IS0300: Antibiotic Resistant Organisms (ARO)	**EFFECTIVE DATE:** September 2006 **REVISED DATE:** November 2010 February 2015, July 2015, June 2016 **REVIEWED DATE:**

1. PURPOSE

To prevent transmission of Antibiotic Resistant Organisms (AROs) in healthcare facilities including hospital, residential care homes and community settings.

2. DEFINITION

Antibiotic Resistant Organism (ARO) – microorganisms that have developed resistance to the action of several antimicrobial agents and that is of special clinical or epidemiological significance. This guideline will refer primarily to MRSA, VRE, ESBLs and CPOs.

Cohorting – the practice of grouping patients (infected or colonized) with the same ARO together, to confine their care to one area.

Colonization – the presence of microorganisms in or on a host with growth and multiplication but without tissue invasion or cellular injury. With most microorganisms, colonization is far more frequent than clinical disease. The patient will be asymptomatic. MRSA colonization may occur in the nose, perineum, decubitus ulcers, sputum, urine and at sites of invasive devices such as feeding tubes and tracheostomies. VRE colonization occurs primarily in the feces.

Contact – an individual who is exposed to a person, colonized or infected, with an ARO in a manner that allows potential transmission to occur, i.e. roommate.

CPO – Carbapenemase-Producing Organisms refers to bacteria such as *Klebsiella, Escherichia coli (E. coli), Acinetobacter,* and *Pseudomonas* that are found in normal human intestines. In some parts of the world these groups of bacteria have acquired genes that make them resistant to a broad spectrum of antibiotics including those known as carbapenem antibiotics. Sometimes these bacteria can spread outside the gut and cause serious infections, such as urinary tract infections, bloodstream infections, wound infections, and pneumonia.

Decolonization – the use of topical and systemic antimicrobials to eradicate colonization of resistant bacteria. Current evidence does not recommend MRSA decolonization therapy as this may promote antibiotic resistance, long-term efficacy is poor and systematic therapy may lead to adverse events.

Enterococci – bacteria normally found in the gastrointestinal tract of 95% of healthy people. Enterococci may contaminate open wounds and, occasionally, are capable of causing invasive disease, particularly in severely immunocompromised people.

ESBL – Extended Spectrum Beta Lactamase producing organisms – a group of Gram-negative bacteria (predominantly bowel organisms) such as *E.coli* and *Klebsiella*, that produce enzymes that break down antibiotics, rendering them useless. Significant infections include urinary tract infections and surgical wound infections.

Infection – when sufficient cellular and tissue changes occur to produce overt signs and symptoms, the individual has clinical disease. Depending on the microorganism and health status of the host, this disease may range from mild to severe. Clinical manifestations of local or systemic infection can include fever, increased white blood cell count, purulence, inflammation, redness, heat, swelling, and/or pain.

MRSA - Methicillin Resistant *Staphylococcus aureus* – strains of *Staphylococus aureus* that are resistant to oxacillin (cloxacillin). Most people with MRSA are colonized. High risk groups in the community include injection drug users, homeless persons, chronically ill persons, individuals taking frequent or prolonged courses of antibiotics and individuals who are in hospital for longer than 48 hours.

Outbreak Management Team – multidisciplinary team including Infection Prevention & Control, Occupational Health, Administration, Nursing, Medical Staff, Support Services; may include Medical Health Officer (MHO).

Point prevalence screening – the collection of specimens on all patients at a single point in time, to determine the total number of cases and evidence of ongoing transmission of a particular microorganism.

Screening – a process to identify patients at risk for being colonized with MRSA and/or CPO and subsequently, obtaining appropriate specimens and ensuring Additional Precautions are implemented.

Staphylococcus aureus (*S. aureus*) – a bacteria normally found in the nose and on the skin of 25 - 35% of healthy people. It can cause infections such as impetigo, boils, abscesses, wound infections or invasive disease such as pneumonia.

VRE - **Vancomycin Resistant Enterococcus –** enterococci that have acquired resistance to vancomycin. Most people with VRE are colonized. There is no evidence that infection with VRE is associated with greater mortality than infection with vancomycin sensitive enterococci.

