

Methicillin Resistant *Staphylococcus aureus* (MRSA)

Staphylococcus aureus (*S. aureus*) is a bacterium that colonizes the skin and is present in the anterior nares in about 25-30% of healthy people. Colonization may also occur in the axillae, chronic or surgical wounds, decubitus ulcers, perineum, sputum, urine and invasive device exit sites such as intravascular catheters, gastrostomy and tracheostomy sites of hospitalized patients. *S. aureus* causes a variety of infections, ranging from localized skin lesions, such as impetigo, boils or wound infections, to severe invasive disease.

Methicillin resistant *Staphylococcus aureus* (MRSA) refers to strains of *S. aureus* resistant to methicillin, oxacillin, cloxacillin, and all other β -lactam agents, including cephalosporins and carbapenems. MRSA is typically resistant to many classes of antimicrobials (e.g., aminoglycosides, erythromycin, quinolones). **Infections caused by MRSA are not inherently more serious than infections caused by methicillin-sensitive strains of *S. aureus* (MSSA), but treatment options for the management of serious MRSA infections are limited.** Most people with MRSA are carriers or colonized, and do not have infection, consistent with other strains of *S. aureus*.

Strains of *S. aureus* that are intermediately (VISA) or completely resistant (VRSA) to vancomycin have been reported in North America, Europe and Asia, but are uncommon to date.

Infection Prevention and Control Practices:

Implement Contact Precautions, in addition to Routine Practices. Place Contact Precautions sign in visible location.

Accommodation

- Single room with a private toilet (or designated commode chair), designated patient sink and a dedicated staff hand washing sink preferred; door may remain open
 - Patients undergoing MRSA decolonization should be in a single room
- When single rooms are limited cohort patients infected or colonized with MRSA in consultation with Infection Prevention and Control
 - Cohort patients with MRSA, including **CMRSA6** or **CMRSA3/6**, with any other MRSA positive patient, regardless of strain
- For newborn nurseries:
 - A single room is not necessary, providing there is required spacing between infant stations to minimize opportunities for direct contact
 - If multiple infants are kept in a single room, ensure there is a minimum of 1, preferably 2 meter separation between infant stations
 - Ensure family members or designated visitors are able to comply with the required precautions.

Duration of Contact Precautions

Contact Precautions can be discontinued by IP&C once the following requirements are met and confirmed:

- Three consecutive sets of negative screening MRSA cultures (nares, wounds, as well as previously positive sites) at least one week apart, while off potentially effective antimicrobials during the 48 hours prior to each specimen collection (so not to lead to a false negative MRSA screen)
- If a patient is MRSA POS at only one wound site (e.g., surgical, catheter/device exit site), the wound site is healed, AND the patient has had 3 consecutive negative nares screening cultures, the patient is presumed to no longer be colonized with MRSA. No further screening specimens from the wound site are required
- If any culture in the three consecutive sets is positive, discontinue subsequent cultures, maintain Contact Precautions and wait at least one month before starting the next set of consecutive cultures.

Screening

- Screening specimen sites for MRSA include
 - Anterior nares (both nares with one swab)
 - *Open* wounds/lesions/incisions/invasive device insertion sites (e.g., central lines). Do not collect specimens from closed wounds/ lesions/ incisions/invasive device insertion sites
 - Refer to Guidelines for Specimen Collection (Appendix B)
- Screen patients admitted to or directly transferred from a health care facility, including personal care homes, within or outside Canada within the previous 6 months, where they were admitted for more than 24 continuous hours
 - Isolate patients with exposure outside of Canada pending results of screening tests
 - Isolate patients receiving hemodialysis in another province/country pending results of screening tests, unless current screening results from within 7 days of admission to site are available and negative
- Screen patients when the Inter-facility Transfer/Referral Form indicates admission screening is required
- Screen patients who were once MRSA POS and whose positive status is currently unknown
- Screen patients identified as MRSA SUS in the flagging system
- Screen patients identified as MRSA contacts
- Screen a patient who is either starting dialysis or new to the dialysis unit
- Screen a patient living in a correction setting or a communal living setting (e.g., group home)
- If a patient/family refuses MRSA screening, explain the procedure and rationale for the screening and any testing to the patient/family again
- If the patient/family still refuses screening, where achievable, place patient on Contact Precautions for duration of admission and notify IP&C.

