)</td>
</tr>
<tr>
<td>Contact Precautions adherence measured (wearing gloves or gowns) [N=62]</td>
<td>15 (24)</td>
<td>35 (57)</td>
<td>9 (15)</td>
<td>3 (5) 0 (0)</td>
</tr>
</tbody>
</table>
IDPH CDI Prevention Practices Hospital Survey, May 2012: *IC Culture*

<table>
<thead>
<tr>
<th>SURVEY QUESTION</th>
<th>ALWAYS N (%)</th>
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<th>SOMETIMES N (%)</th>
<th>RARELY; NEVER N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private room used for patients with CDI [N=79]</td>
<td>68 (86)</td>
<td>10 (13)</td>
<td>0 (0)</td>
<td>0 (0) 1 (1)</td>
</tr>
<tr>
<td>Hand hygiene policy adherence measured in at least 1 unit [N=78]</td>
<td>42 (54)</td>
<td>31 (40)</td>
<td>4 (5)</td>
<td>1 (1) 0 (0)</td>
</tr>
<tr>
<td>Compliance w/ appropriate environmental cleaning practices monitored by IP staff [N=76]</td>
<td>7 (9)</td>
<td>29 (38)</td>
<td>17 (22)</td>
<td>16 (21) 7 (9)</td>
</tr>
<tr>
<td>Contact Precautions adherence measured (wearing gloves or gowns) [N=78]</td>
<td>19 (24)</td>
<td>38 (49)</td>
<td>13 (17)</td>
<td>6 (8) 2 (3)</td>
</tr>
</tbody>
</table>
C diff. prevention challenges

- Spores are not killed by alcohol hand rubs
  - the action of rubbing hands with soap under water removes the spores

- Spores are resistant to common cleaners
  - require bleach or a disinfectant with sporicidal activity to be effectively killed

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Hand Hygiene

- Hand hygiene should be a cornerstone of prevention efforts
- As part of a hand hygiene intervention, consider:
  - Ensuring easy access to soap and water/alcohol-based hand gels
  - HCP knowledge about appropriate HH practices
  - Observation/feedback of compliance - particularly around high-risk situations
  - Feedback – “Just in time” feedback if failure to perform hand hygiene observed
- Although not a primary recommendation, there is evidence that hand washing with soap and water may be preferred over alcohol-based hand rubs following care of a resident with CDI

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Lack of Efficacy of Alcohol-Based Handrub Against *C. difficile*

<table>
<thead>
<tr>
<th>Interventions compared</th>
<th>Mean log reduction (95% CI), $\log_{10}$ CFU/mL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention 1</strong></td>
<td><strong>Intervention 2</strong></td>
</tr>
<tr>
<td>Warm water and plain soap</td>
<td>No hand hygiene</td>
</tr>
<tr>
<td>Warm water and plain soap</td>
<td>Alcohol-based handrub</td>
</tr>
<tr>
<td>Cold water and plain soap</td>
<td>No hand hygiene</td>
</tr>
<tr>
<td>Cold water and plain soap</td>
<td>Alcohol-based handrub</td>
</tr>
<tr>
<td>Warm water and plain soap</td>
<td>Antiseptic hand wipe</td>
</tr>
<tr>
<td>Warm water and antibacterial soap</td>
<td>No hand hygiene</td>
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<td>Cold water and plain soap</td>
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<tr>
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<td>Cold water and plain soap</td>
</tr>
<tr>
<td>Alcohol-based handrub</td>
<td>No hand hygiene</td>
</tr>
</tbody>
</table>

When should hand hygiene be performed?

- Before and after physical contact with a resident
- Before donning gloves and after removing gloves
- After handling soiled or contaminated items and equipment, including linens
- Before performing an invasive procedures
- Before handling sterile or clean supplies
- When hands are visibly dirty or soiled with blood and/or bodily fluids*

- After care of a resident with known or suspected infectious diarrhea*

- Before and after eating or handling food*

- After personal use of bathroom*

* Situations where soap and water preferred over alcohol-based hand rub

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Hand Hygiene and *C. difficile*

- Hand hygiene is the primary means of preventing transmission of infections...
- What is your facility’s current message?