3. GUIDING PRINCIPLES

3.1 Due to the limited number of single rooms available in acute care use the **Algorithm for IPAC Private Room Allocation in Acute Care Facilities** to determine priority for the single room assignments. (NOT AVAILABLE TO NON IH FACILITIES)

3.2 **How are AROs Spread?**

Note
The single most common mode of transmission for AROs in a health care setting is on the hands of health care workers who acquire it from contact with colonized or infected patients, OR after handling contaminated surfaces or equipment.

3.3 An ARO Alert is entered into the patient's electronic record by the Infection Control Practitioner when required. **Alerts must protect the confidentiality of the patient.**

3.4 The ARO status of a patient should not affect the decision about accepting the individual in transfer from another healthcare setting or department and a negative specimen is not required to transfer a patient.

3.5 In high risk areas of acute care such as ICUs, burn units, transplantation units or cardiothoracic units any patients potentially exposed to a known MRSA or CPO positive patient should have screening cultures performed. However, in other situations screening of contacts may not be practicable as there are limited possibilities to intervene based upon results.

3.6 An outbreak of an ARO occurs when there is an increase in the rate of healthcare associated cases (infected and colonized) over the baseline rate, or a clustering of healthcare associated cases due to the transmission of a specific microbial strain(s) in a healthcare setting. Infection Control would call together a multidisciplinary Outbreak Management Team to review the situation and provide guidance and support in regards to appropriate control measures to implement.

4.0 PROCEDURE

4.1 Acute Care Admission Screening for MRSA and CPO

- All patients being admitted to acute care for 24 hours or more require screening. Follow procedure outlined on patient Admission History forms. Use the Acute Care Admission Screening for MRSA and CPO tool for pre-surgical screening, for surgical patients with an unplanned admission and for patient transfers between acute care facilities Screening must be completed within 24 hours of admission
- All patients who have been hospitalized anywhere for more than 48 hours within the last 3 months require swabs for **MRSA screening:**
    - Nose (1 swab both nares)
    - Groin (1 swab both sides)
    - One swab of any open wound
- All patients require a rectal swab for **CPO screening** if they answer 'yes' to any of the following:
    - Has the patient ever had a CPO?
    - Has the patient had an overnight stay in a hospital or undergone a medical/surgical procedure outside Canada within the past 12 months?
    - Has the patient had dialysis outside Canada within the past 12 months?
    - Has the patient had close contact with a known CPO patient within the past 12 months? (close contact defined as household member or roommate in hospital)
    - Has the patient been transferred from a facility with known, active CPO transmission?
    - **Any patient requiring CPO screening swabs must be placed on Contact Precautions in a single room**
    - There are different types of CPOs, so patients who are known to be CPO positive must be rescreened for each hospital admission

4.2 A **PCRA (point of care risk assessment)** for **every patient interaction** needs to be done to help determine room placement and necessary personal protective equipment.

4.3 Hand Hygiene

- Perform hand hygiene as per IF0200 (Hand Hygiene Guideline)

4.4 Patient Placement and accommodation ***PRIVATE ROOM ALGORITHM***

- All **known ARO positive patients** to be placed on **Contact Precautions**
- Single room with toilet, patient sink and hand washing sink preferred especially for ARO patients with diarrhea or large uncontained draining wounds
    - Door may remain open
    - Contact Precautions signage placed at the entrance to the patient room, cubicle or designated bed space including Emergency Department

- **Cohort**
    - Cohort patients who are infected or colonized with the same microorganism and are suitable roommates
    - Contact your ICP regarding appropriateness of cohorting
- **Shared Room**
    - Maintain spatial separation of at least 2 metres between patients
    - Roommates should be selected based on their ability to comply with precautions
    - Roommates should not be at high risk for serious disease if transmission occurs
    - A patient with diarrhea should not share a toilet with another patient

4.5 Patient Flow / Transport

- Communication of Additional Precautions is essential when a patient goes to another department for testing, to another unit or to other healthcare settings/facilities. This communication must include Emergency Medical Services (EMS) staff and other transport staff
- Personal protective equipment should be removed and disposed of and hand hygiene performed, prior to transporting patients
- Health care provider to wear gloves and gown for **direct contact** with patient during transport

Remind patients to adhere to the 4 C's when outside of their room.

