Implementation Guide:   
Toolkit for MRSA Prevention   
in ICU & Non-ICU Settings

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# Introduction

Setting up or improving MRSA Prevention in your hospital or unit can seem daunting. There are many strategies, and sorting the options can be time consuming. The **Toolkit for MRSA Prevention in ICU & Non-ICU Settings** was developed by a multidisciplinary team of clinicians, researchers, and experts to help teams tackle the complex challenges of MRSA prevention. The toolkit includes current evidence, guidelines, and best practices related to MRSA prevention. It also contains resources to help sites support an implementation plan.

This document is intended to guide teams and facilities who utilize the toolkit. This toolkit designed to be flexible and adaptable. You are encouraged to adjust and modify it to meet the needs of your facility and units.

## The Importance of MRSA Prevention

*Staphylococcus aureus* is associated with negative patient outcomes, including prolonged length of hospital stay, increased healthcare costs, morbidity, and mortality. Methicillin-resistant *S. aureus* (MRSA) presents a further threat as it is resistant to many available antimicrobial agents, complicating treatment. Antibiotic pressure can selectively induce increased antibiotic resistance in *S. aureus* strains, leading to treatment failures. MRSA is one of the most invasive and deadly multidrug-resistant organisms (MDROs). Despite a decline in incidence, MRSA remains a significant problem, causing over 10,000 deaths each year.1

MRSA is a prominent cause of healthcare-associated infections (HAIs), including central line-associated bloodstream infections (CLABSI), ventilator-associated pneumonia (VAP), and surgical site infections (SSI). Because many HAI statistics are publicly reported, including laboratory-identified (LabID) MRSA bacteremia, HAIs also negatively impact hospitals’ reputations and financial reimbursement.

One of the primary reservoirs of MRSA is the group of patients who are already colonized with MRSA upon admission to a healthcare facility. Many people carry MRSA without showing symptoms. MRSA infection arises when a colonized patient progresses to an invasive infection during hospitalization. Alternatively, MRSA may be transmitted between patients, from a contaminated patient care environment, or via contaminated medical equipment or healthcare personnel.

Hospitalized patients are vulnerable because their immune systems may be weakened due to illness or treatments. Their natural defenses may be circumvented by invasive procedures and medical devices, which can save lives but create portals of entry for pathogens such as MRSA.

Proximity to other patients and contact with healthcare providers who may unwittingly carry MRSA heightens the risk. All these factors converge to make hospitalization a high-risk environment for MRSA infection.

## Four Key Strategies of MRSA Prevention

MRSA prevention is complex and requires a multifaceted, multidisciplinary, comprehensive approach involving multiple strategies.

In this toolkit, MRSA prevention is organized around four key strategies:

1. **Decolonize Patients**
2. **Decontaminate the Environment**
3. **Prevent Person-Based Transmission**
4. **Prevent Device- and Procedure-Related Infections**

Image - Take Aim to Prevent MRSA.
This image shows a stylized target with four arrows. The center of the target contains "MRSA". The 4 main areas of focus for MRSA prevention in the ICU and non-ICU patient population are represented in the arrows.
1. Decolonize Patients
2. Decontaminate the Environment
3. Prevent Person-Based Transmission
4. Prevent Device- & Procedure-Related Infections 

These strategies aim to interrupt MRSA transmission and the progression from MRSA colonization to invasive infection.

Each key strategy includes a variety of topics, concepts, and tactics. In addition, the toolkit discusses a few topics that don’t fit into one of the four key strategies but are impactful for MRSA prevention.

### Decolonize Patients

**Decolonization** eliminates or reduces the amount of colonizing bacteria on patients’ skin and in their nares. Colonized individuals carry MRSA without experiencing symptoms and represent the primary source of MRSA in hospital settings. When these individuals are hospitalized, MRSA colonization may progress to infection or MRSA can be transmitted to other patients, via contamination of the environment or healthcare personnel.

MRSA decolonization consists of a daily bath using chlorhexidine gluconate solution and the application of nasal mupirocin or iodine-based products. This decreases the amount of MRSA bacteria on the skin and nares, reducing the likelihood of transmission or progression to infection.

This toolkit provides educational presentations and materials on the evidence behind MRSA decolonization. It also includes educational materials and comprehensive tools and resources to assist in the implementation of a decolonization program.

### Decontaminate the Environment

One of the most common pathways of MRSA transmission is via contaminated environmental surfaces or equipment. The bacteria are transferred from a colonized or infected patient to surfaces where MRSA can survive for weeks or months. It can then be transferred to a healthcare worker or another patient. Consequently, environmental decontamination is critical to prevent MRSA transmission. Cleaning and disinfection should focus on high-touch surfaces that are most frequently contacted, including items such as the bedside table and an IV pole.

This toolkit focuses on how to implement optimal environmental cleaning and disinfection protocols, and methods to assess and monitor the thoroughness of cleaning.

### Prevent Person-to-Person Transmission

Another common MRSA transmission pathway is from person to person. Healthcare personnel can inadvertently be vectors of MRSA transmission, picking up the bacteria and transferring it to other patients and hospital surfaces. MRSA prevention requires meticulous adherence to infection prevention practices including hand hygiene, standard precautions, and transmission-based isolation precautions. Robust programs to promote evidence-based best practices and hold healthcare personnel accountable for these practices are required for effective MRSA prevention.

This toolkit discusses the promotion and monitoring of hand hygiene, proper use of personal protective equipment, and implementation of standard and contact isolation precautions to interrupt the spread of MRSA.

### Prevent Device and Procedure-Related Infections

Treatment with medical devices or procedures is often necessary and can be lifesaving. However, these devices and procedures place patients at an increased risk for infection. Openings in the skin and invasive devices provide portals of entry for bacteria, including MRSA. MRSA is a major cause of CLABSI. Preventing device- and procedure-related infections is therefore an important part of a comprehensive MRSA prevention program.

This toolkit focuses on employing evidence-based interventions to optimize the prevention of HAIs, with particular emphasis on CLABSI and VAP prevention, which are often caused by MRSA.

### Other Best Practices for MRSA Prevention

**Antimicrobial Stewardship** and **Blood Culture Stewardship** are essential best practices for MRSA prevention. They do not fit into of the toolkit’s four key strategies but are significant components of a comprehensive MRSA prevention program.

Antibiotic stewardship aims to optimize the use of antibiotics to ensure they are prescribed appropriately. Overuse and misuse of antibiotics are primary contributors to the emergence of antimicrobial resistance. Antibiotic stewardship promotes the selection of the right drug and the right dose at the right time for the right duration.

Blood culture stewardship focuses on optimizing the use of blood cultures to improve the accuracy and reliability of blood cultures, the appropriate use of antibiotics, and reduce the spread of antimicrobial resistance. Consequently, antibiotic stewardship and blood culture stewardship are critical for MRSA prevention. Improving diagnostic accuracy and optimizing antimicrobial utilization are vital to maintaining the effectiveness of current treatments, reducing healthcare costs, and improving patient outcomes.

# Establishing Your Program

This toolkit is designed to offer a comprehensive and modular approach to MRSA prevention. You can choose to implement the entire set of recommendations or select the specific interventions that align best with your needs and goals. The toolkit can help you decide which intervention(s) will best suit your situation.

Your site may already have some of the recommended MRSA prevention interventions in place. This toolkit provides the opportunity to assess the effectiveness of established interventions such as a hand hygiene or environmental cleaning monitoring program. If you determine these interventions are working as intended but there are still opportunities for improvement in MRSA prevention, the toolkit allows you to focus on other interventions that are not yet fully implemented.

## The CUSP Approach

The MRSA Prevention Toolkit for ICU and non-ICU utilizes the [**Comprehensive Unit-based Safety Program (CUSP)**](https://www.ahrq.gov/hai/cusp/index.html)framework for patient safety and quality improvement. The key to CUSP’s effectiveness lies in its focus on engaging frontline personnel to identify and solve safety problems thereby strengthening the team’s culture of safety.