VS.

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Your 5 moments for hand hygiene at the point of care*

1. Before patient contact
2. Before aseptic task
3. After body fluid exposure risk
4. After patient contact
5. After contact with patient surroundings

*Adapted from the WHO Alliance for Patient Safety 2006

Based on the 'My 5 moments for Hand Hygiene', URL: http://www.who.int/gpsc/5may/background/5moments/en/index.html © World Health Organization 2009. All rights reserved.
How to Handwash?

WASH HANDS WHEN VISIBLE SOILED! OTHERWISE, USE HANDRUB

Duration of the entire procedure: 40-60 seconds

0. Wet hands with water;
1. Apply enough soap to cover all hand surfaces;
2. Rub hands palm to palm;
3. Right palm over left dorsum with interlaced fingers and vice versa;
4. Palm to palm with fingers interlaced;
5. Backs of fingers to opposing palms with fingers interlocked;
6. Rotational rubbing of left thumb clasped in right palm and vice versa;
7. Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;
8. Rinse hands with water;
9. Dry hands thoroughly with a single use towel;
10. Use towel to turn off faucet;
11. Your hands are now safe.

Hand Washing
iScrub

Another free hand hygiene observation tool. Developed at University of Iowa. Can be customized to adapt to specific units and tasks
Hand Hygiene Observations iScrub

Fries J. #69. Presented at: SHEA 2011 Annual Scientific Meeting; April 1-4, 2011; Dallas.
Edited locations and notes

<table>
<thead>
<tr>
<th>Location</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen/Pantry</td>
<td></td>
</tr>
<tr>
<td>Nurses Station</td>
<td></td>
</tr>
<tr>
<td>Med Room</td>
<td></td>
</tr>
<tr>
<td>MD Office</td>
<td></td>
</tr>
<tr>
<td>Therapy Department</td>
<td></td>
</tr>
<tr>
<td>Senior Fit</td>
<td></td>
</tr>
<tr>
<td>Activity Room</td>
<td></td>
</tr>
<tr>
<td>Shepherd's Flock</td>
<td></td>
</tr>
<tr>
<td>Cherished Place</td>
<td></td>
</tr>
<tr>
<td>Clean Utility</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attach Note</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Just In Time Training Done</td>
<td></td>
</tr>
<tr>
<td>C. Difficile Infection</td>
<td></td>
</tr>
<tr>
<td>Gloves Changed Hand Hygiene...</td>
<td></td>
</tr>
<tr>
<td>Gloves No Hand Hygiene</td>
<td></td>
</tr>
<tr>
<td>Signing Out Meds After Given...</td>
<td></td>
</tr>
<tr>
<td>Personal Body Fluids Blowing...</td>
<td></td>
</tr>
<tr>
<td>Touching Common Equipment</td>
<td></td>
</tr>
<tr>
<td>Hand Wash Less Than 15 Seco...</td>
<td></td>
</tr>
<tr>
<td>Correct Technique</td>
<td></td>
</tr>
</tbody>
</table>
### Exports to Excel via e-mail

