

Emerging Novel Pathogens- Enhanced Barrier Precautions

Infection Prevention in Nursing Homes

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"Let me guess...it's contagious!"



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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

- **C**lean Hands and Gloves
- **C**lean Clothes
- **C**lean Equipment and Environment
- **C**ontained Drainage – Includes urine and feces
- **C**overed Wounds
- **C**areful Antibiotic Use



Do not be afraid to speak up!



The Chain of Infection



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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!!!**



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Be someone who has Healing Hands



What Have **YOU** Touched **Today?**

Viruses and bacteria can live for several hours on many surfaces.

- The IV Bag.
- The Stethoscope.
- The Clipboard Chart.
- The Blood Pressure Gauge.
- The Wheelchair.
- The Bed Rail.
- The Forceps Clamp.

Scrub Those Germs Away!

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Environmental Cleaning





Glove hygiene means NOT wearing gloves everywhere when they are contaminated!

The Inanimate Environment Can Facilitate Transmission



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%**

~ Contaminated surfaces increase cross-transmission ~

Abstract: The Risk of Hand and Glove Contamination after Contact with a VRE (+) resident Environment
Hayden M, ICAAC, 2001, Chicago, IL.



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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?



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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....



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A photograph of a person sitting in a wheelchair. The person is wearing a light-colored long-sleeved shirt and a blue mesh apron. The wheelchair has black handles and a black seat. The background is a blurred indoor setting with a pink and white patterned sofa. The text "Transmission-based Precautions WHEN?" is overlaid in a semi-transparent white box in the center of the image.

Transmission-based Precautions WHEN?



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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.
 - 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



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Antibiotic Resistant Threats

Pathogen	Resistance of Concern	Reservoir	Common Infections
<i>Enterobacteriaceae</i>	Carbapenem, Colistin	Large intestine	Pneumonia, urinary tract infection
<i>Pseudomonas aeruginosa</i>	Carbapenem, Colistin	Soil, water	Pneumonia, urinary tract infection, wound
<i>Acinetobacter baumannii</i>	Carbapenem, Colistin	Soil, water	Pneumonia, urinary tract infection
<i>Enterococcus</i> spp.	Vancomycin	Large intestine	Urinary tract infection
<i>Staphylococcus aureus</i>	Methicillin, Vancomycin	Nose, skin	Wound/abscess, Foodborne*

Antibiotic Resistant Germs can Spread like Wildfire

Antibiotic resistance can spread

- From people with and without symptoms of infections
- Between facilities
- Between germs



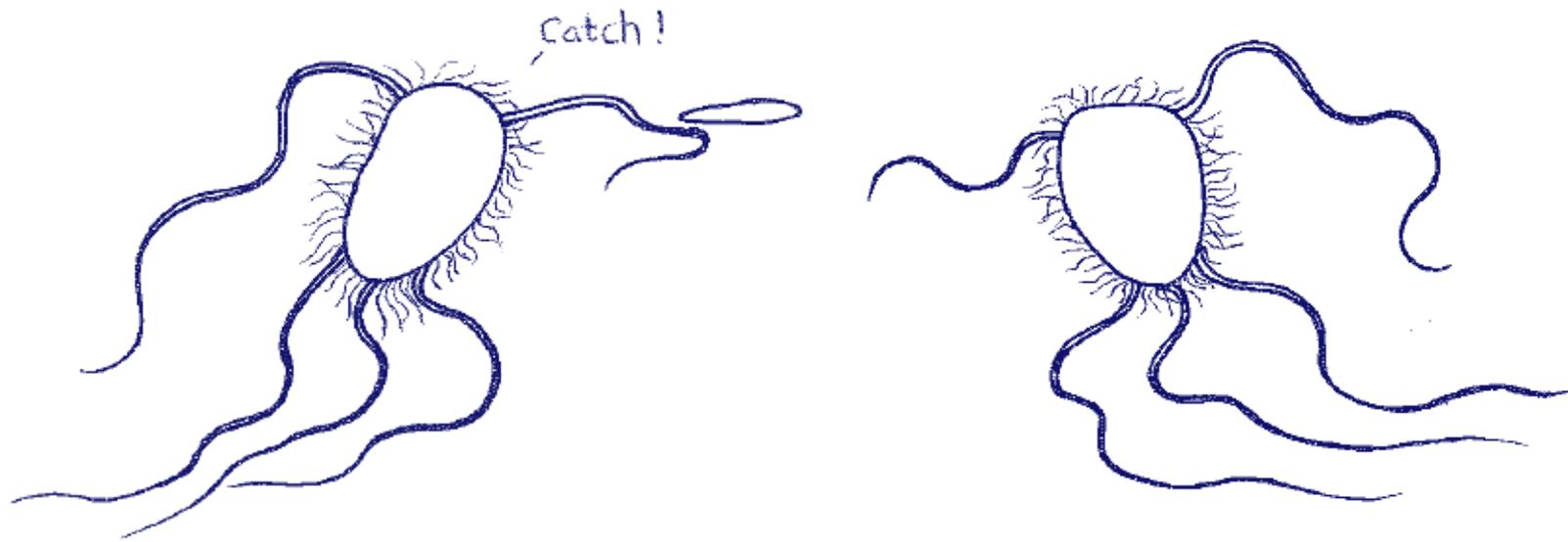
Carbapenem Resistance & Enterobacteriaceae

