
Guidelines to Prevent and Control Methicillin-resistant *Staphylococcus aureus* Transmission in New Jersey General Hospitals, 2008

Acknowledgments: The authors gratefully acknowledge the work of all the Rhode Island infection control professionals who were responsible for developing the original guidance upon which these guidelines are based, especially Meredith S. Arnold, RN, BSN, CIC, CHSP. In addition, the authors gratefully acknowledge the work of all those involved in the VHA MRSA Prevention Initiative, especially Kathleen Risa, MSN, CRNP, CIC, who contributed information which influenced several recommendations that are included in this document. Finally, the authors thank the many individuals who reviewed these guidelines and provided constructive feedback.

MRSA Advisory and Working Group Members:

Chair

Corey Robertson, MD, MPH
Medical Director, Emerging
Infectious Diseases
NJ Department of Health and Senior
Services
(Section Lead)

Eddy A. Bresnitz, MD, MS
Deputy Commissioner/State
Epidemiologist
Public Health Services Branch
NJ Department of Health and Senior
Services

Christine D. Armenti, RN, BSN, MS
Public Health Nurse Consultant
NJ Department of Health and Senior
Services

Jane Badaracco RN, BSN, CIC
Infection Prevention and Control
Coordinator
Raritan Bay Medical Center
Perth Amboy Division and Old
Bridge Division
Northern NJ APIC

Linda Booth, RN, BSN, CIC
Director, Infection Control and
Employee Health
Saint Michael's Medical Center
Northern NJ APIC

Lynne Borden, BSN, CIC
Infection Control Practitioner
Lourdes Medical Center – Burlington
Southern NJ APIC

Christine L. Bottiglieri, RN, BSN,
MSA, CIC
Infection Control Practitioner
Kennedy Health System
Washington Township Campus
Southern NJ APIC

Jacqueline R. Breuer, RN, CIC
Infection Prevention and Control
Coordinator
CentraState Medical Center
Southern NJ APIC

Ruth Charbonneau
Director, Office of Legal and
Regulatory Affairs
NJ Department of Health and Senior
Services

Anne Dikon, RN, BSN, CIC
Infection Control Coordinator
Robert Wood Johnson University
Hospital – Hamilton
Southern NJ APIC

Bridget M. Farrell, RN, CIC, CPHQ
Director, Infection Control and
Employee Health Services
Cape Regional Medical Center
Southern NJ APIC – President

Patricia G. Ford, RN, MSN, CIC
Infection Control Coordinator
Saint Peter's University Hospital
Northern NJ APIC

Ferne A. Founds, RN, CIC
Infection Control
Hackensack University Medical
Center
Northern NJ APIC

Renee Fusco, RN, CIC
Infection Control Coordinator
Underwood Memorial Hospital
Southern NJ APIC

Carol Ann Genese, MT(ASCP), MBA
Coordinator, Infectious Disease
Team – Infectious and Zoonotic
Disease Program
NJ Department of Health and Senior
Services
(Section Lead)

Amy R. Gram, RN, BSN, CIC
Manager, Infection Control
Saint Peters University Hospital
Northern NJ APIC

Rebecca Greeley, MPH
CSTE/CDC Fellow
Infectious and Zoonotic Disease
Program
NJ Department of Health and Senior
Services

Wendy A. Hess, RN, CIC
Director, Infection Control
Hackensack University Medical
Center
Northern NJ APIC

Aline M. Holmes, RN, APNC, MSN,
APRN, CNAA
Senior Vice President,
Clinical Affairs
New Jersey Hospital Association

Peg Janasie RN, BSN, CIC
Manager, Infection Control
Jersey Shore University Medical
Center
Southern NJ APIC – Bylaws
Chairperson
(Section Lead)

Joanne Konschak, RN
Director, Infection Control
South Jersey Healthcare
Southern NJ APIC

Patricia Lafaro, RN, BS, CIC
Director, Infection Prevention,
Somerset Medical Center
Northern NJ APIC – Board of
Directors
(Section Lead)

Anne Maher, MS, M(ASCP), CIC
Infection Control Coordinator
Children's Specialized Hospital
Northern NJ APIC – Board of
Directors
NJ Council of Teaching Hospitals,
Children's Hospitals Section

Pauline McDonough, MS, MT(ASCP)
Microbiology Supervisor
Somerset Medical Center
(Section Lead)

Lourdes H. McGonigle, RN, BSN,
CIC
Director, Clinical Outcomes and
Infection Control
Raritan Bay Medical Center
Robert Wood Johnson Health
Network Representative
Northern NJ APIC
(Section Lead)

Maureen McKee
Director, Program Management
New Jersey Council of Teaching
Hospitals
New Jersey Council of Children's
Hospitals

Suzanne Miro, MPH, CHES
Health Education Coordinator
Communicable Disease Service
NJ Department of Health and Senior
Services

Anthony T. Monaco, MA
Environmental Scientist
Public Health Sanitation and Safety
Program
NJ Department of Health and Senior
Services
(Section Lead)

Barbara Montana, MD, MPH
Medical Director, Health
Infrastructure Preparedness and
Emergency Response
NJ Department of Health and Senior
Services

Linda Pacetti, BS, MT(ASCP)SM
Clinical Laboratory Director
CentraState Medical Center
(Section Lead)

Arlene Potts, MPH, CIC
Director, Infection Prevention
Program
RWJ University Hospital
Southern NJ APIC

Shereen Semple, MS
Epidemiologist
NJ Department of Health and Senior
Services

John Salaki, MD
Infectious Disease Physician
Atlantic Health
New Jersey Council of Teaching
Hospitals

John W. Sensakovic, MD, PhD
Director of Medical Education, Saint
Michaels Medical Center – Newark
Director of Infection Control, JFK
Medical Center – Edison
Infectious Diseases Society of New
Jersey – President
(Section Lead)

Kimberly Simon, RN, BSN, CIC
Infection Control Manager
Riverview Medical Center
Northern NJ APIC – President
(Section Lead)

Jihad Slim, MD
Infectious Disease Physician
Assistant Professor of Medicine
Seton Hall University
Medical Society of New Jersey
(Section Lead)

Neela Sookdeo, JD
Legal Specialist
Office of Legal and Regulatory
Affairs
Office of the Commissioner
NJ Department of Health and Senior
Services

Nancy Szilagyi, LPN, CIC
Infection Prevention
Capital Health System
Southern NJ APIC
(Section Lead)

Christina Tan, MD
Medical Director, Communicable
Disease Service
Deputy State Epidemiologist
NJ Department of Health and Senior
Services

Martin S. Topiel, MD
Infectious Disease Physician
Medical Director, Infection Control
Virtua Health

Carol Ward, RN, CIC
Infection Control Program Manager
Virtua Health
Southern NJ APIC
(Section Lead)

Karyn Young-Engelman, RN, CIC
Infection Prevention and Control
Coordinator
CentraState Medical Center
Southern NJ APIC
(Section Lead)

Note: The guidelines that follow are based on “The Best Hospital Practices for Controlling Methicillin-resistant *Staphylococcus aureus*: On the Cutting Edge.” *Infect Control Hosp Epidemiol* 2002;23:69-76.

PURPOSE AND SCOPE

The purpose of this document is to provide best practice guidelines (“Guidelines”) that shall be utilized by all general hospitals to prevent and control the nosocomial transmission of methicillin-resistant *Staphylococcus aureus* (MRSA), pursuant to N.J.S.A. 26:2H-12.35 through 12.38. These Guidelines shall be incorporated into existing infection control programs required of all general hospitals licensed by the Department of Health and Senior Services pursuant to P.L.1971, c.136 (N.J.S.A. 26:2H-1 et seq.) and be available for inspection.