<table>
<thead>
<tr>
<th>timestamp</th>
<th>location</th>
<th>HCW</th>
<th>opportunity</th>
<th>deviceName</th>
<th>note</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/21/12</td>
<td>Dining Room 2nd floor</td>
<td>Nurse's Aide</td>
<td>Before Touching a Patient</td>
<td>Mommarazzi2</td>
<td>No Hand Washing</td>
</tr>
<tr>
<td>6/21/12</td>
<td>Dining Room 2nd floor</td>
<td>Nurse's Aide</td>
<td>After Touching a Patient</td>
<td>Mommarazzi2</td>
<td>No Hand Washing</td>
</tr>
<tr>
<td>6/22/12</td>
<td>Med Pass</td>
<td>Nurse</td>
<td>Before Touching a Patient</td>
<td>Mommarazzi2</td>
<td>Correct Technique</td>
</tr>
<tr>
<td>9:29</td>
<td>Shower Room</td>
<td>CNA</td>
<td>Before Touching a Patient</td>
<td>iPhone</td>
<td>Gloves No Hand Hygiene</td>
</tr>
<tr>
<td>9:30</td>
<td>Shower Room</td>
<td>CNA</td>
<td>Before Clean/Aseptic Procedures</td>
<td>iPhone</td>
<td></td>
</tr>
<tr>
<td>9:30</td>
<td>Shower Room</td>
<td>CNA</td>
<td>Before Clean/Aseptic Procedures</td>
<td>iPhone</td>
<td></td>
</tr>
<tr>
<td>9:30</td>
<td>Shower Room</td>
<td>CNA</td>
<td>After Touching a Patient</td>
<td>iPhone</td>
<td></td>
</tr>
<tr>
<td>9:31</td>
<td>Shower Room</td>
<td>CNA</td>
<td>Before Clean/Aseptic Procedures</td>
<td>iPhone</td>
<td>Gloves No Hand Hygiene</td>
</tr>
<tr>
<td>9:32</td>
<td>Shower Room</td>
<td>CNA</td>
<td>After Touching a Patient</td>
<td>iPhone</td>
<td>Hand Wash Less Than 15 Seconds</td>
</tr>
</tbody>
</table>
Examples of iScrub Feedback opportunities

HCW opportunity

- Hand Hygiene Nurse Before Touching a Patient: No
- Nurse After Touching Patient Surroundings: Rub
- Nurse Before Touching a Patient: No
- Nurse After Touching a Patient: No
- Nurse Before Touching a Patient: Wash
- Nurse After Touching a Patient: Rub
- Nurse Before Touching a Patient: Rub
- Nurse Med Pass After Touching a Patient: Rub
- Nurse Med Pass Before Touching a Patient: Rub
- Nurse Med Pass After Touching a Patient: Rub
- Nurse Med Pass After Touching Patient Surroundings: Rub
- Nurse Med Pass Before Touching a Patient: Rub
- Nurse Med Pass After Touching a Patient: No
- Nurse Med Pass After Touching a Patient: Wash

4 Missed Hand Hygiene Opportunities

8 Correct Hand Hygiene Opportunities 67% Participation
### Infection Management

#### Survey Question

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Precautions used for suspect CDI [N=63]</td>
<td>55 (87)</td>
<td>8 (13)</td>
</tr>
<tr>
<td>Contact Precautions used for active CDI [N=63]</td>
<td>63 (100)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>
### IDPH CDI Prevention Practices Hospital Survey, May 2012: *Infection Management*

<table>
<thead>
<tr>
<th>SURVEY QUESTION</th>
<th>YES N (%)</th>
<th>NO N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine placement of suspect CDI patients on Contact Precautions prior to lab confirmation [N=79]</td>
<td>71 (90)</td>
<td>8 (10)</td>
</tr>
<tr>
<td>Dedicated noncritical medical items (e.g., B/P cuff, stethoscope) used for CDI patients [N=79]</td>
<td>71 (90)</td>
<td>8 (10)</td>
</tr>
</tbody>
</table>
Methods to Prevent Transmission of *C. difficile* in HCF

**Barrier Precautions:**

<table>
<thead>
<tr>
<th>Precaution</th>
<th>Clinical Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel wear gloves</td>
<td>proven</td>
</tr>
<tr>
<td>handwashing</td>
<td>probable</td>
</tr>
<tr>
<td>gowns</td>
<td>untested</td>
</tr>
<tr>
<td>patient cohorting</td>
<td>probable</td>
</tr>
</tbody>
</table>

**Cleaning, Disinfection, Disposables:**

<table>
<thead>
<tr>
<th>Precaution</th>
<th>Clinical Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>patient room disinfection</td>
<td>proven</td>
</tr>
<tr>
<td>disposable rectal thermometers</td>
<td>proven</td>
</tr>
<tr>
<td>endoscope disinfection</td>
<td>proven</td>
</tr>
</tbody>
</table>
Glove use vs. hand hygiene for preventing CDI transmission

“Healthcare personnel who care for patients with known *C. difficile* colonization or infection wear gloves, which means that *C. difficile* contamination on hands, if present at all, may be so low that transfer to another hand or surface would not be clinically meaningful”

Ellingson & McDonald  Infect ContrHospEpi 2010;36:571-573.