4 C's
• Clean Hands: do hand hygiene. • Clean Clothes: wear a clean gown or clothes. • Contained wounds/body fluids: wounds covered with clean dressing. Urine/feces and other body fluids contained. • Co-operative: able to follow instructions.

- Patients are not to wear gloves and/or an isolation gown when outside the room. Patients should not use common areas of the hospital such as the cafeteria or lounge and should not enter other patient rooms

4.6 Personal Protective Equipment

- Personal protective equipment should be available either directly outside the patient room, cubicle or designated bed space
- Wear gloves and gown when in direct contact with patient or patient environment
- **Remove gown and gloves and discard before leaving the room or bed space and do hand hygiene**
- **The same personal protective equipment should not be worn for more than one patient**

4.7 Cleaning and disinfection of non-critical patient care equipment

- Dedicate equipment to a single patient (e.g. blood pressure cuff, commodes etc.)
- If equipment must be shared it must be cleaned and disinfected between patients
- Do not take extra supplies into patient's room
- Do not take patient chart into the room
- Clean and disinfect equipment used for transport after each use

4.8 Cleaning of patient environment

- When precautions are discontinued **or** the patient is moved, do an **additional precautions discharge clean** of the room/bed space and bathroom which includes changing privacy curtains and cleaning and disinfecting or changing string/cloth call bells or light cords

4.9 Waste, laundry and dishes

- Use Routine Practices

4.10 Education of patients, families and visitors

- Educate as per Contact Precautions signage
- Recommend to visit only one patient
- Visitors to wear gloves and gown if participating in direct patient care
- Visitors to remove gloves and gown and perform hand hygiene prior to leaving room
- Provide the appropriate ARO patient information pamphlet to the patient and family available on the **INFECTION PREVENTION & CONTROL WEBSITE. (NOT AVAILABLE TO NON IH FACILITIES)**

4.11 Surgical Settings (OR, PAR, DCS)

- **REFER TO SURGICAL SERVICES PRACTICE MANUAL**. (NOT AVAILABLE TO NON IH FACILITIES)
- Pre-surgical screening is done as an outpatient and includes screening for AROs)

4.12 Emergency, Ambulatory Care and Outpatient Settings

- For all outpatients and diagnostic areas, additional ARO screening is not required
- Instruct patients to clean their hands upon entering and leaving the outpatient setting
- Clean and disinfect shared equipment between patients
- Use routine practice for cleaning environment
- If environment is visibly soiled, do an **additional precautions discharge clean** of the room/bed space and bathroom which includes changing privacy curtains and cleaning and disinfecting or changing string/cloth call bells or light cords

4.13 Maternity/Newborn Nursery

- All babies admitted to the Nursery from another hospital are screened for MRSA and CPO and placed on Contact Precautions; if swab results are negative Contact Precautions are discontinued.
- ARO positive mom must be placed on Contact Precautions:
  - Newborn must be placed on Contact Precautions in the Nursery if newborn is not rooming in with their mother
  - Newborn does not require screening unless admitted from another hospital.

4.14 Dialysis Settings

- Screening (including swabs taken) for MRSA and CPO should be done using the Acute Care Admission Screening for MRSA & CPO screening tool, Form #807910:
  - On initial admission to any hemodialysis facility (**NOTE:** If an in-patient, confirm that screening swabs for MRSA and CPO were performed during their in-patient stay)

  - Upon returning from an admission to an acute care hospital **outside of Canada** or having had hemodialysis **outside of Canada**
  - If requested (patients traveling to other health care centers outside of IH may require screening swabs)
- Visiting dialysis patients to have screening swabs done by their home unit, prior to their arrival to the visiting dialysis unit
- Admission to any hemodialysis unit should not be denied on the basis of ARO status
- Contact Precautions need to be implemented for ARO positive patients and can be done at the bedside. However, a private room is preferred for patients with uncontained draining wounds or uncontrolled diarrhea and for CPO positive patients