An expert working group comprised of members representing the disciplines of public health, infection control, infectious disease medicine, quality improvement, and clinical microbiology developed these Guidelines based on a review of scientific literature, current as of the Guidelines’ distribution date. Recommendations are categorized according to a system developed by the Centers for Disease Control and Prevention (CDC) and the Hospital Infection Control Practices Advisory Committee (HICPAC) (see Recommendations section), which provides information regarding the strength of evidence and theoretical rationale underpinning each recommendation, and identifies those activities that are mandated by federal and/or state law. The Guidelines provide hospitals with the flexibility to adopt several recommended practices according to its physical plant, available resources, and the patient population it serves. These guidelines may need to be revised in the future as new scientific information becomes available.

DEFINITIONS

“Active surveillance program” means a program that involves the collection of specimens from patients for laboratory testing to identify those who might be colonized with bacteria of clinical and epidemiologic importance.

“Anterior nares” means the front area of the pair of openings in the nose.

“Bagging” means a procedure in which a bag-valve-mask resuscitator is used to provide artificial ventilation to people who are having difficulty breathing or have stopped breathing altogether.

“CDC” means the Centers for Disease Control and Prevention.

“Chromogenic agar” means a gel-like nutrient system used for growing bacteria that causes select bacteria to produce characteristic colors which facilitate their detection.

“Cohorting” means the practice of grouping patients infected or colonized with the same infectious agent together to confine their care to one area and prevent contact with susceptible patients.

“Colonization” means the presence of microorganisms at a body site not associated with active infection.

“Colonized” means having the presence of an organism without disease; the organism may be a precursor of disease.

“Contact precautions” means isolation practices for using personal protective equipment and other environmental procedures, designed to prevent transmission of serious illnesses or epidemiologically important infections or colonization that are easily transmitted by contact with the patient or with items in the patient’s environment.

“Culturette” means a single, sterile swab used to take a biological sample.

“Decolonization” means the treatment of persons colonized with a specific multi-drug resistant organism to eradicate carriage of that organism.

“Department” means the New Jersey Department of Health and Senior Services.

“Environmental decontamination” means removing pathogens from contaminated surfaces and items.

“Flagging” means a method of identifying a patient who was previously positive for methicillin-resistant *Staphylococcus aureus* (MRSA) to be used on re-admission to a facility. Usually, the flagging system is computer-based.

“Full-care patient” means a patient who cannot perform activities that aid in disease recovery or coping with the effects of disease; the patient usually requires skilled nursing care and either cannot or has substantial difficulty with carrying out activities of daily living.

“G-tube” means a tube inserted through a small incision in the abdomen into the stomach and is used for long-term enteral nutrition.

“Hand hygiene” means any one of the following: 1) handwashing with plain (non-antibacterial) soap and water; 2) antiseptic hand wash (soap containing antiseptic agents and water); 3) antiseptic hand rub (waterless antiseptic product, most often alcohol-based, rubbed on all surfaces of hands; or 4) surgical hand

antiseptics (antiseptic hand wash or antiseptic hand rub performed preoperatively by surgical personnel to eliminate transient hand flora and reduce resident hand flora).

“Healthcare worker (HCW)” means any person who had professional or technical training in a healthcare-related field and provides patient care in a healthcare setting or any person who provides services that support the delivery of healthcare such as dietary, housekeeping, engineering, or maintenance personnel.

“HICPAC” means Hospital Infection Control Practices Advisory Committee.

“High-risk patient care area” means a patient care area where patients have an increased likelihood of acquiring MRSA and/or developing severe clinical outcomes resulting from a MRSA infection.

“Hospital” shall mean any medical institution that the Department licenses as a general hospital pursuant to N.J.S.A. 26:2H-1 et seq., and in accordance with the definition of hospital and classification of general hospital set forth in the Department’s Hospital Licensing Standards at N.J.A.C. 8:43G-1.2 and 1.3(b).

“Hospital-onset infection” means an infection occurring in a patient in a hospital and in whom it was not present or incubating at the time of admission, or the residual of an infection acquired during a previous admission.

“Infection” means the condition in a host resulting from the presence of and invasion by microorganisms.

“Inpatient psychiatric unit” means the patient care area in a hospital where patients are admitted for psychiatric (mental health) treatment.

“Intervention unit” means the patient care area in a hospital where active surveillance for MRSA is being performed.

“Isolate” means a population of microorganisms that has been obtained in pure culture from a field case or location.

“Isolation” means a separation of a person from others as to prevent or limit the direct or indirect transmission of an infectious agent from those infected to those who are susceptible to infection or who may spread the agent to others.

“LINCS” means the New Jersey Local Information Networks and Communication System.

“MDRO module” means the multi-drug resistant organism component of the CDC National Healthcare Safety Network.

“Methicillin-resistant *Staphylococcus aureus* (MRSA)” means any *Staphylococcus aureus* isolate with resistance to oxacillin or methicillin, detected and defined according to “Performance Standards for Antimicrobial Susceptibility Testing,” written and published by the Clinical and Laboratory Standards Institute, as amended and supplemented. This document is available for purchase through the Clinical and Laboratory Standards Institute, <http://www.clsi.org/>.

“MRSA-colonized patient” means a patient who carries MRSA without evidence of infection (e.g., nasal swab test positive for MRSA, without signs or symptoms of infection).

“MRSA-positive patient” means a patient who is either colonized or infected with MRSA.

“MRSA screening tests” means laboratory methods to detect MRSA (e.g., polymerase chain reaction (PCR), chromogenic agar, latex tests and culture).

“Multidrug-resistant organism (MDRO)” means bacteria (excluding *Mycobacterium tuberculosis*) that are resistant to one or more classes of antimicrobial agents and usually are resistant to all but one or two commercially available antimicrobial agents (e.g., MRSA, vancomycin resistant enterococci (VRE), extended spectrum beta-lactamase (ESBL)-producing or intrinsically resistant gram-negative bacilli).

“Mupirocin-resistant MRSA” means methicillin-resistant *Staphylococcus aureus* that is also resistant to mupirocin. Mupirocin is a topical antimicrobial agent that can be used to treat skin and soft tissue infections.

“NHSN” means National Healthcare Safety Network, which is a secure, internet-based surveillance system that integrates patient and healthcare personnel safety surveillance systems managed by the Division of Healthcare Quality Promotion at the CDC.

“Non-critical medical equipment” means items that are used for routine patient care, such as a thermometer, stethoscope, and blood pressure cuff.

“Patient care area (PCA)” means a division within a hospital dedicated to the care of numerous patients having the same or similar condition.

“Percutaneous device” means a device that passes through the skin and provides access to inner organs or other tissue.

“Personal protective equipment (PPE)” means such items as gloves, gowns, medical masks, or eye protection (such as a face shield, goggle, or visor).

“Polymerase chain reaction (PCR)” means a laboratory method for detecting the genetic material of an infectious disease agent in specimens from patients. This type of testing has become an essential tool for detecting infectious disease agents.

“Screening” means examination of a population to detect the existence of a particular disease or potential for developing a disease.

“Self-care patient” means a patient who can perform preventive and health promotion practices that aid in disease recovery or coping with the effects of disease, with minimal medical, professional, or other assistance or oversight.

“Standard precautions” means a group of infection prevention practices that apply to all patients, regardless of suspected or confirmed diagnosis or presumed infection status. Standard Precautions are a combination and expansion of Universal Precautions and Body Substance Isolation. Standard Precautions are based on the principle that all blood, body fluids, secretions, excretions (except sweat), nonintact skin, and mucous membranes may contain transmissible infectious agents. Standard Precautions include hand hygiene, and depending on the anticipated exposure, the use of gloves, gown, mask, eye protection, or face shield. Also, equipment or items in the patient environment likely to have been contaminated with infectious fluids must be handled in a manner to prevent transmission of infectious agents (e.g., wear gloves for handling, contain heavily soiled equipment, and properly clean and disinfect or sterilize reusable equipment before use on another patient).

