A Call for Action:
The Atlanta Regional CRE Continuum of Care Collaborative

Presented by: Jeanne Negley, MBA
Public Health Director Healthcare Associated Infections

Cindy Prosnak RN, BSN, CIC
Alliant GMCF Infection Prevention Consultant

Date: March 5, 2014
Objectives

• Federal and State Initiatives to Address Healthcare Associated Infections (HAIs)
• Readmissions and HAIs
• Long-Term Care is a Vital Link in the Continuum of Care
• How the Regional approach benefits:
  – Hospitals
  – Long-Term Acute Care Hospitals
  – Nursing Homes
Federal Initiative to Address Infections
2009 HHS Action Plan in Response to GAO

News Release

FOR IMMEDIATE RELEASE
Tuesday, January 6, 2009

HHS Issues Action Plan to Prevent Health Care-Associated Infections

The U.S. Department of Health and Human Services (HHS) unveiled a plan that establishes a set of five-year national prevention targets to reduce and possibly eliminate health care-associated infections (HAIs).

Health care-associated infections are infections that patients acquire while undergoing medical treatment or surgical procedures. These infections are largely preventable.

The Action Plan to Prevent Health Care-Associated Infections lists a number of areas in which HAIs can be prevented, such as surgical site infections. The plan also outlines cross-agency efforts to save lives and reduce health care costs through expanded HAI prevention efforts.

“This plan will serve as our roadmap on how the department addresses this important public health and patient safety issue,” HHS Secretary Mike Leavitt said. “This collaborative interagency plan will help the nation build a safer, more affordable health care system.”

The plan establishes national goals and outlines key actions for enhancing and coordinating HHS-supported efforts. These include development of national benchmarks prioritized recommended clinical practices, a coordinated research agenda, an integrated information systems strategy and a national messaging plan.

The plan also identifies opportunities for collaboration with national, state, tribal and local organizations.

HHS intends to update the plan in response to public input and new recommendations for infection prevention. The plan, and instructions for submitting comments on the plan, can be found online at [http://www.hhs.gov/ophs](http://www.hhs.gov/ophs).
<table>
<thead>
<tr>
<th>HAI Event</th>
<th>Facility Type</th>
<th>Reporting Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSI</td>
<td>Acute Care Hospitals, Adult, Pediatric, and Neonatal ICUs</td>
<td>January 2011</td>
</tr>
<tr>
<td>CAUTI</td>
<td>Acute Care Hospitals Adult and Pediatric ICUs</td>
<td>January 2012</td>
</tr>
<tr>
<td>SSI (COLO, HYST)</td>
<td>Acute Care Hospitals</td>
<td>January 2012</td>
</tr>
<tr>
<td>Intravenous antimicrobial start</td>
<td>Dialysis Facilities</td>
<td>January 2012</td>
</tr>
<tr>
<td>Positive Blood Culture</td>
<td>Dialysis Facilities</td>
<td>January 2012</td>
</tr>
<tr>
<td>Signs of vascular access infection</td>
<td>Dialysis Facilities</td>
<td>January 2012</td>
</tr>
<tr>
<td>CLABSI</td>
<td>Long-Term Acute Care Hospitals</td>
<td>October 2012</td>
</tr>
<tr>
<td>CAUTI</td>
<td>Long-Term Acute Care Hospitals</td>
<td>October 2012</td>
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<tr>
<td>CAUTI</td>
<td>Inpatient Rehabilitation Facilities</td>
<td>October 2012</td>
</tr>
<tr>
<td>MRSA Bacteremia</td>
<td>Acute Care Hospitals</td>
<td>January 2013</td>
</tr>
<tr>
<td>C. Difficile Lab ID</td>
<td>Acute Care Hospitals</td>
<td>January 2013</td>
</tr>
<tr>
<td>Healthcare Worker Influenza Vaccination</td>
<td>Acute Care Hospitals</td>
<td>January 2013</td>
</tr>
<tr>
<td>Healthcare Worker Influenza Vaccination</td>
<td>Ambulatory Surgical Centers</td>
<td>October 2014</td>
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## HHS Action Plan to Reduce HAIs

