



Carbapenem-Resistant Organism (CRO) Submission Guidelines Guidance for Clinical Laboratories and Infection Control Professionals

Purpose

Carbapenem-resistant organisms (CROs) are a significant public health concern due to their resistance to last-line antibiotics, including carbapenems. These pathogens are difficult to treat, highly transmissible, and associated with increased morbidity, mortality, and healthcare costs. Early detection and reporting of CROs are essential for public health surveillance, outbreak prevention, and effective infection control.

Among CROs, carbapenemase-producing organisms (CPOs) pose the greatest risk. These organisms produce enzymes—such as KPC (*Klebsiella pneumoniae* carbapenemase), IMP (Imipenemase), VIM (Verona integron-encoded metallo- β -lactamase), NDM (New Delhi metallo- β -lactamase), and OXA-48 (Oxacillinase-48)—that inactivate carbapenems and other beta-lactams, severely limiting treatment options. Many CROs submitted for surveillance are ultimately confirmed as CPOs. Prompt identification and reporting of these organisms allow healthcare facilities to work closely with the Arkansas Department of Health (ADH) to prevent transmission of these organisms in healthcare facilities.

Organisms and Submission Criteria

Carbapenem-Resistant Enterobacterales (CRE) Resistant to ertapenem (MIC ≥ 2 $\mu\text{g/mL}$) ¹ OR Resistant to imipenem or meropenem (MIC ≥ 4 $\mu\text{g/mL}$) ¹ Commonly submitted species, include but are not limited to: <i>E. coli</i> , <i>Klebsiella</i> spp., <i>Enterobacter</i> spp., <i>Citrobacter freundii</i> , <i>Serratia marcescens</i>
Carbapenemase-Producing Organism (CPO)* Phenotypic methods (e.g., Modified Carbapenem Inactivation Method (mCIM), Carba NP) OR Molecular methods (e.g., PCR for blaKPC, blaNDM, blaVIM, blaIMP, blaOXA-48) ^{1,2}
Carbapenem-Resistant <i>Acinetobacter baumannii</i> (CRAB) Resistant to imipenem or meropenem (MIC ≥ 8 $\mu\text{g/mL}$) ¹
Carbapenem-Resistant <i>Pseudomonas aeruginosa</i> (CRPA) Resistant to imipenem or meropenem (MIC ≥ 8 $\mu\text{g/mL}$) ² AND Non-susceptible (intermediate or resistant) to cefepime or ceftazidime (MIC ≥ 16 $\mu\text{g/mL}$) ²
Pan-Resistant or Pan-Non-Susceptible Isolates Not susceptible (i.e., intermediate or resistant) to all antimicrobials tested at your facility. ⁴

***Note: not all facilities have the capability for CPO testing. Refer to CRE/CRAB/CRPA for submission criteria if your facility does not have CPO testing capabilities.**

Priority Submissions

These isolate types are especially valuable to public health surveillance efforts:

- Carbapenemase-positive by any validated method (mCIM, PCR, etc.)
- Cepheid Carba-R positive results
- mCIM positive/Carba-R negative discordant results
- Suspected or confirmed *Candida auris*³ (submitted to TB/Mycology Lab)

Submission Process

1. Pre-Approval
 - a. Request approval using the ADH Laboratory Web Portal (LWP):
<https://prod.labwebportal.com/ar>
 - b. New users can register directly on the portal.
2. Isolate Preparation
 - a. Submit a pure isolate on appropriate media.
3. Required Documentation
 - a. Include antimicrobial susceptibility testing (AST) results which include minimum inhibitory concentration (MICs).
 - b. Attach completed LWP submission form.

Shipping Instructions

Ship all specimens using Category B compliant packaging to:

Arkansas Department of Health – Public Health Laboratory
201 S. Monroe Street
Little Rock, AR 72205
Attn: Microbiology – CRO Surveillance

HAI/AR Program Contact Information

- Phone: (501) 280-4368
- Email: adh.hai@arkansas.gov

References

1. Clinical and Laboratory Standards Institute (CLSI). (2023). Performance Standards for Antimicrobial Susceptibility Testing (33rd ed.; CLSI supplement M100).
2. Centers for Disease Control and Prevention (CDC). (2023, Sept 25). About CRE. <https://www.cdc.gov/cre/about/index.html>
3. CDC. (2024, Jan 26). Identification of *Candida auris*. <https://www.cdc.gov/candida-auris>
4. CDC. (2022, Jul 13). Interim Guidance for a Public Health Response to Contain Novel or Targeted MDROs. <https://www.cdc.gov/healthcare-associated-infections/media/pdfs/Health-Response-Contain-MDRO-H.pdf>