Infection Prevention & Control Antibiotic-Resistant Organisms (ARO) Bloodstream Infection (BSI) Surveillance Information Sheet

Purpose

The aim of this document is to inform Interior Health (IH) healthcare staff on key concepts related to antibiotic-resistant organism bloodstream infection (ARO-BSI) surveillance.

Context

- Bloodstream infections are associated with significant morbidity, mortality, prolonged hospital stays and increased healthcare costs. When caused by an ARO such as methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococcus (VRE), carbapenemase-resistant organisms (CPO) and *Candida auris* (*C. auris*), the healthcare burden is greater due to limited treatment options and the need for additional interventions.

Key Messages

- Surveillance for ARO-BSI includes any new BSI with one of the AROs under surveillance. A patient may have multiple surveillance cases with a new ARO-BSI recorded for every new infection event.
- Interventions to reduce HA-BSI include appropriate hand hygiene, appropriate skin prep and the use of disinfecting caps.

Methodology

- All new episodes of positive blood cultures with an antibiotic-resistant organism (MRSA, VRE, CPO, or C. auris) while the patient is admitted to an IH acute care facility are eligible for surveillance.
- ARO blood culture results are identified via lab results and the Infection Control Professionals (ICPs) review these results to determine if they represent a new BSI case.
- The ICP will classify a new case as healthcare-associated (HA) or community-acquired (CA).
- A patient is eligible for a new BSI episode if the event is greater than 14 days from a negative blood culture (if done) and greater than 14 days from completion of antibiotic therapy.
- If a patient has a subsequent positive blood culture with a different organism, the event is reported as a new ARO-BSI case.
- A BSI is classified as Primary, line-related if the patient has an eligible central line in place and no infection at a secondary site (refer to CLABSI information sheet).
- A BSI is classified as Secondary if the infection is related to an infection at another body site.
- ARO-BSI identified as secondary to a surgical site infection will be assigned to the facility where the surgery was performed.

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.

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

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

Limitations and Explanations

- The individual ARO surveillance protocols for MRSA, CPO and *C. auris* measure the first event for an inpatient in an Interior Health acute care facility and does not measure subsequent infections.
- These surveillance rates measure BSI where an ARO is involved which may be the first identification of an ARO for that patient or may be a subsequent BSI for a known patient with an ARO.

References

- Duncan, M., Warden, P., Bernatchez, S. F., & Morse, D. (2018). A bundled approach to decrease the rate of primary bloodstream infections related to peripheral intravenous catheters. Journal of the Association for Vascular Access, 23(1), 15–22. https://doi.org/10.1016/j.java.2017.07.004

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.