Routine screening is not recommended for a MRSA POS patient who remains in hospital. Assess patients on a case-by-case basis in consultation with Infection Prevention and Control, to determine when subsequent cultures are indicated.

- Obtain cultures only when indicated for acute changes in clinical status, e.g. respiratory infection, wound drainage.

Health Record

- Written records should not go into the room of a patient on Contact Precautions. Where there are documents that must enter the room (e.g., Power of Attorney, Paneling Papers, Advanced Care Directive)
 - Wipe the table on which the document is signed with a facility-approved cleaner/disinfectant prior to signing
 - Assist the patient to perform hand hygiene with alcohol-based hand rub prior to signing/handling the document
 - Wipe the pen with a facility-approved disinfectant after signing
- The Medication Administration Record (MAR) should not be taken into the room of a patient on Contact Precautions; PYXIS slips may be used to perform bedside checks
 - If the MAR has been in the isolation room: wipe the pen and the external surface of the MAR with facility approved disinfectant upon leaving.
- There are no special precautions for other documents not going into the health record
- If the health record is required to accompany the patient for tests or treatments, place in a protective cover (i.e., plastic bag) to prevent contamination. Otherwise, have a dedicated staff person carry the chart without contaminating self or the chart
- If the outside of the chart becomes contaminated, clean and disinfect with facility-approved disinfectant.
- Do not take mobile computers or e-records that cannot be cleaned and disinfected into the room of a patient on Contact Precautions. In situations where it is essential for patient care, these devices may be taken into the room if covered in plastic. Prior to removal from the room, the plastic must be removed and disposed or disinfected.

Housekeeping

- Facility-approved disinfectant must achieve manufacturer's recommended contact time on all surfaces to ensure disinfection
- During an outbreak more extensive and frequent cleaning with the facility-approved disinfectant may be required. Any changes will be recommended by the Outbreak Management Team
- Follow Regional/Facility Standard Operating Procedure, Cleaning of Isolation Discharge Client Room/Cleaning of Occupied Client Isolation Room.

Laboratory Specimens

- Dedicate specimen collection equipment to the specific patient
- Do not take phlebotomy trays/carts into the room
- Plan and take all required equipment into the room at the start of the procedure
- Deposit specimen(s) into an impervious, sealable bag immediately following removal from the patient room. Ensure outside of the bag does not become contaminated

Out-Patient Laboratory

- Avoid cross contamination between patients and supplies
 - Follow Routine Practices and Contact Precautions unless otherwise directed by Infection Prevention & Control
 - Modification of Contact Precautions: ONLY when practices to avoid cross contamination between patient and supplies are in place AT ALL TIMES, Routine Practices may be sufficient when providing services to patients with an ARO in this setting. The Routine Practices procedures must first be reviewed by the Infection Control Professional and include hand hygiene, proper removal/replacement of gloves after handling the requisition/computer registration, before gathering clean supplies, and before/after drawing blood from the patient. In addition, the registration keyboard, and patient chair and armrest must be wiped between all patients with facility-approved disinfectant
- Ensure all patient care equipment is cleaned/disinfected with facility-approved disinfectant (i.e., keyboard, patient chair and armrest).

Supplies/Equipment

- Dedicated equipment preferred
- If reusable equipment must be used, clean/disinfect with facility-approved disinfectant prior to removal from room
- Keep minimal supplies in patient room. Do not overstock
- Use dedicated personal supplies, e.g., combs, razors, lotions, creams, and soaps.
- Discard supplies that cannot be appropriately disinfected or sterilized when patient is discharged, deceased, or Contact Precautions discontinued
- Upon discharge, bag personal articles that cannot be disinfected (e.g., books, magazines, toys, playing cards) and give to the patient or discard.