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<tbody>
<tr>
<td><strong>Reduce Central-line Associated Bloodstream Infections (ICU)</strong></td>
<td>↓36%</td>
<td>↓46%</td>
<td>↓50%</td>
</tr>
<tr>
<td><strong>Catheter Associated Urinary Tract Infections (ICU)</strong></td>
<td>No Change</td>
<td>↑9%</td>
<td>↓25%</td>
</tr>
<tr>
<td><strong>Surgical Site Infections - Colon</strong></td>
<td>↓17%</td>
<td>↓20%</td>
<td>↓25%</td>
</tr>
<tr>
<td><strong>Surgical Site Infections – Abdominal Hysterectomy</strong></td>
<td>↓13%</td>
<td>↓11%</td>
<td>↓25%</td>
</tr>
<tr>
<td><strong>MRSA Infections (invasive sites; population)</strong></td>
<td>To be reported in 2014</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td><strong>Clostridium difficile infections</strong></td>
<td>To be reported in 2014</td>
<td>30%</td>
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</tbody>
</table>
Legend:
- Better than U.S. National Rate
- No different than U.S. National Rate
- Worse than U.S. National Rate
- U.S. National Rate

Central-Line-Associated Blood Stream Infections (CLABSI)
Why is this important?

Lower Numbers are Better

Hospital A
Hospital B
Hospital C
Georgia

Range of uncertainty around estimate death rate
Interval Estimate
Estimated Risk adjusted death rate
Interval estimate range
Hover over the carrot to view

We Protect Lives.
Federal Initiatives for Nursing Homes

• HHS has also published a Long Term Care Chapter of the HAI Action Plan in April 2013.
• Does not currently require public reporting.
• One state (Pennsylvania) requires reporting.
• The entire document can be found at this link:
# Federal Priorities for Nursing Homes

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Goal</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Enrollment in NHSN for Nursing Home Infection Surveillance Activity</td>
<td>5% certified nursing homes enroll in NHSN in 5 years</td>
</tr>
<tr>
<td>2</td>
<td>Clostridium difficile</td>
<td>Pilot NHSN to implement surveillance</td>
</tr>
<tr>
<td>3</td>
<td>Vaccination for Residents (Influenza, Pneumococcal)</td>
<td>85% vaccination of LTCF residents for influenza and pneumocococcus in 5 years.</td>
</tr>
<tr>
<td>4</td>
<td>Health Care Personnel Influenza Vaccination</td>
<td>75% of HCP in long-term care receive the seasonal influenza vaccination by 2015.</td>
</tr>
<tr>
<td>5</td>
<td>Urinary Tract Infections, Catheter-Associated Urinary Tract Infections, and Catheter Care Processes</td>
<td>Pilot reporting to NHSN, evaluate variability, and determine five-year goal.</td>
</tr>
</tbody>
</table>
State Activities with Nursing Homes

• Piloting NHSN reporting with five nursing homes in the state
• Participating in training on infection prevention for nursing homes in May and October 2014
• Convening this meeting and initiating this regional program to effectively address healthcare-associated infections
Cost of Healthcare Associated Infections (HAIs)

• Every day: 1 out of 20 patients has an infection caused by healthcare
• Every year: 2 million people get an antibiotic resistant infection and 23,000 die
• The economic burden of HAIs is estimated as high as $45 billion per year in the US
  – Estimated 70% of these infections are preventable

http://www.cdcfoundation.org/businesspulse/safe-healthcare-infographic
# Cost of Specific Types of HAIs

<table>
<thead>
<tr>
<th>Infection Type</th>
<th>Average Cost Per Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Line Associated Bloodstream Infections</td>
<td>$45,814</td>
</tr>
<tr>
<td>Ventilator-Associated Pneumonia</td>
<td>$40,144</td>
</tr>
<tr>
<td>Surgical Site Infections</td>
<td>$20,785</td>
</tr>
<tr>
<td>Clostridium <em>difficle</em> (C. diff) infections</td>
<td>$11,285</td>
</tr>
<tr>
<td>Catheter-associated urinary tract infections</td>
<td>$896</td>
</tr>
</tbody>
</table>

