Carbapenem-resistant Enterobacteriaceae (CRE) Infection in Skilled Nursing Facilities

What are CRE?

CRE, which stands for Carbapenem-resistant Enterobacteriaceae, are a family of bacteria that include *Klebsiella* species *and Escherichia coli*. CRE are difficult to treat because they have high levels of resistance to antibiotics. CRE are an important emerging threat to public health. CRE have spread throughout many parts of the United States and been confirmed in Arizona. CRE are associated with a high mortality rate-up to 50% of CRE bloodstream infections result in death.

Core Measures for Skilled Nursing Facilities

- **Hand Hygiene -** Promote hand hygiene, Monitor hand hygiene adherence and provide feedback. Ensure access to hand hygiene stations.
- **Contact Precautions -** Place CRE colonized or infected residents that are high-risk for transmission on contact precautions (as described in text); for residents at lower risk for transmission use Standard Precautions unless drainage, secretions, and/or excretions are not contained.
- **Healthcare Personnel (HCP) Education** - All HCPs in all settings who care for patients with Multidrug-Resistant Organisms (MDROs), including CRE, should be educated about preventing transmission of these organisms. This should include information on Contact Precautions, specifically the proper use of personal protective equipment (PPE), and hand hygiene. Facilities should ensure that there is a process to monitor and improve HCP adherence to Contact Precautions.
- **Resident and staff cohorting -** Use private rooms when possible. Develop strategies to identify appropriate roommate and staff selection for residents admitted with CRE who are in semi-private rooms. Dedicate equipment to the colonized/infected resident.
- **Minimize use of invasive devices -** Remove devices as soon as possible.
- **Lab Notification -** Skilled Nursing Facilities should have plans in place to follow-up CRE identified from clinical specimens.
- **Promote antimicrobial stewardship**
- **CRE Screening -** Screen residents with epidemiologic links to CRE colonized or infected residents in outbreak situations.
- **CRE Reporting -** CRE can be reported to Arizona Department of Health Services (ADHS) for questions and assistance.
- **Communication -** Internal and external communication is recommended through verbal and nonverbal means. Ensure staff is trained and will implement proper communication, resources (Transfer Tool), and precautions when CRE are identified.

How are CRE spread?

- Person to person contact of a colonized or infected person
- Through wounds (injury/surgery)
- Invasive devices (central line catheter, urinary catheter, etc.)
- Environmental surfaces

What risk factors are associated with CRE infection?

- Hospitalized patients
- Residents of Skilled Nursing Facilities with underlying medical conditions
- Exposure to antibiotics
- Compromised immune system
- Invasive devices
- Receiving medical care at another facility or outside the United States

What can Skilled Nursing Facilities do to prepare?

Being proactive is always the best policy! Additional resources about CRE can be found at the following sites:

- 2012 CDC CRE Toolkit - http://www.cdc.gov/hai/organisms/cre/cre-toolkit/index.html
- CDC's *Antibiotic resistance threats in the United States, 2013* - http://www.cdc.gov/drugresistance/threat-report-2013/
- Association for Professionals in Infection Control and Epidemiology - http://www.apic.org/For-Consumers/Monthly-alerts-for-consumers/Article?id=cre-the-nightmare-bacteria
- Arizona's HAI website – www.preventHAIaz.gov
- Arizona's Long Term Care Subcommittee webpage and transfer tools - http://www.azdhs.gov/phs/oids/hai/advisory-committee/long-term-care.htm

3/2014

Sample CRE Laboratory Report

Final Report

Demographics

Your Facility
Your Phone Number
Your Address
Your City, State, Zip

Printed By: Your name

Antimicrobial Susceptibility and Organism Identification Report

Name: Patient Name
PT# 123456
MRN: 000123456
DOB: Patient D O B
Sex: M or F
Race: Unknown

Status: I/P
Service: ICU
Att Physician: Attending Doctor
Family Physician: Family Doctor
Medical Director: Medical Director

Admitted: Date Admitted
Discharged: N/A

Specimen Information

Order #: 2001
Specimen #: A9874561
Specimen Source: Specimen type
Procedure: Test type
Ordering Physician: Who ordered the test

Collected: Date Collected
Received: Date Received
Reported: Date Reported

Bacteriology

Stains/Preparations

Gram Negative bacilli

Suspected Agent: E. coli

Verified: Date finalized

Agent	MIC (µg/mL)	Interpretation
Doripenem	**1**	**S**
Ertapenem	**2**	**I**
Imipenem	**0.5**	**S**
Meropenem	**5**	**R**

Current Breakpoints* (M100-S23) MIC (µg/mL)			
Susceptible	**Susceptible**	**Intermediate**	**Resistance**
Doripenem	≤ 1	2	≥4
Ertapenem	≤ 0.5	1	≥2
Imipenem	≤ 1	2	≥4
Meropenem	≤ 1	2	≥4

Current Clinical and Laboratory Standards Institute Interpretive Criteria for Carbapenems and Enterobacteriaceae

S-Susceptible **I-Intermediate** **R-Resistant**

* Newer CLSI breakpoints may not be updated on commercial panels. However, where appropriate, clinical laboratories may use either CLSI or FDA breakpoints. A clinical laboratory must perform a verification for a commercial system if using breakpoints other than those provided by the manufacturer.

Please visit www.preventHAIaz.gov for more information