CRE and XDRO for Long Term Care Facilities

May 28, 2014
The opinions, viewpoints, and content presented in this webinar may not represent the position of the Illinois Department of Public Health.
CRE Detect and Protect webinar for long-term care staff

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Infection Preventionist: Lutheran Home/Lutheran Life Communities
Questions: Inquiring minds want to know

• how do we prevent or contain CRE?

• how do we implement prevention programs in a long term facility?

• how do we educate frontline staff on identification and prevention

• what cleaning products are effective
What to Do?
- Define
- Collaborate
- Prepare
- Watch
- Identify and Report
- Respond and Control
Definitions

- **CRE Enterobacteriaceae** - A family of bacteria. These types of bacteria have developed ways to become very resistant to commonly used antibiotics. The resistance makes the bacteria very difficult to kill and infections very hard to treat. There are 2 main types. *E-coli* (a common intestinal bacteria), and *Klebsiella pneumoniae*

- **PCR (Polymerase Chain Reaction)** A test that makes copies of DNA (or RNA) in order to identify specific organisms

- **Modified Hodge Test** Lab test that can identify organisms that produce carbapenemase
Illinois Detect and Protect Campaign

Background

The Illinois Department of Public Health (IDPH) is leading the statewide “CRE Detect and Protect” education campaign to promote practices that prevent carbapenem-resistant Enterobacteriaceae (CRE) infections. CRE are extensively drug-resistant organisms (XDR Os) with few antibiotic treatment options that can transfer their resistance to other bacteria. These deadly superbugs have been increasingly detected among patients in Illinois.

As part of the campaign, IDPH is working with hospitals, long-term care facilities, and laboratories to adopt the Centers for Disease Control and Prevention strategy of detecting CRE and protecting patients through appropriate infection control and prevention measures. IDPH is providing educational materials and online trainings on CRE prevention and use of the XDRO registry, which is a tool for sharing patient information across facilities and reporting CRE isolates to IDPH. A statewide CRE Task Force comprised of infectious disease and infection prevention experts is helping to guide efforts.

Campaign participants have the opportunity to learn from other healthcare facilities, laboratories, and CRE experts committed to this issue. Preventing the spread of these drug-resistant infections will result in better outcomes for patients and reduced healthcare costs in Illinois.

Funding

The CRE Detect and Protect Campaign is funded by an Affordable Care Act award from the Centers for Disease Control and Prevention.

Sponsors
The XDRO Registry

- Purpose #1 Report CRE-carrying patients to the XDRO
- Purpose #2 Query the XDRO registry to determine whether or a person has a history of CRE
- LTC in Illinois is required to report
- Need access to the XDRO registry through the IDPH portal
- Get access BEFORE you need it
- Lessons Learned….
  - Access to SIREN does not mean you have access to the XDRO registry…..
Talk to your Micro Lab

- Ask what kind of CRE detecting capability is available?
- How will they let you know if they detect a CRE/KPC?
- Will they report to the XDRO registry?
Burdalls High C’s of Infection Prevention and Control

Clean Hands
Clean Clothes
Clean Equipment and Environment
Contained Drainage
Covered Wounds
Careful Assessment
Careful Use of Antimicrobials
Collaborative Approach
Communication
The care we provide is undertaken as a **Human** issue, and we need to approach care in a biopsychosocial and spiritual framework. The person does not become the bacteria.
Readiness

• Build on systems that consider biological, psychological, social, and spiritual needs
• Put systems in place to respond to colonization and infection
• Focus on risk factors that can be addressed to prevent colonization and infection
• Avoid using “limitations” as an excuse not to provide care OR admit residents and patients
• However, understanding limits of each level of LTC is very important
2012 CRE Toolkit - Guidance for Control of Carbapenem-resistant Enterobacteriaceae (CRE)

CRE Toolkit Guidance: *Core Measures for All Acute and Long-term Care Facilities*

- **Minimize use of invasive devices**
  - Get them out!

- **Promote antimicrobial stewardship**
  - Avoid antibiotic pressure
  - Avoid pressuring the prescribers for antibiotics
• Hand Hygiene
  – Promote hand hygiene
  – Monitor hand hygiene adherence and provide feedback
  – Ensure access to hand hygiene stations
Proper Glove Use is a PhD Level Skill

- Gloves are useful when used correctly

- Gloves can be a nightmare when used in the wrong way

- Do not wear 1 pair of gloves for more than 1 job!!
Hand Hygiene is one of the most important interventions to stop the spread of disease causing organisms!

Reported worldwide hand hygiene participation rates ranging from 5% to 89%

overall average reported to be 38.7%

Pittet, D., Allegranzi, B., & Boyce, J. (2009). The World Health Organization guidelines on hand hygiene in health care and their consensus recommendations • Infection Control and Hospital Epidemiology, 30(7), 611-622
F-441 Based Hand Hygiene

Hand Sanitizer OR
Soap and Water

• Wash or sanitize hands
• When coming to work and before going home
• When going room to room
• Before and after each resident contact
• After handling soiled equipment
• Before using gloves and after removing gloves

Soap and Water

• Are visibly soiled (dirty)
• If they have come in contact with blood or other body fluids
• Before and after eating
• Before and after handling food
• Before and after assisting a resident with toileting
• After contact with a resident with infectious diarrhea
• After performing your own personal hygiene or personal use of the toilet
Hand Hygiene Observations iScrub

