Los Angeles County Department of Public Health

Health Officer Order for the Reporting of Carbapenem-Resistant Enterobacteriaceae (CRE) and Multi-Drug Resistant Organisms (MDROs)

A Review of the 2019 Reporting Requirements and Instructions

Healthcare Outreach Unit (HOU)
Acute Communicable Disease Control Program (ACDC)
February 5th, 2020
Housekeeping

- All participant phone lines will be muted during the presentation.
- Please submit your questions in the chat box.
- We will have time for questions at the end of the webinar.
- This webinar will be recorded.
- The reporting instructions and recorded webinar will be made available online at:
  - [http://publichealth.lacounty.gov/acd/Diseases/CRE.htm](http://publichealth.lacounty.gov/acd/Diseases/CRE.htm)
  - [http://publichealth.lacounty.gov/acd/Diseases/NMDRO.htm](http://publichealth.lacounty.gov/acd/Diseases/NMDRO.htm)
Overview

- MDRO Reporting Overview
- CRE Overview and Definition
  - Review current CRE reporting
  - Discuss the new CP-CRE reporting requirements
- New MDROs reportable to LAC DPH
- Resources
## MDRO Threats in the United States

<table>
<thead>
<tr>
<th>Organism</th>
<th>Cases</th>
<th>Deaths</th>
<th>Attributable healthcare costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>C. auris</em></td>
<td>323</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>CRAB</td>
<td>8,500</td>
<td>700</td>
<td>$281,000,000</td>
</tr>
<tr>
<td>CRE</td>
<td>13,100</td>
<td>1,100</td>
<td>$130,000,000</td>
</tr>
<tr>
<td>CRPA</td>
<td>32,600</td>
<td>2,700</td>
<td>$767,000,000</td>
</tr>
</tbody>
</table>

## LACDPh MDRO Reporting Requirements

<table>
<thead>
<tr>
<th>Organism</th>
<th>Criteria</th>
<th>Who reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candida auris (C. auris)</td>
<td><em>Candida auris</em></td>
<td>Provider &amp; Lab</td>
</tr>
<tr>
<td></td>
<td>Presumptive <em>C. auris</em></td>
<td>Provider only</td>
</tr>
<tr>
<td>Carbapenemase-producing/resistant Enterobacteriaceae (CRE)</td>
<td>Enterobacteriaceae that are resistant to one or more carbapenems</td>
<td>Provider only</td>
</tr>
<tr>
<td></td>
<td>Confirmed or unknown carbapenemase-producing (CP)-CRE</td>
<td>Lab only</td>
</tr>
<tr>
<td>Carbapenemase-producing <em>Acinetobacter baumannii</em></td>
<td><em>Acinetobacter</em> spp. that are positive for carbapenemase</td>
<td>Lab only</td>
</tr>
<tr>
<td>Carbapenemase-producing <em>Pseudomonas aeruginosa</em></td>
<td><em>P. aeruginosa</em> that are positive for carbapenemase</td>
<td>Lab only</td>
</tr>
<tr>
<td>Vancomycin-resistant <em>Staphylococcus aureus</em> (VRSA)</td>
<td><em>S. aureus</em> with a vancomycin MIC $\geq$16</td>
<td>Lab only</td>
</tr>
<tr>
<td>Pan-resistant organisms (Suspect PDR)</td>
<td>Gram negative bacteria that are non-susceptible to all antibiotics tested</td>
<td>Lab only</td>
</tr>
</tbody>
</table>
Scenario #1: CRE Outbreak in a SNF

- A hospital reported 22 cases of CRE patients admitted from the one skilled nursing facility from January to September 2017
- The original facility was only aware of 6 (27%) of the CRE infections
- Outbreak investigation found a CRE colonization rate of 60%
- Mandating CRE as a reportable condition contributed to timely reporting and controlling the outbreak
What’s the difference?