“Susceptibility profile” means the results of antibiotic-sensitivity testing for an organism.

“Tracheostomy” means a surgically constructed opening made in the trachea in order to insert a catheter or tube into the trachea, especially to facilitate breathing.

“Typing method” means a method for distinguishing among bacterial strains. Such methods are especially useful during outbreak investigations to the extent that they can differentiate outbreak-related bacterial strains from endemic or sporadic isolates.

“Visitors” means non-staff, non-clinician, non-patient persons who enter a hospital.

“Well baby” means a healthy baby who is free from infection or illness.

RECOMMENDATIONS

The CDC/HICPAC system for categorizing recommendations is as follows:

Category IA: Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies.

Category IB: Strongly recommended for implementation and supported by some experimental, clinical, or epidemiologic studies and a strong theoretical rationale.

Category IC: Required for implementation, as mandated by federal and/or state regulation or standard.

Category II: Suggested for implementation and supported by suggestive clinical or epidemiologic studies or a theoretical rationale.

No recommendation: Unresolved issue. Practices for which insufficient evidence or no consensus regarding efficacy exists.

I. SCREENING PROTOCOLS—for identification of patients who might have MRSA

A. Candidates for MRSA screening

1. A general hospital shall screen all patients admitted to a patient care area (PCA) where active surveillance is being performed. This PCA shall also be known as an intervention unit. **Category IC**

Comment: This essentially constitutes universal screening of patients for MRSA once the active surveillance program is expanded facility-wide. The working group voiced concern that it would be impractical for staff to perform risk assessments on patients to decide who should get screened and who should not. Having staff perform risk assessments might result in a fair amount of missed screening opportunities. It would be more practical to screen everyone who is admitted. With this recommendation, it is likely that persons might get screened who do not need to be. However, the thought is that it would be better to potentially “over screen” the population admitted to facility rather than miss someone who might have been colonized, because staff did not apply appropriate criteria when assessing the patient’s eligibility to be screened. Of note, this “universal” screening practice would also be in line with Society for Healthcare Epidemiology of America (SHEA) guidance that states, “The goal of this program should be to identify every colonized patient, so that all colonized

patients are cared for in contact (or cohort) isolation to minimize spread to other patients.”

2. A general hospital shall screen and manage, that is isolate or cohort, well babies born to MRSA-positive mothers in accordance with the hospital’s existing infection control policy. **Category II**

B. Initiation and expansion of the MRSA active surveillance program

1. A general hospital shall implement active surveillance for MRSA in at least one medical or surgical intensive care unit (ICU) or other high-risk PCA within 30 days of these Guidelines being disseminated through the New Jersey Local Information Network and Communications System (LINCS). **Category IC**

2. Per N.J.S.A. 26:2H-12.36, a general hospital shall expand the active surveillance program facility-wide, taking into account its patient population, physical plant, and other facility-specific circumstances. **Category IC**

Comment: This provision of the law gives a general hospital the necessary flexibility to expand its active surveillance program facility-wide according to factors that might be unique to its institution.

3. A general hospital may use data resulting from its evaluation of the impact of the active surveillance program on hospital-onset MRSA infection rates to inform expansion of the program to its other PCAs. **Category II**

Comment: The working group decided that a general hospital should base expansion of the active surveillance program on lessons learned from piloting the program in the hospital’s ICU or other high-risk PCA rather than establishing a “date certain” by which programs should be expanded facility-wide. N.J.S.A. 26:2H-1 et seq. does not provide a time frame by which facility-wide expansion should occur, so this approach is in accordance with the law.

4. Per N.J.S.A. 26:2H-12.36, a general hospital may exclude its inpatient psychiatric units from the expansion program if the hospital’s infection control committee has not identified this unit as a high-risk PCA. **Category IC**

C. Anatomical sites and methods for MRSA screening

1. Bilateral anterior nares, utilizing one (1) culturette for both nares. This is a minimum requirement for screening. **Category IB**

2. Additional screening using specimens collected from areas of active skin breakdown or draining wounds, including surgical sites when noted upon admission to the hospital is optional, but strongly recommended. **Category IB**

3. Recommended methods for performing nasal specimen collection can be found on pp. 35-36 of the March 2007 APIC “Guide to the Elimination of Methicillin-resistant Staphylococcus aureus (MRSA) Transmission in Hospital Settings.”

D. Timeframe for performing screening (Also see Appendix A.)

1. General hospitals shall screen all patients within 24 hours upon arrival to the intervention unit. Screening for MRSA shall not delay care that would otherwise jeopardize the patient's well-being. **Category IC**

2. Once a patient screens positive for MRSA, he or she shall be considered “MRSA-positive” for the duration of his or her current hospital stay and should not be subjected to repeat screening for MRSA during this period, unless repeat screening is being done to determine the effectiveness of a decolonization attempt. **Category II**

3. Repeat screening during a current hospital admission is only indicated for a patient that is being managed in an intervention unit and who:

i. Has screened negative for MRSA since his or her admission; **Category II**

or

ii. Has been decolonized during his or her current hospital admission. **Category II**

4. Cultures, as opposed to testing that might detect nonviable MRSA bacteria (e.g., polymerase chain reaction [PCR]), should be done to rescreen a patient who was decolonized during his or her current hospitalization. (See Section VIII.) **Category II**

5. A general hospital shall establish a policy for performing repeat MRSA screening on a periodic basis in the intervention unit. The frequency of this screening should be based on the prevalence of MRSA in the intervention unit. **Category IA**

6. For patients eligible for repeat screening (See I.D.3.): A general hospital is not required to rescreen a patient upon his or her transfer from one intervention unit to another. Instead, the patient’s next screening test may be performed according to the receiving unit’s schedule for repeat screening. **Category II**

E. Patient refusal of MRSA screening

1. A general hospital shall base isolation decisions for patients who refuse active surveillance testing on the presence of risk factors¹ in the patient and clinical data only. **Category II**

Comment: This recommendation regarding how to manage patients refusing to be screened for MRSA comes from Diekema DJ and Edmond MB. Look before you leap: active surveillance for multidrug-resistant organisms. *Clin Infect Dis.* 2007 Apr 15;44(8):1101-7.

¹Risk factors for MRSA include:

History of MRSA infection or colonization

History in the past year of:

Hospitalization admission to a long term care facility (nursing home, skilled nursing, or hospice)

Dialysis and end-stage renal disease

Diabetes mellitus

Surgery

Permanent indwelling catheters or medical devices that pass through the skin into the body

Injection drug use

Recent (i.e., within 3-6 months) and/or frequent antibiotic use

Close contact with someone known to be infected or colonized with MRSA

Recurrent skin disease

Crowded living conditions (e.g., homeless shelters)

Incarceration

Infection among sports participants who have:

Skin-to-skin contact

Pre-existing skin damage

Shared clothing and/or equipment

II. CULTURING/SCREENING HEALTH CARE WORKERS

A. A general hospital shall not screen healthcare workers (HCWs) as a matter of routine, as this practice is usually not an effective strategy. **Category IA**

B. HCWs are not obligated to divulge the results of MRSA screening tests obtained through their medical providers as this information is considered private health information. If a general hospital's supervisory staff somehow learns that an asymptomatic HCW is colonized with MRSA, the HCW need not be subjected to measures such as work exclusion, removal from regular duties, or decolonization unless the HCW is believed to be a point source for ongoing MRSA transmission. Provided HCWs are educated on a routine basis about infection control practices, including proper hand hygiene, asymptomatic HCWs who are colonized with MRSA should not be considered a threat to patient well-being. **Category II**

C. If a general hospital has reason to suspect or, in any way, has knowledge that a HCW's health status poses an unacceptable risk to patient health, the HCW in question should be referred to the hospital's employee health service for evaluation to determine if the HCW is fit for duty. Similarly, if HCWs themselves

have reason to believe their health status might adversely impact patient health, they have a responsibility to seek out a fitness for duty evaluation. **Category II**

D. A general hospital shall consider screening HCWs during MRSA clusters or outbreaks that occur in the hospital, on the basis of epidemiologic data.