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

#### Location

<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>

#### Attach Note

- Just In Time Training Done
- C. Difficile Infection
- Gloves Changed Hand Hygiene...
- Gloves No Hand Hygiene
- Signing Out Meds After Given...
- Personal Body Fluids Blowing...
- Touching Common Equipment
- Hand Wash Less Than 15 Seco...
- Correct Technique
Examples of iScrub lite Feedback opportunities

<table>
<thead>
<tr>
<th>HCW Opportunity</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Hygiene Nurse Before Touching a Patient</td>
<td>No</td>
</tr>
<tr>
<td>Nurse After Touching Patient Surroundings</td>
<td>Rub</td>
</tr>
<tr>
<td>Nurse Before Touching a Patient</td>
<td>No</td>
</tr>
<tr>
<td>Nurse After Touching a Patient</td>
<td>No</td>
</tr>
<tr>
<td>Nurse Before Touching a Patient</td>
<td>Wash</td>
</tr>
<tr>
<td>Nurse After Touching a Patient</td>
<td>Rub</td>
</tr>
<tr>
<td>Nurse Before Touching a Patient</td>
<td>Rub</td>
</tr>
<tr>
<td>Nurse Med Pass After Touching a Patient</td>
<td>Rub</td>
</tr>
<tr>
<td>Nurse Med Pass Before Touching a Patient</td>
<td>Rub</td>
</tr>
<tr>
<td>Nurse Med Pass After Touching a Patient</td>
<td>Rub</td>
</tr>
<tr>
<td>Nurse Med Pass After Touching Patient Surroundings</td>
<td>Rub</td>
</tr>
<tr>
<td>Nurse Med Pass Before Touching a Patient</td>
<td>Rub</td>
</tr>
<tr>
<td>Nurse Med Pass After Touching a Patient</td>
<td>No</td>
</tr>
<tr>
<td>Nurse Med Pass After Touching a Patient</td>
<td>Wash</td>
</tr>
</tbody>
</table>
CLEAN ENVIRONMENT

• “The more I think about it, the more I realize cleanliness is the key with multi-drug resistant organisms”
  Pat Rosenbaum RN, CIC
Ideal Cleaner Disinfectant

- Single step (clean and disinfect in one step)
- Stable
- Low toxicity/danger for humans and pets
- EPA approved
- Rapid kill of wide range of microorganisms with minimal contact time
- Does not damage surfaces
Some Common LTC Sanitizing and Disinfecting Products

- Isopropyl or Ethyl Alcohol
- Chlorine products
- Hydrogen Peroxide [Advanced hydrogen peroxide products (AHP)]
- Quaternary Ammonium Compounds
<table>
<thead>
<tr>
<th>Cleaner/Disinfectant/Antiseptic</th>
<th>YES- USE HERE!!!</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advanced Hydrogen Peroxide (Surfaces)</strong></td>
<td>WASHING MACHINES AND DRYERS Carts and TABLES equipment</td>
</tr>
<tr>
<td></td>
<td>IF THERE IS DIARRHEA, NAUSEA, VOMITING</td>
</tr>
<tr>
<td></td>
<td>SAFE FOR SURFACES EXCEPT FOR MARBLE</td>
</tr>
<tr>
<td><strong>BLEACH/DETERGENT (Surfaces)</strong></td>
<td>WASHING MACHINES</td>
</tr>
<tr>
<td></td>
<td>BLOOD TESTING EQUIPMENT</td>
</tr>
<tr>
<td></td>
<td>ISOLATION ROOMS (INCLUDING C-DIFF)</td>
</tr>
<tr>
<td></td>
<td>IF THERE IS DIARRHEA, NAUSEA, VOMITING</td>
</tr>
<tr>
<td><strong>Hand Sanitizing Gel, Foam Wipes (Skin)</strong></td>
<td>HANDS OF RESIDENTS STAFF</td>
</tr>
<tr>
<td></td>
<td>EMPLOYEES VISITORS CHILDREN</td>
</tr>
<tr>
<td></td>
<td>WIPE 15-30 SECONDS</td>
</tr>
<tr>
<td><strong>Chlorhexidine (CHG) bathing (Skin)</strong></td>
<td>SKIN</td>
</tr>
<tr>
<td></td>
<td>FOLLOW MANUFACTURER’S RECOMMENDATIONS</td>
</tr>
<tr>
<td><strong>Personal Cleansing Cloths</strong></td>
<td>RESIDENT/PATIENT/CLIENT SKIN EVERY DAY CLEAN UP</td>
</tr>
<tr>
<td>THESE WIPES DO NOT KILL GERMS</td>
<td>PERSONAL CARE</td>
</tr>
<tr>
<td></td>
<td>INCONTINENCE CARE</td>
</tr>
</tbody>
</table>
Clean and Disinfect

• Cleaning is everyone’s responsibility
• Concentrate general cleaning/disinfecting on high touch/high use areas
• Equipment must be cleaned/disinfected between each resident/client use
• Cleaning/disinfecting supplies must be available at the point of care
Diffusion of Responsibility for Cleaning

“Housekeeping’s Job”

Equipment and Environment Not Cleaned

“Nursing’s Job”
CRE Toolkit Guidance: *Core Measures for All Acute and Long-term Care Facilities*

- **Contact Precautions**
- Long-term care: CRE colonized or infected residents
- Patients/residents at high-risk for transmission on CP (as described in text)
- Patients/residents at lower risk for transmission use Standard Precautions for most situations
Standard Precautions does not mean “no precautions”
Standard Precautions require that PPE is Always Available
PPE Closets, Housekeeping carts

• Stock with gloves, gowns, goggles, masks
Standard Precautions: When should PPE be used?