**Your site can use this toolkit even if you do not have a CUSP infrastructure in place.** The patient safety and quality improvement concepts from CUSP are integrated into the toolkit materials to ensure accessibility to all users.

Access the section on [**CUSP and MRSA Prevention**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/cusp.html) on the toolkit website to find educational materials and CUSP resources tailored to MRSA prevention. Topics include:

* [**Why Choose a CUSP Approach?**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/cusp-approach.html)**:** This section offers a brief introduction to the CUSP framework and how its principles can enhance MRSA prevention efforts.
* [**The Science of Safety**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/science-safety.html)**:** Here, patient safety is described from the perspective of systems and safe design. Understanding these concepts helps you implement MRSA prevention interventions more effectively.
* [**How To Integrate a CUSP Approach**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/integrate-cusp-approach.html)**:** This section focuses on practical aspects of incorporating CUSP into MRSA prevention. It provides guidance on assembling and running a CUSP team, and how to engage individuals in quality improvement activities.
* [**CUSP Psychological Safety**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/cusp-psychological-safety.html)**:** Psychological safety is a core principle of CUSP. When individuals feel safe, they are more willing to speak up and share their ideas and concerns. Cultivating a safe environment for open communication and broad and diverse input improves the likelihood that your interventions will succeed.
* [**Performing a Premortem Assessment**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/premortem-assessment.html)**:** The [**CUSP Premortem Project Assessment**](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/116-cusp-premortem-project-assessment.docx) is a proactive way to anticipate potential points and reasons for failure before launching an intervention. This allows your team to design the intervention to mitigate these potential risks.
* [**What Are The 4 Es?**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/what-are-4e.html)**:** The **4 Es** is an implementation framework that consists of four iterative steps: **Engage, Educate, Execute, Evaluate.** Use this structured framework to support your implementation plan and evaluate its effectiveness.
* [**Learning From Defects**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/learning-from-defects.html)**:** In CUSP, a **“defect”** is defined as **“Anything you don’t want to happen again.”** The learning from defects process allows you to identify unwanted events, analyze the contributing factors, and respond with new knowledge to mitigate future risks.
* [**Evaluating & Sustaining Progress**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/progress.html)**:** Safety is not a one-time event that can be “solved.” Instead, it is an ongoing cycle of continuous improvement and adjustment as circumstances change. This section discusses how to sustain improvements and build on your successes.

The CUSP portion of this toolkit is not intended to serve as a comprehensive tutorial on the CUSP framework. It does, however, provide essential CUSP concepts and demonstrates how they can be applied to MRSA prevention. For more in-depth information on CUSP, please refer to the [**AHRQ Core CUSP Toolkit**](https://www.ahrq.gov/hai/cusp/index.html).

## Conducting a Gap Analysis

Before implementing new MRSA prevention interventions, it’s essential to evaluate your facility’s current MRSA prevention status. This involves taking stock of the current MRSA data and building a comprehensive picture of the existing program’s resources, strategies, strengths, and limitations. First, figure out where you are. This helps you decide where you want to go and the steps to get there.

A **Gap Analysis** is a systematic method to identify “gaps” between your current and desired state. By conducting a gap analysis, you can evaluate your current practices, define your goals, and identify specific areas for improvement.

This toolkit includes two MRSA Prevention gap analyses: one for the [**Hospital Level**](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/167-hospital-level-gap-analysis.pdf) and one for the [**Unit Level**.](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/122-unit-level-gap-analysis.pdf) These tools provide a thorough review of MRSA prevention resources and practices to help you identify opportunities for improvement at both levels.

Start by completing both gap analyses. Collaborate with your hospital’s infection prevention team and hospital and unit leaders to gather the necessary data to complete the gap analyses. Spend the necessary time and effort to obtain precise data so you can develop a detailed understanding of the current state of MRSA prevention in your facility.

Once the gap analyses are completed, review the results. Discuss them with your team and identify any shortcomings. For example, do you see gaps in your institution’s hand hygiene program or an opportunity to enhance environmental cleaning and disinfection? Is there a robust relationship with the microbiology laboratory that supports MRSA prevention activities and assessments? Does your hospital or unit have a MRSA decolonization protocol, and is it routinely utilized? Completing and reviewing the answers with a team will give you insights into areas that need additional focus or resources.

Compare the results from both the hospital and unit levels. This can highlight discrepancies between institutional expectations and actual practices.

Repeat these gap analyses every 6 or 12 months to track progress, compare against the baseline, and assess how the MRSA prevention program has changed over time.

## Assembling a Team

For your MRSA prevention interventions to succeed, you’ll need a team composed of dedicated and active members who can plan, execute, and sustain improvements. This toolkit uses the term “CUSP Team,” but it is adaptable to different quality improvement infrastructures and frameworks. These tools and resources are flexible and can be used with any type of quality improvement initiative, whether you have a formal CUSP team, a different type of quality improvement (QI) team, or no pre-existing QI team.

The section of the toolkit titled **[How To Integrate a CUSP Approach](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/integrate-cusp-approach.html)** provides guidance and resources for assembling and organizing a MRSA prevention team, including team roles and responsibilities, coordination of schedules, and engaging with personnel and institutional leaders.

The strength of your team lies in collaboration, diversity of expertise, and shared mutual understanding. Building an engaged, well-rounded team with clear goals and open communication gives your efforts the best chance for success.

## Deciding Where To Start

Tackling MRSA prevention can seem daunting. The key is to focus your team’s efforts on one area at a time.

The gap analyses are an excellent place to start. As a team, review the results of your gap analyses and identify priority areas for improvement. You can also draw on other valuable data, such as from your electronic health records and event reporting systems. Team meetings and direct staff feedback can provide real-time insights or highlight issues not immediately visible in the quantitative data. You may also want to use CUSP tools like the [**Team Checkup Tool**](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/118-monthly-team-checkup-tool.pdf) or the [**Staff Safety Assessment**](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/113-staff-safety-assessment.docx).

Once you have identified your areas for improvement, discuss them as a team and rank them in terms of priority. Consider the following key questions to guide your prioritization:

* **Which areas have the greatest impact on MRSA prevention and patient safety?**
* **Which areas have the most feasible implementation solutions with our available resources?**

Prioritize the areas of improvement with the greatest feasibility and impact. As a team, arrive at a consensus list of rankings.

It is often advantageous to start with “low-hanging fruit”—interventions that are straightforward and likely to yield quick results. For example, is your facility’s MRSA and hand hygiene data readily available and widely shared with frontline personnel and hospital leaders? Sharing quality improvement data to raise awareness of an issue and to track its progress is a practical, evidence-based intervention that can be relatively straightforward to implement or reinvigorate. Starting out with an easier intervention not only provides early success, but also helps build team cohesion and confidence, establishes communication and engagement with personnel, demonstrates progress to leadership, and helps build the relationships and processes to tackle more complex challenges in the future.

Focus your efforts on one area at a time. Once an area for improvement has been addressed, go back to your priority list, and move onto the next target area.

### Setting Goals

Once your team has identified its area(s) of focus, you need to set clear, specific, measurable, and achievable goals for your interventions. Use baseline data and establish a specific target. Don’t forget that along with infection rates, there are many other types of data that can capture information about key MRSA prevention practices, such as hand hygiene adherence rates or chlorhexidine bathing rates. Key considerations include:

* **What specific metric will we use to measure progress?**
* **How will we collect and track these data?**
* **What is our target based on this metric?**

Clear, actionable goals are essential to keep you on track and gauge progress. Be specific about your data collection process and ensure it is timely and consistent.

Once your goals are set, share them broadly. While it’s essential that the team understand the goals, it’s just as important to communicate them to hospital leadership and frontline personnel. Their feedback can help you ensure your goals align with institutional priorities and the realities of clinical practice.

