

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/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



Organism	Cases	Deaths	Attributable healthcare costs
<i>C. auris</i>	323	n/a	n/a
CRAB	8,500	700	\$281,000,000
CRE	13,100	1,100	\$130,000,000
CRPA	32,600	2,700	\$767,000,000



LACDPH MDRO Reporting Requirements

Organism	Criteria	Who reports
<i>Candida auris</i> (C. auris)	<i>Candida auris</i>	Provider & Lab
	Presumptive <i>C. auris</i>	Provider only
Carbapenemase-producing/resistant Enterobacteriaceae (CRE)	Enterobacteriaceae that are resistant to one or more carbapenems	Provider only
	Confirmed or unknown carbapenemase-producing (CP)-CRE	Lab only
Carbapenemase-producing <i>Acinetobacter baumannii</i>	<i>Acinetobacter</i> spp. that are positive for carbapenemase	Lab only
Carbapenemase-producing <i>Pseudomonas aeruginosa</i>	<i>P. aeruginosa</i> that are positive for carbapenemase	Lab only
Vancomycin-resistant <i>Staphylococcus aureus</i> (VRSA)	<i>S. aureus</i> with a vancomycin MIC ≥ 16	Lab only
Pan-resistant organisms (Suspect PDR)	Gram negative bacteria that are non-susceptible to all antibiotics tested	Lab only