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

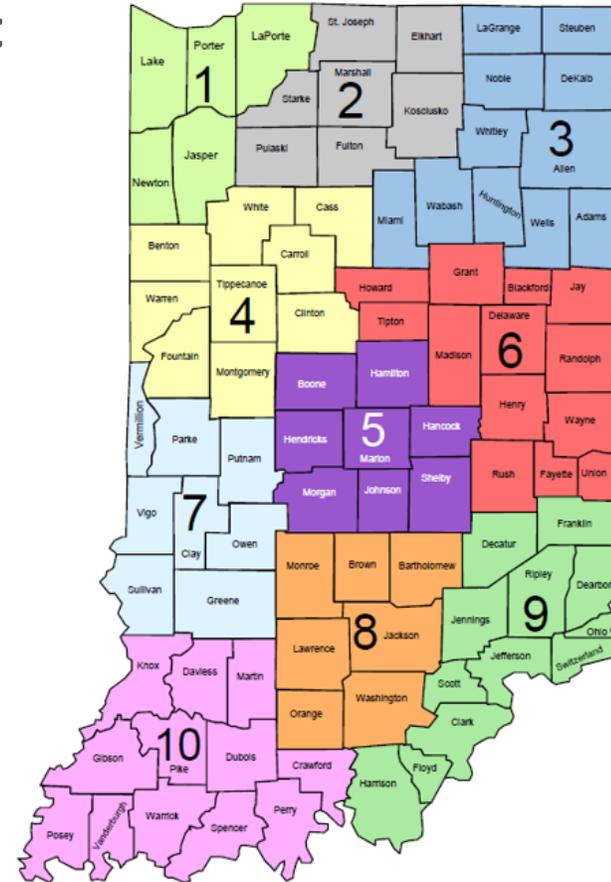


Now what?



Indiana CP-CRE Cases by District 2016-2018

State: 879
District 1: 380
District 2: 30
District 3: 70
District 4: 19
District 5: 200
District 6: 90
District 7: 51
District 8: 17
District 9: 17
District 10: 5



*Preliminary 2018 data represents



Indiana CP-CRE Cases 2016-2018

879 CP-CRE cases

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

Mechanisms

804 KPC
22 NDM
18 VIM
9 OXA-48-like
2 IMP
24 unknown

*Preliminary 2018 data represents
1/1/2018 – 7/31/2018



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Updated Cases- CP-CRE 2018 -2019