Importantly, communicating your goals helps to make sure everyone is on the same page as you begin your intervention—establishing a shared mindset of where you currently are and what success will look like.

### The 4 Es

As you proceed with your intervention, keep in mind [**The 4 Es**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/what-are-4e.html): **Engage, Educate, Execute,** and **Evaluate**. These four key processes are central to successful implementation.

**Engage:** Actively engage staff, leadership, and any other stakeholders. Engagement means getting people’s active involvement and collaboration in the project by making them aware of the problem, soliciting their feedback and insights, and securing their buy-in for the outcomes. These are the individuals who are supporting and carrying out your interventions; success of the program depends on their attitudes and behaviors.

**Educate:** Education is the process of conveying vital technical information to staff and providers on how to effectively implement the intervention. When developing your education plan, consider employing multiple modes of education to reinforce learning. Remember, it is important to evaluate the effectiveness of the education to ensure that the training conveyed the intended information.

**Execute:** Execution is putting plans into action. Preparation is key. Refer to principles of safe design: Simplify the system and standardize care. Create redundancy and institute independent checks. And learn from your mistakes. Execution doesn’t end at launch—you need to keep adjusting and making improvements as challenges and shortcomings arise. The guiding principle of execution is to make it easy for people to do the right thing.

**Evaluate:** Evaluation is the process of collecting, analyzing, and reporting data. How will you know your efforts are making a difference? Establish your processes for data collection, analysis, and review. Evaluation enables you to track progress, identify challenges, and adapt your interventions based on insights gained. Remember to share the data and disseminate results widely. Sharing findings in a timely manner helps to identify issues, celebrate success, and maintain engagement and momentum.

The 4 Es are ongoing processes—you must continually engage, educate, execute, and evaluate throughout the intervention to ensure success.

### Premortem Project Assessment

The [**CUSP Premortem Project Assessment**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/premortem-assessment.html) is a proactive method to identify potential future risks and failures before they happen. Before launching your intervention, your team brainstorms scenarios, how things could go wrong, and what could be done preemptively to mitigate those potential reasons for failure. This exercise helps you to anticipate vulnerabilities and develop strategies to prevent them.

### Team Checkup Tool

The [**Team Checkup Tool**](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/118-monthly-team-checkup-tool.pdf) is a structured monthly review, designed to help units regularly assess their own progress and the effectiveness of their MRSA prevention efforts. It facilitates the monitoring of clinical practices and adherence to interventions, while also promoting accountability and transparency.

### Learning From Defects

In CUSP, a “defect” is defined as “anything that you don’t want to happen again.” [**Learning From Defects**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/learning-from-defects.html) is a core CUSP process that helps teams to understand and identify the system factors that contributed to the defect and develop strategies to prevent the defect from recurring.

## Sustainability

Launching your intervention is just the first step. Successful implementation means ensuring that improvements last beyond the initial intervention. The goal is to embed the new practices as part of regular clinical workflow, ensuring that personnel will continue to follow them consistently. Planning for sustainability from the start helps to make your project more resilient. Sustainability is a cycle of continual evaluation, analysis, feedback, and improvement. Refer to the toolkit section on [**Evaluating & Sustaining Progress**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/progress.html).

# Clinical Topics and Best Practices Related to MRSA Prevention

Each of the following clinical topics has its own section on the MRSA Prevention Toolkit website that provides educational presentations with PowerPoint slides and accompanying Facilitator Guides. These presentations include discussion of implementation strategies related to each specific topic. Each section also includes additional tools and resources.

## [Decolonization](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/decolonize-patients.html)

**Decolonization** refers to the process of reducing the bacterial burden on a patient's body. By lowering the body’s bacterial burden, decolonization protects patients from both transmission and infection, especially during hospitalization when patients are most vulnerable. MRSA decolonization targets the skin and nose, which are the primary reservoirs of MRSA in the human body. Decolonization is a proven strategy to significantly reduce the risk of MRSA infection and transmission in acute care settings.

Protocols for MRSA decolonization involve bathing with chlorhexidine gluconate (CHG) to decolonize the skin and application of nasal mupirocin ointment or nasal iodophor (povidone-iodine) to decolonize the nose.

Effective implementation of decolonization requires coordination, preparation, engagement, and training. This requires dedicated effort from leaders and healthcare personnel but the potential benefits for patient safety and healthcare outcomes are significant.

The MRSA Prevention Toolkit provides the following resources on decolonization.

* **Presentation: The Evidence Behind Decolonization Strategies for MRSA**
  + This presentation offers a concise overview of decolonization and reviews the current evidence supporting CHG bathing and nasal decolonization. The question of universal versus targeted strategies for decolonization is also discussed.
    - * [Slides (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/046-evidence-behind-decolonization-strategies-slides.pptx)
      * [Facilitator Guide (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/047-evidence-behind-decolonization-strategies-notes.docx)
* **Presentation: Implementation of CHG Bathing and Nasal Decolonization**
  + This presentation addresses practical aspects of how to implement decolonization. It includes information on MRSA decolonization protocols, planning and preparation for how to implement a decolonization program, and common barriers and helpful tips for successful implementation.
    - * [Slides (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/049-dec-implementation-slides.pptx)
      * [Facilitator Guide (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/050-dec-implementation-notes.docx)
  + For more in-depth guidance on implementation of MRSA decolonization, along with useful materials and tools, please refer to the section on [**Tools & Resources for Decolonization**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/tools-resources-decolonization.html).
* **One Pager:** [Key Evidence for Decolonization One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/048-key-evidence-decolonization.docx)
  + Provides a concise summary of pivotal studies on the topic of MRSA decolonization.
* **One Pager:** [Top 10 Pearls for Successful CHG and Nasal Decolonization One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/051-top-10-successful-decolonization.docx)
  + A practical tip sheet offering top 10 pearls of wisdom for CHG and nasal MRSA decolonization.

To support implementation, this toolkit offers documents, training materials, and other resources to guide your planning and implementation of MRSA decolonization. You can access all these tools and resources in the [**Tools and Resources for Decolonization**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/tools-resources-decolonization.html) section.