**Carbapenem-Resistant**
- R to carbapenem antibiotic
- May or may not be due to presence of carbapenemase

**Carbapenemase-Positive**
- Is positive for or producing carbapenemase enzyme
Carbapenemase-producing organisms

• **What are carbapenemases?**
  – Enzymes that can be encoded on mobile gene elements (plasmids)
  – Confer resistance to carbapenems, potentially others
  – Most common= KPC, OXA, NDM, VIM, IMP

• **Why are CPOs important to detect and contain?**
  – Genes may be shared between bacteria = potential for rapid spread of AR
  – Need for contact precautions and communication of test results to prevent spread
# Carbapenemase Testing Methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Enterobacteriaceae (Enterobacterales)</th>
<th><em>Pseudomonas aeruginosa</em></th>
<th><em>Acinetobacter spp.</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Detects presence or absence of carbapenemase enzyme (Phenotypic Test)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CarbaNP</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>mCIM</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>mCIM with eCIM</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modified Hodge Test</td>
<td></td>
<td></td>
<td>No longer recommended</td>
</tr>
<tr>
<td>Detects specific type of carbapenemase enzyme (e.g. KPC, NDM, VIM, IMP, OXA) (Molecular Test)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BD Phoenix™ CPO Detect</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Biomerieux Rapidec® Carba NP</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hardy NG-Test® CARBA 5</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cepheid Xpert® Carba-R</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Biofire® FilmArray® BCID Panel for pos blood cultures (KPC only)¹</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>VERIGENE® gene detection for pos blood cultures¹</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Check-Points Check-Direct CPE for BD MAX™ (RUO)</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>In-House PCR assay for gene detection</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

RUO, research use only
¹ FDA cleared for positive blood cultures

**Note:** Additional RUO commercial tests might be considered in some laboratories

**CDC website:** [https://www.cdc.gov/hai/organisms/cre/technical-info.html#Identification](https://www.cdc.gov/hai/organisms/cre/technical-info.html#Identification)
Carbapenemase Epidemiology in LA County

Carbapenemase-positive Organisms, LACDPH Public Health Laboratories, 2019

- *Enterobacteriaceae*: 69%
- *Pseudomonas aeruginosa*: 4%
- *Acinetobacter baumannii*: 75%
**CRE Health Officer Order**

- Issued January 19, 2017 to acute care hospitals and skilled nursing facilities (SNFs) in Los Angeles County

- Mandated the following:
  - Facilities enrolled in NHSN report CRE via LabID
  - SNFs not enrolled in NHSN report via submission of CRE Epidemiology Report Form and lab report to LACD PH Morbidity Unit
CRE Surveillance Definition

Any *Escherichia coli*, *Klebsiella oxytoca*, *Klebsiella pneumoniae*, or *Enterobacter* spp. demonstrating resistance by one or more of the following methods:

- Resistant to carbapenems
  
  OR

- Production of a carbapenemase
CRE Epidemiology Form – For SNFs not enrolled in NHSN

• Similar to the standard LACDPh CMR form, include:
  – patient information (name, DOB, etc.)
  – reporting facility name, address
  – name and phone number of the person submitting the report
New CDPH Requirements

• Title 17, Section 2505, Subsection (e)(2) laboratory reportable conditions list, effective October 1, 2019

• Any *Enterobacter* spp., *E. coli*, or *Klebsiella* spp. where the isolate is:
  – Positive for carbapenemase production by a phenotypic method -OR-
  – Positive for a known carbapenemase resistance mechanism (KPC, NDM, IMP, VIM, OXA-48, novel carbapenemase) by a recognized molecular test
New CDPH Requirements

• Laboratories that do not perform or obtain carbapenemase testing, will report the following:

*Enterobacter* spp., *E. coli*, or *Klebsiella* spp. from any site, resistant to any carbapenem (doripenem, ertapenem, imipenem, meropenem)
How to Report

Healthcare Provider
– Continue to report in NHSN (Acute Care Hospitals) or by paper (Skilled Nursing Facilities)

Laboratory
– ELR: transmit lab data.
– No ELR: Fax final lab report (including all AST) with completed LACDPH CMR form to 888-397-3778 or 213-482-5508.
What to Report

