4. Determine when screening will be performed.
   a. MRSA surveillance may be performed upon admission to the hospital, preoperatively, upon initiating dialysis, on entry to a specific unit, or upon identifying a potential outbreak.
   b. Although not always included in active surveillance testing programs, additional testing of patients with initial negative surveillance test results can be done either at regular intervals (eg, weekly) or upon discharge or transfer from the hospital or unit in order detect patients who have acquired MRSA while in the hospital. This may be particularly important during MRSA outbreaks. One study demonstrated that patients identified as MRSA carriers by screening at the time of ICU discharge accounted for 27% of MRSA carriers detected by active surveillance and for 27% of the total number of MRSA colonization days in non-ICU wards for patients discharged from the ICU.[195]
   c. Testing at regular intervals has the potential to detect patients who have acquired MRSA during their hospitalization earlier than testing only at discharge and thus allows implementation of contact precautions and other response activities (eg, decolonization, different empiric or prophylactic antibiotics) to prevent transmission or disease.
   d. When testing is to be performed at regular intervals, consider identifying a specific day of the week when specimens will be collected. This will simplify the process and allow the microbiology laboratory to anticipate the increased volume of specimens and plan staffing and supplies accordingly.
5. Determine the anatomic sites that will be sampled.
   a. The sensitivity of surveillance specimens obtained from a variety of anatomic sites has been evaluated in several settings and patient populations. Although no single site will detect all MRSA-colonized persons, most studies have found the anterior nares to be the most frequently positive site, with sensitivity ranging from 48% to 93%.[194,196–200] Because of this and the accessibility of the site, the anterior nares have generally been considered to be the primary site for sampling in MRSA screening programs. However, collection of samples from other sites, such as skin (groin, perineum, wounds), foreign body (eg, gastrostomy or tracheostomy tube) exit sites, throat, and the perianal area, will allow identification of additional colonized patients that would not be identified by nasal specimens alone. Several recent studies have demonstrated that sampling from 1 or more additional sites, such as the throat and/or perineum, was required to increase the sensitivity of AST to >90%.[194,196,198,199]
   b. The neonatal ICU has a number of unique features that should be considered when planning an AST program for that setting.[24] For management of MRSA outbreaks in NICUs, nares samples alone may be sufficient to detect MRSA-colonized neonates,[164] but a sampling strategy that includes collection of specimens from other sites, such as the umbilicus, may have greater sensitivity for detection of MRSA than sampling the nares alone.[125,201]
   c. To simplify the specimen collection procedure and optimize resource utilization, some hospitals performing multisite sampling use a single swab to collect specimens from multiple sites (eg, nose, axillae, and groin).[166] When using molecular-based testing methods, confirm with laboratory personnel that the test has been validated for use with all sampling sites.
6. Select the laboratory method that will be used to detect MRSA.
   a. MRSA can be detected using culture-based methods or molecular diagnostic testing methods, such as polymerase chain reaction (PCR). Many factors must be considered when determining which laboratory method(s) will be used in a MRSA screening program. These factors include but are not limited to performance characteristics of the test (eg, sensitivity, specificity), batch testing, turnaround time, capabilities of the laboratory that will be providing the service (whether an in-house or reference lab), number of specimens that will be processed, and facility-specific cost-benefit calculations.
   b. A detailed discussion of the various laboratory methods for MRSA detection is beyond the scope of this guideline, but some of the key features of the most common methods are discussed below.
      i. Culture-based methods: Numerous microbiologic media and culture techniques have been described for use in the detection of MRSA colonization. One of the more commonly used selective media is mannitol salt agar (MSA) with or without antimicrobial (eg, oxacillin or cefoxitin) supplementation to increase specificity for methicillin-resistant organisms. The time required for detection of MRSA is ~48 hours using most culture-based techniques. Several chromogenic agar media have been developed that allow more rapid detection of MRSA than conventional media, usually within 24 hours. Studies using established collections of isolates and clinical specimens have shown that these chromogenic media rival or outperform more conventional microbiological techniques.[202–208] Additional enrichment steps, such as overnight incubation in trypticase soy broth, can further increase the yield of standard and chromogenic culture-based methods.[209–211]
      ii. Molecular testing methods: In recent years, there have been advances in molecular diagnostic testing methods, such as real-time PCR, for detection of MRSA. Earlier evaluations of these PCR assays found them to be highly sensitive (90%–100%) and specific (91.7%–98.4%) compared to standard culture-based methods.[212–215]Although more costly than culture-based techniques, one potential advantage of these molecular tests is their ability to provide a result in <2 hours from the time of specimen collection, although in actual practice the turn-around time may be longer due to batching of samples. At least 1 uncontrolled study[216] and 3 mathematical models[217–219] have suggested that rapid testing may allow for more effective use of contact precautions and enhanced prevention of MRSA transmission. However, a cluster randomized crossover trial of universal screening in general wards failed to identify a difference in MRSA acquisition rates with the use of rapid testing as compared with the use of a culture-based method.[52,220–222] These data suggest that the clinical and economic benefits of rapid testing may vary among individual hospitals and settings.
7. Determine how to manage patients while awaiting the results of screening tests.[57]
   a. Before implementing a screening program, a decision should be made regarding how a patient will be managed while waiting for the result of the admission MRSA screening test.

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