4.15 Mental Health – including inpatient Psychiatry

- Admission screening for AROs is not required
- **A Point of Care Risk Assessment** (PCRA) should be done to determine if Additional Precautions are required
- Restrict activities if wound drainage or diarrhea cannot be contained
- Follow the 4 C's as in box above

4.16 Residential Care

- A residential care facility is the resident's "home" and infection control precautions must be balanced with promoting an optimal, healthy lifestyle for the residents. Studies indicate that residents who are colonized or infected with AROs do not endanger the health of staff or other residents, particularly when healthcare providers consistently use **Routine Practices** when providing **ALL** care in these settings
- Screening for AROs is not a recommended practice in Residential Care in BC
- **A Point of Care Risk Assessment** (PCRA) should be done to determine if Contact Precautions are required – signage is available
- Restrict activities if wound drainage or diarrhea cannot be contained
- Follow the 4 C's as in box above
- See the RESIDENTIAL ARO CARE PLAN

4.17 Community Care

- Home and Community Care Programs must balance infection control precautions with promoting an optimal, healthy lifestyle for the client, particularly in view of the fact that colonization or infection with an ARO may persist indefinitely. Experience to date does not indicate that clients who are colonized or infected with these microorganisms pose a health risk to healthcare providers, or to other household contacts, particularly when healthcare providers consistently use **Routine Practices** when providing **ALL** care in these settings

> *Hand hygiene and cleaning and disinfection of shared equipment are the most important ways to reduce risk of transmission of any AROs*

- ARO positive persons should not be denied admission to Community Care programs.
  In addition to Routine Practice:
  Symptomatic clients in the home should be advised to:
  - Stay away from others, in a separate room, if available
  - Use a designated bathroom, whenever possible
  - Clean the bathroom frequently, especially frequently touched surfaces
  - Not share towels or other personal items
  - Stay home until symptoms resolved
  - If medical appointment necessary – advise of symptoms
  - See the COMMUNITY ARO CARE PLAN

4.18 Outbreak Management

- Take surveillance specimens from all patients that are contacts (i.e. roommates) of the source patient as well as others who were in close geographic proximity to the source patient
- For **MRSA**, consider screening staff contacts if the outbreak is due to the same strain of MRSA and new cases are identified despite precautions
- Specimens for detection of **MRSA** should include nasal swab, groin swab (perianal preferred) and swab(s) from skin lesions, wounds, incisions, ulcers, exit sites of indwelling devices; for newborn infants, a swab from the umbilicus should also be taken
- Consider conducting a prevalence screen/surveillance on the affected floor/unit if additional cases are found after doing contact tracing, particularly if these cases have the same strain as the source patient
- Continue prevalence screening on a regular basis (e.g. weekly) until at least two consecutive screens are negative

5.0 REFERENCES

5.1 **Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care Settings**; Public Health Agency of Canada; 2013.

5.2 **Best Practices for Infection Prevention and Control in Perinatology In All Health Care Settings that Provide Obstetrical and Newborn Care**; Provincial Infectious Diseases Advisory Committee (PIDAC), Ontario; April, 2012.

5.3 **Annex A: Screening, Testing and Surveillance for Antibiotic Resistant Organisms (AROs) in All Health Care Settings.** Provincial Infectious Diseases Advisory Committee (PIDAC), Ontario; February, 2013.

5.4 **Antibiotic Resistant Organisms Prevention and Control Guidelines For Healthcare Facilities.** Provincial Infection Control Network (PICNet) BC; March 2013.

5.5 **Routine Practices and Additional Precautions Assessment and Educational Tools.** Public Health Agency of Canada; 2013.

ACUTE CARE PLAN FOR AROs (Antibiotic Resistant Organisms)