Category IA

E. A general hospital shall utilize pulsed-field gel electrophoresis or other typing method to assist in its investigation of MRSA clusters or outbreaks, provided this resource is readily available to the facility. **Category IA**

Comment: The working group did not want general hospitals to be put in the position of needing to find resources to carry out this activity, given that microbiology resources are already strapped and will be even more so with the current legislation. Hence, the caveat: “provided this resource is readily available to the facility.”

III. FOLLOW-UP FOR EXPOSURE TO NONISOLATED MRSA POSITIVE PATIENTS

A. Scientific evidence is insufficient to determine whether a follow-up investigation is indicated when a non-isolated patient is identified as having a positive MRSA test (either screening or clinical), has been in the hospital ≥ 24 hours, and there is a potential for the positive patient to have exposed other patients to MRSA. However, general hospitals may opt to engage in this activity.

Unresolved issue

Comment: Though this activity was considered a “Level 1” priority in the guidelines written for hospitals in Rhode Island, the team responsible for drafting this section did not find literature to support performing this activity.

IV. CONTACT (ISOLATION) PRECAUTIONS / PRACTICES

Note: N.J.S.A. 26:2H-12.36 mandates use of “contact precautions for patients found to be MRSA positive, as ‘contact precautions’ is defined by the Centers for Disease Control and Prevention.”

A. Transmission-based precaution category: Contact Precautions, with additional requirements for controlling the spread of resistant organisms. **Category IA**

1. A general hospital shall implement contact precautions when clinical specimens or surveillance screening tests are positive for MRSA. **Category IA**

2. A general hospital is not required to isolate patients screened for MRSA while test results are pending. **Category II**

Comment: The University of Pittsburgh Medical Center, which reported substantial declines in their hospital-onset MRSA infection rates following implementation of their active surveillance program, did not isolate patients until they were determined to be MRSA-positive.

3. A general hospital shall implement contact precautions for patients infected with other multidrug-resistant organism (MDROs) on the basis of the hospital's established isolation policy or practices. **Category IA**

B. Candidates for Contact (Isolation) Precautions

1. All patients with MRSA infection, any anatomical site. **Category IA**

2. All patients with MRSA colonization, any anatomical site. **Category IC**

C. Criteria for use of personal protective equipment (PPE) by a healthcare worker (HCW) caring for a MRSA-positive patient.

1. A general hospital shall require the use of PPE as follows:

i. A HCW caring for patients on contact precautions shall wear a gown and gloves for all interactions that may involve contact with the patient or potentially contaminated areas in the patient's environment (e.g., medical equipment or bed rails). A HCW shall don a gown and gloves upon entry into the room or cubicle. A HCW shall remove and dispose of the gown and gloves according to the hospital's established practice and perform appropriate hand hygiene (See Section IV.E.) before leaving the patient's room or cubicle. **Category 1B**

Comment: This recommendation is consistent with CDC's recommendations regarding the use of gowns and gloves.

ii. A HCW shall use masks according to standard precautions when performing splash-generating procedures (e.g., wound irrigation, oral suctioning, intubation); when caring for patients with open tracheostomies and the potential for projectile secretions; and in circumstances where there is evidence of transmission from heavily colonized sources (e.g., burn wounds). Masks are not otherwise recommended for prevention of MDRO transmission from patients to HCWs during routine care (e.g., upon room entry). **Unresolved issue**

D. Isolation Room

1. All MRSA positive patients, whether infected or colonized shall:

i. Be placed in a private room and/or cohorted; **Category II**

and

ii. Be restricted to his or her room, except when in need of diagnostic or therapeutic services. **Category II**

2. For ambulatory patients: If the patient needs to leave his or her room for diagnostic or therapeutic services, he or she shall wear clean clothing or a gown and shall have practiced handwashing with soap and water or application of an alcohol-based, waterless product (as appropriate) prior to leaving the room.

Category II

3. A general hospital shall identify rooms where contact precautions should be used with signage that is clearly visible and contains information presented in a manner that would be easily understood by the lay public, including, but not limited to, what PPE is required before room entry. **Category II**

E. Hand Hygiene

1. A HCW shall practice handwashing with soap and water or application of an alcohol-based, waterless product (as appropriate) before and after caring for patients. **Category IA**

2. A HCW shall perform hand hygiene, as described in IV.E.1., before donning gloves. **Category II**

3. A HCW shall perform hand hygiene, as described in IV.E.1., immediately following the removal of gloves. **Category IB**

F. Visitors of patients on Contact (Isolation) Precautions

1. A general hospital may choose whether visitors need to wear PPE when visiting a patient on MRSA contact (isolation) precautions. **Unresolved issue**

2. If a hospital chooses to have visitors wear PPE, hospitals may refer to the following recommendations:

i. A visitor shall wear gloves whenever touching the patient's intact skin or surfaces and articles in close proximity to the patient (e.g. medical equipment or bed rails). A visitor shall don gloves on entry into the room or cubicle. A visitor shall remove gloves, dispose of them according to the hospital's established practice, and perform appropriate hand hygiene (see Section IV.E.) before leaving the patient's room or cubicle. **Unresolved issue**

ii. A visitor shall wear a gown whenever anticipating that clothing will have direct contact with the patient or potentially contaminated environmental surfaces or equipment in close proximity to the patient. A visitor shall don a gown on entry into the room or cubicle. A visitor shall remove the gown, dispose of it according

to the hospital's established practice, and perform appropriate hand hygiene (see Section IV.E.) before leaving the patient's room or cubicle. **Unresolved issue**

3. When indicated, a HCW shall instruct the visitor of a MRSA-positive patient how to don, remove, and dispose of gowns and gloves. This education should occur prior to the visitor entering the room of a MRSA-positive patient. **Category II**

Comment: The use of PPE by visitors is a contentious topic. Given the media attention given to MRSA during the fall of 2007, visitors might feel the need to be "protected" through the use of PPE. However, according to the SHEA, household contacts were found to already be carriers of the same organisms of the patients they were visiting; therefore, standard precautions should suffice. Furthermore, some members of the team responsible for drafting this section argued that most visitors are just sitting at the patient's bedside and are not involved in direct patient care. PPE use may be more of a consideration for visitors participating in direct patient care activities. The team members responsible for drafting this section agreed that a requirement to have visitors to wear PPE would be difficult to enforce. The recommendations in this section are presented in a way to provide hospitals with some discretion regarding the use of PPE by visitors, given the reasons presented above.