* [**Tools & Resources for Decolonization: First Steps, Readiness, and Pre-Launch**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/decolonization-first-steps.html)**:** This section covers Readiness and Pre-Launch. It is recommended to start here. This section includes the following:
  + **Info Sheet:** [Action Chart for Implementing Decolonization (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/052-dec-guide-action-chart-implementing-decolonization.docx)
    - This one-page action chart visually outlines the steps for implementing MRSA decolonization, from early decision-making to prelaunch activities.
  + **Guide:** [Decolonization Decision-Making & Readiness for Implementation (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/053-dec-guide-readiness.docx)
    - This guide offers structured guidance on steps and decisions in the early stages.
  + **Guide:** [Decolonization Pre-Launch Activities (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/054-dec-guide-pre-launch-activities.docx)
    - This guide gives structured guidance on the essential prelaunch activities for successfully implementing a MRSA decolonization program.
  + **Tool:** [Decolonization Nursing Practice Guide (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/055-guide-nursing-practice.docx)
    - This chart summarizes and highlights key nursing practices and processes for launching and maintaining a successful MRSA decolonization program.
  + **Guide:** [Which Type of MRSA Decolonization Will Work Best in My Unit? (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/159-which-type-decolonization-work-best.docx)
    - This document provides guidelines to help healthcare teams decide between universal and targeted MRSA decolonization strategies for their unit.
* [**Tools & Resources for Decolonization: Sample Protocols**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/decolonization-protocols.html)**:** Access sample unit and nursing protocols for CHG and nasal MRSA decolonization.
  + **Unit Protocols for MRSA Decolonization:** Unit protocols will vary depending on whether your unit implements Universal Decolonization or Targeted Decolonization.
    - * [Unit Protocol: Universal MRSA Decolonization (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/160-dec-universal-unit-protocol.docx)
      * [Unit Protocol: Targeted MRSA Decolonization (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/158-dec-targeted-unit-protocol.docx)
  + **CHG Skin Decolonization Protocols:** Detailed nursing decolonization protocols for different methods of CHG application.
    - * [Bed Bathing With 2% CHG Pre-Impregnated Cloths (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/056-nursing-protocol-bathing-cloths.docx)
      * [Basin Bed Bathing With 4% CHG Liquid (Diluted to 2%) (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/057-nursing-protocol-bathing-liquid.docx)
      * [Showering With 4% CHG Liquid (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/058-nursing-protocol-showering-liquid.docx)
  + **Nasal Decolonization Protocols:** Detailed nursing decolonization protocols for nasal mupirocin and nasal iodophor.
    - * [Nasal Mupirocin (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/059-nursing-protocol-nasal-mupirocin.docx)
      * [Nasal Iodophor (10% Povidone-Iodine) (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/060-nursing-protocol-nasal-iodophor.docx)
* [**Tools & Resources for Decolonization: Staff Training Materials**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/decolonization-training-materials.html)**:** Below are materials to assist in healthcare personnel education. Adapt these materials to meet your unit’s needs.
  + **Protocol Training Modules:** Personnel training PowerPoint slides on MRSA decolonization protocols.
    - * [Protocol Training: Decolonization with CHG (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/062-protocol-training-decolonization-with-chg.pptx)
      * [Protocol Training: Nasal Decolonization (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/063-protocol-training-nasal-decolonization-slides.pptx)
  + **Skin Decolonization Training Videos:** AHRQ developed these training videos as part of the “[ABATE Toolkit for Decolonization of Non-ICU Patients With Devices](https://www.ahrq.gov/hai/tools/abate/index.html).” While these videos were developed with non-ICU patients in mind, the techniques demonstrated are suitable for patients in all acute care settings. These videos are publicly available on YouTube.
    - **Video:** [ABATE Toolkit for Decolonization of Hospital Non-ICU Patients With Indwelling Devices: Overview](https://youtu.be/bQ9MP4dOOhg)

*Below are topics and timepoints for different segments in the above video:*

|  |  |
| --- | --- |
| [Instructions for CHG Bed Bath Using Impregnated Cloths](https://www.youtube.com/embed/bQ9MP4dOOhg?start=158&end=267) | 2:38–4:26 |
| [Instructions for CHG Bed Bath Using Diluted CHG Liquid](https://www.youtube.com/embed/bQ9MP4dOOhg?start=267&end=338) | 4:27–5:38 |
| [Instructions for Patient Self-Showering with CHG](https://www.youtube.com/embed/bQ9MP4dOOhg?start=540&end=624) | 9:00–10:23 |
| [Scenario: Talking to a Patient about CHG Decolonization](https://www.youtube.com/embed/bQ9MP4dOOhg?start=338&end=458) | 5:38–7:37 |
| [Scenario: Teaching a Patient How to Self-Shower with CHG](https://www.youtube.com/embed/bQ9MP4dOOhg?start=458&end=540) | 7:38–8:59 |
| [Scenario: Talking to a Patient about Nasal Mupirocin](https://www.youtube.com/embed/bQ9MP4dOOhg?start=624&end=716) | 10:24–11:54 |

* + - **Video:** [ABATE Toolkit: Cleaning Central and Midline Catheters With CHG](https://youtu.be/Id2OhR0Sx5c)
    - **Video:** [ABATE Toolkit: Cleaning Lumbar Drains With CHG](https://youtu.be/jXdbSNcv6oY)
  + **Staff Training Sheets & FAQs:** Training materials for healthcare personnel
    - * [Info Sheet: Decolonization Do’s and Don’ts (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/064-dec-staff-decolonization-dos-donts.docx)
      * [Staff FAQs: Staff Frequently Asked Questions: CHG, Nasal, & Wound Care (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/065-dec-staff-faqs-decolonization.docx)
      * [Staff FAQs: Staff Frequently Asked Questions: Safety & Side Effects (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/066-dec-staff-faqs-safety-side-effects.docx)
      * [Tool: Decolonization: Sample Adherence Report (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/067-dec-staff-sample-adherence-report.docx)
* **Talking Points for Patients:** Key talking points and answers to common patient questions.
  + - * [Talking Points: Talking Points for Patients: Chlorhexidine Gluconate (CHG) Bathing (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/071-dec-patient-talking-points-bathing.docx)
      * [Talking Points: Talking Points for Patients: Nasal Decolonization (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/072-dec-patient-talking-points-nasal-decolonization.docx)
* [**Tools & Resources for Decolonization: Patient Educational Resources:**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/decolonization-patient.html) Resources and instructions for distribution to patients, along with talking points to help healthcare personnel respond to patient questions.
  + **Resources for Patients:** Materials to distribute to patients.
    - * [Daily Bathing With Chlorhexidine Gluconate (CHG) Information Sheet for Patient & Family (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/130-dec-patient-daily-bathing-chg-handout.docx)
      * [Patient Instruction Sheet: Patient Instructions: Bathing With CHG Cloths (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/074-dec-patient-instructions-cloth.docx)
      * [Patient Instruction Sheet: Patient Instructions: Showering With CHG (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/073-dec-patient-instructions-chg-showering.docx)
      * [Patient/Family Resource: Wall Poster: CHG Bathing Reminder (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/075-dec-patient-wall-poster-bathing-reminder.docx)
  + **Talking Points for Patients:** Key talking points and answers to common patient questions.
    - * [Talking Points: Talking Points for Patients: Chlorhexidine Gluconate (CHG) Bathing (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/071-dec-patient-talking-points-bathing.docx)
      * [Talking Points: Talking Points for Patients: Nasal Decolonization (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/072-dec-patient-talking-points-nasal-decolonization.docx)

Decolonization materials are adapted from [Universal ICU Decolonization: An Enhanced Protocol](https://www.ahrq.gov/hai/universal-icu-decolonization/index.html) and the [Toolkit for Decolonization of Non-ICU Patients With Devices](https://www.ahrq.gov/hai/tools/abate/index.html).

All resources can be accessed in the [**Decolonization section**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/decolonize-patients.html) on the AHRQ Toolkit for MRSA Prevention website.

## [MRSA Surveillance](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/surveillance.html)

Understanding the prevalence and identifying the transmission patterns of MRSA within a specific patient population is greatly beneficial for effective prevention and treatment strategies. Conducting **MRSA surveillance** is the primary means of gaining this insight. About one in three individuals are colonized with *Staphylococcus aureus*. *S. aureus* can be spread via direct or indirect contact with other patients, environmental surfaces, healthcare personnel, and medical devices. *S. aureus* can survive for months on dry surfaces like bed rails and bedside tables.

Therefore, it is important to detect patients who are colonized or infected with MRSA so that you can intervene to prevent MRSA transmission, implement appropriate precautions, and make informed decisions regarding antimicrobial therapy.

Although surveillance alone does not reduce MRSA transmission, it plays a pivotal role supporting other interventions to break the chain of MRSA transmission and infection.

The MRSA Prevention Toolkit provides the following resources on the topic of MRSA surveillance:

* **Presentation: MRSA Surveillance**
  + This presentation offers an overview of MRSA surveillance, discusses both active and passive approaches to MRSA surveillance and their pros and cons, and outlines how to use MRSA surveillance data to inform MRSA prevention approaches and optimize treatment decisions.
    - * [Slides (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/039-mrsa-surveillance-slides.pptx)
      * [Facilitator Guide (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/040-mrsa-surveillance-notes.docx)
* **One Pager:** [MRSA Surveillance Strategies One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/041-pros-cons-mrsa-surveillance-one-pager.docx)
  + A concise overview of MRSA surveillance strategies, including pros and cons.
* **External link:**
  + [SHEA/IDSA/APIC Practice Recommendation: Strategies to Prevent Methicillin-Resistant *Staphylococcus aureus* Transmission and Infection in Acute-Care Hospitals: 2022 Update](https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/sheaidsaapic-practice-recommendation-strategies-to-prevent-methicillinresistant-staphylococcus-aureus-transmission-and-infection-in-acutecare-hospitals-2022-update/5DB835D2E13F7E813A8A2FD7CB8386BD)
    - The Society of Healthcare Epidemiology of America, the Infectious Diseases Society of America, and the Association for Professionals in Infection Control and Epidemiology updated their 2014 guidelines for the prevention of MRSA and published these guidelines in 2022.

