Emerging Novel Pathogens-Enhanced Barrier Precautions

Infection Prevention in Nursing Homes

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"Let me guess...it's contagious!"
Two IP approaches
“Go long or go wide?”

“Vertical interventions”
- Aim to reduce infection risk from a “targeted”, specific pathogen
- Examples: ASC or swabs for asymptomatic carriers (MRSA, VRE, certain MDR-GNRs), contact precautions for infected patients, and targeted decolonization

“Horizontal interventions”
- Aim to reduce infection risk from a broad range of pathogens that are not pathogen-specific
- Examples: hand hygiene, standard precautions, universal CHG bathing, antimicrobial stewardship, enhanced environmental cleaning, *Enhanced Barrier Precautions in Nursing homes*
Breaking the Chain

How Can You Break the Chain of Infection?

Education
• Hand hygiene
• Proper glove use
• Clean rooms
• Disinfected surfaces
• Proper medical device care and maintenance

Ensure Patients and Residents have
• Good personal hygiene
• Covered cuts and wounds
• Isolation and enhances barrier precautions
• No unnecessary antibiotics
• Proper waste disposal
The High Cs of Caring for Residents
Collaborative Approach
Families and Staff working together

- Clean Hands and Gloves
- Clean Clothes
- Clean Equipment and Environment
- Contained Drainage – Includes urine and feces
- Covered Wounds
- Careful Antibiotic Use

Do not be afraid to speak up!
Does Hand Hygiene Matter?

National trends are just below 50% for health care workers who properly sanitize their hands.

From 2000-2009 almost 9% of US nursing homes received a deficiency citation for HH in annual inspection. 66.3% were cited at “D” level for more than minimal harm.

2,000,000 infections, 100,000 lives lost, 40,000 lives could be saved just by performing hand hygiene before we touch the patient or resident!

Have ABHR at Point of Care in your facility!
Lack of sinks available!!!
Be someone who has Healing Hands
Environmental Cleaning
Glove hygiene means NOT wearing gloves everywhere when they are contaminated!
After touching the resident or resident and environment: Study of 131 Healthcare workers hands were cultured 75% of ungloved hands, 9% of gloved hands had VRE on them

Gloves do not protect HCW 100%
Perform Hand Hygiene = Glove Hygiene

Change Gloves!

Never go from dirty to clean sites without removing gloves and performing HH
Change gloves ► hand hygiene ► don clean gloves when going from one body site to another

– two different wounds at two different body sites
– between oral and wound care
– between oral care and catheter care
– assisting in toileting and then assisting in ADLs
Standard Precautions- WHEN?
Standard Precautions

Recommend PPE and other infection control practices to prevent transmission in any healthcare setting.

Decisions about PPE use determined by type of clinical interaction with resident.

Assumes blood and body fluid of ANY resident could be infectious.

??? IS IT AVAILABLE??? Where are the gowns, goggles, face shields in LTC settings? Gloves are everywhere....
Transmission-based Precautions

WHEN?
PPE for Transmission Based Precautions

Contact Precautions
- Gown and gloves for contact with resident or environment of care (e.g., medical equipment, environmental surfaces)
- In some instances these are required for entering resident’s environment

Droplet Precautions
- Isolation mask within 3 feet of resident
- Mask upon entry to room if resident is coughing

Airborne Precautions
- Particulate respirator
- Negative pressure isolation room also required
Contact Precautions

• Pathogen transmission is not completely interrupted by Standard Precautions
• To prevent transmission of infectious agents, like MDROs, that are spread by direct or indirect contact with the resident or the patient or resident’s environment
• Requires the use of gown and gloves on every entry into a patient or resident’s room
• The resident is given dedicated equipment (i.e., stethoscope and BP cuff)
• The resident is placed into a private room.
  o When private rooms are not available, some patients or residents (affected with the same pathogen) may be cohorted, or grouped together
• Patients or residents on contact precautions should be restricted to their rooms except for medically necessary care and restricted from participation in group activities
• Because contact precautions require room restriction, they are generally intended to be time limited and, when implemented, should include a plan for discontinuation or de-escalation.
When to Use PPE