**Healthcare Provider**
- Current surveillance definition

**Laboratory**
- Positive for carbapenemase production or mechanism
- Carbapenemase testing was not done
Scenario #2: VIM+IMP-positive Carbapenem-resistant *P. aeruginosa* (CRPA)

### Detection
- VIM+IMP-producing CRPA detected by LAC PHL Surveillance Project
- Facility staff educated

### Investigation
- Organism acquired during hospitalization in Peru
- Facility ID physician identified CRPA with same AST pattern
- LACDPH notified
- Isolate tested at LAC PHL

### Second case
- Facility ID physician identified CRPA with same AST pattern
- LACDPH notified
- Isolate tested at LAC PHL

### Containment
- On-site infection control assessment and unit-wide point prevalence survey
Carbapenemase-producing *Acinetobacter* spp. Definition

- Any *Acinetobacter* spp. where the isolate is:
  - Positive for carbapenemase production by a phenotypic method - OR -
  - Positive for a known carbapenemase resistance mechanism by a recognized molecular test

- See slide 5 for list of current test methods

- Do **NOT** report carbapenem-resistant *Acinetobacter* if carbapenemase test is not performed or negative
How to Report CP-Acinetobacter spp.

Laboratory

- ELR: transmit lab data.
- No ELR: Fax final lab report (including all AST) with completed [LACDPH CMR form](#) to 888-397-3778 or 213-482-5508.

Both clinical and colonized cases should be reported within 1 working day.
Carbapenemase-producing *Pseudomonas aeruginosa* Definition

- Any *P. aeruginosa* where the isolate is:
  - Positive for carbapenemase production by a **phenotypic** method -OR-
  - Positive for a known carbapenemase resistance mechanism by a recognized **molecular** test
  - See slide 5 for list of current test methods

- Do **NOT** report carbapenem-resistant *Pseudomonas aeruginosa* (CRPA) if carbapenemase test is not performed or negative
How to Report CP- *P. aeruginosa*

**Laboratory**

- ELR: transmit lab data.
- No ELR: Fax final lab report (including all AST) with completed [LACDPH CMR form](#) to 888-397-3778 or 213-482-5508.

Both clinical and colonized cases should be reported within 1 working day.
# Carbapenem-Resistant Organism Reporting Overview (Laboratories)

<table>
<thead>
<tr>
<th>Organism</th>
<th>Carbapenemase test result</th>
<th>Report to LAC DPH?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterobacteriaceae</td>
<td>Positive</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Negative or Indeterminate</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Not Performed</td>
<td>Yes</td>
</tr>
<tr>
<td><em>Acinetobacter</em> spp.</td>
<td>Positive</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Indeterminate, negative, or not performed</td>
<td>No</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>Positive</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Indeterminate, negative, or not performed</td>
<td>No</td>
</tr>
</tbody>
</table>
Suspect rare carbapenemase-producing organisms (CPO)

<table>
<thead>
<tr>
<th>Targeted MDRO</th>
<th>Organism(s)</th>
<th>Phenotypic Criteria</th>
<th>Genotypic Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare carbapenemase producing organisms</td>
<td>Carbapenem-resistant (CR)- Enterobacteriaceae</td>
<td>Carbapenemase positive* and/or R to ceftazidime-avibactam and/or meropenem-vaborbactam</td>
<td>VIM, NDM, IMP, and/or OXA</td>
</tr>
<tr>
<td></td>
<td>CR-Pseudomonas aeruginosa</td>
<td>Carbapenemase positive** and/or R to cefepime and/or ceftazidime</td>
<td>KPC, VIM, NDM, IMP, and/or OXA</td>
</tr>
<tr>
<td></td>
<td>CR-Acinetobacter spp.</td>
<td>Carbapenemase positive**</td>
<td>KPC, VIM, NDM, IMP, and/or OXA</td>
</tr>
</tbody>
</table>

Call Acute Communicable Disease Control (ACDC)
Phone: 213-240-7941
Fax: 213-482-4856