PATIENT CONCERN	GOAL	INTERVENTION	COMMENTS – Date & Signature
Colonization: ❑ MRSA ❑ ESBL ❑ Other	Control spread of ARO	1. In addition to Routine Practice, initiate Contact Precautions 2. Always do a Point of Care Risk Assessment for every patient interaction to determine any additional precautions that need to be taken 3. **4 C**'s should be adhered to if patient is leaving room: • **C**lean Hands: Wash hands for at least 15 seconds with soap and water or alcohol based hand rub (ABHR). • **C**lean Clothes: wear clean patient gown or clean clothes. • **C**ontain wounds/body fluids: wounds covered with clean, dry dressing. Urine/feces and other body fluids contained. • **C**o-operative: able to follow instructions. 4. Patient and Visitor Teaching: use ARO Information pamphlets • Ensure compliance with proper hand hygiene. • Teach visitors re: hand washing as above and use of appropriate PPE. • Visitors are not required to wear PPE unless participating in direct patient care. • Visitors and patients who leave the patient's room are asked to not use the kitchen, lounges or other facilities in the hospital. 5. Safety: Compliance with hand hygiene requires continuous reinforcement! • Equipment that is not dedicated to resident use must be cleaned and disinfected between uses. 6. Documentation: Each shift, check off on the patient record that the appropriate care plan has been followed and Infection Control Recommendations remain in place.	
	Ensure Patient Confidentiality	1. Signage regarding Contact Precautions is required outside patient's room. 2. Information about the patient's ARO status is to remain confidential among direct care providers (i.e. housekeeping and dietary staff only need to know type of precautions, not patient condition). 3. When patient goes to another department, or is transferred to another facility, the receiving department or facility MUST be notified of ARO status.	
ARO Infection	Stabilize condition and eradicate infection	1. Physician to coordinate antibiotic regime if required. 2. In addition to Contact Precautions, contact the ICP to determine necessary additional activity restrictions and/or care interventions. 3. Patients presenting with respiratory symptoms who have an ARO identified in their sputum must be placed on Droplet/Contact Precautions.	

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Note: in this document the term "patient" is inclusive of patient, resident or client.

RESIDENTIAL CARE PLAN FOR AROs (Antibiotic Resistant Organisms)

RESIDENT CONCERN	GOAL	INTERVENTION	COMMENTS – Date & Signature
Infection: ❑ MRSA ❑ ESBL ❑ Other Site: • Wound • Sputum	Control spread of ARO	1. In addition to Routine Practices, use Contact Precautions • Always do a Point of Care Risk Assessment for every resident interaction to determine any additional precautions that need to be taken. • Room placement may need to be reviewed with ICP. • **WOUND**: Cover open wounds with dressing or clothing when resident is in close contact with other residents. • **SPUTUM**: If possible, residents with symptoms of respiratory infection should be kept in their rooms until symptoms resolve. 2. Mobility: The resident is **not** restricted from common living areas, dining facilities or recreational and socializing activities unless the resident has diarrhea, pneumonia or copiously draining wounds. Any restrictions are only in place until the symptoms resolve. The 4 C's should be adhered: • **C**lean Hands: Wash hands for 15 seconds with soap and water or use alcohol based hand rub (ABHR). • **C**lean Clothes: wear clean clothes every day. • **C**ontain wounds/body fluids: wounds covered with clean, dry dressing. Urine/feces and other body fluids contained. • **C**o-operative: able to follow instructions. 3. Resident and Visitor Teaching: use ARO Information pamphlets • Assist with hand washing & appropriate use of ABHR – to be done prior to leaving their room, after using the toilet, prior to eating/handling food and when soiled. • Teach visitors re: hand hygiene as above. 4. Safety**: Compliance with hand hygiene requires continuous reinforcement! Equipment that is not dedicated to resident use must be cleaned and disinfected between uses.**	Add pertinent interventions (i.e. decisions regarding a designated toilet) and highlight areas under intervention that apply to resident
	Ensure Resident Confidentiality	1. Signage for Contact Precautions available if required. 2. Information about the resident's ARO status is to remain confidential among direct care providers. 3. Upon transfer, notify receiving sites and transfer personnel of ARO status – teach resident and visitors about additional precautions taken at acute care sites (Contact Precautions, single room, etc.).	

EFFECTIVE DATE: September 2006 **REVISED DATE: Feb 2011 / Feb 2015**

COMMUNITY CARE PLAN FOR AROs (Antibiotic Resistant Organisms)

Note: in this document the term "patient" is inclusive of patient, resident or client.