4. A visitor of a MRSA-positive patient shall practice handwashing with soap and water or application of an alcohol-based, waterless product (as appropriate) upon leaving the patient's room. **Category II**

5. A HCW may instruct a visitor how to practice handwashing before the visitor enters the MRSA-positive patient's room. **Category II**

G. Transporting MRSA positive patients

1. When practical, the patient shall wear a clean patient gown when being transported from his or her room. **Category II**

2. A HCW may wear regular work attire and have gloves available during transport. **Category II**

3. During transportation, all HCWs providing direct patient care, such as "bagging" critically ill patients in transit, may don PPE. If the patient can be transported in a clean stretcher, HCWs involved in transporting the patient are not required to wear PPE. **Unresolved issue**

4. If a patient is transferred from his or her bed to a stretcher for transport, a HCW shall make up the stretcher with clean linen, including a clean pillow cover. The patient's bed linens shall not travel with the patient on the stretcher. **Category II**

5. A HCW shall disinfect stretchers and wheelchairs between patient use according to the hospital's established practice. **Category II**

6. If a patient cannot be transferred to a stretcher and has to be transported in his or her bed, a HCW shall wipe down the head- and footboards and side rails with an appropriate germicidal agent (See Section XII.A.) and clean sheets shall be placed over the bed prior to leaving the room.² The HCWs involved in transporting the patient are not required to wear PPE in this circumstance.

Unresolved issue

²N.B.: The performance of these activities shall not delay the transport of patients in need of urgent or emergent care.

7. A general hospital may choose to implement a more conservative policy of requiring its HCWs to wear clean PPE during all instances of transporting a MRSA-positive patient. **Unresolved issue**

V. DECOLONIZATION OF PATIENTS

Comment: There is apparently wide variation among general hospitals in NJ regarding decolonization procedures. Since there is not sufficient evidence available to recommend one policy over another, the conference call participants decided not to provide detailed recommendations with respect to this activity. In addition, CDC does not recommend that decolonization be performed as a matter of routine.

A. A general hospital shall develop a policy regarding decolonization which includes, but is not limited to, criteria for identifying which patients, if any, should undergo decolonization and methods for carrying out decolonization. A general hospital should reevaluate its policy within one year of the date of these Guidelines being distributed via LINCS or as new information becomes available, whichever comes first. **Category II**

B. General hospitals may refer to pp. 47-48 of the March 2007 APIC "Guide to the Elimination of Methicillin-resistant Staphylococcus aureus (MRSA) Transmission in Hospital Settings" when developing their policies regarding decolonization, including decolonization regimens.

1. Though optimal decolonization regimens have not yet been established, expert opinion is that a decolonization regimen should include intranasal topical mupirocin, twice a day for five days, when feasible. **Category II**

C. Key concepts that should be considered:

1. It is not routinely recommended to attempt MRSA decolonization. There are circumstances, though, in which decolonization can be considered:

i. Elimination of MRSA colonization (decolonization) has been suggested as an MRSA control and prevention measure when there is ongoing MRSA transmission in a well-defined cohort group, especially one whose members have close contact with one another. **Category II**

ii. Decolonization has been suggested as a patient management strategy when a clinician determines that a patient may benefit clinically from decolonization (e.g., preoperative patients colonized with MRSA, patients with recurrent MRSA infections). **Category II**

2. MRSA colonization recurs in a significant number of decolonization attempts, and despite short-term benefits, long-term MRSA decolonization success is questionable.

3. Decolonization may lead to the selection of high- or low-level, mupirocin-resistant MRSA strains in treated patients and in patient populations.

Comment: Note, all key concepts in Section V.C. were taken, for the most part, verbatim from the 2007 APIC Guide, with some slight modifications based on input provided by members of the Decolonization Section and the Infectious Diseases Society of NJ.

D. During an intervention that includes decolonization, both MRSA transmission rates and MRSA resistance to the decolonizing agent should be monitored. When mupirocin is used as the decolonizing agent, mupirocin resistance should be monitored when possible/practical. Of note, susceptibility testing standards have not yet been established for mupirocin (Also see Section VI.D.) **Category II**

Comment: Most of the language in item V.D. is also taken from the 2007 APIC Guide.

E. Culture (rather than a test that might detect nonviable bacteria, [i.e., PCR]) should be used to determine the effectiveness of a decolonization attempt. **Category II**

N.B.: Therapy for a clinical infection does not necessarily eliminate carriage.

VI. MICROBIOLOGY PROCEDURES

A. MRSA screening test(s)

1. Microbiologists are not required to perform a full susceptibility profile when screening for MRSA by culture. For MRSA screening purposes, microbiologists

may limit susceptibility testing of *Staphylococcus aureus* isolates to oxacillin (or preferably ceftazidime)—to determine presence or absence of methicillin resistance.

Category IA

2. Hospitals shall consider utilizing rapid methodologies, such as PCR, fluorescence in situ hybridization (FISH), chromogenic agar, latex tests, or any other method that identifies MRSA within 24 hours. **Category II**

Comment: The working group encourages use of rapid methodology. Rapid methods provide real-time results that allow earlier intervention, which can reduce hospital-acquired MRSA infections significantly. Published articles document ~40% reduction with culture and ~twice that with PCR.

B. Clinical cultures

1. Clinical microbiologists shall perform a full susceptibility profile, including vancomycin, on cultures being processed for a clinical work-up, as per laboratory protocol. **Category IA**

2. A general hospital shall monitor trends in MRSA resistance to vancomycin. **Category IA**

Comment: In other words all microbiology labs will be tracking vancomycin susceptibility/resistance on all clinical isolates.

3. A general hospital shall consider modifying routine protocols to facilitate the identification of MRSA to within 24 hours of specimen collection. **Category II**

C. Periodic testing for susceptibility to mupirocin is encouraged, but should be done in consultation with microbiologists, given the issues outlined in the comment box below. **Unresolved issue**

Comment: There are three major problems associated with testing for susceptibility to mupirocin: 1) Susceptibility testing standards have not yet been established; 2) Discs are not readily available in the USA because large distributors do not carry them; and 3) The E-test is not FDA-approved for mupirocin susceptibility testing; it is available for investigational use only. Therefore, at this time, mupirocin susceptibility testing should only be considered during outbreak settings or when guidelines and a validated susceptibility testing product are readily available.

D. Microbiologists are encouraged to refer to the most recent version of the Clinical and Laboratory Standards Institute's Performance Standards for Antimicrobial Susceptibility Testing for details regarding recommended methods for performing antimicrobial susceptibility testing on *S. aureus*.

E. Notification of newly positive MRSA cultures

1. A general hospital shall establish a procedure by which staff in the microbiology laboratory notifies staff in the inpatient nursing unit/area and/or the infection control department when a new MRSA isolate is identified so that contact (isolation) precautions might be implemented as soon as feasible.

Category IA

2. A general hospital shall establish a procedure by which a member of the hospital's staff notifies a patient's admitting physician or physician of record of the patient's positive MRSA screening test in the event the patient was discharged to home or another facility before the test result became available.

Category IA

VII. SURVEILLANCE METHODOLOGIES

A. IMPORTANT: Facilities should enroll in CDC's National Healthcare Safety Network (NHSN) as soon as feasible, so that their MRSA infection rates and adherence to active surveillance testing can be systematically tracked through NHSN's MDRO module when it is available. MRSA infection rates and adherence to active surveillance testing have been identified as measures that should be reported to the Department at a minimum. For more information about NHSN, including how to enroll, go to <http://www.cdc.gov/ncidod/dhgp/nhsn.html>.

Category IC

B. In the event that the NHSN MDRO module is not available for reporting purposes, hospitals will be asked to report the outcome measure and process measure as outlined below through alternative means. If reporting through an alternative means becomes necessary, the Department will provide further guidance regarding how to submit reports through this alternative system. Of note, the following outcome and process measures are based, in large part, on those developed by the Institute for Healthcare Improvement (IHI).