Gloves:
• Before any possible contact with blood or body fluids, mucous membranes (eyes, nose, mouth) or potentially infectious materials such as contaminated medical equipment or waste

Face masks or shields
• To protect eyes during situations where blood or body fluids may spray or splatter

Gowns
• To protect skin and clothing during situations where blood or body fluids may spray or splatter or care of resident could result in contamination of skin/clothing
Contact Precautions

• Hand Hygiene
  – Before / after PPE use
  – During resident care as appropriate (e.g., if gloves changed)

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

• Dedicating non-essential items for resident care
  – May help decrease transmission due to contamination
  – Blood pressure cuffs; Stethoscopes; IV poles and pumps

• Private rooms or cohorting residents if possible
Individual with active infection on Contact Precautions

Social Interaction or Minimal Contact

Hand Hygiene

Personal Care
Dressing Changes

Gown, Glove, possibly Mask and Eye Protection, Hand Hygiene
Challenges with Contact Precautions in LTC

• 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 MDRO carriage
  – Underestimating the sources of potential transmission
Strategic placement of residents based on risk factors

• New roommate assignments on resident characteristics and history of MDRO carriage
  – Try to avoid placing two high risk residents together
  – May be safer to cohort low-risk and high-risk residents

• Don’t necessarily change stable room assignments just because of a new culture result unless it now poses new risk
  – Roommates who’ve been together for a long time have already had opportunity to share organisms in the past (even if you only learned about it recently)
CRE Toolkit Guidance: *Core Measures for All Acute and Long-term Care Facilities*

- **Patient and staff cohorting**
  - When available cohort CRE colonized or infected patients and the staff that care for them even if patients are housed in single rooms
  - If the number of single patient rooms is limited, reserve these rooms for patients with highest risk for transmission (e.g., incontinence)
CRE Toolkit Guidance: *Core Measures for All Acute and Long-term Care Facilities*

- **Supplemental Measures for Healthcare Facilities with CRE Transmission**
  - Active Surveillance and screening
  - Preemptive Contact Precautions
  - Chlorhexidine bathing
    - Bathe patients with 2% chlorhexidine
Case Study

- Mr. Jones, an 86 year old white male, is a planned admission.
- He has some sort of resistant bacterial colonization (he flagged in the hospital system), but the hospital staff nurse giving report did not have the history on hand.
- He is not being treated with an antibiotic at this time.
Situation

What is the situation, and what information do you need to care for Mr. Jones?
What do you need to tell the Physician or the Infection Preventionist?
What background information is needed to get a good picture of the individual and the situation?
Exam

• Temperature is 98°F tympanic (normal range is 97.8 to 98.2°F)
• Blood pressure is 122/78 (normal range is 116/70 to 130/82)
• Pulse is 76 and regular (normal range is 68-80)
• His respiratory rate is 16. His lungs are clear.
• He has no open wounds or rashes- skin is clear and in good condition
• He has a urinary catheter inserted in the hospital, but there is no documentation about why he needs the catheter.
With Lab Result A
Lab Result A

Source: URINE 01/13/13 clean catch
FINAL REPORT 01FEB14
100,000 COLONIES/ML
KLEBSIELLA PNEUMONIAE
SUSCEPTIBILITY TESTING

<table>
<thead>
<tr>
<th>Drug</th>
<th>MIC</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMPICILL/SULBAC</td>
<td>8</td>
<td>S</td>
</tr>
<tr>
<td>CEFAZOLIN</td>
<td>&lt;=4</td>
<td>S</td>
</tr>
<tr>
<td>CIPROFLOXACIN</td>
<td>&lt;=0.25</td>
<td>S</td>
</tr>
<tr>
<td>ESBL</td>
<td>NEGATIVE</td>
<td></td>
</tr>
<tr>
<td>GENTAMICIN</td>
<td>&lt;=1</td>
<td>S</td>
</tr>
<tr>
<td>MEROPENEM</td>
<td>&lt;=0.25</td>
<td>S</td>
</tr>
<tr>
<td>NITROFURANTOIN</td>
<td>64</td>
<td>I</td>
</tr>
<tr>
<td>TIGECYCLINE</td>
<td>1</td>
<td>S</td>
</tr>
<tr>
<td>TOBRAMYCIN</td>
<td>&lt;=1</td>
<td>S</td>
</tr>
<tr>
<td>TRIMETH/SULFA</td>
<td>&lt;=20</td>
<td>S</td>
</tr>
<tr>
<td>ZOSYN</td>
<td>&lt;=4</td>
<td>S</td>
</tr>
</tbody>
</table>
With Lab Result B
Lab Result B

• 13 January, 2013
• 100,000 COLONIES/ML
• PROTEUS MIRABILIS
• EXTENDED SPECTRUM BETA LACTAMASE PRODUCER
• RENDERING CEPHALOSPORINS, PENICILLINS, AND AZTREONAM CLINICALLY RESISTANT TO THERAPY.
• INSTITUTE CONTACT ISOLATION PRECAUTIONS AS PER INFECTION CONTROL POLICY.