Standard and Enhanced Barrier Precautions
## Antibiotic Resistant Threats

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Resistance of Concern</th>
<th>Reservoir</th>
<th>Common Infections</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Enterobacteriaceae</em></td>
<td>Carbapenem, Colistin</td>
<td>Large intestine</td>
<td>Pneumonia, urinary tract infection</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>Carbapenem, Colistin</td>
<td>Soil, water</td>
<td>Pneumonia, urinary tract infection, wound</td>
</tr>
<tr>
<td><em>Acinetobacter baumannii</em></td>
<td>Carbapenem, Colistin</td>
<td>Soil, water</td>
<td>Pneumonia, urinary tract infection</td>
</tr>
<tr>
<td><em>Enterococcus spp.</em></td>
<td>Vancomycin</td>
<td>Large intestine</td>
<td>Urinary tract infection</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>Methicillin, Vancomycin</td>
<td>Nose, skin</td>
<td>Wound/abscess, Foodborne*</td>
</tr>
</tbody>
</table>
Antibiotic Resistant Germs can Spread like Wildfire

Antibiotic resistance can spread

• From people with and without symptoms of infections

• Between facilities

• Between germs
Carbapenem Resistance & Enterobacteriaceae

CP-CRE
- Carbapenemase Producing-Carbapenem Resistant Enterobacteriaceae
- First identified in the U.S. in 1996
- Most concerning resistance mechanism
  - Responsible for much of the spread of CRE in the U.S. and worldwide
- High mortality rates (i.e. sepsis 50%)
- Directly breaks down the carbapenem beta-lactam rings
- Can share their resistant code gene with other gram-negative bacteria
  - All bacteria are very good at sharing genes for antibiotic resistance
Now what?
Indiana CP-CRE Cases by District 2016-2018

<table>
<thead>
<tr>
<th>District</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>879</td>
</tr>
<tr>
<td>District 1</td>
<td>380</td>
</tr>
<tr>
<td>District 2</td>
<td>30</td>
</tr>
<tr>
<td>District 3</td>
<td>70</td>
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<td>District 4</td>
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<td>District 5</td>
<td>200</td>
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<td>District 6</td>
<td>90</td>
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<td>District 7</td>
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<td>District 8</td>
<td>17</td>
</tr>
<tr>
<td>District 9</td>
<td>17</td>
</tr>
<tr>
<td>District 10</td>
<td>5</td>
</tr>
</tbody>
</table>

*Preliminary 2018 data represents*
## Indiana CP-CRE Cases 2016-2018

### Organisms
- 664 *Klebsiella pneumoniae*
- 70 *Serratia marcescens*
- 53 *Escherichia coli*
- 42 *Enterobacter cloacae complex*
- 19 *Citrobacter freundii complex*
- 15 *Klebsiella oxytoca*
- 6 *Citrobacter koseri*
- 4 *Proteus mirabilis*
- 2 *Klebsiella aerogenes*

### Mechanisms
- 2 *Providencia rettgeri*
- 1 *Klebsiella ozaena*
- 1 *Klebsiella variicola*
- 1 *Leclercia adecarboxylata*
- 1 *Morganella morganii*

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPC</td>
<td>804</td>
</tr>
<tr>
<td>NDM</td>
<td>22</td>
</tr>
<tr>
<td>VIM</td>
<td>18</td>
</tr>
<tr>
<td>OXA-48-like</td>
<td>9</td>
</tr>
<tr>
<td>IMP</td>
<td>2</td>
</tr>
<tr>
<td>unknown</td>
<td>24</td>
</tr>
</tbody>
</table>

*Preliminary 2018 data represents 1/1/2018 – 7/31/2018*
Updated Cases- CP-CRE 2018 -2019

In Indiana during 2018, we had 367 confirmed cases of CP-CRE.*

In Indiana during the first quarter of 2019 (January 1-April 30), we have 90 confirmed cases of CP-CRE.*

*preliminary data (ISDH has completed 2018 data close-out but it’s not available just yet)
Novel or Targeted Organisms - OH MY!