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

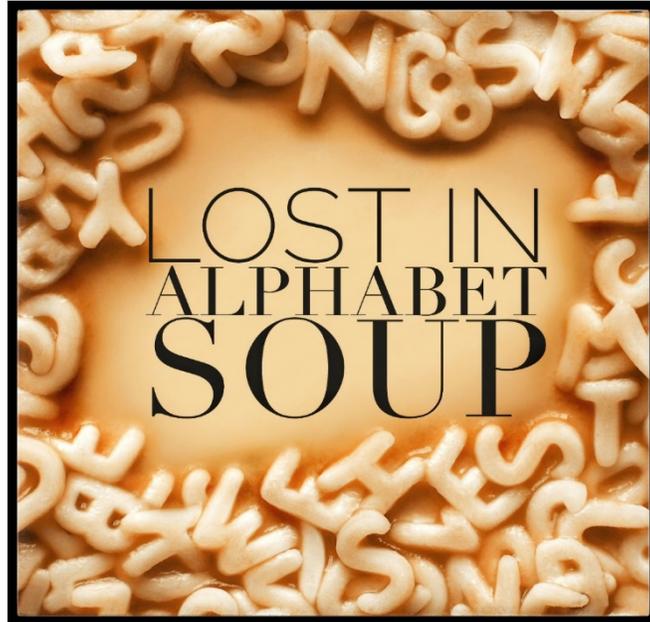
In Indiana during the first quarter of 2019 (January 1-April 30), we have 90 confirmed cases of CP-CRE.*

*preliminary data (ISDH has completed 2018 data close-out but it's not available just yet)



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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)



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Enhanced Barrier Precautions LTC

Accessible version: <https://www.cdc.gov/hai/containment/PPE-Nursing-Homes.html>



Implementation of Personal Protective Equipment in Nursing Homes to Prevent Spread of Novel or Targeted Multidrug-resistant Organisms (MDROs)

Updated: July 26, 2019

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.

As of July 2019, Novel or Targeted MDROs are defined as:

- Pan-resistant organisms,
- Carbapenemase-producing enterobacteriaceae,
- Carbapenemase-producing *Pseudomonas* spp.,
- Carbapenemase-producing *Acinetobacter baumannii*, and
- *Candida auris*



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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.



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Candida Auris (*C. auris*)

Why is *C. auris* a problem?

- **It causes serious infections**
 - *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**
 - 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**
 - 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.

***Candida auris*: A drug-resistant yeast that spreads in healthcare facilities**

A CDC message to infection preventionists



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Infection Preventionist Factsheet

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.
 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 ; quaternary cleaning agents do not work effectively 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 facility 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/fungal/candida-auris/pdf/C-Auris-Infection-Factsheet-H.pdf>



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Outbreak Management



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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



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Resources

ISDH Infection Control Transfer Form

INFECTION CONTROL TRANSFER FORM				
<i>(Discharging Facility to complete form and communicate information to Receiving Facility)</i>				
Demographics	Patient/Resident		Date of Birth:	MRN:
	<i>Last Name</i>	<i>First Name</i>		
	Sending Facility Name:		Contact Name:	Contact Phone:
	Receiving Facility Name:			
Precautions	Currently in Isolation Precautions? <input type="checkbox"/> Yes			<input type="checkbox"/> No
	If Yes check: <input type="checkbox"/> Contact <input type="checkbox"/> Droplet <input type="checkbox"/> Airborne <input type="checkbox"/> Other: _____			Isolation Precautions
Organisms	Did or does have <i>(send documentation)</i> :		Current Infection, History, or Ruling Out*	
	Multiple Drug Resistant Organism (MDRO):		<input type="checkbox"/> Yes	
	MRSA		<input type="checkbox"/>	
	VRE		<input type="checkbox"/>	
	Acinetobacter not susceptible to carbapenems		<input type="checkbox"/>	
	Carbapenemase-producing CRE (CP-CRE)		<input type="checkbox"/>	
C. difficile		<input type="checkbox"/>		
			<input type="checkbox"/> No	
			Known MDRO or Communicable Diseases	





**Making infection prevention
part of your daily practice.
What *you* do matters most!**

#1 Believe that infection prevention is everyone's responsibility



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Any Questions?