Diagnostic Imaging/Ambulatory Care

- Referral source must notify department in advance of the required Contact Precautions
- Cover or remove supplies/equipment not required for the visit
- Patient performs hand hygiene on arrival
- Place patient directly in examination room. If this is not possible, maintain a spatial separation from other individuals in the waiting room
- Cover open wounds
- Procedures can be performed with 2 staff members
- One staff member must not touch:
 - The patient
 - Any equipment or surfaces that the patient or staff have contaminated by touching
- The second staff member only touches the patient, equipment or environmental surfaces the patient would have come in contact with
- If only one healthcare worker is available, everything touched by the patient and staff must be cleaned/disinfected by area staff
- All staff must wear PPE per Contact Precautions. Appropriate hand hygiene between patients and tasks is essential
- Ensure privacy curtains are changed between patients if visibly soiled Disinfect all reusable equipment and surfaces touched by patient and/or healthcare worker with facility-approved disinfectant after patient leaves or before use on another patient
- Clean and disinfect floors after patient leaves according to routine schedule and when visibly soiled.

Inter-Facility Patient Transport

- Avoid transfer within facilities unless medically indicated
 - Following a risk assessment of cognitive ability, hygiene, continence, and lack of draining wounds, consideration may be made for select patients to leave their room
- Notify the receiving unit/clinic/site in advance of the Contact Precautions required
- During out-of-room procedures, a health care worker in contact with the patient must maintain Contact Precautions. A dedicated clean person may be used to minimize environmental contamination.

Precautions for the Patient when Transported

- Patient to perform hand hygiene on leaving room
- Patient to wear clean clothes, housecoat or cover gown; no gloves or isolation gown required by the patient
- Cover all wounds
- If the patient is required to be transferred in a bed, wheelchair or other equipment that resides in the patient room
 - Clean and disinfect the external frequently touch surfaces (e.g., handles, bed rails) with a facility-approved disinfectant prior to leaving the room
 - Cover the patient and equipment with a clean sheet
- If the patient is transferred using a clean transport stretcher or wheelchair, the stretcher/wheelchair does not need to be cleaned prior to transport
- After returning the patient to the room, clean and disinfect the stretcher or wheelchair with a facility-approved disinfectant prior to removal from room.

Health Care Worker Precautions for Transport

- Follow Contact Precautions to enter and exit the room
- Remove PPE before leaving the room
- Perform hand hygiene after removal of PPE and before leaving room
- Apply clean gloves and gown outside the room.

Visitor Precautions for Transporting the Patient

- Perform hand hygiene before leaving the room
- Visitors are not required to wear gloves and gown outside the room.

Discharge/Transfer between Facilities

- The transferring facility must identify known MRSA Positive and Suspects when the patient is being transferred; communicate this to the receiving facility **in advance** of the discharge/transfer.

MRSA Suspect

- Document the status of a MRSA Suspect patient on the patient's Inter-facility Transfer Referral Form.



MRSA Positive

- Prior to discharge/transfer, notify the receiving facility, physician and other involved health care agencies (e.g., Home Care, Physiotherapy) of the patient's MRSA Positive status and treatment
- Advise the patient of the importance of informing any health care worker of their MRSA Positive status
- Document patient's MRSA Positive on the patient's Inter-facility Transfer Referral form
- The receiving facility should not routinely rescreen a known MRSA Positive patient following transfer
- An ambulance is not required for the transport of a MRSA Positive patient. The patient can be transferred by a transportation company with trained HCWs and the ability to follow proper IP&C precautions. Other transportation systems, (e.g. Stretcher Care Service) may be used
 - Prior to discharge/transfer the transferring facility must notify the transport service when the patient is on Contact Precautions.

Precautions relevant to the Patient for Transfer

- Use a clean stretcher or wheelchair
- Cover all wounds
- Patient to perform hand hygiene on leaving room
- Patient to wear clean clothes, housecoat or cover gown; no gloves required for the patient.

Precautions relevant to the Health Care Worker for Transfer

- Follow Contact Precautions to enter and exit the room
- Remove PPE before leaving the room
- Perform hand hygiene before contact with the patient, after removal of PPE and before leaving the room
- Apply clean gloves and gown outside the room to transport patient

Precautions relevant to the Transport Service

- Follow Contact Precautions inside the patient room and when leaving the room
- Follow Contact Precautions at the receiving facility, to place patient in their room and upon leaving patient room
- Consider wheelchair/stretchers used in the transport as contaminated. Clean and disinfect prior to removal from isolation space or use with another patient
- Disinfect vehicle surfaces and any equipment that was in contact with the patient with facility-approved disinfectant

Waste

- Routine Practices; no special precautions required. Double bagging of waste not required
- Wear clean gloves to remove waste from room
- Remove gloves and perform hand hygiene after handling waste.

