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1. **PURPOSE**

To prevent the acquisition, emergence, and transmission of MRSA to patients, visitors and caregivers within the healthcare setting.

2. **SCOPE**

This policy applies to Aurora Health Care, Inc., and any entity or facility owned, in whole or in part, and controlled by Aurora Health Care. The scope of this policy includes all Aurora Healthcare employees, members of the medical caregivers, students, volunteers, agency caregivers, and any other individuals engaged in patient contact or in contact with the patient’s environment.

3. **DEFINITIONS**

**Ambulatory Setting**: Refers to areas where the patient is not admitted to a facility such as a clinic, physician office, and other outpatient areas at the hospital such as outpatient rehabilitation.

**Aurora at Home Setting**: Includes the patient’s home environment when healthcare services are received within the home by a visiting Aurora at Home caregiver.

**Behavioral Health Setting**: Includes Aurora Psychiatric Hospital, and all other behavioral health facilities or inpatient units. Does not include behavioral health clinics, which fall under the ambulatory setting.

**Colonization**: the condition when the pathogen is present in or on a body site but where no symptoms or clinical manifestation of illness or infection are evident; the presence of bacteria without tissue invasion or damage. Patients are screened for colonization following table 1. Table 2 outlines the proper infection control measures.

**Decolonization**: treatment of colonized patients with antibiotics or other measures to eradicate the organism from the site of colonization (skin and mucous membranes).

**Hospice Setting**: Includes Aurora hospice facilities (e.g. Zilber Hospice). Does not include hospice in hospital (Hospital Inpatient Setting), home hospice (Aurora at Home Setting) or nursing homes. Follows hospital inpatient setting for transmission-based precautions procedures (System Policy #2051). If precautions hinder hospice care, Infection Prevention is available for consultation for an individualized plan of care. MRSA screening for colonization (i.e., nasal PCR) is not routinely done. For the purpose of this policy, procedures for patients at high-risk for MRSA and with a history of MRSA follow Aurora at Home procedures (Table 2).

**Hospital Inpatient Setting**: Includes all inpatient areas associated with a hospital such as, but not limited to, medical/surgical unit and intensive care units. (Does not include Behavioral Health
Settings.) For the purpose of this policy, also includes pre-surgical patients who may be screened prior to admission.

**Hospitalization:** A patient is considered to have a history of ‘hospitalization’ if their hospital stay was longer than 24 hours duration.

**Infection:** The condition when a pathogen has entered a body site, is multiplying and is causing clinical consequences such as fever, suppurative (purulent) wound or tissue destruction. Follow System Policy #2051 “Standard and Transmission-Based Precautions (“Isolation”) Policy for patients with a MRSA infection.

**Microbiological Clearance:** Laboratory testing indicating that MRSA is not present, and that infection or colonization with MRSA has been cleared, and transmission-based precaution may be discontinued following section 6.2.

**MRSA Methicillin-resistant *Staphylococcus aureus***: Includes *S. aureus* cultured from any specimen that tests oxacillin-resistant, cefoxitin-resistant, or methicillin-resistant by standard susceptibility testing methods, or by a laboratory test that is FDA-approved for MRSA detection from isolated colonies; these methods may also include a positive result by any FDA-approved test for MRSA detection from specific sources.

1.) **Healthcare-associated (HA-MRSA):** MRSA occurs most frequently among persons in hospitals and healthcare facilities. The onset of most HA-MRSA occurs OUTSIDE the hospital, therefore is called community-onset, health care-associated MRSA. If the onset is DURING the hospital stay, it is called hospital-onset HA-MRSA.

   a. **Community-Onset (CO) MRSA:** MRSA specimen collected an outpatient location, or in an inpatient location less than or equal to 3 days after admission to the facility (i.e., days 1, 2, or 3 of admission. The following are risk factors of CO-MRSA: presence of an invasive device at time of admission, history of MRSA infection or colonization, history of surgery, hospitalization, dialysis, or residence in a long-term facility in previous six (6) months preceding culture dates.

   b. **Healthcare Facility-Onset (HO) MRSA:** MRSA specimen collected in an inpatient location greater than 3 days after admission to a facility (i.e., on or after day 4). These cases may also have one or more risk factors for CO-MRSA.