LACDPH Novel MDRO Reporting Guide accessible at:
Candida auris (C. auris) Definitions

- Confirmed C. auris: *C. auris*
- Presumptive C. auris: varies by lab ID method, includes:
  - *Candida catenulate*
  - *Candida famata*
  - *Candida duobushaemulonii*
  - *Candida guilliermondii*
  - *Candida haemulonii*
  - *Candida intermedia*
  - *Candida lusitaniae*
  - *Candida parapsilosis*
  - *Candida sake*
  - *Rhodotorula glutinis*
  - *Saccharomyces kluveri*

Refer to CDC: [https://www.cdc.gov/fungal/candida-auris/recommendations.html](https://www.cdc.gov/fungal/candida-auris/recommendations.html)
What to Report

Laboratory
• Confirmed C. auris

Healthcare Provider
• Confirmed & presumptive C. auris

Both clinical and colonized cases should be reported within 1 working day.
How to Report C. auris

**Laboratory**

- ELR: transmit lab data.
- No ELR: Fax final lab report (including all AST) with completed [C. auris Case Report form](#) to 888-397-3778 or 213-482-5508.
How to Report C. auris

Healthcare Provider

• Fax final lab report with completed C. auris Case Report form via to 888-397-3778 or 213-482-5508.

– VisualCMR C. auris tab coming soon!
Vancomycin-resistant *Staphylococcus aureus* (VRSA) Definition

*S. aureus* with a vancomycin MIC $\geq 16$ μg/mL
How to Report VRSA

Laboratory

• ELR: transmit lab data.
• No ELR: fax final lab report, including AST results.

Both clinical and colonized cases should be reported within 1 working day.
Suspect pan-resistant gram-negative organisms (suspect PDR) Definition

- Isolates that are resistant to all antimicrobial drugs tested on your gram negative panel (excluding colistin)

LACDPh expects to update this definition.

How to Report suspect PDR

Laboratory

- Fax **final** lab report (including all AST) with completed [LACDPH CMR form](#) to 888-397-3778 or 213-482-5508.

Report within 1 working day.
Facilities work together to protect patients.

**Common Approach (Not enough)**
- Patients can be transferred back and forth from facilities for treatment without all the communication and necessary infection control actions in place.

**Independent Efforts (Still not enough)**
- Some facilities work independently to enhance infection control but are not often alerted to antibiotic-resistant or *C. difficile* germs coming from other facilities or outbreaks in the area.
- Lack of shared information from other facilities means that necessary infection control actions are not always taken and germs are spread to other patients.

**Coordinated Approach (Needed)**
- Public health departments track and alert health care facilities to antibiotic-resistant or *C. difficile* germs coming from other facilities and outbreaks in the area.
- Facilities and public health authorities share information and implement shared infection control actions to stop spread of germs from facility to facility.

Photo credit: CDC
Resources

• CDPH FAQ for CP-CRE Reporting: https://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/CP-CRE_ReportingFAQ_Approved_10.4.19 ADA.pdf

• CRE reporting updates: http://publichealth.lacounty.gov/acd/Diseases/CRE.htm

• Novel MDRO reporting updates: http://publichealth.lacounty.gov/acd/Diseases/NMDRO.htm

• Carbapenemase-producing organisms (CPO) resources: http://publichealth.lacounty.gov/acd/Diseases/CPO.htm

• C. auris FAQs to Aid Clinical Laboratorians: http://publichealth.lacounty.gov/acd/docs/C.auris_FAQs.pdf
Remember...

• When in doubt or in need of guidance, contact the Healthcare Outreach Unit (HOU) of the Acute Communicable Disease Control Program (ACDC)
  – Phone: 213-240-7941
  – Email: hai@ph.lacounty.gov

• Never send isolates to LACDPh Public Health Lab (PHL) without calling ACDC first

• Always save any isolates that may require confirmatory testing via LACDPh
Questions?
LACDPH Confidential Morbidity Report (CMR) Form

Use for all reports