



## Communicable Disease Case Reporting and Investigation Protocol **CARBAPENEM-RESISTANT *ENTEROBACTERIACEAE***

### I. IDENTIFICATION AND DEFINITION OF CASES

**Clinical Description:** Carbapenemase-producing carbapenem-resistant *Enterobacteriaceae* (CP-CRE) are an emerging and epidemiologically important public health threat. Infections with CP-CRE are difficult to treat and associated with high mortality rates. Carbapenem antibiotics (imipenem, meropenem, doripenem, and ertapenem) are often used as the last line of treatment for infections caused by highly resistant gram-negative bacteria, including those in the *Enterobacteriaceae* family. CP-CRE contains mobile antibiotic-resistant elements that facilitate transmission of resistance to other gram-negative bacilli. Early detection and aggressive implementation of infection prevention and control strategies are necessary to prevent further spread of CP-CRE, especially novel CP-CRE.

**A. Laboratory Criteria:** Any *Enterobacteriaceae* spp. that tests positive or indeterminate for carbapenemase production by a phenotypic method or positive for a carbapenemase resistance mechanism by molecular testing methods.

1. Examples of phenotypic methods for the detection of carbapenemase production:
  - Carba NP positive
  - Metallo- $\beta$ -lactamase testing (e.g., E-test) positive
  - Modified Carbapenem Inactivation Method (mCIM) positive or indeterminate
  - Carbapenem Inactivation Method (CIM) positive or indeterminate
2. Examples of molecular methods for the detection of carbapenemase resistance mechanisms:
  - Commercial or validated laboratory-developed PCR for KPC, NDM, OXA-48, IMP, VIM or other carbapenemase
  - Xpert® Carba-R (KPC, NDM, OXA-48, VIM, or IMP)
  - Next Generation or other sequencing methods

**B. Wisconsin Surveillance Case Definition:**

- **Confirmed:** An isolate of *Enterobacteriaceae* spp. that is positive for a carbapenemase resistance mechanism (e.g., KPC, NDM, VIM, IMP, OXA-48) by an FDA approved or validated laboratory-developed test (e.g., PCR, Xpert® Carba-R), or sequencing method.
- **Probable:** An isolate of *Enterobacteriaceae* spp. for which the phenotypic test is positive or indeterminate (e.g., metallo- $\beta$ -lactamase test, Carba NP, Carbapenem Inactivation Method [CIM], or modified CIM), but the molecular testing is negative or not performed.

### II. REPORTING

- A. Wisconsin Notifiable Disease Category I – Methods for Reporting:** This disease shall be reported **IMMEDIATELY BY TELEPHONE** to the patient's local health officer or to the local health officer's designee upon identification of a case or suspected case, per Wis. Admin. Code § [DHS 145.04 \(3\) \(a\)](#). In addition to the immediate report, complete and fax, mail or electronically report an Acute and Communicable Disease Case Report (DHS [F-44151](#)) to the address on the form, or enter the data into the Wisconsin Electronic Disease Surveillance System (WEDSS), within 24 hours.
- B. Responsibility for Reporting:** According to Wis. Admin. Code § [DHS 145.04\(1\)](#), persons licensed under Wis. Stat. ch. [441](#) or [448](#), laboratories, health care facilities, teachers, principals, or nurses serving a school or day care center, and any person who knows or suspects that a person has a communicable disease identified in [Appendix A](#).
- C. Clinical Criteria for Reporting:** None.
- D. Laboratory Criteria for Reporting:** Laboratory evidence of infection or colonization by culture or non-culture-based methods that meet the laboratory criteria. All positive results shall be reported and all positive isolates shall be forwarded to the Wisconsin State Laboratory of Hygiene (WSLH).

### III. CASE INVESTIGATION

- A. **Responsibility for case investigation:** It is the responsibility of the local health department (LHD) to investigate or arrange for investigation of suspected or confirmed cases as soon as is reasonably possible. A case investigation may include information collected by phone, in person, in writing, or through review of medical records or communicable disease report forms, as necessary and appropriate.
- B. **Required Documentation:**
1. Complete the WEDSS disease incident investigation report, including appropriate, disease-specific tabs.
  2. Healthcare facilities are required to report any cases into the National Healthcare Safety Network (NHSN).
- C. **Additional Investigation Responsibilities:** The Wisconsin Division of Public Health (DPH) Healthcare-Associated Infections (HAI) Program will determine whether or not a facility that reports a carbapenemase-producing CRE (CP-CRE) is eligible for colonization screening via fee-exempt testing for carbapenemase production.

### IV. PUBLIC HEALTH INTERVENTIONS AND PREVENTION MEASURES

- A. In accordance with Wis. Admin. Code § [DHS 145.05](#), local public health agencies should follow the methods of control recommended in the current editions of *Control of Communicable Diseases Manual*, edited by David L. Heymann, published by the American Public Health Association, and the American Academy of Pediatrics' *Red Book: Report of the Committee on Infectious Diseases*, unless otherwise specified by the state epidemiologist.
- B. Information on case and contact management can be found in the Wisconsin Division of Public Health "Guidance for Preventing Transmission of Carbapenem-Resistant *Enterobacteriaceae* (CRE) in Hospitals" or "Guidance for Preventing Transmission of Carbapenem-Resistant *Enterobacteriaceae* (CRE) in Skilled Nursing Facilities" toolkits.

### V. CONTACTS FOR CONSULTATION

- A. Local health departments and tribal health agencies: <https://www.dhs.wisconsin.gov/lh-depts/index.htm>
- B. Bureau of Communicable Diseases, Communicable Diseases Healthcare-Associated Infection Prevention Program: 608-266-0365 or 608-266-0915
- C. Wisconsin State Laboratory of Hygiene: 1-800-862-1013; after hours emergency number: 608-263-3280

### VI. RELATED REFERENCES

- A. Heymann DL, ed. Infection Prevention and Control. In: *Control of Communicable Diseases Manual*. 20th ed. Washington, DC: American Public Health Association, 2015: A28-36.
- B. Pickering LK, ed. Infection Control and Prevention for Hospitalized Children. In: *Red Book: 2015 Report of the Committee on Infectious Diseases*. 30th ed. Elk Grove Village, IL: American Academy of Pediatrics, 2015: 161-176.
- C. Centers for Disease Control and Prevention. Facility Guidance for Control of Carbapenem-resistant *Enterobacteriaceae* (CRE) – November 2015 Update CRE Toolkit. Retrieved from <http://www.cdc.gov/hai/pdfs/cre/CRE-guidance-508.pdf>
- D. Wisconsin Division of Public Health. Guidance for Preventing Transmission of Carbapenem-Resistant *Enterobacteriaceae* (CRE) in Acute Care and Long Term Care Hospitals. Available at: <https://www.dhs.wisconsin.gov/library/P-00532A.htm>
- E. Wisconsin Division of Public Health. Guidance for Preventing Transmission of Carbapenem-Resistant *Enterobacteriaceae* (CRE) in Skilled Nursing Facilities. Available at: <https://www.dhs.wisconsin.gov/library/p-00532.htm>