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

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Specimen Source: URINE CULTURE
Collection Date: 03/10/2017 Receipt Date: 03/10/2017
Accession#: ----
ORG#1 >100,000 COLONIES/ML
ORG#1 THIS ISOLATE DEMONSTRATES CARBAPENEMASE PRODUCTION
ORG#1 VERIFIED BY MODIFIED HODGE TEST (CARBAPENEMASE PRODUCTION)
ORG#1 MULTIPLE DRUG RESISTANT ORGANISM
ORG#1 ADDITIONAL SENSITIVITIES BY DISK METHOD
ORG#1 COLISTIN 10ug : S , POLYMYXIN B 300ug : S
ORG#1 10 200 COLONIES/ML
```

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*****
POSITIVE for Klebsiella pneumoniae.
POSITIVE for KPC resistance gene.
Presumptive carbapenem resistant organism.
*****Comment*****
Preliminary identification performed using
Verigene nucleic acid test. Mixed infections
may not be detected by this method. Rare
cross-reactivity with organisms other than that
identified may occur for both identification
and resistance marker testing.
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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

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

RUO, research use only

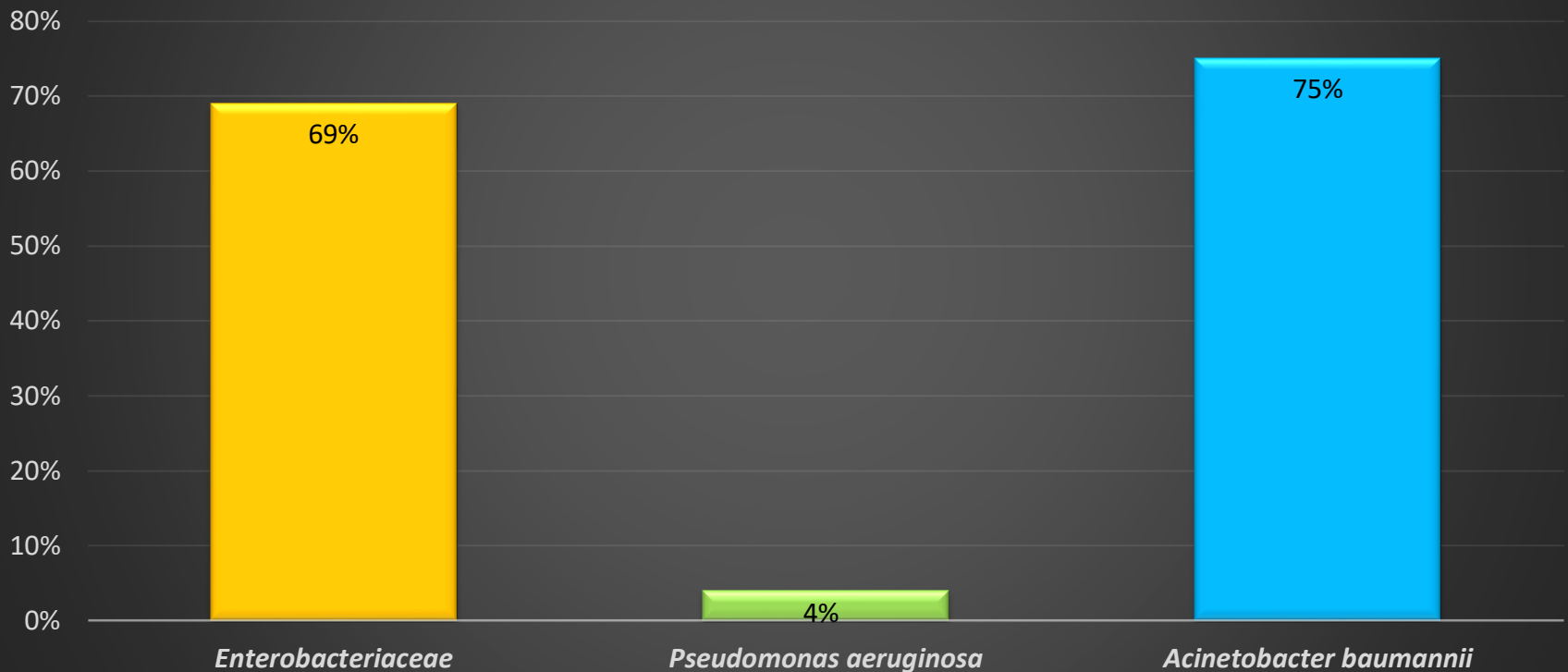
¹ FDA cleared for positive blood cultures

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



Carbapenemase Epidemiology in LA County

Carbapenemase-positive Organisms, LACDPH Public Health Laboratories, 2019



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 LACDPH 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

		CARBAPENEM-RESISTANT ENTEROBACTERIACEAE EPIDEMIOLOGY REPORT FORM <i>Klebsiella spp., Escherichia coli, and Enterobacter spp.</i> Only for use by Skilled Nursing Facilities				
<small>Acute Communicable Disease Control 313 N. Figueroa St., Rm. 212, Los Angeles, CA 90012 213-240-7641 (phone), 213-482-4850 (facsimile) www.lapublichealth.org/acd</small>						
PATIENT INFORMATION						
Patient Name-Last		First	Middle Initial	Date of Birth	Age	Sex
Race (check one)				Ethnicity (check one)		
<input type="checkbox"/> African-American/Black <input type="checkbox"/> Asian/Pacific Islander <input type="checkbox"/> Native American <input type="checkbox"/> White <input type="checkbox"/> Other: _____				<input type="checkbox"/> Hispanic/Latino <input type="checkbox"/> Non-Hispanic/Non-Latino		
REPORTING FACILITY INFORMATION						
Reporting Facility Name		Name of Person Reporting		Reporting Facility Phone Number		
Reporting Facility Address- Number, Street		City	State	ZIP Code		



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

Investigation

Organism acquired during hospitalization in Peru
Facility staff educated

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)

Organism	Carbapenemase test result	Report to LAC DPH?
Enterobacteriaceae	Positive	Yes
	Negative or Indeterminate	No
	Not Performed	Yes
<i>Acinetobacter</i> spp.	Positive	Yes
	Indeterminate, negative, or not performed	No
<i>Pseudomonas aeruginosa</i>	Positive	Yes
	Indeterminate, negative, or not performed	No



Suspect rare carbapenemase-producing organisms (CPO)

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

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



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 lusitanae*
 - *Candida parapsilosis*
 - *Candida sake*
 - *Rhodotorula glutinis*
 - *Saccharomyces kluyveri*

Refer to CDC:

<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!*

County of Los Angeles Public Health SUSPECT CANDIDA AURIS REPORT FORM

PATIENT INFORMATION

Patient Name- Last, First: _____ Facility name (if not living at home): _____ Date of birth: _____ Age: _____

Address- Number, Street, Apt # _____ City of Residence: _____ State: _____ ZIP Code: _____

Patient's current gender identity? Male Female Female-to-Male (FTM) Transgender Male/Trans Man Male-to-Female (MTF) Transgender Female/Trans Woman Genderqueer, non-binary, or other gender not listed Other Prefer not to state

Patient's sex at birth? Male Female Other: _____