All resources can be accessed in the [**MRSA Surveillance section**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/surveillance.html) of the AHRQ Toolkit for MRSA Prevention website.

## [Environmental Cleaning](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/environmental-cleaning.html)

The hospital environment often harbors drug-resistant pathogens like MRSA and other dangerous pathogens like *Clostridioides difficile*. This issue poses a risk of pathogen transmission, especially from “high-touch surfaces,” which are frequently contacted by healthcare personnel and patients, including intravenous poles, bedrails, and over-bed tables. Therefore, environmental cleaning and disinfection play a critical role in MRSA prevention. Goals of environmental cleaning and disinfection include:

* Incorporating effective and evidence-based environmental cleaning and disinfection practices into a facility’s environmental care program.
* Addressing and optimizing the training of environmental care personnel, type and quality of cleaning methods, use of effective disinfectants, and appropriate deployment of adjunct cleaning methods.
* Ensuring that a facility has an effective environmental cleaning monitoring program that incorporates the essential steps, optimizes the roles and methods of environmental cleaning monitoring, and feeds data back to the organization to drive improvement efforts and accountability.

The objective of optimizing and assessing environmental cleaning is to measure cleaning effectiveness, improve cleaning efficacy, and monitor progress over time.

The MRSA Prevention Toolkit provides the following resources on the topic of environmental cleaning:

* **Presentation: Optimizing Environmental Cleaning**
  + This educational presentation provides an overview of environmental cleaning through a discussion of why environmental cleaning is critical, a review of the current state of knowledge regarding environmental cleaning, and an exploration of interacting facets of environmental cleaning and disinfection.
    - * [Slides (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/021-optimizing-evc-webinar-slides.pptx)
      * [Facilitator Guide (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/022-optimizing-evc-webinar-notes.docx)
* **Presentation: Assessing Environmental Cleaning Effectiveness**
  + This educational presentation discusses aspects of an effective environmental cleaning monitoring program, describes strategies and considerations of quality of cleaning monitoring methods, reviews essential steps when implementing an environmental cleaning monitoring program, explores roles best positioned to conduct environmental cleaning monitoring, and discusses methods for effective data feedback to drive improvement efforts and accountability of an environmental cleaning monitoring program.
    - * [Slides (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/024-assessing-evc-webinar-slides.pptx)
      * [Facilitator Guide (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/025-assessing-evc-webinar-notes.docx)
* **One Pager:** [Environmental Cleaning: Monitoring Methods One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/023-optimizing-evc-one-pager.docx)
  + An outline of the most common methods used to monitor cleaning and disinfection practices, and their advantages and disadvantages.
* **One Pager:** [Assessing Environmental Cleaning: Essential Aspects and Steps One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/026-assessing-evc-essential-one-pager.docx)
  + Overview of the essential aspects and steps involved in establishing a program to assess environmental cleaning and disinfection practices.
* **One Pager:** [Who Should Take On the Task of EVC Monitoring? One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/142-who-should-take-task-evc-monitoring-one-pager.docx)
  + Summary of advantages and disadvantages of utilizing personnel from various roles to act as monitors for environmental cleaning and disinfection effectiveness.
* **Tool:** [Evaluating Environmental Cleaning With Fluorescent Gel (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/027-evaluating-cleaning-data-collection.docx)
  + Step-by-step instructions and a data collection form for fluorescent gel monitoring, including a sample report template for tracking effectiveness over time. While originally designed for fluorescent gel monitoring, this tool can be adapted for use with other evaluation methods.
* **Tool:** [How To Randomly Order List of Rooms and High-Touch Surfaces (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/028-randomly-order-rooms-surfaces.docx)
  + Instructions on how to randomize the selection of rooms and high-touch surfaces for placement and evaluation of fluorescent gel. While originally designed for fluorescent gel monitoring, this tool can be adapted for use with other evaluation methods.
* **External Resources:** 
  + **Environmental Protection Agency (EPA) Website:** [Selected EPA-Registered Disinfectants](https://www.epa.gov/pesticide-registration/selected-epa-registered-disinfectants)
    - The EPA registers and maintains listings for all disinfectants, specifying the organisms against which they are effective. This web page also provides lists of disinfectants that are effective against specific pathogens. Some of these lists are highlighted below:
      * [EPA’s Registered Antimicrobial Products Effective Against Methicillin-resistant Staphylococcus aureus (MRSA) and/or Vancomycin-resistant Enterococcus faecalis/faecium (VRE) [List H]](https://www.epa.gov/pesticide-registration/epas-registered-antimicrobial-products-effective-against-methicillin)
      * [EPA’s Registered Antimicrobial Products Effective Against *Clostridioides difficile* (C. diff) Spores [List K]](https://www.epa.gov/pesticide-registration/epas-registered-antimicrobial-products-effective-against-clostridioides)

All resources can be accessed in the [**Environmental Cleaning section**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/environmental-cleaning.html) on the AHRQ Toolkit for MRSA Prevention website.

## Prevention of Central Line-Associated Bloodstream Infection (CLABSI)

CLABSI is a serious healthcare concern, occurring when pathogens enter the bloodstream through a central venous catheter, leading to infection. These infections are associated with significant morbidity, mortality, and increased length of stay and costs of care. There are three primary entry points where pathogens can access the bloodstream via a central line: the infusate (fluid administered), the catheter hub, and the line entry site. These entry points are vulnerable to intrinsic sources of contamination—such as the patient’s skin flora—and extrinsic sources of contamination from the healthcare environment or on healthcare personnel’s hands. Due to these risks, central lines present a major infection risk.

The best way to prevent CLABSI is to avoid placing a central line when possible. A systematic review of clinical indicators should be conducted before placing any central line to determine its necessity.

If a central line is required, effective CLABSI prevention relies on adherence to evidence-based best practices for central line insertion and maintenance. Utilizing comprehensive intervention bundles for insertion and maintenance have been proven to significantly reduce infection rates.

Because *Staphylococcus aureus* is one of the leading causes of CLABSI, preventing CLABSI is critical for MRSA prevention. By following established protocols for safe central line use, healthcare providers can effectively reduce the risk of CLABSI, and, in turn, prevent MRSA infections in patients.

The MRSA Prevention Toolkit provides the following resources on the topic of preventing central line-associated bloodstream infections:

* **Presentation: Prevention of CLABSI**
  + This presentation defines CLABSI and identifies its significance to patient safety and MRSA prevention. The presentation outlines key evidence-based strategies and targets for CLABSI prevention and describes implementation approaches to ensure that evidence-based best practices are in place for every patient with a central line.
    - * [Slides (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/001-clabsi-prevention-webinar-slides.pptx)
      * [Facilitator Guide (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/003-clabsi-prevention-webinar-fg.docx)
* **One Pager:** [CLABSI Prevention to Reduce Harm from MRSA: Four Key Steps – One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/132-preventing-clabsi-4-key-steps-one-pager.docx)
  + An overview of the four fundamental steps to prevent CLABSI.
* **One Pager:** [Preventing CLABSI: Components of a Central Line Insertion Bundle - One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/133-clabsi-prevention-central-line-insertion.docx)
  + A summary of best practices of central line insertion.
* **One Pager:** [Preventing CLABSI: Components of Central Line Maintenance Bundle - One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/134-clabsi-prevention-central-line-maintenance.docx)
  + A summary of best practices of central line maintenance.