Code Blue

- Unit staff member to inform Code Blue team of patients ARO status and required Contact Precautions
- Keep Code Blue cart with medications outside the room. In a multi-bed room, the cart should stay outside the bed space curtain
- Clean HCW shall pass supplies as required to staff in room
- Obtain all necessary supplies prior to entering room or bed space
- Remove defibrillator from the cart and take into the room
- The intubation basket may be taken into the room
- When resuscitation is completed, all reusable equipment that entered the room must be sent to MDR for reprocessing, or cleaned and disinfected with facility approved disinfectant
- Discard single use items and all disposable used or unused supplies
- If Code Blue medications are brought into the room, follow the Code Blue Team Resuscitation in Acute Care Policy # 110.050.010, available at <http://home.wrha.mb.ca/corp/policy/files/110.050.010.pdf>
- If the Code Blue cart is taken into the room, clean and disinfect the cart, inside and out, with facility approved disinfectant.

Emergency/Resuscitation Room

- Remove all unnecessary supplies from the room
- Ensure items remaining on top of carts are kept in an enclosed bin or placed in a drawer
- Relocate chart from racks to outside of room
- Disinfect outside surfaces of all carts in surrounding bed space upon patient discharge
- Change curtain upon patient discharge due to the higher risk of body fluid sprays and splashes.

Management of MRSA Positive Patient in the Operating Room

- The patient can be scheduled on the OR slate and does not need to be scheduled for a particular time of day
- Transport the patient as outlined above
- During the procedure a health care worker who is in contact with the patient must maintain Contact Precautions. A dedicated clean person may need to be present to minimize environmental contamination
- The patient health record and specific procedure forms needed for the procedure may be taken into the OR
 - Keep these on a designated table in a low traffic corner of the theatre that does not have contact with the health care worker who has patient contact
- Recover the patient in the Post Anaesthetic Care Unit on Contact Precautions. If the patient is unable to be recovered in the Post Anaesthetic Care Unit, rescheduling of patients may need to be done to recover them in the theatre on Contact Precautions
- After the case, standard OR cleaning procedures are sufficient to clean the theatre.

Management of Neonate Born to MRSA Positive Mother

Infant is Rooming in with Mother

- Implement Contact Precautions for care of the mother and infant with the following modifications.

- Gloves and gowns do not need to be changed when moving from caring for the infant to the mother or from the mother to the infant
- Upon discharge the infant will be maintained as MRSA Suspect and screened if readmitted to a health care facility.

Infant Admitted to Level II or Level III Nursery

- Identify infant as MRSA Suspect
- Follow Routine Practices in the nursery. If a known MRSA POS mother visits her infant in the nursery, she shall perform hand hygiene and wear a clean cover gown
- Specimen(s) is/are taken from the infant greater than or equal to 48-96 hours after birth
 - If the infant tests MRSA POS, implement Contact Precautions
 - If the infant tests negative, IP&C will deflag the infant identified as a MRSA SUS.

Visitors to a MRSA Positive Patient

- Perform hand hygiene on entering and leaving the patient room
- Visitors are not required to wear PPE, unless they are assisting in the direct care of a patient. This does not include feeding a patient or pushing them in a wheelchair
- Direct visitors to ask for assistance in obtaining patient care supplies/items from shared spaces on the unit.

MRSA Positive Patient Visiting Other Patients

- Patients who are MRSA Positive do not visit other patients in hospital. In extraordinary circumstances and on a case-by-case basis, visiting may be done for compassionate reasons following consultation with Infection Prevention and Control.

MRSA Positive Patient Requiring Rehabilitation (e.g. Physiotherapy, Occupational Therapy)

- Patient requiring rehabilitation should receive therapy as indicated
- Transport the patient as outlined above
- Consult Infection Prevention and Control to develop case-by-case precautions as required during rehabilitation for a specific patient
 - Cohorting of MRSA Positive patients can be done (e.g. in a MRSA outbreak situation, multiple MRSA Positive patients scheduled at one time). Maintain Contact Precautions between patients
 - Designate therapy to one area of the department
 - Schedule therapy to minimize possible exposure/transmission
 - Use patient-dedicated equipment. If unavailable, clean and disinfect shared equipment with facility-approved disinfectant between patient uses
 - Clean and disinfect communal equipment (e.g., parallel bars) with facility-approved disinfectant between patient uses.