Patient's race or ethnicity? (check all that apply) White Hispanic/Latino/Latina origin Black/African American Asian American Indian/Alaskan Native Native Hawaiian/Other Pacific Islander Other: _____

DIAGNOSTIC TESTS

Specimen collection: Urine Blood Sputum Other: _____

Site of final result: C. auris (C. auris) C. bruggii C. intermedia C. sake C. dubliniensis C. guilliermondii C. lusitana C. parapsilosis Pseudomonas guineae C. glabrata C. lusitana C. parapsilosis Saccharomyces kluyveri

Specimen source: Blood Nasal swab Rectal swab Respiratory Skin swab Urine Wound Sputum (non-sterile) Other: _____

Testing Method (check one only) API 20C Inhibitory VITEK MS MALDI-TOF MicroScan Other: _____

API 20C Bruker Sequencer MALDI-TOF Vitek 2 YST SDC Phoenix GenieLab when SDC is not Panel Vitek 2 YST

HEALTHCARE PRESENTATION

Facility Name: _____ Admit date: _____ Discharge date: _____

Infection status: Colonization Infection Unknown/Unknown Was patient previously colonized prior to current admission? Yes No Unknown

Disposition: Discharged to facility name: _____ Discharged home Fatal - Date of Death: _____ Other: Specify _____

EPIDEMIOLOGIC LINKS/ RISK FACTORS

Has the patient stayed overnight in a healthcare facility within the past 12 months? Yes No Unknown

If Yes, healthcare facility location was: Outside of US Inside US OR: both

Specific dates of admission and re-admission: _____

History of carbapenemase-producing organisms? Yes No Unknown If Yes, Date of collection: _____

If Yes, specify source performed (check all that apply): Culture (CFU) eQCM mQCM Modified Hodge Test (MHT) PCR-based Other: _____

Exposed to another case? Yes No Unknown If Yes, Case Name & Birthdate: _____

REMARKS



Vancomycin-resistant *Staphylococcus aureus* (VRSA) Definition

S. aureus with a vancomycin MIC \geq 16 $\mu\text{g}/\text{mL}$



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.

See: Magiorakos, A.P., et.al. Multidrug-resistant, extensively drug-resistant and pandrug-resistant bacteria: an international expert proposal for interim standard definitions for acquired resistance. Clin Microbiol Infect2012;18:268–281



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.



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



COUNTY OF LOS ANGELES • DEPARTMENT OF PUBLIC HEALTH
MORBIDITY UNIT
CONFIDENTIAL MORBIDITY REPORT



NOTE: This form is not intended for reporting STDs, HIV, AIDS or TB. See comments below

DISEASE BEING REPORTED: _____			DISTRICT CODE (internal use only): _____		
Patient's Last Name: _____		Social Security Number: _____			
First Name and Middle Name (or initial): _____		Birthdate (MM/DD/YYYY): _____		Age: _____	
Address (Street and number): _____					
City/Town _____		State CA		Zip code _____	
Home Telephone Number: _____		Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other _____			
Work Telephone Number: _____		Pregnant? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown			
		Estimated Delivery Date: _____			
Patient's Occupation or Setting:					
<input type="checkbox"/> Day Care		<input type="checkbox"/> Correctional Facility		<input type="checkbox"/> Food Service (Explain): _____	
<input type="checkbox"/> Health Care		<input type="checkbox"/> School		<input type="checkbox"/> Other (Explain): _____	
Race (check one):					
<input type="checkbox"/> American Indian / Alaskan Native					
<input type="checkbox"/> Asian (specify one):					
<input type="checkbox"/> Asian Indian		<input type="checkbox"/> Hmong		<input type="checkbox"/> Laotian	
<input type="checkbox"/> Cambodian		<input type="checkbox"/> Japanese		<input type="checkbox"/> Thai	
<input type="checkbox"/> Chinese		<input type="checkbox"/> Korean		<input type="checkbox"/> Vietnamese	
<input type="checkbox"/> Filipino		<input type="checkbox"/> Other _____			
<input type="checkbox"/> Black / African American					
<input type="checkbox"/> Native Hawaiian / Other Pacific Islander (ie. Guam, Samoa)					
<input type="checkbox"/> White					
<input type="checkbox"/> Other _____					
Risk Factors / Suspected Exposure Type: _____					

Use for all reports