[**AHRQ Toolkit for Preventing CLABSI and CAUTI in ICUs (2022)**](https://www.ahrq.gov/hai/tools/clabsi-cauti-icu/index.html)

* The **AHRQ Toolkit for Preventing CLABSI and CAUTI in ICUs** offers clinical and cultural guidance aimed at reducing CLABSI and CAUTI rates in intensive care units. Although designed originally with ICUs in mind, the recommendations and resources are applicable in various healthcare settings.

Some parts of the toolkit are highlighted below:

* + [A Playbook for Preventing CLABSI and CAUTI in the ICU Setting](https://www.ahrq.gov/hai/tools/clabsi-cauti-icu/overcome/index.html)
  + [Assessing Progress on CLABSI and CAUTI Prevention](https://www.ahrq.gov/hai/tools/clabsi-cauti-icu/implement/playbook.html)
  + [Tools to Overcome Common Challenges](https://www.ahrq.gov/hai/tools/clabsi-cauti-icu/assess/index.html)
  + [CLABSI Learn from Defects Tool Worksheet (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/clabsi-cauti-icu/clabsi-learning-from-defects.docx)
  + [Central Venous Catheter Indications and Alternatives (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/clabsi-cauti-icu/central-catheter-indications.pptx)

[**AHRQ Toolkit for Reducing CLABSI (2012)**](https://www.ahrq.gov/hai/clabsi-tools/index.html)

* The **AHRQ Toolkit for Reducing Central Line-Associated Blood Stream Infections (CLABSI)** was designed to implement evidence-based practices to reduce CLABSI. More than 1,000 intensive care units across the country have used the tools in this toolkit.
* **Tools: Central Line Insertion Checklists**
  + Implementing a standardized central line insertion checklist helps staff ensure that proper procedure is performed every time a central line is inserted and helps identify breaches in technique.

Below are publicly available central line insertion checklists that you may consider adapting for your program.

* + - [AHRQ: Central Line Insertion Care Team Checklist](https://www.ahrq.gov/hai/patient-safety-resources/cli-checklist/index.html)
    - [Centers for Disease Control and Prevention (CDC): Checklist for Prevention of CLABSI](https://www.cdc.gov/healthcare-associated-infections/media/pdfs/checklist-for-CLABSI-P.pdf)
    - [Johns Hopkins Medicine: Central Line Insertion Checklist](https://www.hopkinsmedicine.org/heic/infection-surveillance)
    - [The Joint Commission: Central Line Insertion Checklist](https://www.jointcommission.org/-/media/tjc/documents/resources/health-services-research/clabsi-toolkit/clabsi_toolkit_tool_3-23_daily_central_line_maintenance_checklist_word_versiondoc.doc)
* **Tool:** [Central Line Maintenance Infographic (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/168-central-line-maintenance-infographic.docx)
  + Providing healthcare personnel with a central line maintenance checklist helps them to remember daily best practices for the care of central lines.

Other publicly available central line maintenance checklists are listed below.

* + - [The Joint Commission: Central Line Maintenance Checklist](https://www.jointcommission.org/-/media/tjc/documents/resources/health-services-research/clabsi-toolkit/clabsi_toolkit_tool_3-23_daily_central_line_maintenance_checklist_-_templatepdf.pdf)
    - [CDC: Checklist for Prevention of CLABSI](https://www.cdc.gov/healthcare-associated-infections/media/pdfs/checklist-for-CLABSI-P.pdf)
* **Tool:** [Central Line Rounds Form (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/163-central-line-rounds-form.docx)
  + This form is designed to facilitate central line rounds to systematically evaluate the necessity of each central line and enable the prompt removal of unnecessary lines as well as to ensure that the line is appropriately dressed and maintained.
* **Tools Daily Goals Checklist**
  + The **Daily Goals Checklist** is a CUSP tool designed to guide healthcare teams in reviewing patient needs and setting daily goals for each patient. By reviewing this checklist together, a team can confirm what care the patient received and what still needs to be done. It is an effective way to track essential practices for patients with central lines.
    - * [Daily Goals Checklist for ICU (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/115-daily-goals-icu-checklist.docx)
      * [Daily Goals Checklist for Non-ICU (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/161-inpatient-daily-goals.docx)

More detail on the Daily Goals can be found on the AHRQ website: [AHRQ: Daily Goals During Interdisciplinary Rounds: Facilitator Guide](https://www.ahrq.gov/hai/tools/mvp/modules/cusp/daily-goals-rounds-fac-guide.html).

* **Video:** [Stop CLABSI! Tip | Scrub the Hub – Johns Hopkins Medicine](https://www.youtube.com/watch?v=x96cU3_Nkas)
  + This video demonstrates proper technique for scrubbing a central line hub. The video is produced by Johns Hopkins Medicine and hosted on YouTube.
* **External Links:**
  + [SHEA/IDSA/APIC Strategies to Prevent Central Line-Associated Bloodstream Infections in Acute-Care Hospitals: 2022 Update](https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/strategies-to-prevent-central-lineassociated-bloodstream-infections-in-acutecare-hospitals-2022-update/01DC7C8BBEA1F496BC20C6E0EF634E3D)
    - The Society of Healthcare Epidemiology of America, the Infectious Diseases Society of America, and the Association for Professionals in Infection Control and Epidemiology updated their 2014 guidelines for the prevention of central line-associated bloodstream infections and published these guidelines in 2022.
  + [HICPAC CDC Guidelines for the Prevention of Intravascular Catheter-Related Infections (2011)](https://www.cdc.gov/infection-control/media/pdfs/Guideline-BSI-H.pdf)
    - These guidelines were developed for healthcare personnel who insert intravascular catheters and for persons responsible for surveillance and control of infections in hospital, outpatient, and home healthcare settings.

All resources can be accessed in the [**Prevention of CLABSI section**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/clabsi.html) on the AHRQ Toolkit for MRSA Prevention website.

## [Prevention of Hospital-Associated Pneumonia: VAP & NV-HAP](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/vap.html)

Reducing or eliminating VAP and non-ventilator healthcare-associated pneumonia (NV-HAP) are part of the key strategy of preventing device or procedure-related infections. While NV-HAP is not device related, there are common infection prevention themes for both VAP and NV-HAP, and both types of infections are healthcare-associated.

VAP is associated with an increased duration of mechanical ventilation, and both VAP and NV-HAP are associated with adverse patient outcomes, longer lengths of stay, and higher healthcare costs. In addition, healthcare-associated pneumonia can lead to increased use of antimicrobials, which raises concerns in terms of antimicrobial resistance.

*Staphylococcus aureus* is the most commonly identified gram-positive organism to cause both HAP and VAP. Therefore, interventions to prevent VAP and NV-HAP are essential for preventing MRSA.

The MRSA Prevention Toolkit provides the following resources on the topic of VAP and NV-HAP prevention:

* **Presentation: Prevention of Hospital-Associated Pneumonia: VAP & NV-HAP**
  + This presentation offers an overview of hospital-associated pneumonia, VAP, and NV-HAP, describes the causes and risk factors, and reviews current guidelines and best practice recommendations for preventing healthcare-associated pneumonia.
    - * [Slides (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/042-vap-prevention-slides.pptx)
      * [Facilitator Guide (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/043-vap-prevention-notes.docx)
* **One Pager:** [VAP Prevention: Essential Practices One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/044-vap-prevention-essential.docx)
  + A concise summary of key essential practices for VAP prevention.
* **One Pager:** [NV-HAP Prevention: Essential Practices One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/139-nv-hap-prevention-essential-one-pager.docx)
  + A concise summary of key essential practices for NV-HAP prevention.
* **Tools: Daily Goals Checklist**
  + The **Daily Goals Checklist** is a CUSP tool designed to guide healthcare teams in reviewing patient needs and setting daily goals for each patient. By reviewing this checklist together, a team can confirm the care each patient received and what still needs to be done. It is an effective way to track essential practices for ventilated patients.
    - * [Daily Goals Checklist for ICU (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/115-daily-goals-icu-checklist.docx)
      * [Daily Goals Checklist for Non-ICU (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/161-inpatient-daily-goals.docx)

More detail on the Daily Goals can be found on the AHRQ website: [AHRQ: Daily Goals During Interdisciplinary Rounds: Facilitator Guide](https://www.ahrq.gov/hai/tools/mvp/modules/cusp/daily-goals-rounds-fac-guide.html).