Interior Health

CLIENT CONCERN	GOAL	INTERVENTION	COMMENTS
Infection: ❑ MRSA ❑ ESBL ❑ Other Site: • Wound • Stool • Urine • Sputum	Control spread of ARO	1. In addition to Routine Practices, use Contact Precautions • Always do a Point of Care Risk Assessment for every client interaction to determine any additional precautions that need to be taken. • **WOUND**: Cover open wounds with dressing or clothing. • **URINE or STOOL:** If possible, client should have separate toilet. Empty urinary catheter contents in designated toilet. When separate toilet not available, the shared toilet requires routine cleaning with a household disinfectant. • **SPUTUM**: If possible, clients with symptoms of respiratory infection should be requested to stay at home until symptoms resolve. 2. Mobility: The client is not restricted in home or public unless there is an uncontained draining wound – public pools and contact sports or other skin to skin contact should be avoided until the wound is healed. Client should notify any medical personnel of MRSA status prior to appointments. Teach client to follow the 4 C's: • **C**lean Hands: Wash hands for 15 s with soap and water or alcohol based hand rub (ABHR) often while at home and in the community. • **C**lean Clothes: wear clean clothes every day and practice good personal hygiene. • **C**ontain wounds/body fluids: wounds covered with clean, dry dressing or clothing; urine/feces and other body fluids container. • **C**o-operative: able to follow instructions. 3. Client & Family Teaching: use ARO Information pamphlets 1. Assist with hand washing with plain soap – to be done prior to leaving their home, after using the toilet, prior to eating/handling food and when are visibly soiled. • Remind visitors to practice good hand hygiene. 4. Safety: Compliance with hand hygiene requires continuous reinforcement!	Add pertinent interventions to CHW care plan; i.e. decisions regarding a designated toilet and clothing over open wounds will need to be included in the CHW care plan
	Ensure Client Confidentiality	1. Signage regarding ARO status is NOT required. 2. Information about the client's ARO status is to remain confidential among direct care providers. 3. Notify acute or residential site of ARO status upon transfers – teach client and visitors regarding additional precautions taken at acute care sites (Contact Precautions, single room, etc.).	To ensure client confidentiality, DO NOT write the ARO status on the CHW care plan.

EFFECTIVE DATE: September 2006 **REVISED DATE: Nov 2010 / Feb 2015**

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Interior Health

Acute Care Admission Screening for MRSA and CPO

Interior Health

ACUTE CARE ADMISSION SCREENING for MRSA & CPO
(Antibiotic Resistant Organisms)

Interview ALL PATIENTS being admitted to hospital
Nurse to complete within 24 hours of Admission

Date _____ Performed by _____

Admission Screen

1. Has the patient ever had an ARO? ☐ Yes ☐ No
   ☐ MRSA* ☐ CPO**
2. Has the patient had an overnight stay in a hospital or undergone a medical/surgical procedure **outside Canada** within the past 12 months? ☐ Yes ☐ No
3. Has the patient had hemodialysis **outside Canada** within the past 12 months? ☐ Yes ☐ No
4. Has the patient had close contact*** with a known CPO patient within the past 12 months? ☐ Yes ☐ No/unknown
5. Has the patient been transferred from a facility with known, active CPO transmission? ☐ Yes ☐ No/unknown

If question 1 is "**Yes**" for **CPO** or "**Yes**" answer to any of questions 2, 3, 4, 5,
implement Contact Precautions and swab for CPO

Requisition Screening for CPO

- Rectal swab (must have fecal staining) ☐ Swab done by _____
- Stool if rectal swab not available

If question 1 is "Yes" for MRSA, implement contact precautions–no further action required

If questions 1-5 are "No", continue on with question 6.

6. Has the patient been hospitalized for more than 48 hours within the last 3 months?
   ☐ No – No further action
   ☐ Yes – Swab for MRSA – if patient has large draining wounds and/or diarrhea
   Implement Contact Precautions

Requisition Screening for MRSA

- Nose (1 swab both nares) ☐ Swab done by _____
- Groin (1 swab both sides) ☐ Swab done by _____
- One of any open wound ☐ Swab done by _____

* MRSA: Methicillin-resistant Staph aureus
** CPO: Carbapenemase-producing organisms
*** Close contact is defined as: household member, roommate in hospital

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