Infection Prevention & Control Carbapenemase-Producing Organism (CPO) Surveillance Information Sheet

Purpose

The aim of this document is to inform Interior Health (IH) healthcare staff on key concepts related to carbapenemase-producing organism (CPO) surveillance.

Context

- Carbapenemase-producing organisms are gram-negative bacteria which are resistant to many antibiotics, including carbapenems which are considered a treatment of last resort.
- CPO cases have been reportable to the BC Provincial Health Officer since 2014.

Key Messages

- CPO are an emerging antibiotic-resistant organism (ARO). Although Canadian rates are low, prevalence has been increasing in BC, primarily in the lower mainland.
- Risk factors include a history of travel (with or without healthcare) or previous healthcare in Canada.

Methodology

- All new gene-confirmed CPO isolates while a patient is admitted to an Interior Health acute care facility are eligible for surveillance.
- A new CPO case is the first identification of a specific CPO gene. Different CPO genes from the same patient are considered to be a different CPO case.
- New cases are classified as healthcare-acquired (HA) or community associated (CA).
- New cases are classified as an infection or colonization using infection definitions from the National Healthcare Surveillance Network.

Calculation

ARO-BSI rate calculations are shown below. The rate allows for comparability both within a single facility over time, or between different facilities across Canada or internationally.

$$\text{Rate of HA CPO} = \frac{\text{Number of HA CPO incident cases}}{\text{Number of patient-days}} \times 10{,}000$$

$$\text{Rate of CA CPO} = \frac{\text{Number of CA CPO incident cases}}{\text{Number of admissions}} \times 1{,}000$$

Limitations and Explanations

- CPO surveillance is gene-based.
  - Gene typing is performed at the BC Public Health Lab.
  - The same CPO gene identified from the same patient will be regarded as the same CPO case, regardless of the bacterial species or sample type.
  - A different CPO gene identified from the same patient will be considered as a new CPO case, regardless of bacterial species or sample type.
- The BC Public Health Lab maintains a complete record of all BC CPO isolates. Interior Health IPAC surveillance is performed for eligible inpatient of IH acute care facilities.

Background Information about IPAC Surveillance Measures

Surveillance for healthcare-associated infections and for antimicrobial resistant organisms is a mandate for IPAC programs to establish baseline frequency of disease, identify risk factors, measure the impact of prevention initiatives, and provide information to inform and educate healthcare workers. Surveillance is most successful when it is comprehensive and linked to program objectives so that surveillance reports are timely and subsequent actions are meaningful and addressed. IH IPAC surveillance indicators are chosen to monitor quality issues that may need further review and investigation. The data are used by healthcare providers to monitor trends and improve care, and by governments to monitor system performance and for public reporting.

The IPAC program in Interior Health conducts surveillance in every acute care facility in the region. Trained Infection Preventionists perform chart reviews and use the protocols to determine surveillance cases, and the IPAC Epidemiologist reviews all cases for data quality purposes. Surveillance is performed in a web-based app so that no duplicate cases are included, and to ensure complete case capture. The IPAC Data Quality Working Group provides oversight for the surveillance system, surveillance protocols and definitions, and ensuring minimal variability in practices across the health authority so that results are reliable.

Incidence indicators represent the proportion of patients with a new presentation of the condition/event of interest. The IPAC surveillance indicators are presented as a rate for a fiscal year, fiscal quarter, or fiscal period, and allow facilities to compare to their own performance over time.