2.) **Community-associated (CA-MRSA):** MRSA infections that occur in otherwise healthy people who have not been recently (within the six (6) months) hospitalized nor had a medical procedure (such as dialysis, surgery, catheters) are known as community-associated MRSA infections.

**MRSA Culture (CMRSA):** Culture performed on selective and differential medium for direct detection of MRSA. This test should not be used for routine screening because the PCR assay
is 10-15% more sensitive and the turnaround time of the PCR assay is half that of the culture. This is the test for ‘test of cure’ if the patient has been treated in past 4 weeks for MRSA.

MRSA PCR (MRSASC): Rapid, qualitative molecular-based assay for the direct detection of MRSA. This is the test that should be ordered for routine screening of MRSA carriers. (Note: the MRSA PCR may remain (falsely) positive for 2-4 weeks after treatment for MRSA due to detection of non-viable MRSA.)

MSSA (Methicillin-susceptible Staphylococcus aureus): S. aureus cultured from any specimen testing intermediate or susceptible to oxacillin, cefoxitin, or methicillin by standard susceptibility testing methods, or by a negative result from a test that is FDA-approved for MRSA detection from isolated colonies; these methods may also include a positive result from any FDA-approved test for MSSA detection from specific specimen sources.

Staph Aureus Screen with MRSA (SAMRSC)- This test identifies the presence of both MSSA and MRSA. It is a PCR reaction where more than one primer set is included in the reaction pool, allowing multiple DNA targets to be amplified and detected in a single reaction tube. It is more expensive than the MRSASC. The SAMRSC is for screening pre-surgical patients for both types of Staphylococcus. This test should not be routinely used for screening inpatients.

4. POLICY

4.1 A physician order is required for all laboratory testing for MRSA.

4.2 In the Hospital Inpatient Setting, the following categories **must** be screened for MRSA for all patients who are admitted (refer to Appendix A).

a) **History of MRSA** (infection or colonization): A patient is considered to have a positive history of MRSA if any of the following are identified:
   
i) Previous positive lab test (PCR or culture) from any lab
   
ii) Patient has a self-reported history of MRSA
   
iii) Documentation in the medical record of MRSA history.

b) **High Risk Patient** (These patients have no previous history of MRSA (infection or colonization) but have one or more of the following risk factors for MRSA):
   
i) Recent hospitalization, including transfers, within the prior 6 months.
   
ii) Admission to the ICU, including direct admits and transfers, if screen has not been completed at any previous time during patient's current stay.
iii) Patient in a long term care facility, nursing home, community-based residential facility within the prior 6 months.

iv) Dialysis patient

v) Patient in a correctional facility, within the prior 6 months.

c) **Pre-surgical patients:**

i) Per physician discretion, patients undergoing cardiothoracic surgery or orthopedic procedures with hardware implantation will be evaluated for MSSA/MRSA and complete lab testing and decolonization prior to hospital admission.

ii) **Note:** The overall benefits of routine screening of orthopedic patients is still being studied, but many hospitals have reported a decline in their infection rates after implementing MRSA screening programs. There is stronger evidence for screening patients for MSSA/MRSA who are undergoing cardiothoracic surgery.

4.3 In the **Ambulatory, Aurora at Home, Hospice,** and **Behavioral Health Settings,** patients will be screened for MRSA when the patient’s condition, reason for visit or planned surgical procedure (including MRSA/MSSA) warrants the identification of the patient’s MRSA status (refer to Appendix A).