[**AHRQ Toolkit to Improve Safety for Mechanically Ventilated Patients**](https://www.ahrq.gov/hai/tools/mvp/index.html)

* Please visit the **AHRQ Toolkit to Improve Safety for Mechanically Ventilated Patients**, for more in-depth information and resources on improving care for patients on mechanical ventilation.
* **External Resources:** 
  + **CDC Website:** [CDC NHSN Patient Safety Component](https://www.cdc.gov/nhsn/psc/index.html)
    - These are the surveillance definitions used by the CDC National Health Safety Network. Useful links are highlighted below:
      * [CDC NHSN Ventilator-Associated Events (VAE) Module](https://www.cdc.gov/nhsn/psc/vae/index.html)
      * [CDC NHSN Pediatric VAE (PedVAE) Module](https://www.cdc.gov/nhsn/psc/pedvae/index.html)
      * [NHSN Training: Chapter 6 PNEU Training](https://www.cdc.gov/nhsn/training/patient-safety-component/pneu.html)
      * [NHSN Training: Chapter 10 VAE Training](https://www.cdc.gov/nhsn/training/patient-safety-component/vae.html)
      * [NHSN Training: Chapter 11 PedVAE Training](https://www.cdc.gov/nhsn/training/patient-safety-component/pedvae.html)
  + **Guidelines and Recommendations for VAP and NV-HAP Prevention**
    - Follow the below links to access available guidelines on prevention of VAP and NV-HAP.
      * [**SHEA/IDSA/APIC:** Strategies to Prevent Ventilator-Associated Pneumonia, Ventilator-Associated Events, and Non-ventilator Hospital-Acquired Pneumonia in Acute-Care Hospitals: 2022 Update](https://shea-online.org/guidance/strategies-to-prevent-ventilator-associated-pneumonia-ventilator-associated-events-and-nonventilator-hospital-acquired-pneumonia-in-acute-care-hospitals-2022-update/)
      * [**Society of Critical Care Medicine:** ICU Liberation Bundle (A-F)](https://www.sccm.org/Clinical-Resources/ICULiberation-Home/ABCDEF-Bundles)
      * [**APIC:** Practice Position Statement: Non-Ventilator Healthcare-Associated Pneumonia (NV-HAP)](https://apic.org/wp-content/uploads/2019/10/PositionPaper_NVHAP_2019_v3.pdf)
      * [**APIC:** Implementation Guide on Non-Ventilator Healthcare-Associated Pneumonia (NV-HAP)](https://www.ajicjournal.org/issue/S0196-6553(20)X0005-8)
      * [**The Joint Commission:** Quick Safety Newsletter: Preventing Non-Ventilator Hospital-Acquired Pneumonia](https://www.jointcommission.org/resources/news-and-multimedia/newsletters/newsletters/quick-safety/quick-safety-issue-61)
      * [**VHA:** Hospital Acquired Pneumonia Prevention by Engaging Nurses (HAPPEN) Initiative](https://marketplace.va.gov/innovations/project-happen)

For more information on VAP, NV-HAP, and appropriate interventions, please visit the [**Prevention of Hospital -Associated Pneumonia: VAP & NV/HAP section**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/vap.html) on the AHRQ Toolkit for MRSA Prevention website.

## [Contact Precautions](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/contact-precautions.html)

The implementation of **contact isolation precautions** and other transmission-based precautions is recommended by the CDC to interrupt MRSA transmission. Proper implementation of such precautions can be effective in preventing contamination and transmission to other hospitalized patients.

Contact precautions protect patients by:

* Ensuring appropriate patient placement.
* Using personal protective equipment appropriately.
* Using disposable or dedicated patient-care equipment.
* Prioritizing effective cleaning and disinfection of the rooms.

The MRSA Prevention Toolkit provides the following resources on the topic of contact precautions:

* **Presentation: Contact Precautions**
  + This presentation discusses the purpose and the different elements of contact isolation precautions. It also discusses how to implement contact precautions, in conjunction with other interventions as part of a bundle.
    - * [Slides](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/016-contact-precautions-webinar-slides.pptx) (.pptx)
      * [Facilitator Guide](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/017-contact-precautions-webinar-slides-notes.docx) (.docx)
* **One Pager:** [Summary of Evidence for Contact Precautions for MRSA Prevention One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/018-revision-summary-contact-precautions.docx)
  + Provides a concise summary of the current literature around contact precautions.
* **Patient Resource:** [Contact Precautions Info Sheet for Patient & Family (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/020-contact-info-sheet.docx)
  + An information sheet for distribution to patients and families to explain the purpose of contact precautions.
* **External Resources:** 
  + [CDC Isolation Precautions Guidelines](https://www.cdc.gov/infection-control/hcp/isolation-precautions/index.html)
    - The CDC guidelines on isolation precautions offer detailed guidance implementation of isolation precautions to minimize transmission of infectious agents in healthcare settings.
  + [SHEA/IDSA/APIC Practice Recommendation: Strategies to Prevent Methicillin-Resistant *Staphylococcus aureus* Transmission and Infection in Acute-Care Hospitals: 2022 Update](https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/sheaidsaapic-practice-recommendation-strategies-to-prevent-methicillinresistant-staphylococcus-aureus-transmission-and-infection-in-acutecare-hospitals-2022-update/5DB835D2E13F7E813A8A2FD7CB8386BD)
    - The Society of Healthcare Epidemiology of America, the Infectious Diseases Society of America, and the Association for Professionals in Infection Control and Epidemiology updated their 2014 guidelines for the prevention of MRSA and published these guidelines in 2022.

All resources can be accessed in the [**Contact Precautions section**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/contact-precautions.html) on the AHRQ Toolkit for MRSA Prevention website.

## [Hand Hygiene Promotion](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/hand-hygiene.html)

**Hand hygiene** is a fundamental practice for reducing HAIs. However, adherence rates for hand hygiene vary widely across units and hospitals and are often surprisingly low. Hospitals aiming to improve and sustain high adherence to appropriate and effective hand hygiene should utilize multiple approaches. Goals of hand hygiene promotion include:

* Incorporating the key best practice recommendations for hand hygiene in healthcare settings.
* Addressing the advantages and disadvantages of various hand hygiene measurement methodologies.
* Ensuring that units have a comprehensive program in place to promote excellent hand hygiene practices as part of an overall approach to prevent MRSA.

The objective of hand hygiene promotion is to provide information about hand hygiene indications and techniques, as well as guidance on how to implement a hand hygiene promotion program and how to measure adherence to hand hygiene policies.