- Pan- Resistant Organisms
- Carbapenemase-producing Enterobacteriaceae (CP-CRE)
- Carbapenemase producing Pseudomonas i.e. aeruginosa (CR-PA)
- Carbapenemase-producing Acinetobacter baumannii (AB)
- Candida auris- (C. auris)
Examples of high-contact resident care activities requiring gown and glove use for enhanced barrier precautions include:

• Dressing  •  Bathing/showering  •  Transferring  •  Providing hygiene  •  Changing linens  •  Changing briefs or assisting with toileting  •  Device care or use: central line, urinary catheter, feeding tube, tracheostomy/ventilator  •  Wound care: any skin opening requiring a dressing

Gown and gloves would not be required for resident care activities other than those listed above, unless otherwise necessary for adherence to standard precautions. Residents are not restricted to their rooms or limited from participation in group activities, however assure proper hand hygiene education for resident, caregivers and family.
Candida Auris (C. auris)

*Candida auris* (C. auris) is an emerging fungus that presents a serious global health threat. CDC is concerned about *C. auris* for 3 main reasons:

- It is often multidrug-resistant, meaning multiple antifungal drugs are less or not at all effective in treating *C. auris*.
- It is difficult to identify with standard laboratory methods, and it can be misidentified in labs without specific technology. Misidentification may lead to inappropriate management.
- It has caused outbreaks in healthcare settings. It is important to quickly identify *C. auris* in a resident so that facilities can take special precautions to stop its spread.
Candida Auris (C. auris)

Why is C. auris a problem?
• It causes serious infections
  o C. auris can cause blood stream and other invasive infections, particularly in residents in nursing homes who have multiple medical problems. More than 1 in 3 residents die within a month of C. auris infection.
• It is often multidrug-resistant
  o Antifungal medications commonly used to treat often Candida infections often don’t work for C. auris. Some C. auris isolates are resistant to all three major classes of antifungals.
• It is becoming more common
  o Although C. auris was just recognized in 2009, it has emerged quickly. Since then, it has been reported from over 20 countries, including the United States.
What do I do now?

1. Check the CDC website for the most up-to-date guidance on identifying and managing C. auris: [www.cdc.gov/fungal/candida-auris](http://www.cdc.gov/fungal/candida-auris).
2. Report possible confirmed cases immediately to your public health department.
3. Ensure adherence to CDC recommendations for infection control containment:
   a. Place resident in a single room if colonized or infected and begin contact precautions;
   b. Assess gown and glove use;
   c. Reinforce hand hygiene; and
   d. Coordinate with environmental services to disinfect with products effective against C. auris. Use “List K” at [www.epa.gov](http://www.epa.gov); quaternary cleaning agents do not work effective and using sporicidal including bleach products 1:10 solutions are recommended.
4. After consulting with public health, screening contacts of case residents to identify others that may be colonized with C. auris may be requested. Use the same infection control measures for residents that are colonized.
5. When a resident is transferred from your facility to another health care facility, clearly communicate with the IP at the transfer faculty regarding the residents C. auris status.
6. Use Enhanced Barrier Precautions guidance from the CDC. The guidance is available here: [https://www.cdc.gov/hai/containment/PPE-Nursing-Homes.html](https://www.cdc.gov/hai/containment/PPE-Nursing-Homes.html).

C. auris Outbreak data in US

Cases are categorized by the state where the specimen was collected. Most probable cases were identified when laboratories with current cases of C. auris reviewed past microbiology records for C. auris. Isolates were not available for confirmation. Early detection of C. auris is essential for containing its spread in healthcare facilities.

Clinical cases of Candida auris reported by U.S. states, as of July 31, 2019
Infection Control Risk Assessments (ICARs)

• Educational Response to District 1 on C. auris and CP-CRE by ISDH IP and AR-EPI

• Screening in some facilities that have had colonized and clinical cases by ISDH IP and AR-EPI

• IP LTC Course facilitated and designed by ISDH IP
Infection Risk During Transitions

- Increase risk of antibiotic resistant organism exposure
- Residents and patients colonized with antibiotic resistant organisms can increase risk
# ISDH Infection Control Transfer Form

![ISDH Infection Control Transfer Form](image-url)
Making infection prevention part of your daily practice. What you do matters most!
Believe that infection prevention is everyone’s responsibility
Any Questions?