Zimlichman et al. JAMA Intern Med. 2013 Dec 9-23; 173(22); 2039-46
30-Day Readmissions

• Infections and cardiovascular disorders were the primary diagnosis for 63% of the hospital readmissions from a skilled nursing facility (SNF)

• Common diagnosis for readmissions post-acute: heart failure, *urinary tract infection*, *pneumonia, septicemia*, nutritional and metabolic disorders, *esophagitis*, *gastroenteritis*, and digestive disorders

Georgia Emerging Infections Program

Carbapenem-Nonsusceptible Enterobacteriaceae in Metropolitan Atlanta

- Total (n=257)
- LTCF Residents (n=81)
- Hospital Inpatients (n=58)

Month

We Protect Lives.
CRE Snapshot of Transfer Patterns

- Metro Atlanta
  - Jan – Jun 2013 data for CRE, Acinetobacter and C. difficile
  - Patterns of transfer indicate CRE in nursing home results in readmission/transfer
  - Lost revenue for nursing home
  - Increased burden on hospital related to 30-day readmission
Long-Term Care Facilities in the Care Continuum

• The role of long-term care facilities has changed.
• Between 1999 and 2008, the number of long-term care residents increased 10%.
• Shorter lengths of stay in hospitals.
• Long-term care facilities have observed the increased use of devices.
Nursing Homes are Reservoirs of MDROs

- **NH residents colonized with MDR-Gram Negative Rods (~20% prevalence)**
  - O’Fallon et al. *Infect Control Hosp Epidemiol* 2009; 30: 1172-1179

- **NH residents colonized with MRSA (40-50% prevalence)**
  - Stone et al. *Infect Control Hosp Epidemiol* 2012; 33(6): 551-7

- **NH residents colonized with VRE (5-10% prevalence)**
  - Benenson et al. *Infect Control Hosp Epidemiol.* 2009 30:786-9
C. difficile infection (CDI) in NH

McDonald LC et al Emerg Infect Dis 2006;12
Campbell et al. ICHE 2009; 30(6): 526-33
Regional Efforts are Key

Siouxland project demonstrated that an outbreak of VRE could be controlled through collaboration between all of facilities in the area.

Emergence and Rapid Spread of KPC Enterobacteriaceae

• “We observed extensive transfer of KPC-positive patients throughout the exposure network of 14 acute care hospitals, 2 long-term acute hospitals, and 10 nursing homes. Although few cases were identified at most institutions, many facilities were affected. Successful control of KPC-producing Enterobacteriaceae will require a coordinated, regional effort among acute and long-term health care facilities and public health departments.”

A Call for Action

Healthcare CEOs and Chief Medical Officers:

Know your Infection Rates

- Use your data to identify "hot spots" in your facility and target prevention efforts.
- Invest in electronic health record systems that can connect to CDC's National Healthcare Safety Network.

Be Vigilant

- Insist that staff members consistently follow CDC infection prevention guidelines.
- Prescribe antibiotics correctly. Take a 48-hour "time out" and use lab cultures to modify prescriptions.
- Remove temporary medical devices ASAP.
- Use the right size medical vials and correct injection safety procedures.

Foster Collaboration

- Work with labs that accurately identify drug-resistant infections and alert clinical and infection prevention staff of findings.
- Make it a policy to notify receiving facilities about infections when transferring patients.
- Join or start regional prevention efforts. Contact your state health department for more details.

Find Your State Health Department
Contact Information

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Cindy Prosnak, RN, CIC
Georgia Medical Care Foundation
706-836-8361
Cindy.Prosnak@gmcf.org
Healthcare Community Partnerships Across the Continuum

Denise M. Flook, RN, MPH, CIC
VP, Infection Prevention/Staff Engagement
Partnership for Patients Knows No Boundaries

We are part of a national movement for the triple aim to Put Patients First and make patient care:

• safer
• more reliable
• less costly
The Partnership for Patients Challenge

• Making Care Safer. Reducing preventable hospital-acquired conditions by 40% compared to 2010.
• Improving Care Transitions
Community-based Care Transitions Program

- Reducing complications during transitions from one care setting to another. Safe, effective, and efficient care transitions require thoughtful collaboration among health care providers, hospitals, nursing homes and other facilities, social service providers, patient caregivers, and patients themselves.

