

# PICNet

PROVINCIAL INFECTION CONTROL  
NETWORK OF BRITISH COLUMBIA

A program of the Provincial Health Services Authority

## Surveillance Protocol for Methicillin-Resistant *Staphylococcus aureus* (MRSA) in BC Acute Care Facilities

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## Introduction

Methicillin-resistant *Staphylococcus aureus* (MRSA) remains one of the most prevalent bacterial pathogens in both healthcare and community settings worldwide<sup>1</sup>. Effective surveillance for healthcare-associated infections is critical for infection prevention and control 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<sup>2</sup>. The data for MRSA incidence in BC hospitals have been collected by each health authority (HA), either as a member of the Canadian Nosocomial Infection Surveillance Program (CNISP), or a part of its own infection prevention and control program. A provincial surveillance protocol for MRSA was developed in 2011 by PICNet’s Surveillance Steering Committee (SSC) (see appendix A) to standardize case definitions, data collection and reporting. The protocol is reviewed annually to ensure consistency with national and international accepted definition and reflect scientific advances in MRSA prevention and control practices. This updated protocol provides guidance for collecting and reporting MRSA surveillance data in BC acute care facilities from April 2017 onwards. Any modifications or changes in applying this protocol should be communicated with PICNet in advance to facilitate data analysis and interpretation.

## Objectives

The objectives of the provincial MRSA surveillance program are to:

- determine the rate of healthcare-associated MRSA in BC acute care facilities
- monitor the trend and patterns of MRSA in the province
- provide provincial information to assist in improving and evaluating MRSA infection prevention and control programs

<sup>1</sup> Simor AE, Pelude L, Golding G, et al. *Infection Control & Hospital Epidemiology* 2016;37:390–397

<sup>2</sup> Bush K, Leal J, Fathima S, et al. *Antimicrobial Resistance and Infection Control* 2015;4:35

## Population under surveillance

The population under MRSA surveillance is the inpatients admitted to the acute care facilities in BC.

### INCLUDES:

- patients admitted to the emergency department awaiting placement (e.g. patients admitted to a service who are waiting for a bed)
- patients in alternative level of care beds
- patients in labour and delivery beds
- patients in mental health beds

*Note: In the case that mental health inpatients are NOT included in the population under surveillance for MRSA in your health authority, the cases of MRSA identified among mental health inpatients should be EXCLUDED from your MRSA data submission.*

### EXCLUDES:

- outpatient visits to the clinics in the acute care facilities
- emergency room patients who were not admitted to an acute care inpatient unit
- patients in extended care beds housed in acute care facilities

## Case definition

The MRSA cases under PICNet surveillance must meet **ALL** of the following criteria:

- Laboratory identification of MRSA, including *Staphylococcus aureus* cultured from any specimen that tests oxacillin-resistant by standard susceptibility testing methods; or by a positive result for penicillin binding protein 2a (PBP2a); or molecular testing for mecA. May also include positive results of specimens tested by other validated polymerase chain reaction (PCR) tests for MRSA
- Patient must be admitted to the reporting facility for acute care
- Must be a new case of MRSA, either infection or colonization, as an inpatient in the reporting facility
- Patient has no known history of MRSA in any BC acute care facilities

### INCLUDES:

- MRSA cases identified for the first time among the inpatients at the time of admission or during their hospitalization in the reporting facility
- MRSA cases newly identified among the patients in the emergency department who were subsequently admitted to the reporting facility
- MRSA cases that were identified previously by outpatient clinics (including ambulatory care), or long-term care facilities, or out of BC, but were a new case as an inpatient to a BC acute care facility

### EXCLUDES:

- MRSA cases previously identified by the reporting facility or other acute care facilities in BC
- MRSA cases identified in the emergency department or outpatient clinics who were not admitted to the reporting facility

- Patients transferred from another acute care facility with documented positive MRSA history
- MRSA cases identified in the long-term care facilities or residence facilities, or outpatient clinics and the patients were not admitted to a BC acute care facility

## Case classification

The MRSA cases are classified into the following 5 categories based on the date of MRSA identification and patient's healthcare encounter history in the last 12 months:

- **Healthcare-associated with Current Admission to the Reporting Facility**
  - An MRSA case (as defined above) identified > 48 hours or > 2 calendar days (the day of admission counted as the first calendar day, the same hereinafter) after the patient was admitted to the reporting facility

Note: *The health authorities that have applied > 72 hours or > 3 calendar days after admission<sup>3</sup> can continue their timeframe for MRSA cases being classified as associated with current admission to the reporting facility, and ≤72 hours or ≤3 calendar days for the following categories, with communication to PICNet.*
- **Healthcare-associated with Previous Encounter with the Reporting Facility**
  - An MRSA case (as defined above) identified ≤ 48 hours or ≤2 calendar days after the patient was admitted to the reporting facility, **AND** one of the followings
  - The patient was admitted to the reporting facility for a period of ≥ 24 hours or at least overnight stay within the last 12 months, OR
  - Presence of indwelling catheters or other medical device at time of admission, which was inserted by the reporting facility, OR
  - Documented history of weekly visits to an outpatient clinic (e.g., dialysis, oncology) in the reporting facility for more than 4 weeks in the last 12 months
- **Healthcare-associated with Another Healthcare Facility**
  - An MRSA case (as defined above) identified ≤ 48 hours or ≤ 2 calendar days after the patient was admitted to the reporting facility, **AND** one of the following:
  - The patient was admitted to another healthcare facility (including acute care and long-term care) for a period of ≥ 24 hours or at least overnight stay, or weekly visits to an outpatient clinic (e.g., for dialysis, oncology) at another facility, within the last 12 months, OR
  - Presence of indwelling catheters or other medical device at time of admission, which was inserted by another facility
- **Community-associated**
  - An MRSA case (as defined above) identified ≤ 48 hours or ≤ 2 calendar days after the patient was admitted to the reporting facility, **AND** there was no documented history for any of following healthcare exposure within the last 12 months:
  - Admitted to an acute care facility
  - Residence in a long-term care facility or rehab centre

<sup>3</sup> Cohen AL, et al. Infection Control and Hospital Epidemiology 2008; 29:901-913

- Weekly visits to an outpatient clinic (e.g., dialysis, oncology) in the healthcare facilities
- Use of indwelling catheters or other medical device
- **Unknown**
  - An MRSA case (as defined above) where there is insufficient information on healthcare exposure history to classify the case

Note:

- 1) *An MRSA case (as defined above) in a newborn (less than 28 days) may be considered as “HCA with current admission in the reporting facility” if the mother was not known to be MRSA positive on admission or the mother was not suspected to have MRSA colonization prior to admission. In the case of a newborn transferred from another institution and MRSA is identified ≤ 48 hours after admission, the case can be classified as “HCA with another healthcare facility”.*
- 2) *If the patient had multiple encounters with different healthcare facilities (i.e. overnight or ≥ 24 hours stay, weekly visits to outpatient clinics) in the past 12 months, the attribution of MRSA classification can be judged by the risk assessment of the encounters, or based on the most recent healthcare encounter.*

## Data collection and submission

The following information of MRSA cases and denominators was determined by the SSC as a minimum dataset for the provincial MRSA surveillance.

- **Core data elements for MRSA cases**

The following variables should be collected for each MRSA case.

- Case ID #
- Date of admission
- Name of reporting facility
- Date of specimen collection (or MRSA identification)
- Classification
  - Healthcare-associated with Current Admission to the Reporting Facility
  - Healthcare-associated with Previous encounter with the Reporting Facility
  - Healthcare-associated with Another Healthcare Facility
  - Community Associated
  - Unknown

- **Denominator data**

The following data should be collected from each acute care facility by fiscal quarter (or calendar quarter) as denominators for MRSA measurement:

- Total number of patient hospital admissions
- Total number of inpatient-days
- Average count of beds per quarter
- **Data submission**

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After end of each fiscal quarter, each HA will aggregate the cases of MRSA at the facility level (see Appendix B), then submit these data to PICNet along with the denominator data (see Appendix C), via email by due date. At the end of each fiscal year, PICNet will verify the quarterly submitted data with each HA.