C. Outcome Measure—Hospital-onset MRSA bloodstream infections: Hospitals shall monitor and report to the Department hospital-onset MRSA infection rates as follows: **Category IC**

<p><u>Comment</u>: Limiting case counts to bloodstream infections reduces the likelihood of erroneously capturing cases representing MRSA colonization.</p>

1. Calculation Details:

i. Numerator Definition: Number of patients with a hospital-onset MRSA bloodstream infection during the calendar month.

ii. Numerator Exclusions:

- a. Patients with a length of stay of 2 days or less
- b. Patients with MRSA bloodstream infection identified from blood cultures collected in the first 2 days of the patient's stay
- c. Patients with a known MRSA positive test (either clinical or surveillance) upon admission to the intervention unit.

iii. Multiple blood cultures positive for MRSA during a 30-day period should be considered to represent a single bacteremia episode, while those that are more than 30 days apart represent a new episode.

iv. Denominator Definition: Total number of patient-days for the calendar month for the intervention unit:

v. Denominator Exclusions: None.

Comment: Though this method violates the principle of removing persons “not at risk” from the denominator, the thought is that including the total number of patient-days for a particular unit would be a more practical approach for obtaining the denominator, yet would have little impact on the resulting MRSA infection rate compared to the one that would be calculated according to IHI methodology.

2. Measurement Period Length: Each calendar month.

3. Definition of Terms: MRSA bloodstream infection—CDC definition for laboratory-confirmed bloodstream infection (LCBI) with MRSA as the organism identified in blood culture. (SOURCE: The National Healthcare Safety Network (NHSN) User Manual, page 6.)

4. Calculation of Rate: Calculate as (numerator / denominator) x 1000; express as the number of hospital-onset MRSA bloodstream infections per 1000 patient-days.

5. Sampling Strategy: A general hospital may limit initial measurements to only intervention units. As the implementation of the active surveillance program expands to other PCAs, a general hospital shall expand its measurement accordingly.

D. Staff with expertise in monitoring the hospital's infection rates should also monitor hospital-onset MRSA infection rates, by PCA, and provide this information to the hospital's HCWs, especially HCWs working in an intervention unit. **Category IB**

E. Process Measure: Adherence to active surveillance testing: Hospitals shall monitor and report to the Department the percentage of patients who have a MRSA surveillance specimen collected upon admission to an intervention unit
Category IC

1. Calculation Details:

i. Numerator Definition: Number of patients in the intervention unit who have a MRSA surveillance specimen collected from the anterior nares within 48 hours of admission during the calendar month.

ii. Numerator Exclusions: None.

iii. Denominator Definition: Total number of patients admitted to the intervention unit for the calendar month.

iv. Denominator Exclusions: Patients admitted to the intervention unit for whom screening was not required upon admission to the unit (e.g., patients who previously screened positive for MRSA during the current hospitalization).

2. Measurement Period Length: Each calendar month.

3. Calculate as: $(\text{numerator} / \text{denominator}) \times 100$; express as the percentage of patients admitted to the intervention unit who had a MRSA surveillance specimen collected upon admission to an intervention unit.

4. Sampling Strategy:

i. Use the following sampling strategy for generating an adherence rate: all patients in the intervention unit on a randomly selected day of the week.

ii. A general hospital may limit initial measurements to only intervention units. As the implementation of the active surveillance program expands to other PCAs, a general hospital should expand its measurement accordingly.

Comment: This process measure has been included for reporting purposes to determine how well a hospital is performing surveillance testing for MRSA. This measure will assist in putting hospital-onset MRSA infection rates in some context, which could be useful if hospitals are compared with one another with respect to their MRSA infection rates.

F. To the extent that resources permit, general hospitals may monitor staff adherence to: 1) hand hygiene and 2) appropriate PPE use (i.e., use of gowns and gloves during the care of patients on contact precautions). For those hospitals that have the ability and resources to perform such monitoring, they may choose to monitor either hand hygiene or PPE use or both. Such monitoring

might be in the form of an indirect measure (e.g., assessing the volume of hand rub used in a particular PCA each month) or direct observation—again, based on hospital resources. Until a viable, standard, and valid method for measuring adherence of these activities becomes available for public reporting purposes, reporting these process measures to the Department is optional. **Category II**

Comment: From IHI's How-to-Guide: Improving Hand Hygiene: "Hand hygiene (i.e., handwashing with soap and water or use of a waterless, alcohol-based hand rub) has long been considered one of the most important infection control measures for preventing health-care-associated infections. However, compliance by health care workers with recommended hand hygiene procedures has remained unacceptable, with compliance rates generally below 50% of hand hygiene opportunities. Recognizing a worldwide need to improve hand hygiene in health care facilities, the World Health Organization (WHO) launched its Guidelines on Hand Hygiene in Health Care (Advanced Draft) in October 2005. These global consensus guidelines reinforce the need for multidimensional strategies as the most effective approach to promote hand hygiene. Key elements include...use of performance indicators..."

"Wearing gloves during patient care is an additional intervention to help reduce transmission of infectious agents in high-risk situations. Gloves protect patients by reducing contamination of the health care worker's hands and subsequent transmission of pathogens to other patients." Presumably this can be extrapolated to gown use as well.

Because the monitoring activities being proposed could be labor-intensive depending on the method(s) that a particularly facility chooses for monitoring, hospitals should be given the option of monitoring and reporting these process measures. At this time, it appears that there is not a universal standard for assessing adherence to hand hygiene and glove/gown use, though IHI currently has methodology for performing these assessments, and CDC is likely to come out with its own methodology (whether it will ultimately be in line with IHI's or be drastically different is yet to be determined). Regardless, the goal here is for a hospital to choose some method that is in line with its existing resources and continue to use that same method to track its own rates over time. The intent is not to compare hospitals with respect to adherence to hand hygiene and glove/gown use. Rather, the hope is that through monitoring these process measures and feeding information back to staff, individual hospitals might be able to track and improve their rates of adherence to these activities and target resources toward PCAs where rates are suboptimal.

G. Timeframe for submitting required measures

1. A general hospital shall submit its hospital-onset MRSA infection rates and adherence to active surveillance testing, stratified by PCA, within 30 days of the

end of the calendar month, using a web-based interface to be developed and communicated by the Department. **Category IC**

H. When a MRSA-positive patient is transferred from a hospital to another healthcare facility, the receiving facility shall be notified. **Category IC**

VIII. IDENTIFICATION OF PATIENTS KNOWN TO BE MRSA POSITIVE

A. A general hospital shall develop a reliable method of identifying previously positive MRSA patients on re-admission to a facility, such as a computer-based “flagging” system. **Category IC**

IX. DISCONTINUING ISOLATION / REMOVING MRSA FLAGS

A. Each hospital shall have a protocol in place to remove MRSA-positive patients from isolation, based on current scientific guidelines (i.e., CDC’s “Management of Multidrug-Resistant Organisms In Healthcare Settings,” 2006; APIC’s “Guide to the Elimination of Methicillin-resistant *Staphylococcus aureus* (MRSA) Transmission in Hospital Settings,” 2007). A general hospital should reevaluate its protocol within one year of the date of these Guidelines being distributed via LINCS or as new information becomes available, whichever comes first.

