West Virginia Department of HEALTH
BUREAU FOR PUBLIC HEALTH

Carbapenemase-Producing Organisms Guide for Facilities, Providers & Laboratories

The WV Healthcare-Associated Infections (HAI) Program created the Carbapenemase-Producing Organisms (CPOs) Guide to provide direction for facilities, providers and laboratories on testing for and investigating CPOs. This Guide is designed to be used alongside the West Virginia Prevention and Control of Multidrug-Resistant Organisms (MDRO) Strategic Work Plan 2026, which provides additional infection prevention and control (IPC) and screening recommendations that change based on local or regional CPO epidemiology. Implementing some practices (e.g., cohorting) in this guide can be challenging or not feasible in some healthcare facilities, but this should not preclude facilities from accepting and caring for patients and residents with CPOs.

Background

Carbapenem-resistant organisms (CROs) are gram-negative bacteria that are resistant to at least one carbapenem antibiotic (e.g., meropenem, imipenem, ertapenem). CROs may include:

- Carbapenem-Resistant Enterobacterales (CRE)
- *Pseudomonas aeruginosa (CRPA)*
- *Acinetobacter baumannii (CRAB)*

A **subset** of CROs are CPOs. CPOs make carbapenemase enzymes that inactivate carbapenem antibiotics. These enzymes include:

- *Klebsiella pneumoniae* carbapenemase (KPC)
- New Delhi metallo-β-lactamase (NDM)
- Oxacillinases (OXA-23, OXA-24, OXA-24/40, etc.)
- Verona integron-encoded metallo-β-lactamase (VIM)
- Imipenem-resistant Pseudomonas (IMP)

Carbapenemase genes that produce these enzymes can be transmitted within and between bacterial species on mobile genetic elements, increasing spread of antimicrobial resistance.

CPOs spread from patient to patient through transient contamination of the hands or clothing of healthcare personnel (HCP), on contaminated equipment, or in the healthcare environment.

Patients at most risk are those with indwelling medical devices, on broad-spectrum antimicrobials, and those with recent international travel or healthcare exposure.

WV Specific Information

Prior to 2023, testing for and reporting of CPOs were minimal. Through education and outreach to laboratories and healthcare facilities, reporting increased and now continues to improve.

2023 CPO cases (N = 89)
KPC = 63
NDM = 4
OXA-(all types) = 19
VIM = 3

2024 CPO cases (N = 122)
KPC = 69
NDM = 9
OXA-23 = 13
OXA-24 = 27
OXA-24/40 = 4

Recommendations

- If not already being done, **CROs should be tested for carbapenemase production.**
- Clinical laboratories should include Minimum Inhibitory Concentration (MIC) values for any carbapenem drugs tested on all lab reports, both hardcopy and electronic. This is required for case assertation.
- Submit clinical isolates to the Office of Laboratory Services (OLS) for identification of CPOs.
- Consider screening for CPOs among high-risk populations.
- Implement empirical contact precautions or Enhanced Barrier Precautions (EBP) in long-term care facilities pending test results for at-risk patients.
  - Mechanically ventilated patients.
  - Patients from any Long-Term Acute Care Hospital (LTACH) or other facility with known CPO cases.
  - High-risk contacts of a confirmed CPO case including roommates, those who shared a bathroom, those who occupy the same bedspace immediately after the initial or index patient was identified.

Additional Infection Prevention Guidance

- Facilities with multiple patients or residents with CPO(s) may create cohorts within rooms or in the same geographic areas of the facility (e.g., KPC positive *Klebsiella pneumoniae* with other KPC positive *Klebsiella pneumoniae*).
- Perform and audit hand hygiene practices.
- Use dedicated equipment and staff.
- Conduct and audit daily and terminal cleaning and disinfection of patient care environments.
- Participate in an onsite Infection Control and Response (ICAR) assessment.

For additional information, please visit:
OEPS website A to Z

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