## Data analysis and dissemination

PICNet will merge and analyze the data submitted quarterly from each HA, and generate the following metrics:

- Total number of MRSA cases by fiscal quarter and year
- Proportion of MRSA by classification and HA
- Provincial rate of MRSA associated with reporting facility by fiscal quarter and year
- Rate of MRSA associated with reporting facility by HA
- Rate of MRSA associated with reporting facility by size of facility
- Rate of MRSA associated with reporting facility by acute care facility

The quarterly results will be summarized in the tables and graphs as quarterly MRSA surveillance report. An annual MRSA surveillance report will be developed at the end of each fiscal year. All reports will be sent to the SSC members/HA for review, then to the Ministry of Health for approval for public release. Once approved, the reports will be posted at PICNet's website ([www.picnet.ca](http://www.picnet.ca)). As required, the data will also be posted at the SharePoint of Ministry of Health each quarter.

## Appendices

- Appendix A. Surveillance Steering Committee
- Appendix B. MRSA Cases Data Submission Form
- Appendix C. MRSA Denominators Data Submission Form

## Appendix A. Surveillance Steering Committee

PICNet's Surveillance Steering Committee (SSC) consists of the representatives from each health authority, related professional societies, and PICNet Management Office. SSC provides guidance to the provincial surveillance programs regarding healthcare-associated infections and assists the PICNet Management Office in implementation within the participating Health Authorities. The current members of the committee include:

- Dr. Elizabeth Bryce  
Medical Microbiologist, Vancouver Coastal Health
- Jun Chen Collet  
Epidemiologist, Infection Prevention and Control, Provincial Health Services Authority
- Tara Donovan  
Managing Consultant, Infection Prevention & Control, Fraser Health
- Dr. Randall Dumont  
Pathologist, Northern Health
- Leslie Forrester  
Regional Epidemiologist & Manager, Surveillance and Performance Measurement, Vancouver Coastal Health
- Bruce Gamage  
Manager, Provincial Infection Control Network of British Columbia (PICNet)
- Diana George  
Epidemiologist, BC Center for Disease Control
- Dr. Guanghong Han  
Epidemiologist, Provincial Infection Control Network of British Columbia (PICNet)
- Lisa Harris  
Infection Control Practitioner, Vancouver Coastal Health
- Deanna Hembroff  
Regional Manager, Infection Prevention & Control, Northern Health
- Dr. Linda Hoang  
Medical Microbiologist, Public Health Laboratory of BC Center for Disease Control/ BC Association of Medical Microbiologists (BCAMM)
- Dillon Kelly  
Infection Control Practitioner, Interior Health
- Dr. Pamela Kibsey  
Medical Microbiologist, Island Health
- Kelsi Laporte  
Infection Control Practitioner, Providence Health Care
- Anthony Leamon  
Epidemiologist, Infection Prevention and Control, Island Health
- Dr. Christopher Lowe  
Medical Microbiologist, Providence Health Care
- Dr. Neil Mina  
Medical Microbiologist, Fraser Health
- Dr. Julie Mori  
Epidemiologist, Infection Prevention and Control, Interior Health
- David Puddicombe  
Epidemiologist, Providence Health Care
- Dr. Peter Tilley  
Medical Microbiologist, Provincial Health Services Authority
- Dr. Bing Wang  
Medical Microbiologist, Interior Health
- Louis Wong  
Epidemiologist, Infection Prevention and Control, Fraser Health
- Dr. Titus Wong  
Medical Microbiologist, Vancouver Coastal Health

## Appendix B. MRSA Cases Data Submission Form

Health Authority:

Reporting period:

Number of MRSA cases by classification and facility

Name of Acute Care Facility	Healthcare-associated with Current Admission to the Reporting Facility	Healthcare-associated with Previous Encounter with the Reporting Facility	Healthcare-associated with Another Healthcare Facility	Community-associated	Unknown	Total
<b>Total</b>						

## Appendix C. MRSA Denominator Data Submission Form

Health Authority:

Reporting period:

Name of facility	Number of acute care beds	Total number of acute care inpatient days	Total number of acute care admissions
<b>Total</b>			