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>MIC Value</th>
<th>Susceptibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMPICILLIN</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>CEFAZOLIN</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>CEFEPIME</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>CEFOTAXIME</td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>CIPROFLOXACIN</td>
<td>&gt;2</td>
<td>R</td>
</tr>
<tr>
<td>ESBL</td>
<td>POSITIVE</td>
<td></td>
</tr>
<tr>
<td>GENTAMICIN</td>
<td>&gt;8</td>
<td>R</td>
</tr>
<tr>
<td>LEVOFLOXACIN</td>
<td>&gt;4</td>
<td>R</td>
</tr>
<tr>
<td>MEROPENEM</td>
<td>&lt;=1</td>
<td>S</td>
</tr>
<tr>
<td>TOBRAMYCIN</td>
<td>&gt;8</td>
<td>R</td>
</tr>
<tr>
<td>TRIMETH/SULFA</td>
<td>&gt;2</td>
<td>R</td>
</tr>
<tr>
<td>ZOSYN</td>
<td>R</td>
<td></td>
</tr>
</tbody>
</table>
With Lab Result C
Lab Result C

- **SUSCEPTIBILITY PHONED TO:** RN 0900 ON 01/13/13
- **100,000 COLONIES/ML** *KLEBSIELLA PNEUMONIAE*
- **MULTIPLE DRUG RESISTANT STRAIN. INSTITUTE CONTACT ISOLATION PRECAUTIONS AS PER INFECTION CONTROL POLICY.**

**CONFIRMED CARBAPENEMASE PRODUCER**
(CONFIRMATORY TESTING PERFORMED BY OUTSIDE LABORATORY)

- **SUSCEPTIBILITY TESTING**
- **KLEPNE** MIC MIC
  - AMPICILL/SULBAC >=32 R
  - CEFAZOLIN >=64 R
  - CEFEPIME R
  - CEFTRIAXONE R
  - CIPROFLOXACIN >=4 R
  - ESBL NEGATIVE
  - GENTAMICIN <=1 S
  - IMIPENEM R
  - NITROFURANTOIN 256 R
  - TOBRAMYCIN >=16 R
  - TRIMETH/SULFA >=320 R
Recommendation

Recommendation based upon scope of practice. How should the problem be corrected?

Source: The SBAR Communication Technique, Thomas et al.,
Assessment

What is your assessment of this patient’s immediate needs?
Summary for Long term Care

• Register for the XDRO registry
• Educate direct care staff about CRE/KPC
• Involve the residents/patients and their families
• Hand Hygiene
• Cleaner/disinfectants at point of care
• Empower direct care staff re: Contact Precautions
• Minimize Antimicrobial Use
• Get tubes and lines out
• Rapid identification of symptoms
• Prompt isolation of infections (immune imbalance: host/microbe)
• Accurate and ongoing assessment
Realize we are part of a larger healthcare community and must work together in a spirit of cooperation.
XDRO Registry
for long term care facilities:
6 month update

May 2014

Michael Lin, MD MPH
William Trick, MD
Chicago CDC Prevention Epicenter
Objectives

1. CRE overview and recent trends
2. CRE definition / laboratory considerations
3. XDRO registry sign-up and website update
4. Querying and automated alerts
5. Question and answer
CRE: “nightmare bacteria”

- Carbapenem-resistant Enterobacteriaceae (CRE) are extensively drug resistant organisms (XDROs) with few antibiotic options, high mortality rate
Enterobacteriaceae

• Family of bacteria that include:
  – *Escherichia coli*
  – *Klebsiella* species
  – *Enterobacter* species
  – *Citrobacter* species

• Cause healthcare and community-associated infections
  – Example: urinary tract infections
CRE

- Normally found in GI tract, sometimes skin.

Most CRE patients are asymptomatic carriers ("colonized")

Resistance iceberg

Some patients develop CRE infections
## CRE: 2 dominant types

<table>
<thead>
<tr>
<th></th>
<th>KPC</th>
<th>NDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stands for:</td>
<td>Klebsiella pneumoniae carbapenemase</td>
<td>New Delhi metallo-β-lactamase</td>
</tr>
<tr>
<td>Bacterial species</td>
<td>Usually Klebsiella, sometimes <em>E. coli</em></td>
<td>Often <em>E. coli</em> (in U.S.) but variable</td>
</tr>
<tr>
<td>Prevalence</td>
<td>Most common CRE</td>
<td>Rare but emerging</td>
</tr>
<tr>
<td>Treatment</td>
<td>Nearly impossible</td>
<td>Nearly impossible</td>
</tr>
<tr>
<td>Concerning?</td>
<td>Yes!</td>
<td>Yes!! Because it is still rare in U.S. and spreads aggressively. If your lab suspects it, report right away to IDPH</td>
</tr>
</tbody>
</table>
CRE in Chicagoland

<table>
<thead>
<tr>
<th>Facility type</th>
<th>CRE colonization prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short stay acute care hospitals (adult ICUs)</td>
<td>3%</td>
</tr>
<tr>
<td>Long term acute care hospitals (LTACHs)</td>
<td>30%</td>
</tr>
</tbody>
</table>

- CRE are relatively common in some Chicago healthcare facilities, particularly LTACHs.
- Data unclear for nursing homes, but data suggest that skilled nursing facilities with ventilated patients have CRE rates similar to LTACHs.