- The goals of the Community-based Care Transitions Program are:
  - To improve transitions of beneficiaries from the inpatient hospital setting to other care settings
  - To improve quality of care
  - To reduce readmissions for high risk Medicare beneficiaries
  - To document measurable savings to the Medicare program
Hospital Success Depends on A Population Community Heath Approach

Payment for care is now based on quality not volume

• Value Based Purchasing
  – Medicare payment incentives/penalties to promote:
    • Achievement of high quality care
    • Improvement in care quality
    • Annual Market update increased or reduced beginning October 2102 up to 2% by 2017
  – Payment based on quality measures and Patient satisfaction (HCAPHS)
  – Better scores higher payments, low scores lower payments

• Nonpayment for Hospital Acquired Conditions
  – Higher payment withheld if condition not present on admission

• Payment penalties for
  – readmissions
  – HAC soon

• Public Reporting of Quality and Patient Satisfaction Scores
The Cost of Readmissions to Georgia Hospitals

It is estimated that Georgia hospitals will lose over $3.4 million due to the Readmission penalty
(Calculation time frame: July 1, 2009 – June 30, 2012)
HAI is a Community Health Challenge

- MRSA with > CO then Hospital acquired
- C. diff becoming a community HAI
- Sepsis – high morbidity and mortality that is across the community
Partnerships Are Key to Decreasing Harm

- No longer think inside of our 4 walls
- Hospitals are at the center of your community’s health
- Hospitals can provide leadership for the partnerships that need to be forged to be successful
  - Patients
  - Providers
  - Home Health
  - Long term care
  - Assisted living
  - EMS
  - Local public health
Risk of CRE Infections

1. Local Short-Stay Hospital
   - Jan has a stroke and is in the hospital. She is stable but needs long-term critical care at another facility.

2. Long-Term Acute Care Hospital
   - Other patients in this facility have CRE. A nurse doesn’t wash his hands, and CRE are spread to Jan. She develops a fever and is put on antibiotics without proper testing.

3. Local Short-Stay Hospital
   - Jan becomes unstable and goes back to the hospital, but her new doctors don’t know she has CRE. A doctor doesn’t wash her hands after treating Jan. CRE is spread to other patients.

How CRE Take Over

1. Lots of germs, 1 or 2 are CRE
2. Antibiotics kill off good germs
3. CRE grow
4. CRE share genetic defenses to make other bacteria resistant

SOURCE: CDC Vital Signs, 2013
Patient/Family Centered Safe Care

Everyone Must:

Work Together to Promote:

- Patient/Family focus and engagement
- Boundarilessness, seamless care
- Unconditional team work
- Speed and agility of change
- Decreased cycle time to improvement
- Repetition, testing, and evolving in real time
- Reliability, standardization and spreading what works

If you’re not working together, you’re not doing your job!
National Overview of Carbapenem-Resistant Enterobacteriaceae

Alex Kallen, MD, MPH
Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention

The findings and conclusions in this report are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Objectives

- Describe the epidemiology of carbapenem-resistant Enterobacteriaceae (CRE) in the United States
- Briefly review measures necessary to halt transmission
- Recognize the importance of a regional approach to CRE control
BACKGROUND
Enterobacteriaceae

- Normal human gut flora & environmental organisms
- More than 70 species
  - E. coli
  - Klebsiella
- Range of human infections: UTI, wound infections, pneumonia, bacteremia
- Important cause of healthcare- and community-associated infections
  - Some of the most common organisms encountered in clinical laboratories
### Pathogens Reported to NHSN 2009-2010

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Overall percentage</th>
<th>CLABSI</th>
<th>CAUTI</th>
<th>VAP</th>
<th>SSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. coli</td>
<td>12% (2)</td>
<td>4%</td>
<td>27%</td>
<td>6%</td>
<td>9%</td>
</tr>
<tr>
<td>K. pneumoniae</td>
<td>8% (4)</td>
<td>8%</td>
<td>11%</td>
<td>10%</td>
<td>4%</td>
</tr>
<tr>
<td>P. aeruginosa</td>
<td>8% (5)</td>
<td>4%</td>
<td>11%</td>
<td>17%</td>
<td>6%</td>
</tr>
<tr>
<td>Enterobacter spp.</td>
<td>5% (8)</td>
<td>5%</td>
<td>4%</td>
<td>9%</td>
<td>4%</td>
</tr>
</tbody>
</table>

These three groups of organisms make up about 25% of organisms reported to NHSN Device and Procedure module.