Category II

B. For a variety of reasons, there are no definitive criteria for discontinuing the contact (isolation) precautions that are used during the management of a MRSA-positive patient. However, on the basis of current expert opinion, a general hospital may consider discontinuing contact (isolation) precautions and removing a MRSA flag according to the following criteria:

1. During a current hospitalization: At least three negative surveillance cultures or molecular tests are obtained from the patient and the patient does not have evidence of an active MRSA infection. Surveillance specimens should be collected—ideally no sooner than 48 hours—after all antibiotics (including those used for decolonization) have been stopped. Surveillance specimens should be collected at intervals of approximately one week or longer. **Unresolved issue**

2. During a hospitalization occurring within two years of a patient being determined to be MRSA-positive: The same criteria outlined in IX.B.1. should be met before discontinuing contact (isolation) precautions and removing a MRSA flag. **Unresolved issue**

3. During a hospitalization occurring two years after a patient was determined to be MRSA-positive: One negative surveillance culture from any chronic wound (e.g., a tracheostomy) or body site(s) with a percutaneous device (e.g., a G-tube) and one negative surveillance culture (or molecular test) from the anterior nares should be obtained before discontinuing contact (isolation) precautions and

removing a MRSA flag. Hospitals should consider using more stringent criteria (i.e., >1 negative surveillance culture from any chronic wound or body site(s) with a percutaneous device and >1 negative surveillance culture (or molecular test) from the anterior nares) for patients who have additional risk factors for MRSA (i.e., risk factors that go beyond a history of infection or colonization with MRSA). Risk factors for MRSA are listed in the comment box under I.E.1. **Unresolved issue**

X. COHORTING MRSA-POSITIVE PATIENTS

A. A general hospital may cohort MRSA-positive patients in the same room, when private rooms are not available. **Category IB**

B. The same contact (isolation) precautions (See Section IV.) shall be used for cohorted patients. **Category IA**

C. A general hospital shall cohort patients according to specific criteria, based on risk or probability of transmission from one patient to another. (See Appendix B.) **Category II**

XI. EDUCATION

A. A general hospital shall educate its HCWs about:

1. Hospital responsibilities mandated by N.J.S.A. 26:2H-1 et seq., including, but not limited to, performing active surveillance for MRSA.
2. How MRSA is transmitted.
3. Appropriate use of PPE.
4. Proper hand hygiene.
5. The process by which active surveillance for MRSA is/will be performed in the institution.
6. The 12 steps that encompass CDC's Campaign to Prevent Antimicrobial Resistance in Healthcare Settings.
7. Environmental decontamination.

Category IC

B. A general hospital shall educate its patients and the patients' family members and visitors about:

1. What is MRSA.
2. Why active surveillance for MRSA is being performed among the patient population.
3. The method(s) that the facility uses to conduct screening (e.g., swabbing the nares).
4. The implications of a positive test (e.g., being managed with contact precautions, being placed in isolation or cohorted with others with MRSA).
5. What it means to be colonized vs. infected with MRSA.
6. Why decolonization might be attempted for some patients but not for others.
7. What it means to managed with contact precautions, placed in isolation or cohorted with others with MRSA.
8. The role and responsibilities of patients and their family members and visitors with respect to adhering to the institution's infection control policies and procedures.
9. How patients with MRSA should be managed after discharge, including steps close contacts should take to prevent and/or control MRSA transmission.

Category II

<p><u>Comment:</u> Members of the NJ Chapters of APIC will be developing document(s) that can be provided to patients and their family members/visitors that address the items listed in section XI.B.</p>
--

C. A general hospital shall inform hospitalized patients (or their proxies, if applicable) of the results of MRSA screening and diagnostic tests. **Category II**

XII. ENVIRONMENTAL DECONTAMINATION

A. Housekeeping Practices

1. MRSA is susceptible to a variety of low- and intermediate-level disinfectants such as sodium hypochlorite and quaternary ammonium compounds.
2. A general hospital shall require that standard housekeeping procedures apply to the cleaning of rooms of MRSA-positive patients, with emphasis on high-touch surfaces such as bedrails, doorknobs, over-bed tables, blood pressure cuffs, computer table, bedside tables and portable medical equipment. **Category IB**

3. Housekeeping staff shall wet dust horizontal surfaces with cleaning cloths pre-moistened with a hospital disinfectant to control the dispersal of microorganisms in the air. **Category IB**

4. A general hospital shall train and monitor housekeeping staff to ensure that they are following correct procedures and are using the appropriate germicide at the proper dilution. **Category II**

5. A HCW shall dedicate noncritical medical equipment for use on a single patient known to be infected or colonized with MRSA or, if this is not practical/possible, disinfect this equipment between its use on different patients. **Category IB**

B. Laundry and Personnel Clothing

1. A HCW shall collect personnel clothing and bed linen of MRSA-positive patients that has been contaminated with potentially infectious drainage (e.g., drainage resulting from weeping cellulitis or infected surgical wounds) in leak-resistant laundry bags. **Category II**

2. Standard laundry cycles will eliminate MRSA from bed linen and clothing.

C. Dietary Dishes

1. General hospitals are not required to use single-use dishes and utensils for patients infected with MRSA. **Category II**

2. Standard sanitizing agents used in food service will eliminate MRSA from dishes and tableware.

D. Environmental Cultures

1. Under no circumstance should a general hospital engage in routine environmental sampling for culturing purposes. The only situation in which environmental sampling should be employed is when epidemiological data strongly suggest that an environmental reservoir exists. **Category II**

E. Solid Waste

1. Dressings and other items saturated with wound discharge should be disposed of directly into the regulated medical waste container according to the hospital's established practice. **Category IC**

F. Common-use Equipment

1. Hydrotherapy equipment – MRSA-positive patients who require whirlpools, birthing tubs, and foot baths should not be denied this service. To reduce the risk of MRSA transmission, a general hospital should ensure:

i. A MRSA-positive patient uses these services at the end of the day, when feasible;

and

ii. These small pools and tanks are drained after each patient use, thoroughly cleaned with a detergent, and disinfected according to manufacturers' instructions. **Category II**

2. Cleaning and disinfection practices, as described in XII.F.1.ii., should sufficiently eliminate MRSA from this equipment.

G. Special Precautions on Burn Units

1. A general hospital should consider use of preemptive barrier precautions with all patients in a burn unit; new and clean gown and gloves shall be used for any physical contact with a burn patient. **Category IB**

Appendix A. Scenarios to Illustrate: 1) When MRSA Screening Is Indicated, 2) When MRSA Flags Should be Removed, and 3) When Isolation (Contact) Precautions for MRSA Should be Discontinued.

Example 1: Upon admission to a hospital, a patient has a specimen collected from the anterior nares for MRSA screening. The screening test is positive for MRSA. Decolonization is not attempted and the person is discharged to home. The person is readmitted to the same facility and the patient is flagged and isolated upon readmission.

Question 1: Assuming the patient's admission is to an intervention unit, should the patient be rescreened at the time of the second admission?

Answer: Yes. Per I.A.1., "A general hospital shall screen all patients admitted to a patient care area (PCA) where active surveillance is being performed."

Question 2: If the interval between the patient's hospitalizations is ≤ 2 years (and assuming the patient does not have evidence of an active MRSA infection), is one negative screening test sufficient to remove the "flag" and manage the patient without contact precautions?

Answer: No. Per IX.B.1, at least three negative surveillance cultures or molecular tests should be obtained from a patient before discontinuing contact (isolation) precautions and removing a MRSA flag.

Question 3: If the interval between the patient's hospitalizations is > 2 years (and assuming the patient does not have any chronic wounds, percutaneous devices, and is not receiving dialysis), is one negative screening test sufficient to remove the "flag" and manage the patient without contact precautions?

Answer: Yes. Per IX.B.3., one negative surveillance culture (or molecular test) should be sufficient to discontinue contact (isolation) precautions and remove the MRSA flag in this instance.

Example 2: At 6AM, a patient is admitted to an intervention unit (PCA #1). The patient has a MRSA screening test (by PCR method) performed at 7AM and the result is positive. Later that day, the patient is transferred from PCA #1 to another PCA (PCA #2).

Question: Is a MRSA screening test required upon the patient's transfer from PCA #1 to PCA #2?