Lin et al. CID, 2013. 57(9): 1246-1252.
CRE definition and laboratory considerations
CRE definition: Enterobacteriaceae with one of the following test results:

1. Molecular test (e.g., PCR) specific for carbapenemase
   OR

2. Phenotypic test (e.g., Modified Hodge) specific for carbapenemase production
   OR

3. For *E. coli* and *Klebsiella* species only: non-susceptible to ONE of the carbapenems (doripenem, meropenem, or imipenem) AND resistant to ALL third generation cephalosporins tested (ceftriaxone, cefotaxime, and ceftazidime).

Report 1<sup>st</sup> CRE event per patient per encounter
CRE reporting: points of confusion

• What are Enterobacteriaceae?

<table>
<thead>
<tr>
<th>Common</th>
<th>E. coli, Klebsiella spp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less common</td>
<td>Enterobacter, Proteus, Citrobacter, Serratia, Morganella, or Providentia species</td>
</tr>
<tr>
<td>Never</td>
<td>Pseudomonas, Acinetobacter</td>
</tr>
</tbody>
</table>

• Ignore ertapenem susceptibility

• ESBL (extended spectrum β-lactamase) does not qualify as CRE
Laboratory considerations

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Lab test</th>
<th>Common?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Molecular</td>
<td>PCR</td>
<td>Some</td>
</tr>
<tr>
<td>2: Phenotypic</td>
<td>Modified Hodge</td>
<td>Some</td>
</tr>
<tr>
<td>3: Susceptibility</td>
<td>Automated system</td>
<td>All labs</td>
</tr>
</tbody>
</table>

- Ask your lab about testing capability
  - Currently, many facilities will only use criterion 3
- Molecular testing (PCR) tests for the presence of CRE genes, and is currently the only way to confirm the carbapenemase type (KPC vs NDM)
Ceftriaxone was only 3rd gen cephalosporin reported

Non-susceptible to at least 1 carbapenem

Ignore ertapenem results

This laboratory performed confirmation testing and thus was able to determine carbapenemase presence. (but I had to ask the lab that the test was PCR and that it confirmed KPC)
Questions to ask your lab

1) What kind of testing do you perform for CRE?
   a. Modified Hodge testing?
   b. PCR testing?
   c. Metallo-β-lactamase E-test [MBL E-test]?

2) Are you (the lab) reporting CRE results to IDPH on our behalf? (if yes, LTCF needs to let IDPH know)
Facility Data

(Facility data is fictitious, but state data is real)

State Data
Illinois CRE trend (unique pts)

618 total patients reported; 471 pts since Nov. 2013
(average 2 to 3 patients reported per day)
Resistance mechanisms reported to XDRO registry

![Bar chart showing percentages of KPC, NDM, and Other resistance mechanisms.]

- **KPC**: 86% (n=338)
- **NDM**: 9% (n=34)
- **Other**: 5% (n=19)

Data through May 5, 2014; from pts with reported mechanism data, 63% of total
Organism distribution

KPC (N=338)

<table>
<thead>
<tr>
<th>Organism</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klebsiella</td>
<td>93%</td>
</tr>
<tr>
<td>E. coli</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
</tr>
</tbody>
</table>

NDM (N=34)

<table>
<thead>
<tr>
<th>Organism</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klebsiella</td>
<td>94%</td>
</tr>
<tr>
<td>E. coli</td>
<td>6%</td>
</tr>
</tbody>
</table>

Data through May 5, 2014; from pts with reported mechanism data, 63% of total
### Specimen sources of reported CRE

<table>
<thead>
<tr>
<th>Specimen Source</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urine</td>
<td>49</td>
</tr>
<tr>
<td>Wound</td>
<td>14</td>
</tr>
<tr>
<td>Sputum</td>
<td>13</td>
</tr>
<tr>
<td>Rectal (screening)</td>
<td>12</td>
</tr>
<tr>
<td>Blood</td>
<td>7</td>
</tr>
<tr>
<td>Body fluid, tissue, other</td>
<td>5</td>
</tr>
</tbody>
</table>
XDRO registry website:
orientation and updates
Carbapenem-resistant Enterobacteriaceae (CRE) are extremely drug resistant organisms (XDR Os) that have few treatment options and high mortality rates. CRE are increasingly detected among patients in Illinois, including acute and long term care healthcare facilities.

In response to the CRE public health threat, the Illinois Department of Public Health (IDPH) has guided development an infection control tool called the XDRO registry. The purpose of the XDRO registry is two-fold:

1. **Improve CRE surveillance:** The first CRE-positive culture per patient stay must be reported to the XDRO registry.
2. **Improve inter-facility communication:** Healthcare facilities can query the XDRO registry to see whether a patient has been previously reported as CRE-positive.

For access to the XDRO registry, click here

**UPDATES**

IL CRE Detect and Protect Campaign. [More...]

CRE are reportable to IDPH via the XDRO registry. Links: [IDPH letter to facilities, September 2013][Reporting rule]

XDRO registry orientation webinar [Slides][Recording]

CDC guidance on control of CRE: [The 2012 Toolkit]

As of November 1, 2013, the XDRO registry is open for CRE submissions and queries.

View FAQs: [FAQs PDF]
Welcome to the IDPH Web Portal

From here, you can:

- Find all your public health related information at one secure site.
- Join online communities to share files, discussions, calendars and more.
- Access Web-based applications.