Antimicrobial Resistance in Enterobacteriaceae

- Resistance to β-lactams has been a concern for decades
  - β-lactamases
  - Extended-spectrum β-lactamases (ESBLs)

- Carbapenems – “last resort” antibiotics
  - Imipenem, meropenem, doripenem, ertapenem
Carbapenemases – Enzymes that break down carbapenems and β-lactam antibiotics (generally)
Carbapenemase-producing CRE in the United States

November 2006

CDC, unpublished data
KPC-producing CRE in the United States
February 2014

CDC, unpublished data
# Carbapenemases (January 2014)

<table>
<thead>
<tr>
<th>Enzyme</th>
<th>Number (number of states) identified to date in US</th>
</tr>
</thead>
<tbody>
<tr>
<td>KPC</td>
<td>(47 states)</td>
</tr>
<tr>
<td>NDM</td>
<td>97 (15 states)</td>
</tr>
<tr>
<td>IMP</td>
<td>4 (2 states)</td>
</tr>
<tr>
<td>VIM</td>
<td>5 (3 states)</td>
</tr>
<tr>
<td>OXA</td>
<td>16 (9 states)</td>
</tr>
</tbody>
</table>
Carbapenemase-producing CRE in the United States

December, 2013
CRE INCIDENCE
## Change in CRE Incidence, 2001-2011

<table>
<thead>
<tr>
<th>Organism</th>
<th>National Nosocomial infection Surveillance system, Number (%) of isolates</th>
<th>National Healthcare Safety Network, Number (%) of isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2001</td>
<td>2011</td>
</tr>
<tr>
<td><strong>Isolates</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Klebsiella pneumoniae and oxytoca</td>
<td>654 (38.7)</td>
<td>1,902 (70.0)</td>
</tr>
<tr>
<td>E. coli</td>
<td>1,424 (29.6)</td>
<td>3,626 (64.8)</td>
</tr>
<tr>
<td>Enterobacter aerogenes and cloacae</td>
<td>553 (52.1)</td>
<td>1,045 (69.7)</td>
</tr>
<tr>
<td>Total</td>
<td>2,631 (36.6)</td>
<td>6,573 (66.8)</td>
</tr>
<tr>
<td><strong>Tested</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-susceptible</td>
<td>253 (1.6)</td>
<td>1,312 (10.4)</td>
</tr>
<tr>
<td></td>
<td>421 (1.0)</td>
<td>2,348 (1.0)</td>
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<tr>
<td></td>
<td>288 (1.4)</td>
<td>728 (3.6)</td>
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<td>962 (1.2)</td>
<td>4,388 (4.2)</td>
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<td>National Nosocomial infection</td>
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<td>Surveillance system, Number (%)</td>
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<td>of isolates</td>
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</tbody>
</table>
## Facilities Reporting at least One CRE (CAUTI or CLABSI) to NHSN, First Half of 2012

<table>
<thead>
<tr>
<th>Facility characteristic</th>
<th>Number of facilities with CRE from a CAUTI or CLABSI (2012)</th>
<th>Total facilities performing CAUTI or CLABSI surveillance (2012)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All acute care hospitals</td>
<td>181</td>
<td>3,918</td>
<td>(4.6)</td>
</tr>
<tr>
<td>Short-stay acute hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long-term acute care hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Facilities Reporting at least One CRE (CAUTI or CLABSI) to NHSN, First Half of 2012