“Since spores may be difficult to remove from hands even with hand washing, adherence to glove use, and Contact Precautions in general, should be emphasized for preventing *C. difficile* transmission via the hands of healthcare personnel

Contact Precautions

• Involves use of gown and gloves for direct resident care
  – Don equipment prior to room entry
  – Remove prior to room exit

• Use of dedicated non-essential items may help decrease transmission due to contamination
  – Blood pressure cuffs; Stethoscopes; IV poles and pumps

• Private rooms or cohorting residents if possible
  – Separate toileting equipment for roommates who can’t be cohorted

• Observe adherence to practices - particularly high-risk situations

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Challenges with Contact Precautions

• Lack of private rooms / limited ability to move residents
  – Moving people is disrupting to residents and staff
  – Ability to identify carriers to cohort is limited (no active surveillance in most facilities)

• Determining duration of contact precautions
  – Unable to restrict resident mobility and participation in social events/therapy for prolonged periods
  – Unlikely to document clearance of carriage

• Large population of residents with unrecognized *C. difficile* carriage
  – Underestimating the sources of potential transmission

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Nurse Interacts with patient, family, co-workers, lab, pharmacy and prescribing physician or APN

Participates in care decisions

Orders based many times on info from nurses

Patient and Family

Long Term Care

RN, LPN

MD, APN, PA

Barriers and Expectations
Infection Prevention and Control in LTC

Infection Prevention and Control is not a “Medical Model Issue”. It is not a “Skilled Care” Issue or a “Hospital” Issue
Infection Prevention and Control in LTC is a **Human** issue, and needs to be dealt with within a biopsychosocial and spiritual framework.
Revision to CMS F241

The restriction of posting signs:

“This restriction does not include the CDC isolation precaution transmission based signage for reasons of public health protection, as long as the sign does not reveal the type of infection”

Consider contact precautions during direct care (STANDARD!)

High risk exposures for *C. difficile* transmission if known carrier (also high risk for acquisition if non-carrier)

- Incontinence
- Current antibiotic use
- Presence of wounds (fresh/new, multiple, increased stage/size, active drainage)
- Indwelling devices (IV lines, urinary catheters, tracheostomy, PEG tubes)

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Discontinuing Contact Precautions

• There is no single ‘best’ strategy for discontinuation of contact precautions for *C. difficile* carriers (in any setting)

• Current recommendation is to discontinue precautions once diarrhea has resolved

• Communication to care-givers and clear documentation of rationale is key

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Consider contact precautions and restricted movement within NH

- Active symptoms of infection
  - Nausea/vomiting
  - New or worsening diarrhea
  - New, undiagnosed fever

- Precautions and restrictions time-limited
  - Only until diagnosis made (e.g. infection excluded) and/or symptoms resolve

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Common Sense Contact Precaution C’s

- Clean Hands
- Clean Clothes
- Clean Equipment
- Contained Drainage
- Covered Wounds
Rationale for Considering Extending Isolation Beyond Duration of Diarrhea

Current practices for discontinuing CDI precautions: Canada, 2005

Table 1. Practices for discontinuing *C. difficile* infection precautions in Canadian health care facilities, by facility type (n = 852)