To access the IDPH Web Portal, users must be running Internet Explorer 6.0 or higher. Some portal applications may not function properly with other browsers such as Mozilla Firefox.

Current Users: click here to access the portal: Login

I need to...

Register for a Portal Account

Contact Customer Service Center
1-800-366-8768

For assistance with IDPH portal access and web-based application support, contact the Customer Service Center at 1-800-366-8768, Option 1, then Option 1 for password reset assistance or Option 7 to reach support personnel for the Department of Public Health.

Please indicate to the CSC staff that you are an IDPH Health Alert Network (portal) user when placing the call to ensure you are routed to the correct support staff to resolve the problem. Include your name, phone number, and specific application name, detail of the issue and error messages, if any, in your description of the problem to ensure efficient resolution.
Registration Page: New Users

<table>
<thead>
<tr>
<th>First name:*</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Last name:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Password:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirm password:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Department:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work address:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City:*</td>
<td></td>
<td></td>
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<td>State:*</td>
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</tr>
<tr>
<td>E-mail:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirm E-mail:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work phone #:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell phone #:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pager #:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAX #:*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervisor's name:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purpose for registration:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please check the appropriate box(es) below to request access to restricted applications.

- [ ] Beach Monitoring System
- [ ] Cancer Registry System
- [ ] EMS Licensing System
- [ ] Environmental Health Licensing System
- [ ] Food Service Sanitation Manager Certification
- [ ] Genetic Counselling System
- [ ] NARC Alert Notification Recipient
- [ ] NARC Alert Notification System: Author
- [ ] Health Care Worker Background Check System
- [ ] Healthy Homes and Lead Poisoning Surveillance System
- [ ] Hospital Bypass/State Disaster Reporting System
- [ ] I-CARE/Immunization Registry (click here to select the KeyMaster's e-mail: [ ])
- [ ] I-CARE/ETT (Military) HELP File Transfer
- [ ] I-CARE/ETT (Military) HELP File Transfer
- [ ] INEDSS (Disease Surveillance) System: Extensively Drug-Resistant Organisms (XDRG)
User Sign-In

State of Illinois
Web Authentication Portal

Security (show explanation)

- This is a public or shared computer
- This is a private computer

I want to change my password after logging on

**Warning! Unauthorized access is prohibited**
Further access is limited to authorized users only. By accessing or using this system you are consenting to monitoring and recording, which may be disclosed for administrative, disciplinary, civil, or criminal actions, penalties, or prosecution. Users should have no expectation of privacy when accessing or using this system or any of its components.

Domain: General Public (Not employed by the State of Illinois)

User name: john.smith

Password: **********

Log On

Don't have an Illinois.gov ID? Sign up

© 2007 State of Illinois. All rights reserved.
XDRO Report

XDRO culture information

* Organism name (genus/species)
  Please Select Organism: 

* Specimen source
  Please Select Specimen: 

* XDRO criteria (select all that apply)
  Reporting rule
  □ Molecular test (e.g. PCR) specific for carbapenemase
  □ Phenotypic test (e.g. Modified Hodge) specific for carbapenemase production
  □ For E. coli and Klebsiella spp. only: Resistant to ALL 3rd gen cephalosporins tested and non-susceptible (intermediate or resistant) to one carbapenem. Ignore ertapenem.

* Date (culture acquisition)
  mm / dd / yyyy

* Mechanism of resistance
  Please Select Mechanism: 

Facility information

Facility name
  Sample Hospital

* Patient MRN

* Date of admission/Encounter Date
  mm / dd / yyyy

□ Culture obtained as outpatient

Patient demographics

* First name

* Last name

Maiden name (if applicable)
## XDRO Report

### XDRO culture information

**Organism name**
- * XDRO criteria (select all that apply)
  - Reporting rule
  - Molecular test (e.g. PCR) specific for carbapenemase
  - Phenotypic test (e.g. Modified Hodge) specific for carbapenemase production
  - For E. coli and Klebsiella spp. only:
    - Resistant to ALL 3rd gen cephalosporins tested and non-susceptible (intermediate or resistant) to one carbapenem. Ignore ertapenem.

**Date (culture acquisition)**
- mm / dd / yyyy

**Mechanism of resistance**
- Please Select Mechanism:

### Patient Information

**First name**
- 

**Last name**
- 

**Maiden name (if applicable)**
- 

**Patient MRN**
- 

**Date of admission/Encounter Date**
- mm / dd / yyyy
XDRO culture information

* Organism name (genus/species)
  Klebsiella pneumoniae

* XDRO criteria (select all that apply)
  Reporting rule
  □ Molecular test (e.g. PCR) specific for carbapenemase
  □ Phenotypic test (e.g. Modified Hodge) specific for carbapenemase production
  □ For E. coli and Klebsiella spp. only: Resistant to ALL 3rd gen cephalosporins tested and non-susceptible (intermediate or resistant) to one carbapenem. Ignore ertapenem.