4.4 Caregivers must institute infection control measures, including standard precautions and transmission-based precautions (i.e., contact precautions) (System Policy #2051 “Standard and Transmission-Based Precautions (‘Isolation’)” based upon the setting, patient’s history and physical condition, and current MRSA status (refer to Appendix B):

a) **Hospitalized Inpatient Setting:** Contact precautions will be followed with all patients who are known to be colonized or infected with MRSA. This includes pregnant women who are hospitalized for observation or at the time of delivery.

i) Patients with a history of MRSA are placed in immediate contact precautions until their current MRSA status is confirmed.

4.5 Patients placed in contact precautions during an episode of care in any setting, may be removed from contact precautions when laboratory testing identifies microbiologic clearance, and criteria for discontinuation of contact precautions is met (refer to section 5.3).

4.6 Patients identified with MRSA will have their status documented in their Electronic Health Record.
4.7 Infection Prevention will place a flag on the patient’s Electronic Health Record for patients with a history of MRSA or laboratory test positive for MRSA.

a) The MRSA flag may be removed only by Infection Prevention or an Infectious Disease physician following procedures outlined in section 5.5.

5. PROCEDURE

5.1 Appropriate infection control measures reduce the risk of transmission of MRSA within the healthcare setting. The selection of infection control precautions depends on the clinical setting, the patient’s history and physical condition, and current MRSA status (Appendix B).

a) Standard Precautions are implemented for all patient encounters across all settings.

i) Rigorous attention to hand hygiene is important, in accordance with System Policy #183 “Hand Hygiene/Surgical Hand Antisepsis”.

ii) Contact Precautions will follow Appendix B

b) The patient and family will be educated (i.e., FYWB) regarding MRSA and contact precautions, and the education will be documented within the Electronic Health Record in accordance with System Policy #2051 “Standard and Transmission-Based Precautions (“Isolation”)”

5.2 Special settings:

a) **Newborn Nursery:**

i) Infants born to mothers infected or colonized with MRSA should remain in the mother’s room as much as possible.

ii) If it is necessary for the infant to leave the mother’s room, contact precautions should be followed within the newborn nursery and the infant should be physically separated from any other infants within the nursery.

b) **Neonatal ICU (NICU):**

i) Infants born to mothers infected or colonized with MRSA residing in the Neonatal ICU should be placed in Contact Precautions.
ii) Infants born to mothers infected or colonized with MRSA should be allowed usual visits and be allowed to breast feed and participate in Kangaroo Care as medical condition allows. These infants should remain under isolation precautions while in the nursery.

iii) NICU may perform a risk assessment to determine need for surveillance culturing of their patients.

iv) Caregivers who provide nursery care to multiple NICU patients (medical staff, respiratory therapy, developmental therapists, and radiology techs) should cluster work activities and minimize movement between isolation areas and the rest of the nurseries. Whenever possible, the infant in isolation should be examined/treated last.

v) Infants with positive MRSA cultures should be moved to an isolation room unless other factors prohibit this. If use of isolation room is not feasible, an isolation area may be set up with screens. The isolation area should contain the following:
   - Contact precautions sign clearly visible to all
   - A container for regular trash
   - A container for red bag waste
   - PPE (gowns, gloves, masks, eye protection)

vi) Cohorting of MRSA positive infants and their supplies should be implemented with dedicated nurse caregivers as much as possible.

vii) Multiple births with discordant MRSA (i.e. one infant is MRSA positive, other infant is MRSA negative) status in Neonatal ICU - Parents visiting multiple infants with discordant MRSA status should visit the non-colonized infant first, while following hand hygiene and gowning procedures per unit policy

viii) Management of expressed breast milk. Breast milk obtained from MRSA positive mothers with active mastitis should be discarded. Good hand hygiene should be encouraged in communal pumping areas and pumps cleaned routinely.

ix) Attempts to “decolonize” neonatal/peripartum patients with topical and/or systemic antibiotics are discouraged except in an outbreak situation.
5.3 Discontinuation of Isolation Precautions - One of the following must be met to indicate microbiological clearance of MRSA:

a) **Hospital Inpatient Setting**: patients with a history of MRSA: after the results of their admission screening test (i.e., PCR) is reported as NEGATIVE.

b) **Hospitalized Inpatient, Behavioral Health or Ambulatory Setting**: patients that have been treated for MRSA in the previous 4 weeks must meet the following:

   i) Patient has been off antibiotic therapy for at least 48 hours **AND**

   ii) Two consecutive sets of negative cultures taken from all previously positive sites, at least 24 hours apart, have been obtained.