Answer: No. Per I.D.2., "Once a patient screens positive for MRSA, he or she shall be considered 'MRSA-positive' for the duration of his or her current hospital

stay and should not be subjected to repeat screening for MRSA during this period...”

Example 3: At 6AM, a patient is admitted to an intervention unit (PCA #1). The patient has a MRSA screening test (by chromogenic agar method) performed at 7AM; the result is pending. Later that day, the patient is transferred from PCA #1 to another PCA (PCA #2).

Question: Is a MRSA screening test required upon the patient’s transfer from PCA #1 to PCA #2?

Answer: No. Per I.D.3., repeat screening during a current hospital admission is only indicated if the patient initially screens negative for MRSA. In this situation, the results of the patient’s initial screen are pending. It would be impractical to screen this patient again.

Example 4: A patient is admitted to an intervention unit (PCA #1). The patient is screened and results are pending. The patient is then transferred the next day to another intervention unit (PCA #2). The patient is discharged from PCA #2 the next day to a general ward, where active surveillance for MRSA is not being performed.

Question 1: Should this patient be subjected to three MRSA screening tests in 3 days?

Answer: No. Per I.D.3., “Repeat screening during a current hospital admission is only indicated for a patient that is being managed in an intervention unit and who has screened negative for MRSA since his or her admission.” In this situation, the results of the patient’s initial screen are pending. Therefore, it is not necessary to repeat the screening test upon the patient’s transfer to PCA #2 as this would be impractical.

Question 2: If the patient’s initial screening test (i.e., that performed in PCA #1) were negative, should the patient have a repeat screening test performed in the general ward?

Answer: No. Per I.D.3., this patient would still not have to have a repeat screening test upon admission to the general ward since active surveillance is not being performed in this ward.

Example 5: A patient is admitted to an intervention unit (PCA #1) on Wednesday. The patient is screened (by PCR method) and the result is negative. The patient is then transferred the next day (Thursday) to another intervention unit (PCA #2). Repeat screening for MRSA is performed every Tuesday in PCA #2.

Question: Should this patient be subject to another MRSA screening test upon admission to PCA #2?

Answer: No. Per I.D.6., “A general hospital is not required to rescreen a patient upon his or her transfer from one intervention unit to another. Instead, the patient’s next screening test may be performed according to the receiving unit’s schedule for repeat screening.” Therefore, this patient’s next screening test should be performed on the upcoming Tuesday—the day of the week when repeat screening is performed in PCA #2.

Example 6: Three weeks ago, a patient was admitted to the ICU, where active surveillance is performed. The patient’s MRSA screening test was negative on admission. The hospital—based on the prevalence of MRSA in its ICU—has decided to perform repeat screening on eligible patients in the ICU every Tuesday. The patient will be discharged to the general medicine ward on Monday.

Question: Should this patient be screened upon discharge from the ICU on Monday?

Answer: No. Per the protocol established by this hospital’s infection control committee, repeat screening for MRSA occurs in the ICU on a weekly basis, that is, every Tuesday. (See I.D.5.) The hospital is not required to screen the patient again since: 1) the patient will be discharged before repeat screening is performed in the ICU and 2) the general medicine ward does not have an active surveillance program in place at this time.

APPENDIX B (Section X. Cohorting MRSA-Positive Patients)

Procedure for cohorting patients with MRSA:

A private room is the first choice for a patient infected or colonized with MRSA. If a private room is not available, patients with MRSA can be cohorted. Consider using the recommendations below for patient placement when private rooms are not available.

NOTE: Avoid placing a MRSA-colonized patient with a postoperative patient or a patient who has an active infection caused by either an unknown organism or an organism other than MRSA.

Preferred Method for Cohorting Patients with MRSA	
First choice	Place a MRSA-infected patient with an infected MRSA patient. OR Place a MRSA-colonized ³ patient with another MRSA-colonized patient.
Second choice	Place a MRSA-colonized patient with a patient who has active MRSA infection.
Third choice	Place a MRSA-colonized patient with a patient that does not have evidence of having MRSA AND is not immunocompromised.

³MRSA-colonized patient is defined as a patient whose only evidence of MRSA consists of a positive screening test, but does not have signs suggestive of an infection and patients with a history of MRSA.

Important considerations for cohorting patients with MRSA:

Place two self-care MRSA-positive patients together, as this would minimize the number of nurse-patient contacts compared to cohorting a MRSA-positive self-care patient with a MRSA-positive full-care patient. If feasible, avoid cohorting a MRSA-positive full-care patient with another MRSA-positive full-care patient, as this would result in the greatest number of nurse-patient contacts and, thereby increase the likelihood of the nurse becoming colonized with MRSA.

References and Resources

Arnold MS, Dempsey JM, Fishman M, McAuley PJ, Tibert C, Vallande NC. The Best Hospital Practices for Controlling methicillin-resistant Staphylococcus aureus: On the Cutting Edge. *Infect Control Hosp Epidemiol*. 2002;23(2):69-76.

Association for Professionals in Infection Control and Epidemiology. Guide to the elimination of methicillin-resistant Staphylococcus aureus (MRSA) transmission in hospital settings. Washington: Association for Professionals in Infection Control and Epidemiology; 2007.

<http://www.apic.org/Content/NavigationMenu/GovernmentAdvocacy/IssuesInitiatives/MethicillinResistantStaphylococcusAureusMRSA/Resources/MRSAguide.pdf>

Diekema DJ and Edmond MB. Look before you leap: active surveillance for multidrug-resistant organisms. *Clin Infect Dis*. 2007;44(8):1101-7.

Institute for Healthcare Improvement. Getting started kit: Reduce methicillin-resistant Staphylococcus aureus (MRSA) infection how-to guide. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2007.

<http://www.ihl.org/ihl>

Mayhall CG, editor. Hospital epidemiology and infection control. Baltimore: Williams and Wilkins; 1996.

Muto CA, Jernigan JA, Ostrowsky BE, Richet HM, Jarvis WR, Boyce JM, Farr BM; Society for Healthcare Epidemiology of America. SHEA Guideline for preventing nosocomial transmission of multidrug-resistant strains of Staphylococcus aureus and Enterococcus. *Infect Control Hosp Epidemiol*. 2003;24(5):362-386. [http://www.shea-](http://www.shea-online.org/Assets/files/position_papers/SHEA_MRSA_VRE.pdf)

[online.org/Assets/files/position_papers/SHEA_MRSA_VRE.pdf](http://www.shea-online.org/Assets/files/position_papers/SHEA_MRSA_VRE.pdf)

Otero, RB. Laundry and Textile (Linen) Services Infection Control. www.cinetwork.com/otero/laundryservices.html.

Safdar N, Marx J, Meyer NA, Maki DG. Effectiveness of preemptive barrier precautions in controlling nosocomial colonization and infection by methicillin-resistant Staphylococcus aureus in a burn unit. *Am J Infect Control*. 2006;34(8):476-83.

Sehulster LM, Chinn RYW, Arduino MJ, Carpenter J, Donlan R, Ashford D, Besser R, Fields B, McNeil MM, Whitney C, Wong S, Juraneck D, Cleveland J. Guidelines for environmental infection control in health-care facilities.

Recommendations from CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). Chicago IL; American Society for Healthcare Engineering/American Hospital Association; 2004.

www.cdc.gov/ncidod/hip/enviro/guide.htm

Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee. Management of multidrug-resistant organisms in healthcare settings, 2006. Atlanta: Centers for Disease Control and Prevention; 2006. <http://www.cdc.gov/ncidod/dhqp/pdf/ar/mdroGuideline2006.pdf>

Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee. 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. Atlanta: Centers for Disease Control and Prevention; 2007. <http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Isolation2007.pdf>