<table>
<thead>
<tr>
<th>Facility characteristic</th>
<th>Number of facilities with CRE from a CAUTI or CLABSI (2012)</th>
<th>Total facilities performing CAUTI or CLABSI surveillance (2012)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All acute care hospitals</td>
<td>181</td>
<td>3,918</td>
<td>(4.6)</td>
</tr>
<tr>
<td>Short-stay acute hospital</td>
<td>145</td>
<td>3,716</td>
<td>(3.9)</td>
</tr>
<tr>
<td>Long-term acute care hospital</td>
<td>36</td>
<td>202</td>
<td>(17.8)</td>
</tr>
</tbody>
</table>
CRE EPIDEMIOLOGY
MUlti-site Gram-negative Surveillance Initiative (MuGSI)
## CRE Organisms by Site (2012*-2013, n=729)

<table>
<thead>
<tr>
<th>Site</th>
<th>E. coli</th>
<th>Enterobacter spp.</th>
<th>Klebsiella spp.</th>
<th>Total CRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>2</td>
<td>16</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>GA</td>
<td>42 (14%)</td>
<td>43 (14%)</td>
<td>223 (72%)</td>
<td>308</td>
</tr>
<tr>
<td>MD</td>
<td>5</td>
<td>10</td>
<td>33</td>
<td>48</td>
</tr>
<tr>
<td>MN</td>
<td>9</td>
<td>43</td>
<td>14</td>
<td>66</td>
</tr>
<tr>
<td>NY</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>OR</td>
<td>3</td>
<td>11</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>64 (13%)</td>
<td>127 (26%)</td>
<td>294 (61%)</td>
<td>485</td>
</tr>
</tbody>
</table>

*2012 cases reported for GA, MN and OR only
### Initial Culture Source (2012-2013, n=729)

<table>
<thead>
<tr>
<th>Culture Source</th>
<th>CR Enterobacteriaceae (n=485)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood</td>
<td>55 (11%)</td>
</tr>
<tr>
<td>Pleural Fluid</td>
<td>2 (0.4%)</td>
</tr>
<tr>
<td>Peritoneal Fluid</td>
<td>7 (1%)</td>
</tr>
<tr>
<td>Joint/Synovial Fluid</td>
<td>1 (0.2%)</td>
</tr>
<tr>
<td>Bone</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Urine</td>
<td>419 (86%)</td>
</tr>
<tr>
<td>Other normally sterile site~</td>
<td>6 (1%)</td>
</tr>
</tbody>
</table>

- 2012 cases reported for GA, MN and OR
- Culture sites are not mutually exclusive
## Epidemiological Classification, by EIP Site (2012-2013, n=710)

<table>
<thead>
<tr>
<th>EIP Site</th>
<th>Community-Associated</th>
<th>Healthcare-Associated Community-Onset</th>
<th>Hospital Onset</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>5</td>
<td>17</td>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>GA</td>
<td>18 (6%)</td>
<td>223 (73%)</td>
<td>63 (21%)</td>
<td>304</td>
</tr>
<tr>
<td>MD</td>
<td>0</td>
<td>34</td>
<td>13</td>
<td>47</td>
</tr>
<tr>
<td>MN</td>
<td>15</td>
<td>40</td>
<td>9</td>
<td>64</td>
</tr>
<tr>
<td>NY</td>
<td>6</td>
<td>8</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>OR</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48 (10%)</strong></td>
<td><strong>327 (70%)</strong></td>
<td><strong>94 (20%)</strong></td>
<td><strong>469</strong></td>
</tr>
</tbody>
</table>

- 2012 data included for GA, MN and OR only
### Preliminary Unadjusted Population Rates of CRE by Site (2013) per 100,000 population

<table>
<thead>
<tr>
<th>Site</th>
<th>Population (2012)</th>
<th>CR <em>Enterobacteriaceae</em> (n=272)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO</td>
<td>2,532,982</td>
<td>0.99</td>
</tr>
<tr>
<td>GA</td>
<td>3,821,534</td>
<td>3.48</td>
</tr>
<tr>
<td>MD</td>
<td>1,905,444</td>
<td>2.52</td>
</tr>
<tr>
<td>MN</td>
<td>1,704,728</td>
<td>1.99</td>
</tr>
<tr>
<td>NY</td>
<td>747,813</td>
<td>2.54</td>
</tr>
<tr>
<td>OR</td>
<td>1,690,785</td>
<td>0.77</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12,403,286</strong></td>
<td><strong>2.19</strong></td>
</tr>
</tbody>
</table>
WHY ARE CRE CLINICALLY AND EPIDEMIOLOGICALLY IMPORTANT?
Why are CRE Clinically and Epidemiologically Important?

