DISEASE SPECIFIC INFORMATION

IC.06.05 Antibiotic-Resistant Organisms (ARO) Admission Screening  Rev. Aug 2018

STANDARDS

- All patients admitted to BC Children’s Hospital, Sunny Hill Health Centre and BC Women’s Hospital will be assessed for Antibiotic-Resistant Organisms (ARO) including: Methicillin-Resistant Staphylococcus aureus (MRSA), Vancomycin-Resistant Enterococci (VRE), and Carbapenemase-Producing Organisms (CPO). Note: Neonatal and Pediatric Intensive Care units have program specific screening guidelines listed below.

- An Admission Form & Requisition for Antibiotic-Resistant Organisms (ARO) will be completed for all inpatients and will be kept on the patient record. The white front page of the screening form is kept on the patient’s record. The yellow copy of the form serves as a requisition for ARO screening and will accompany the swabs to the laboratory.

- Nursing staff will take the appropriate screening swabs based on the Risk Factor Assessment and the instructions located on the front and back of the form. Nursing staff will send the yellow copy of the screening form and screening swabs to the laboratory, noting the date and time. Swabs should be collected within 12 hours of patient admission.

- Notify Infection Prevention and Control (IPAC) of patients who self-report MRSA, VRE or CPO.

- Contact Precautions will be initiated:
  - For patients known to have MRSA or VRE
  - For patients with a household member known to have MRSA or VRE
  - If the patient or a household member is known to have received health care outside Canada within 12 months

- Contact Plus Precautions will be initiated:
  - For patients known to have CPO
  - For patients with a household member known to have CPO

- Consult IPAC before discontinuing Contact or Contact Plus Precautions.

DESCRIPTION OF THE DISEASE

MRSA

- *Staphylococcus aureus* (*S. aureus*) is Gram-positive bacteria that lives on the skin or in the nose of up to 30% of healthy people. It can cause a range of illnesses from minor skin infections to life-threatening diseases, such as pneumonia, meningitis, endocarditis, Toxic Shock Syndrome (TSS), and septicemia. MRSA is a strain of *S. aureus* that is resistant to beta-lactam antibiotics, including all penicillins and cephalosporins.

VRE

- Enterococci are Gram-positive bacteria that live in the gastrointestinal tract of most individuals and are able to survive on environmental surfaces for extended periods. VRE are strains of enterococci that have become resistant to the antibiotic vancomycin. VRE may be found in the bowel without causing disease. Intestinal colonization can last from several months to many years, serving as a reservoir for the spread of VRE to other patients.

CPO

- Carbapenemases are enzymes produced by a number of Gram negative bacilli that inactivate penicillins, cephalosporins and carbapenems. In other words, these organisms are resistant to all beta-lactam antibiotics. Since they typically also carry resistance genes for aminoglycosides, fluoroquinolones, and other drugs, they are usually resistant to most available antibiotics. Infections with such organisms carry a high mortality. Cases have been reported in British Columbia, with health care outside of Canada being the main risk factor.

Route of Transmission:

Patients may be asymptomatic carriers of these organisms. The prompt identification of such patients and implementation of Additional Precautions will diminish the risk of patient-to-patient transmission.
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MRSA
- MRSA is most commonly spread via the transiently colonized hands of health care workers who acquire it from contact with colonized or infected patients, or after handling contaminated material or equipment. Hand hygiene and environmental surface cleaning are, therefore, important measures to prevent transmission.

VRE
- The major mode of transmission of VRE in health care settings is via transiently colonized hands of health care workers who acquire it from contact with colonized or infected patients, or after handling contaminated material or equipment. Contamination of the environment with VRE is more likely when a patient has diarrhea, is incontinent, and/or has poor hygiene. Once VRE is outside of the body, it can survive on surfaces for days or weeks.

CPO
- Transmission of CPO occurs via direct and indirect contact. The site of colonization is the lower gastrointestinal tract. Sinks and other environmental surfaces have been implicated in transmission. Preventing transmission of CPO is crucially important as the options for antibiotic treatment of CPO infections are extremely limited.

PROCEDURE

1. A nurse will initiate the screening form in the Urgent Care Center, Emergency Department or on admission to the unit.

2. The nurse will assess the patient for risk factors by indicating “yes”, “no” or “don’t know” for each risk factor question on the screening form. If a parent or guardian is unavailable at the time the patient arrives or requires an interpreter, please follow-up on any “don’t know” sections within question 1-3 as soon as possible after admission or transfer to the patient unit e.g., within 12 hours. The Admission Form & Requisition for Antibiotic-Resistant Organisms (ARO) is stocked on inpatient units and available via stores.

3. Risk factors included for assessment are:
   - Health care outside Canada within the last 12 months
   - Overnight hospital admission or invasive procedure in the last 12 months (including our facility)
   - Dialysis within the last 12 months
   - Residing at any of the following within the last 12 months: homeless shelter, correctional facility, halfway/group home, or refugee camp
   - Use of street drugs (not including marijuana)
   
   Note: If the patient is too ill, does not understand the question or is unable to answer the question, indicate “don’t know” on the screening form.

4. The nurse will ask if they are aware of the patient or a household member ever having had MRSA, VRE or CPO.

5. If the nurse checks yes or don’t know to any of the risk factor questions, screening swabs are required. If risk factors are absent, screening swabs are not required. When complete, the nurse will sign and date the risk factor section of the screening form.

