Ministry of Health and Long-Term Care

Infectious Diseases Protocol

Appendix B: Provincial Case Definitions for Diseases of Public Health Significance

Disease: Carbapenemase-producing Enterobacteriaceae (CPE) infection or colonization

Effective: February 2019

Ontario

Carbapenemase-producing Enterobacteriaceae (CPE) infection or colonization

1.0 Provincial Reporting

Confirmed cases of colonization or infection

2.0 Type of Surveillance

Case and outbreak level data (see Outbreak Definitions)

3.0 Case Classification

3.1 Confirmed Case

Laboratory confirmation of CPE by an Ontario microbiology laboratory.

Both colonization detected from active screening and clinical infections are considered confirmed cases of CPE. All confirmed cases of CPE require investigation to determine if nosocomial transmission of CPE has occurred, and to identify the source of transmission.

The first positive isolate from any individual identified as colonized or infected with CPE is reportable. Subsequent positive isolates from the same patient are reportable only if the patient tests positive for a different CPE (i.e., different carbapenemase).

3.2 Outbreak Definitions

3.2.1 Suspect Outbreak Definition

An outbreak may be suspected in a health care facility if:

Two or more patients with CPE with the same carbapenemase (not known to be colonized or infected prior or upon admission) are reported on the same ward/unit(s) in a three-month period;

OR

Three or more patients with CPE with the same carbapenemase (not known to be colonized or infected prior or upon admission) are reported at the same health care facility or institution in a three-month period.

Whenever an outbreak is suspected, point prevalence screening should be performed on the ward/unit(s) where the case originated.

3.2.2 Confirmed Outbreak Definition

An outbreak is confirmed in a health care facility if:

Evidence of transmission between patients is identified;

OR

An epidemiological link between patients is identified;

OR

The health care facility/institution considers, based on their policies, transmission has occurred between suspected or confirmed cases, or if the incidence of CPE at the facility is higher than expected even without a clear link between patients.

4.0 Laboratory Evidence

4.1 Laboratory Confirmation

CPE isolated by culture from any human specimen (clinical or screening specimen) tested in an Ontario microbiology laboratory

OR

Positive nucleic acid amplification technique (NAAT) results for CPE from any human specimen (clinical or screening) tested in an Ontario microbiology laboratory

4.2 Approved/Validated Tests

Any validated test approved for CPE culture or NAAT by an Ontario microbiology laboratory.

Note: The first isolate from any individual identified as colonized or infected with CPE should be forwarded to Public Health Ontario Laboratory (PHOL).

4.3 Indications and Limitations

- Not all carbapenem resistant organisms are due to a carbapenemase;
- In carbapenem resistant isolates, the presence of a carbapenemase must be confirmed by a laboratory before CPE is reported
- Carbapenemase genes may also be found in other gram-negative bacteria, including *Acinetobacter* and *Pseudomonas* spp.
- Most carbapenemase testing is limited to identification of known carbapenemases. Novel/currently unknown carbapenemases will not be detected by existing genotypic (e.g. PCR) laboratory testing methods.

5.0 Clinical Evidence

All CPE colonizations and infections are reportable. CPE are associated with a wide range of infections, including, but not limited to, pneumonia, bloodstream infections,

intra-abdominal infections, urinary tract infections, and central venous catheter infections.

6.0 Comments

- Declaration of an outbreak can be made by either the institution/health facility or the medical officer of health (MOH).
- In the event of a disagreement between the institution/health facility and the MOH, the MOH has the authority to determine if an outbreak of a communicable disease exists, for purposes of exercising statutory powers under the *Health Protection and Promotion Act*. Once an outbreak is declared, it is reported to the Ministry through the integrated Public Health Information System (iPHIS).
- The board of health shall declare whether an outbreak is over, in consultation with the institution/facility. Rationale for declaring or not declaring an outbreak, and declaring an outbreak over should be documented.
- Issuing a media release to the public is the responsibility of the institution or health facility. Should there be a public health risk to the general population, a joint media alert may be issued, or the board of health may issue an alert on behalf of the institution or health facility with their knowledge.

7.0 Sources

Centers for Disease Control and Prevention. Case definitions for infectious conditions under public health surveillance. Morbidity and Mortality Weekly Report. 1997;46 (RR10).

Clinical and Laboratory Standards Institute (CLSI). Performance Standards for Antimicrobial Susceptibility Testing (M100). Wayne, PA: Clinical and Laboratory Standards Institute; 2017. Available from: https://clsi.org/standards/products/microbiology/documents/m100/.

Institute for Quality Management in Healthcare. Consensus Practice Recommendations - Antimicrobial Susceptibility Testing and Reporting on Bacteriology Specimens. Toronto, ON; 2017.

Tijet N, Patel SN, Melano RG. Detection of carbapenemase activity in Enterobacteriaceae: comparison of the carbapenem inactivation method versus the Carba NP test. Journal of Antimicrobial Chemotherapy. 2016;71 (1):274-6.

8.0 Document History

Table 1: History of Revisions

Revision Date	Document Section	Description of Revisions
March 2018	Entire appendix developed.	CPE was designated as a disease of public health significance effective May 1, 2018.

Revision Date	Document Section	Description of Revisions
February 2019	General	Minor revisions were made to support the regulation change to Diseases of Public Health Significance.


Ontario