   - If one or both of the cultures are positive, the patient must remain in isolation and further evaluation may be warranted.
   - Sufficient confirmation of the above treatment and microbiological clearance has been obtained. Laboratory testing to confirm microbiologic clearance may be completed on an outpatient basis, prior to a hospital admission.

c) **Special Settings - Neonatal ICU (NICU)**: same as above.

d) **Aurora at Home and Hospice Settings**: Contact precautions may be discontinued when the patient no longer meets the criteria, i.e., the wound is healed or not being contacted, Foley catheter is removed, no contact with urine is anticipated, hygiene concerns are resolved.

5.4 Decolonization of Patients

a) Routine decolonization of all patients colonized with MRSA is not recommended.

b) However, specific patient conditions or reasons for hospital admission or outpatient visit may warrant decolonization to prevent progression to infection. Current literature supports decolonization for the following categories of patients:

   i) Dialysis patients

   ii) Patients with recurrent *S. aureus* infections

   iii) Certain surgical procedures such as cardiothoracic and orthopedic procedures.
c) Consultation with an infectious disease physician may be appropriate for determining treatment course, selection of medications and duration of treatment.

5.5 Removal of a MRSA flag in the Electronic Health Record

a) A MRSA flag indicating a history of MRSA within the Electronic Health Record may be removed only by Infection Prevention or an Infectious Disease physician if ALL of the following criteria are met:

i) No high risk conditions

ii) No active MRSA infection

iii) No positive MRSA cultures within the last 6 months

iv) Documented PCR negative in previous 6 months while off of antibiotics

b) If the patient does not meet all of the criteria above, may consider consultation with an Infectious Disease physician for further consideration of removal.

CROSS REFERENCES:

System Policy #183 “Hand Hygiene/Surgical Hand Antisepsis”

System Policy #2051 “Standard and Transmission-Based Precautions (“Isolation”)”

System Policy #2076 “Approach to Multidrug Resistant Organisms (MDRO)”

OWNER: Director, System Infection Prevention

REFERENCES:


Centers for Disease Control and Prevention (CDC). [www.cdc.gov](http://www.cdc.gov)


Centers for Disease Control and Prevention (CDC). Methicillin-resistant staphylococcus aureus infections among competitive sports participants--Colorado,


Jun 4;136(11):834-44.


Appendix A: Procedures for MRSA Screening Based on Setting and Type of Lab Test

<table>
<thead>
<tr>
<th>Setting:</th>
<th>When To Test:</th>
<th>What Lab Test:</th>
<th>Additional/Alternative Lab Tests Per Physician Discretion*</th>
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<tbody>
<tr>
<td>Hospital Inpatient Setting</td>
<td>Test immediately upon admission if meets screening criteria (see section 4). Based on patient condition and physician discretion, high risk patients may be re-screened for MRSA 7 days after admission, even if their initial screening test was negative.</td>
<td>PCR - Nares Only (MRSASC)</td>
<td>If a patient has completed treatment for MRSA (infection OR colonization) within the previous 4 weeks, the PCR test may not be valid. Culture of the nares may be an alternative screening test. Culture has a longer turn-around time for results, and may be less costly, therefore is an option for outpatient screening of pre-surgical patients.</td>
</tr>
<tr>
<td>Pre-Surgical Patient</td>
<td>Test pre-operatively, either in the outpatient setting or during the hospitalization PER PHYSICIAN DISCRETION</td>
<td>Multiplex PCR (SAMRSC) for MRSA/MSSA is recommended for selected pre-surgical patients</td>
<td></td>
</tr>
<tr>
<td>Aurora at Home, Hospice* Ambulatory and Behavioral Health Setting</td>
<td>Test when the patient's condition, reason for visit, or planned surgical procedure warrants the identification of the patient's MRSA status</td>
<td>PCR - Nares Only (MRSASC)</td>
<td></td>
</tr>
</tbody>
</table>

Additional sites that may be considered for testing if indicated: perirectal, axilla / groin, any existing wounds, vascular catheter insertion sites, or sites that were previously positive for MRSA. Culture is the appropriate lab test for these sites.