MRSA Positive Patient Requiring Recreational Therapy

- Some patients in acute care who are panelled for nursing home and other long-term stay patients should receive Recreational Therapy as indicated by caregivers
- Precautions required during Recreational Therapy may be developed for a specific patient in consultation with Infection Prevention and Control
- Transport the patient as outlined above.

Management of MRSA Positive Patient on Mental Health Unit

- Follow Routine Practices; Contact Precautions are not required
- MRSA Positive patients must perform hand hygiene regularly and prior to leaving the unit. This must be emphasized as compliance is sometimes not optimal due to the nature of the illness.

Handling of Deceased Bodies

- Follow Contact Precautions
 - Place clean sheet on transfer stretcher prior to entering deceased patient's room
 - Don PPE while attending the body
 - Wrap the body in a shroud and transfer to stretcher
 - Remove PPE and perform hand hygiene upon leaving the room
 - Transport body to the morgue
 - Perform hand hygiene upon leaving the morgue
 - Clean stretcher with facility approved disinfectant before use on another patient.

Home Visit/Pass with Health Care Worker, Companion or Family

Precautions required for Patient

- Cover all wounds
- Patient performs hand hygiene on leaving room
- Patient is not required to wear gloves following hand hygiene
- The patient should wear clean clothes.

Precautions for Health Care Worker Accompanying Patient

- A separate HCW transports the patient to the door of the facility they are leaving
- The HCW accompanying the patient on the home visit meets the patient at the door of the facility they are leaving
- Alcohol-based hand rub must be available for hand hygiene of patient and HCW during visit
- Bag, clean, and disinfect any equipment taken on the visit according to facility policy after return to the facility and before use by another patient.

Family Accompanying Patient

- Perform hand hygiene prior to leaving room
- Bag, clean, and disinfect any equipment taken on the visit according to facility policy after return to the facility and before use by another patient.



References:

1. Clinical Microbiology Procedure Manual – Sample Collection. Diagnostic Services Manitoba Inc. (2014, July 24). Available at: http://dsmanitoba.ca/wp-content/uploads/2014/05/1478_120-10-05-V05-Clinical-Microbiology-Sample-Collection-Manual-ALL.pdf.
2. Manitoba Guidelines for the Prevention and Control of Antimicrobial Resistant Organisms. (2016).

Appendix A: Guidelines for Specimen Collection

Specimen collection should be performed using the following guidelines:

1. Surveillance Specimen Collection from Anterior Nares for MRSA

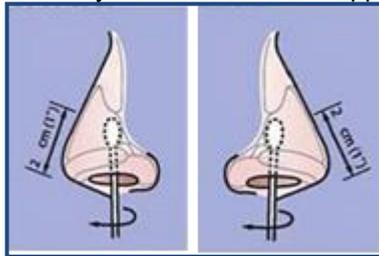
- Carefully insert the swab approximately 2cm into the nares. Rotate the swab against the nasal mucosa. **Note:** sample both nares using the same swab
- Place the swab in the transport container
- Label the container with the site of sample collected and at least two unique patient identifiers
- Ensure the specimen is accompanied by the appropriate requisition which has been completed with all pertinent patient information
- Keep specimens at room temperature and send to the lab as soon as possible according to facility procedure

2. Surveillance Specimen Collection from Wounds for MRSA

- Swab wound site. If the wound is dry, moisten the swab with sterile normal saline first. Collect cultures before cleansing the wound
- Place the swab in the transport container
- Label the container with the site of sample collected and at least two unique patient identifiers
- Ensure the specimen is accompanied by the appropriate requisition which has been completed with all pertinent patient information
- Keep specimens at room temperature and send to the lab as soon as possible according to facility procedure

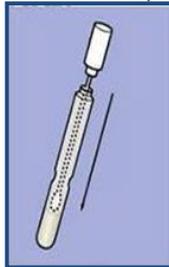
3. Anterior Nares Specimen Collection for MRSA

Carefully insert the swab for approximately 2 cm into the nares



Rotate the swab against the nasal mucosa.

NOTE: Sample both nares using the same swab



Return swab to its container and send to laboratory immediately