- Cause infections associated with high mortality rates
Overall Mortality

OR 3.71 (1.97-7.01)

Attributable Mortality

OR 4.5 (2.16-9.35)

Why are CRE Clinically and Epidemiologically Important?

- Cause infections associated with high mortality rates
- Resistance is highly transmissible
  - Between organisms – plasmids
  - Between patients
Why are CRE Clinically and Epidemiologically Important?

- **Cause infections associated with high mortality rates**
- **Resistance is highly transmissible**
  - Between organisms – plasmids
  - Between patients
- **Treatment options are limited**
  - Pan-resistant strains identified
  - Could be years before new agents are available to treat
Why are CRE Clinically and Epidemiologically Important?

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  - Between organisms – plasmids
  - Between patients
- Treatment options are limited
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- Potential for spread into the community
  - *E. coli* common cause of community infection
MDR GNRs in the Community

- **NDM**
  - Identified in *K. pneumoniae* in river in Hanoi, Viet Nam
  - Cause of community-onset infections in India
    - In one survey, isolates from 2 sites often from community acquired UTIs
  - Gene for NDM detected in 2/50 drinking water samples and 51/171 water seepage samples from New Delhi

Isozumi R et al. EID 2012: 1383-4
Kumarasamy K Lancet ID 2010;
Walsh TR Lancet ID 2011:355-362
**Why are CRE Clinically and Epidemiologically Important?**

- **Cause infections associated with high mortality rates**
- **Resistance is highly transmissible**
  - Between organisms – plasmids
  - Between patients
- **Treatment options are limited**
  - Pan-resistant strains identified
  - Could be years before new agents are available to treat
- **Potential for spread into the community**
  - *E. coli* common cause of community infection
- **In most areas in the United States this organism appears to infrequently identified**
Prevention

http://www.cdc.gov/hai/organisms/cre/cre-toolkit/
Interventions

- **Core**
  - Hand hygiene
  - Contact Precautions
  - HCP education
  - Minimizing device use
  - Patient and Staff cohorting
  - Laboratory notification
  - Antimicrobial stewardship
  - CRE Screening
  - Communication of MDRO status at discharge

- **Supplemental**
  - Active surveillance cultures
  - Chlorhexidine bathing
Surveillance

- First step in Prevention
- Facilities should have an awareness of the prevalence of CRE in their Facility
  - Lab look backs
    - How often are CRE identified?
  - Prospective evaluation
    - Point prevalence surveys
  - Understanding basic epidemiology of CRE in your facility
    - Units these patients are coming from
    - Present at admission?
Basic CRE Prevention Strategy

- "Detect and Protect"
  - Identify patients colonized or infected with CRE
  - Prevent transmission through use of hand hygiene, Contact Precautions, and environmental cleaning

- Basic infection control
  - Antimicrobial stewardship
  - Minimizing device use

- Notifying accepting facilities at transfer

- Application of interventions can vary by setting
REGIONAL APPROACH TO CRE PREVENTION
Inter-Facility Transmission of MDROs (Including CRE)

Figure 3. Patient flow among regional health care facilities. Outbreaks of infection with multidrug-resistant organisms have been found to follow the flow of colonized patients across institutions.