*Hospice Setting does not routinely screen for MRSA.
Appendix B: Infection Control Measures to Prevent the Spread of MRSA

<table>
<thead>
<tr>
<th>Patient Type</th>
<th>Precautions Required:</th>
<th>When to Initiate Precautions:</th>
<th>Additional Infection Control Measures:</th>
<th>Removal of Precautions</th>
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</thead>
<tbody>
<tr>
<td>Hospital Inpatient Setting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Risk Patient</td>
<td>Standard Precautions</td>
<td>Screen for MRSA</td>
<td></td>
<td>If all initial screening tests are negative for MRSA OR documentation is provided indicating appropriate treatment and microbiologic clearance.</td>
</tr>
<tr>
<td>History of MRSA</td>
<td>Contact &amp; Standard Precautions</td>
<td>Immediately upon admission, prior to any lab tests performed or results returned</td>
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</tr>
<tr>
<td>Patient with Positive MRSA Test</td>
<td>Contact &amp; Standard Precautions</td>
<td>Immediately after laboratory conformation of MRSA colonization or infection</td>
<td></td>
<td>Patient has received appropriate treatment and microbiologic clearance.</td>
</tr>
<tr>
<td>All Patients Undergoing a Splash-Generating Procedure OR Caring for Patients with a Potential for Projectile Secretions</td>
<td>Droplet Precautions (surgical mask)</td>
<td>During the procedure</td>
<td></td>
<td>After splash-generating procedure is completed OR when there is no potential for projectile secretions.</td>
</tr>
<tr>
<td>Patient Type</td>
<td>Precautions Required</td>
<td>When to Initiate Precautions</td>
<td>Additional Infection Control Measures</td>
<td>Removal of Precautions</td>
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<tr>
<td>Ambulatory &amp; Behavioral Health Settings (Includes hospital-based outpatient services)</td>
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<td>Use disposable equipment, when possible.</td>
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</tr>
<tr>
<td>High Risk Patient</td>
<td>Standard Precautions</td>
<td></td>
<td>Follow policy and procedure regarding disinfection of reusable equipment (e.g., BP cuff) and environmental surfaces prior to next room use.</td>
<td></td>
</tr>
<tr>
<td>History of MRSA or Positive MRSA Test</td>
<td>Contact &amp; Standard Precautions</td>
<td>Initiate if patient has: uncovered wounds (e.g., dressing changes), incontinence, or hygiene concerns that may expose the environment to secretions or bodily fluids (e.g., Foley insertion, maintenance or discontinuation).</td>
<td>After risk of exposure is resolved.</td>
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</tbody>
</table>
**Patient Type:**

<table>
<thead>
<tr>
<th>Patient Type</th>
<th>Precautions Required</th>
<th>When to Initiate Precautions</th>
<th>Additional Infection Control Measures:</th>
<th>Removal of Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Risk Patient</strong></td>
<td>Standard Precautions</td>
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<td>Limit the amount of equipment carried into the home</td>
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<td></td>
<td></td>
<td></td>
<td>Use disposable equipment, when possible</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Follow policy and procedure regarding disinfection of re-usable equipment (e.g., BP cuff)</td>
<td></td>
</tr>
<tr>
<td><strong>History of MRSA or Positive MRSA Test</strong></td>
<td>Contact &amp; Standard Precautions</td>
<td>Initiate if patient has uncovered wounds, incontinence, or hygiene concerns that may expose the environment to secretions or bodily fluids.</td>
<td>After risk of exposure is resolved.</td>
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</table>