* Date (culture acquisition)
  mm / dd / yyyy

* Mechanism of resistance
  Please Select Mechanism

Facility information

* Facility name
  Sample Hospital

* Patient MRN

* Date of admission/Encounter Date
  mm / dd / yyyy

□ Culture obtained as outpatient

Patient demographics

* First name

* Last name

Maiden name(if applicable)
XDRO culture information

* Organism name (genus/species)
  Klebsiella pneumoniae

* XDRO criteria
  - Molecular test (e.g. PCR) specific for carbapenemase
  - Phenotypic test (e.g. Modified Hodge) specific for carbapenemase production
  - For E. coli and Klebsiella spp. only:
    Resistant to ALL 3rd gen cephalosporins tested and non-susceptible (intermediate or resistant) to one carbapenem. Ignore ertapenem.

* Date (culture acquisition)
  mm / dd / yyyy

* Mechanism of resistance
  Please Select Mechanism:

Facility information

* Facility name
  Sample Hospital

* Patient MRN

* Date of admission/Encounter Date
  mm / dd / yyyy

  ☐ Culture obtained as outpatient

Patient demographics

* First name

* Last name

Maiden name (if applicable)
XDRO culture information

- **Organism name** (genus/species)
  - Klebsiella pneumoniae

- **Specimen source**
  - Please Select Specimen:

**XDRO criteria**

- Molecular test (e.g. PCR) specific for carbapenemase
- Phenotypic test (e.g. Modified Hodge) specific for carbapenemase production
- For E. coli and Klebsiella spp. only: Resistant to ALL 3rd gen cephalosporins tested and non-susceptible (intermediate or resistant) to one carbapenem. Ignore ertapenem.

**Date (culture acquisition)**

- mm / dd / yyyy

**Mechanism of resistance**

- KPC (Klebsiella pneumoniae carbapenemase)
- NDM-1 (New Delhi Metallo-β-lactamase)
- OXA
- Other
- Unknown

Facility information

- **Facility name**
  - Sample Hospital

- **Patient MRN**

- **Date**
  - mm / dd / yyyy

Patient demographics

- **First name**

- **Last name**

- **Maiden name (if applicable)**
**XDRO culture information**

- **Organism name (genus/species)**: Klebsiella pneumoniae

- **Specimen source**: Urine

- **XDRO criteria**
  - Molecular test (e.g., PCR) specific for carbapenemase
  - Phenotypic test (e.g., Modified Hodge) specific for carbapenemase production
  - For E. coli and Klebsiella spp. only:
    - Resistant to all 3rd gen cephalosporins tested and non-susceptible (intermediate or resistant) to one carbapenem. Ignore ertapenem.

- **Date (culture acquisition)**: 04/29/2014

- **Mechanism of resistance**: KPC (Klebsiella pneumoniae)

---

**Facility information**

- **Facility name**: Sample Hospital

- **Patient MRN**

- **Date of admission/Encounter Date**: mm/dd/yyyy

- Culture obtained as outpatient

---

**Patient demographics**

- **First name**

- **Last name**

- Maiden name (if applicable)
Patient demographics

* First name

* Last name

Maiden name (if applicable)

Social Security Number (last 4)

* Gender
  - Male
  - Female

* Date of birth (mm/dd/yyyy)

Ethnicity
  - Hispanic or Latino
  - Not Hispanic or Latino

* Street address

* Race
  - Please Select One:

* City
  - Chicago

* County
  - Cook

* State
  - Illinois

* Zip code

Comments

CANCEL  SAVE DRAFT  SUBMIT
Search Instruction

a. Available fields
   Last name (required), first name (optional), DOB (required).

b. Search algorithm
   i. If you enter all 3 fields, then attempt to match (exact; case insensitive) on all 3 fields.
   ii. If no match returns on 3 fields, then attempt to match (exact; case insensitive) on last name and DOB (ignore first name completely).

c. Results display
   i. In general, You will see the search results for exactly how you entered the information.
   If there are no exact matches for last name and dob, you will see a NULL result.
### Search Patient

* Last name  
  J

* Date of birth  
  10 / 10 / 1999

First name

[Query]

---

Showing results for J, DOB 10/10/1999 (FIRST NAME IGNORED):

<table>
<thead>
<tr>
<th>Name</th>
<th>Date of Birth</th>
<th>SSN</th>
<th>Organism</th>
<th>Culture Date</th>
<th>Last Transaction</th>
<th>Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>J, J</td>
<td>10/10/1999</td>
<td></td>
<td>Other Enterobacteriaceae</td>
<td>10/10/2012</td>
<td>submitted,10/10/2013</td>
<td>Rush-presb-st L..</td>
</tr>
</tbody>
</table>

Disclaimer: A match on name and date of birth only may not be 100% accurate. We recommend that you verify XDRO status with the patient or by contacting the facility that entered the result.
Patient information

Patient name: J, J
Date of birth: 10/10/1999
Address: 2200, Chicago, IL 60612

MRN:
SSN (last 4):

Admission date: 10/10/2012
Race: Black/African American

XDRO culture information

Organism: Other Enterobacteriaceae
XDRO criterion:
Mechanism of resistance:

Culture date: 10/10/2012
Specimen source: Blood

Submitted by Vicky G, 10/10/2013, Rush-presb-st Lukes Medical Center
<table>
<thead>
<tr>
<th>RID</th>
<th>Name</th>
<th>Date of Birth</th>
<th>MRN</th>
<th>Organism</th>
<th>Culture Date</th>
<th>Status</th>
<th>Username</th>
</tr>
</thead>
<tbody>
<tr>
<td>585</td>
<td>Q, Q</td>
<td>12/12/2010</td>
<td>1212</td>
<td>Citrobacter spp.</td>
<td>03/01/2014</td>
<td>Pending</td>
<td>devxtest</td>
</tr>
<tr>
<td>835</td>
<td>Duck, Daffy</td>
<td>11/13/1973</td>
<td>1234</td>
<td>Klebsiella pneumoniae</td>
<td>02/14/2014</td>
<td>Submitted</td>
<td>rleidig</td>
</tr>
<tr>
<td>1017</td>
<td>T, Test</td>
<td>01/01/1955</td>
<td>1234536</td>
<td>Escherichia coli</td>
<td>12/31/2013</td>
<td>Submitted</td>
<td>devxtest</td>
</tr>
<tr>
<td>846</td>
<td>S, B</td>
<td>11/11/1950</td>
<td>32152</td>
<td>Citrobacter spp.</td>
<td>12/12/2013</td>
<td>Submitted</td>
<td>devxtest</td>
</tr>
<tr>
<td>777</td>
<td>E, Ds</td>
<td>11/11/1982</td>
<td>1110</td>
<td>Enterobacter aerogenes</td>
<td>11/22/2013</td>
<td>Submitted</td>
<td>devxtest</td>
</tr>
<tr>
<td>861</td>
<td>, Test Criteria</td>
<td></td>
<td></td>
<td>Escherichia coli</td>
<td>11/12/2013</td>
<td>Pending</td>
<td>devxtest</td>
</tr>
<tr>
<td>872</td>
<td>D, Testzip</td>
<td>11/12/1950</td>
<td>2321321</td>
<td>Enterobacter aerogenes</td>
<td>11/11/2013</td>
<td>Submitted</td>
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<tr>
<td>899</td>
<td>T, Test</td>
<td>01/23/1980</td>
<td>3232132</td>
<td>Citrobacter spp.</td>
<td>11/11/2013</td>
<td>Submitted</td>
<td>devxtest</td>
</tr>
</tbody>
</table>
XDRO Report - Sample Hospital

Patient information
Patient name: Duck, Daffy
MRN: 1234
Admission date: 03/13/2014
Date of birth: 11/13/1973
SSN (last 4): 
Race:
Address: 122 S. Michigan, Chicago, IL 60603

XDRO culture information
Organism: Klebsiella pneumoniae
Culture date: 02/14/2014
XDRO criterion: Molecular test
Specimen source:
Mechanism of resistance: KPC
Comments:
Submitted by ROBYNN LEIDIG, 03/14/2014, Sample Hospital
Patient information

Patient name: Duck, Daffy
Date of birth: 11/13/1973
Address: 122 S. Michigan, Chicago, IL 60603

MRN: 1234
SSN (last 4): 

Admission date: 03/13/2014
Race:

XDRO culture information

Organism: Klebsiella pneumoniae
XDRO criterion: Molecular test
Mechanism of resistance: KPC
Culture date: 02/14/2014
Specimen source:

Comments:

Submitted by ROBYNN LEIDIG, 03/14/2014, Sample Hospital

Reason for deleting the above record:

Please Select Reason: 
Comment:

De-colonization or infection resolution is not a valid reason to delete the record.
XDRO Report - Sample Hospital

**Patient information**

Patient name: Duck, Daffy  MRN: 1234  Admission date: 03/13/2014  
Date of birth: 11/13/1973  SSN (last 4):  
Address: 122 S. Michigan, Chicago, IL 60603

**XDRO culture information**

Organism: Klebsiella pneumoniae  Culture date: 02/14/2014  
XDRO criterion: Molecular test  Specimen source:  
Mechanism of resistance: KPC

Comments:

Submitted by ROBYNN LEIDIG, 03/14/2014, Sample Hospital

Reason for deleting the above record: [Dropdown]  
De-colonization or infection resolved  
Please Select Reason: [Dropdown]  
Other  
Comment: [TextArea]
Querying the XDRO registry
Querying the registry

• Currently, querying requires typing patient information into the webpage
  – Reasonable if few admissions per day
    (e.g., long term care facilities)
  – Large facilities may want to query only high-risk patients (e.g., transfers)
Automated CRE alerts

Your facility

1. Send patient info (encrypted)

2. Receive CRE alert if match

XDRO registry

All Illinois facilities

Automated alerts will be piloted at limited hospitals in 2014; anticipate wider availability in 2015
Take home points

1. You are required to report CRE to the XDRO registry. Discuss with your lab about CRE testing and reporting.

2. Even if your lab reports CRE for you, we advise every facility to designate an infection preventionist to sign up for the XDRO registry - Query the registry to see if new patients have been reported as CRE-colonized
Question and answer forum
# Upcoming Webinars

### Target Audience | Topics | Date
--- | --- | ---
Laboratorians | CRE testing guidelines, Reporting to XDRO | June 6
Long Term Care staff | Antibiotic Use in Nursing Homes | June 26

Webinar recordings and slides will be available at [https://www.xdro.org/cre-campaign/index.html](https://www.xdro.org/cre-campaign/index.html)
Survey and Continuing Education Units

- Fill out webinar evaluation on SurveyMonkey at: https://www.surveymonkey.com/s/cre-ltcf-ip
- Instructions on applying for CEUs will appear at the end of the SurveyMonkey
- Surveys and CEU applications must be completed by Monday, June 9!

Contact: Robynn.Leidig@illinois.gov or Angela.Tang@illinois.gov