<table>
<thead>
<tr>
<th>Precautions discontinued</th>
<th>Acute care (n = 132), n (%)</th>
<th>Long-term care (n = 530), n (%)</th>
<th>Mixed care (n = 190), n (%)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>After patient has been asymptomatic for</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>48 hours</td>
<td>37 (28)</td>
<td>145 (27)</td>
<td>45 (24)</td>
<td>.571</td>
</tr>
<tr>
<td>72 hours</td>
<td>49 (37)</td>
<td>172 (33)</td>
<td>58 (31)</td>
<td>.451</td>
</tr>
<tr>
<td>Other</td>
<td>0 (0)</td>
<td>1 (0.2)</td>
<td>0 (0)</td>
<td>*</td>
</tr>
<tr>
<td>After treatment has been initiated</td>
<td>0 (0)</td>
<td>6 (1)</td>
<td>3 (2)</td>
<td>*</td>
</tr>
<tr>
<td>After treatment has ended and no relapse has been documented within 48 hours</td>
<td>23 (17)</td>
<td>132 (25)</td>
<td>47 (25)</td>
<td>.181</td>
</tr>
<tr>
<td>Precautions are continued until discharge</td>
<td>1 (1)</td>
<td>16 (3)</td>
<td>4 (2)</td>
<td>.368</td>
</tr>
<tr>
<td>Other policy for discontinuing</td>
<td>22 (17)</td>
<td>58 (11)</td>
<td>33 (17)</td>
<td>.037</td>
</tr>
</tbody>
</table>

*P value not calculated, zero-sum cells.

### IDPH CDI Prevention Practices LTCF Survey, May 2012: *Environmental cleaning*

<table>
<thead>
<tr>
<th>SURVEY QUESTION</th>
<th>ALWAYS N (%)</th>
<th>OFTEN N (%)</th>
<th>SOMETIMES N (%)</th>
<th>RARELY; NEVER N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance w/ appropriate environmental cleaning practices monitored by IP staff [N=62]</td>
<td>11 (18)</td>
<td>18 (29)</td>
<td>21 (34)</td>
<td>8 (13)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4 (7)</td>
</tr>
</tbody>
</table>
### Survey Question

<table>
<thead>
<tr>
<th>SURVEY QUESTION</th>
<th>YES N (%)</th>
<th>NO N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleach product used for environmental disinfection in CDI rooms [N=79]</td>
<td>71 (90)</td>
<td>8 (10)</td>
</tr>
<tr>
<td>Bleach product used for daily cleaning [N=71]</td>
<td>49 (69)</td>
<td>22 (31)</td>
</tr>
<tr>
<td>Bleach product used for terminal cleaning [N=71]</td>
<td>56 (79)</td>
<td>15 (21)</td>
</tr>
</tbody>
</table>
Environmental Cleaning

- Bleach can kill spores, whereas other standard disinfectants cannot.
- Limited data suggest cleaning with bleach (1:10 dilution prepared fresh daily) reduces *C. difficile* transmission.
- Two before-after intervention studies demonstrated benefit of bleach cleaning in units with high endemic CDI rates.
- Therefore, bleach may be most effective in reducing burden where CDI is highly endemic.

Daily disinfection of high-touch surfaces – “Source Control”

Environmental Cleaning Checklist: Surface Categories

<table>
<thead>
<tr>
<th>Category</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Touch I</td>
<td>Bed rails, tray tables, IV pole</td>
</tr>
<tr>
<td>High Touch II</td>
<td>Call box/button, telephone, bedside table handle</td>
</tr>
<tr>
<td>High Touch III</td>
<td>Chair, room sink, room light switch, room inner doorknob</td>
</tr>
<tr>
<td>Bathroom Surfaces</td>
<td>Inner doorknob, light switch, handrails, sinks, toilet seat, toilet flush handle, toilet bedpan cleaner</td>
</tr>
<tr>
<td>Equipment</td>
<td>IV pump control, monitor controls, monitor touch screen, monitor cables, ventilator panel</td>
</tr>
</tbody>
</table>

- Adapted from: CDC HAI Environmental Cleaning Excel worksheet.
- Available at: http://www.cdc.gov/HAI/prevent/prevention_tools.html
Technical Challenges: contact time, pre-cleaning, mechanical removal

Environmental cleaning

• Education alone doesn’t work
• Essential to provide routine monitoring and feedback
• Removal of marker may not correlate with all high touch surfaces on one object (overbed table)
• Confusion about who cleans what
• Portable equipment