Regional Approach to MDRO Prevention is Essential

- **Rationale for regional approach**
  - What happens in one facility will impact surrounding facilities
  - Individual facilities can reduce MDRO prevalence *only to a certain point*

KPC outbreak in Chicago, 2008

Overall rate reduction of 68%
Israel Experience

- KPCs likely originally from US identified in Israel beginning in late 2005
- By early 2006, increase in cases
- Initiated National effort to control CRE (initial response) in acute care hospitals
  - Mandatory reporting of patients with CRE
  - Mandatory isolation (CP) of CRE patients
    - Staff and patient cohorting
  - Task Force developed with authority to collect data and intervene
79% decrease from highest and last month
Beyond the first year

- Active surveillance for high-risk patients
- Added long-term care facilities
  - Targeted interventions in facilities from which CRE-patients had been transferred
  - Intervened at 13 high-risk facilities (1/10\textsuperscript{th} of LTCF beds in country)
    - Determine CRE prevalence among sample
    - Map infection control infrastructure and policies
    - Developed CRE control measures by ward type
      - Similar to acute care without cohorting or strict CP
    - Visited facilities to ensure implementation
CDC. Antimicrobial Resistance Threats in the United States, 2013
Available at: www.cdc.gov/drugresistance/threat-report-2013/
What Can Healthcare Facility Leaders do?

- Healthcare CEOs, Medical Officers, and Other Healthcare Facility Leaders Can:
  - Require and strictly enforce CDC guidance for CRE detection, prevention, tracking, and reporting.
  - Make sure your lab can accurately identify CRE and alert clinical and infection prevention staff when these bacteria are present.
  - Know CRE trends in your facility and in the facilities around you.
  - When transferring a patient, require staff to notify the other facility about infections, including CRE.
  - Join or start regional CRE prevention efforts, and promote wise antibiotic use
Summary

- Carbapenem-resistance among Enterobacteriaceae appears to be increasing
  - Appears to be driven primarily by the emergence of carbapenemases
- Heterogeneously distributed within and across regions
- Has the potential to spread widely
  - Healthcare and community settings
- Most areas in a position to act to slow emergence
- Prevention will require facility-level and regional interventions
Thanks for your attention.

Akallen@cdc.gov
Objectives

- State benefits of regional collaborative
- List collaborative areas of concentration
- Identify staff to attend learning sessions
- Sign commitment and authorization documents
Why Participate

Regional Collaborative
• Establish effective patient transfer communication process across the care continuum
• Enhance consistent and standardized practice
• Create a learning continuum of care community

Improved Outcomes
• Improve patient satisfaction
• Improved collaboration between facilities
• Reduce spread of antibiotic resistance
• Reduce readmission rate
Collaborative Benefits

Areas of Concentration

• Education
  – Train-the-Trainer
  – Infection control and prevention
  – Quality Improvement

• Communication
  – Transfers
  – Infection control and prevention
  – Antibiotic Stewardship
  – Laboratory

• Prevention and practice
  – Surveillance
  – Policy and Procedure
  – Standardization
  – Process and Outcome measurement

• Laboratory Reporting
Tools and Resources

We will provide your staff

- **Education**
  - Learning sessions and webinars
  - Train-the-Trainer toolkit
  - Access to SME training
  - Technical support

- **Communication**
  - Transfer form developed through continuum of care collaboration
  - Quality and quantity transfer audit tool
We will provide your staff

- Prevention and practice
  - Hand hygiene observation audit tool

- Laboratory Reporting
  - Talking points
  - Audit tool
Collaborative Commitment

Participating staff will

• Education
  – Attend learning sessions and webinars
  – Train facility staff utilizing the Train-the-Trainer resources.
    • Hospitals train case management/care coordinator staff

• Communication
  – Implement a transfer form developed in collaboration with transferring partners
  – Implement a standardized communication process with laboratory
Collaborative Commitment

Participating staff will

• Prevention and practice
  – Implement quality improvement activities using PDSA cycles
  – Perform surveillance activities
  – Assess and revise infection control (IC) policy and procedures as needed.
  – Standardization of IC practices and processes with continuum of care when possible
  – Track process and outcome measurements

• Laboratory Reporting
  – Assess current practices
Who, What and When...

Collaborative Meetings

- **Who Should Attend**
  - Director of Nursing
  - Infection Preventionist
  - Case/Care Coordinator staff
  - Other front line staff facility elects to attend

- **What**
  - 3 learning sessions
  - Webinars

- **When**
  - Collaborative ends July 31, 2014
  - 1st Learning Session
    - March 20, 2014
The Atlanta Regional CRE Continuum of Care Collaborative work is important to patients and their loved ones in the metro area.

Thank you!