6. Contact Precautions will be initiated:
   - For patients known to have MRSA or VRE
   - For patients with a household member known to have MRSA or VRE
• If the patient or a household member is known to have received health care outside Canada within 12 months

7. If health care was received outside of Canada within 21 days of admission, Contact Precautions must be continued until 3 negative swabs have been obtained at least 24 hours apart, with the last swab being a minimum of 21 days after the last health care exposure outside of Canada.

8. Contact Plus Precautions will be initiated:
   • For patients known to have CPO
   • For patients with a household member known to have CPO

9. The health care worker will ensure that the above information is communicated to the rest of the team and that IPAC is notified.

10. For patients who have risk factors, the nurse will obtain screening swabs within 12 hours of admission. Omit any that are contraindicated. Screening swabs for MRSA, VRE and CPO include:
   • Anterior nares (one swab, both nostrils)
   • Throat
   • Umbilicus (neonates, all patients in the NICU)
   • Groin (one swab, both sides)
   • Rectal (faecal-stained) or ostomy site (stool swab or perianal swab is acceptable if rectal is contraindicated)
   • Any open wounds (specify)
   • All entrance/exit sites of invasive devices (specify)
   • Any sites previously positive (specify)

11. The nurse will check the sites screened, then sign and date the screening swab section when completed. The nurse will place the white copy of the form on the patient record. The nurse will send the yellow copy with the screening swabs to the laboratory. The yellow copy of the screening form will act as the lab requisition. Refrigerate specimens if they will be at room temperature for more than 2 hours.

12. Consult IPAC before discontinuing Contact or Contact Plus Precautions. Refer to “MRSA and VRE Discontinuation of Additional Precautions” in the infection control manual for patients with a known history of MRSA or VRE. Use Routine Practices in all other circumstances, unless the health care worker deems it necessary to implement Additional Precautions for other reasons.

PEDIATRIC INTENSIVE CARE UNIT (PICU) PROCEDURE

1. **PICU is only required to complete the risk factor section of the form if the patient's initial admission is to PICU.** If a parent or guardian is unavailable at the time the patient arrives or requires an interpreter, please follow-up on any “don’t know” sections within question 1-3 as soon as possible after admission or transfer to the patient unit e.g., within 12 hours.

2. All patients admitted to the PICU will be tested for MRSA, VRE, and CPO regardless of the presence or absence of risk factors.

3. Follow steps 6-12 of the above procedure.

**Note:** Cardiology clinic will screen patients within 7 days of an admission for cardio-thoracic surgery. If this screen has occurred and is documented in the patient record, it is not necessary to repeat the screen on the day of admission to Surgical Daycare or PICU. **Note:** If surgery is delayed or occurs more than 7 days after the initial swabs were taken, the swabs for MRSA, VRE, and CPO must be repeated on admission to PICU.
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NEONATAL INTENSIVE CARE UNIT (NICU) PROCEDURE

1. **NICU is only required to complete the risk factor section of the form when the patient is initially admitted. If a parent or guardian is unavailable at the time the patient arrives or requires an interpreter, please follow-up on any “don’t know” sections within question 1-3 as soon as possible after admission or transfer to the patient unit e.g., within 12 hours.**

2. All patients admitted to the neonatal intensive care unit (NICU) will be tested for MRSA, VRE, and CPO regardless of the presence or absence of risk factors.

3. Follow steps 6-12 of the above procedure.

4. In addition to admission screening swabs, all patients admitted to NICU will be swabbed for MRSA, VRE and CPO on a biweekly basis (every two weeks) and more frequently (on a weekly basis) when a patient/mother is admitted to the unit with a known history of MRSA, VRE or CPO and as directed by IPACS. Biweekly and weekly screens will occur on Sunday evenings. If the Monday is a statutory holiday, the biweekly/weekly screen will occur on Monday evening to accommodate laboratory staffing.

Other AROs and Multi-Drug Resistant Organisms (MDRO):

- Patients infected or colonized with other AROs or MDROs must be cared for using Routine Practices and additional Contact Precautions. Refer to the “Table of Recommended Precautions Selected Infectious Diseases, Conditions &/or Microorganisms” in the infection control manual for organism-specific information. Please consult IPAC.

Documentation:

- The white copy of the *Admission Form & Requisition for Antibiotic-Resistant Organisms (ARO)* will remain on the patient record to document the patient’s risk factors, admission screening, and specimens collected.
- Document in the patient record date and time that Additional Precautions were started and discontinued. Specify type of Additional Precautions implemented, e.g., Contact or Contact Plus Precautions.

Education:

- Explain to the patient and/or the family the reason for obtaining the screening swabs.
- Explain the rationale for implementing Additional Precautions when applicable.
- Explain the importance of good hand hygiene.
- Report back to the patient/family regarding the results of the swabs.

Resources:

- “What Methicillin Resistant *Staphylococcus aureus* (MRSA) means to me and my family” patient and family information pamphlet.
- “Vancomycin Resistant Enterococci (VRE) Information Sheet for Patients and Families”.
- “*Carbapenemase-Producing Organisms (CPO)* Information Sheet for Patients and Families”
- “CPO Information Sheet for Staff”.

REFERENCES

5. Kumarasamay et al., Lancet Infectious Diseases 2010, 10:597-602
6. Akova et al., Clinical Microbiology and Infection 2012, 18:439-448
7. Mulvey et al., Emerging Infectious Diseases 2011, 17:103-106

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