Edited from C. Donsky, Louis Stokes VA Medical Center, Cleveland, Ohio IDPH ICE Cdiff webinar, May 31, 2012
Sporicidal products

• “Clean room surfaces with bleach or another EPA-approved, spore-killing disinfectant after a patient with C. difficile has been treated there.” CDC, 2012 Vital Signs report

• Other options:
  – Virasept (Ecolab)
  – Accelerated H2O2
### SURVEY QUESTION:
Type of *C. diff* testing (check all that apply)

<table>
<thead>
<tr>
<th></th>
<th>RESPONSE COUNT [N=77]</th>
<th>RESPONSE PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCR</td>
<td>38</td>
<td>49</td>
</tr>
<tr>
<td>EIA for toxin</td>
<td>35</td>
<td>46</td>
</tr>
<tr>
<td>Cytotoxin assay</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Stool antigen</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td><em>C. diff</em> culture</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>SURVEY QUESTION</td>
<td>YES N (%)</td>
<td>NO N (%)</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>-----------</td>
<td>----------</td>
</tr>
<tr>
<td>Does lab have a rejection policy for FORMED stools [N=79]</td>
<td>64 (81)</td>
<td>15 (19)</td>
</tr>
<tr>
<td>Does lab have a rejection policy for duplicate stool specimens [N=78]</td>
<td>38 (49)</td>
<td>40 (51)</td>
</tr>
<tr>
<td>Is there a system to rapidly (within 24 hours following lab identification) notify staff of new patients with CDI [N=79]</td>
<td>76 (96)</td>
<td>3 (4)</td>
</tr>
</tbody>
</table>
Case Study: Dr. P

Retrospective Chart Review
Resident and family interview
Lessons learned
Dr. P Case History

• Lived with his wife at home until current illness
• Health started to decline after surgery for spinal stenosis and hospitalization in 2 hospitals and with stay in 2 long term care facilities between 12/28/2008 and 1/14/2009.
• Had “Watery diarrhea” prior to discharge from Hospital B on 1/13/2009
• Admitted to LTCF B 1/14/2009
• Started to have loose stools/ “diarrhea”, on 1/18/2009
## Current and Historical Meds

### Ordered Medication 2009

- Florastor,
- Synthroid,
- Tylenol,
- Mylanta,
- MOM,
- Glucosamine,
- fish oil,
- Multivitamins,
- Pepto Bismol,
- Metamucil,
- Immodium and Lomotil when diarrhea started

### Antibiotics

- Amoxicillin January 2009
- Cipro July, 2009
- Levaquin July 2009
- Flagyl July 2009
- Z-Pac March 2010
- Septra DS July and August 2010
- Septra DS September
- Macrobid 100 mg daily “for life”
- Vanco January 2011**
- Flagyl February 2011
- Vanco February and
- Hospitalized March 2011: Flagyl IV and PO
  - Vanco March 2011 with Taper

**Confirmed C-diff DNA Feb 2011**
Other Interventions tried prior to positive *C-diff*

- Florastor
- BRAT Diet
- Lactose Free Diet
- Universal Gloving during care
- Care plan focused on recurring UTI with goals
  - “resident will not experience UTI”
  - “Obtain UA/C&S for any SS of UTI noted”
  - “Notify MD as soon as result of specimen comes in”
  - “Obtain antibiotics as warranted”
- Care Plan did not address chronic loose stools or antimicrobial stewardship
Diagnostics

• Know your lab provider
• Does your lab have rejection criteria (do you?)
• What is the turn around time for results?
• Do you place patients with diarrhea on contact isolation before you have a diagnosis?
Lessons Learned from our Case Study

• To detect *C-diff* toxin in stool, it must be collected, refrigerated and tested quickly.

• Toxin is not stable at room temperature- False negative testing if this is the only laboratory test done

• A sample collected in the evening, left at room temperature, and tested the following day - MAY NOT give accurate results- Dangers?
  – False Negative- False sense of security
  – Delay in implementing Transmission Based Precautions
Antimicrobial stewardship

• Does the patient really need another urinalysis?
Excess Use of Proton Pump Inhibitors (PPI) with Lack of Diagnostic Indications in 22 Midwestern Skilled Nursing Facilities

- Rates of PPI use were determined, and compared to diagnostic codes.
- Of 1381 total admissions, 1101 (79.7%) were prescribed PPI.
- Of these, 996 patients (90.5%) were prescribed PPI without a proven diagnosis.
- Gastroesophageal reflux disease (GERD) tended to be the diagnosis used most frequently for PPIs, but there was usually no follow-up or proof of active GERD.
- There was no appropriate diagnosis for PPI use in 716 (65%) of those admitted during the study period.
- Concurrent therapy with non-steroidal anti-inflammatory drugs (NSAIDS) (including aspirin) and/or anticoagulant therapy (warfarin) was prescribed in 382 (34.6%) patients.
- Total cost of PPIs prescribed from January 2010 to June 2011 was $348,414.00.

Burdsall, et al. 2012  unpublished manuscript
Does the patient need to continue on PPIs?

Conclusion

- There is significant over-use of PPIs in the study population.
- Even when use of NSAIDS and anticoagulant therapy were taken into consideration as valid reasons for PPI use, 615 (55.9%) patients were prescribed PPI without appropriate diagnosis.
- Considering older adults’ underlying medical conditions and frailty, the unnecessary use of PPIs may lead to increased personal and economic cost.
Interfacility Infection Prevention Transfer Form

When transferring patient/resident, please complete to the best of your ability to assist with care transitions.

Patient Information

Last Name: ______________________  First Name: ______________________
Date of Birth: ___/___/____

Isolation Precautions

The patient currently requires the following type(s) of isolation precautions.

- Contact precautions. Reason: ______________________
- Droplet precautions. Reason: ______________________
- Airborne precautions. Reason: ______________________

☐ The patient DOES NOT require isolation.

Infection/Colonization History (check all that apply)

- MRSA (Methicillin-resistant Staphylococcus aureus)
- VRE (Vancomycin-resistant enterococci)
- Clostridium difficile
- Any MDRO gram-negative bacteria (multidrug-resistant). If known, please also specify:
  - Carbapenem-resistant Enterobacteriaceae (examples: Klebsiella or E. coli with KPC, NDM-1)
  - Acinetobacter, multidrug-resistant
Infection Control

“Wise and humane management of the patient is the best safeguard against infection.”

Florence Nightingale
Acknowledgements

• Nimalie Stone, MD, MS
• Judy Conway, RN, BS, CIC
• Kingsley Weaver, MPH
<table>
<thead>
<tr>
<th>SURVEY QUESTION</th>
<th>STRONGLY AGREE N (%)</th>
<th>AGREE N (%)</th>
<th>NEUTRAL N (%)</th>
<th>DISAGREE; STRONGLY DISAGREE N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff received <em>C. diff</em> training &amp; education [N=63]</td>
<td>32 (51)</td>
<td>26 (41)</td>
<td>3 (5)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Hospital: Staff education/training provided about reducing CDI transmission</td>
<td>62 (80)</td>
<td></td>
<td></td>
<td>16 (20)</td>
</tr>
<tr>
<td>(training may include other issues but must specifically review facility’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CDI control program &amp; include info on how CDI is transmitted &amp; measures to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>prevent transmission) [N=78]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff have knowledge about <em>C. diff</em> [N=63]</td>
<td>26 (41)</td>
<td>27 (43)</td>
<td>8 (13)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Preventing CDI is a challenge [N=63]</td>
<td>5 (8)</td>
<td>8 (13)</td>
<td>16 (25)</td>
<td>23 (37)</td>
</tr>
<tr>
<td>Staff turnover had an impact on CDI prevention [N=63]</td>
<td>4 (6)</td>
<td>3 (5)</td>
<td>13 (21)</td>
<td>24 (38)</td>
</tr>
</tbody>
</table>
What concentration of bleach is most effective?