The MRSA Prevention Toolkit provides the following resources on the topic of hand hygiene:

* **Presentation: Hand Hygiene Promotion**
  + This educational presentation describes the best practice recommendations for hand hygiene in healthcare settings, discusses the advantages and disadvantages of various hand hygiene measurement methodologies, and reviews recommendations for implementing a comprehensive hand hygiene promotion and measurement program to optimize hand hygiene adherence and prevent MRSA transmission and infection.
    - * [Slides (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/029-hand-hygiene-webinar-slides.pptx)
      * [Facilitator Guide (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/030-hand-hygiene-webinar-slides-notes.docx)
* **One Pager:** [Hand Hygiene Adherence Monitoring Methods One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/031-hand-hygiene-monitoring.docx)
  + A review of different methods to monitor hand hygiene adherence, highlighting their respective advantages and disadvantages.
* **Video:** [Handwashing Steps Using the World Health Organization (WHO) Technique – Johns Hopkins Medicine](https://youtu.be/IisgnbMfKvI)
  + A step-by-step training demonstration of proper handwashing technique, following WHO guidelines. Originally developed by the Johns Hopkins Hospital Department of Hospital Epidemiology and Infection Control. This video is publicly available on YouTube.
* **Video:** [Hand Rubbing Steps Using the WHO Technique – Johns Hopkins Medicine](https://youtu.be/B3eq5fLzAOo)
  + A step-by-step demonstration of how to use alcohol handrub correctly, following WHO guidelines, and was developed by the Johns Hopkins Hospital Department of Hospital Epidemiology and Infection Control. This video is publicly available on YouTube.
* **External Resources**: These are existing publicly available guidelines for strategies for hand hygiene to prevent HAIs.
  + [SHEA/IDSA/APIC Practice Recommendation: Strategies To Prevent Healthcare Associated Infections Through Hand Hygiene: 2022 Update](https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/sheaidsaapic-practice-recommendation-strategies-to-prevent-healthcareassociated-infections-through-hand-hygiene-2022-update/FCD05235C79DC57F0E7F54D7EC314C2C)
  + [HICPAC: Guideline for Hand Hygiene in Health-Care Settings (2002)](https://www.cdc.gov/mmwr/PDF/rr/rr5116.pdf)
* **External Resources:** [WHO Infection Prevention and Control: Hand Hygiene](https://www.who.int/teams/integrated-health-services/infection-prevention-control/hand-hygiene)
  + WHO provides a range of useful resources and tools for hand hygiene. Some of these resources are highlighted below:
    - * [WHO Guidelines on Hand Hygiene in Health Care (2009)](https://www.who.int/publications/i/item/9789241597906)
      * [WHO Five Moments for Hand Hygiene](https://www.who.int/publications/m/item/five-moments-for-hand-hygiene)
      * [WHO How to Handwash? Poster](https://www.who.int/publications/m/item/how-to-handwash)
      * [WHO How to Handrub? Poster](https://www.who.int/publications/m/item/how-to-handrub)
      * [WHO Glove Use Guidelines](https://www.who.int/publications/m/item/glove-use-information-leaflet-(revised-august-2009))
      * [WHO Hand Hygiene Training Tools](https://www.who.int/teams/integrated-health-services/infection-prevention-control/hand-hygiene/training-tools)
      * [WHO World Hand Hygiene Day](https://www.who.int/campaigns/world-hand-hygiene-day)
* **External Resources:** [CDC | Clean Hands: About Hand Hygiene in Healthcare Settings](https://www.cdc.gov/clean-hands/hcp/clinical-safety/index.html)
  + Centers for Disease Control and Prevention (CDC) offers many promotional and educational materials for public use. CDC’s “Clean Hands Count” campaign specifically targets healthcare professionals and includes a variety of resources. Some of these are highlighted below:
    - * [CDC Clean Hands Count for Healthcare Providers Factsheet](https://www.cdc.gov/clean-hands/media/pdfs/provider-factsheet-508.pdf)
      * [CDC Clean Hands in Healthcare Training](https://www.cdc.gov/clean-hands/hcp/training/index.html)
      * [CDC Global Handwashing Day](https://www.cdc.gov/clean-hands/globalhandwashingday/index.html)

All resources can be accessed in the [**Hand Hygiene Promotion section**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/hand-hygiene.html) on the AHRQ Toolkit for MRSA Prevention website.

## [Blood Culture Stewardship](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/blood-culture.html)

Blood cultures are one of the most ordered microbiologic tests in acute care settings. Hospitals generally report a positive blood culture rate of 2 to 10 percent.2 Up to half of these positives represent the result of blood culture contamination. Contaminated cultures lead to adverse consequences, including extended lengths of stay, inflated costs, additional testing, cancelled procedures, delays to necessary treatment, and unnecessary administration of antibiotics, which increases the threat of antibiotic resistance.

Blood culture stewardship refers to the systematic effort to promote the responsible and efficient use of blood culture testing to minimize the impact of contamination. Goals of blood culture stewardship include:

* Ensuring appropriate selection of patients for testing.
* Improving blood culture processing activities.
* Improving performance of the test.
* Helping avoid false positive results and improve the yield of blood cultures.
* Improving the process of reporting results to ensure clinicians make the most appropriate decisions.

The objective of blood culture stewardship is to optimize blood culture testing, improve the accuracy of diagnosis, reduce contamination rates, and promote appropriate antibiotic use. This involves protocols for optimal patient selection, best practices for culture collection, and ongoing monitoring and feedback to improve practices.

The MRSA Prevention Toolkit provides the following resources on the topic of blood culture stewardship:

* **Presentation: Blood Culture Practices and Stewardship**
  + This educational presentation provides an overview of the topics of blood culture contamination and blood culture stewardship, a review of best practices and strategies to prevent contamination, and a discussion of implementation of a blood culture stewardship program .
    - * [Slides (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/011-blood-culture-webinar-slides.pptx)
      * [Facilitator Guide (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/012-blood-culture-practices-webinar.docx)
* **One Pager:** [Strategies to Prevent Blood Culture Contamination (BCC) One-Pager (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/013-strategies-prevent-bcc.docx)
  + A summary outlining key strategies to prevent blood culture contamination in clinical settings.
* **Tool:** [Blood Culture Decision Support Tool (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/014-bcx-algorithm-decision-support-tool.docx)
  + This support tool provides a decision-making algorithm for optimal use of blood cultures, with appropriate clinical indications for initial and follow-up blood cultures in non-neutropenic adult populations.
* **External Resources:**
  + [CDC: Prevent Adult Blood Culture Contamination: A Quality Tool for Clinical Laboratory Professionals](https://www.cdc.gov/labquality/blood-culture-contamination-prevention.html)
    - The CDC Division of Laboratory Systems provides procedural recommendations to minimize blood culture contamination. You may consider adapting this for your program.

All resources can be accessed in the [**Blood Culture Practices and Stewardship section**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/blood-culture.html) on theAHRQ Toolkit for MRSA Prevention website.

## [Antibiotic Stewardship](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/antibiotic-stewardship.html)

Antibiotics are lifesaving drugs, but a significant amount of antibiotics in hospital settings are prescribed inappropriately, leading to adverse events for patients related to antibiotic therapy. Inappropriate antibiotic use heightens the risk of multidrug-resistant organisms, such as MRSA.

The field of **antibiotic stewardship** addresses safety and overuse concerns associated with antibiotic use by using coordinated interventions to improve and measure the appropriate use of antibiotics. It promotes the selection of the optimal antibiotic drug regimen, dose, duration of therapy, and route of administration.

This MRSA Prevention Toolkit provides the following resources on the topic of antibiotic stewardship:

* **Presentation: Antibiotic Stewardship and MRSA Reduction**
  + This presentation outlines the goals of antibiotic stewardship, describes the association between antibiotic use and MRSA colonization and infection, discusses the evidence that antibiotic stewardship can impact risk of MRSA colonization and infection, and identifies approaches that a hospital unit can implement to improve antibiotic decision making.
    - * [Slide (.pptx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/008-antibiotic-stewardship-slides.pptx)
      * [Facilitator Guide (.docx)](https://www.ahrq.gov/sites/default/files/wysiwyg/hai/tools/mrsa/009-antibiotic-stewardship-guide.docx)

[**AHRQ Toolkit To Improve Antibiotic Use in Acute Care Hospitals (2022)**](https://www.ahrq.gov/antibiotic-use/acute-care/index.html)

* The **AHRQ Toolkit To Improve Antibiotic Use in Acute Care Hospitals** was developed to support implementation of antibiotic stewardship practices by stewardship programs and front-line clinicians. The toolkit focuses on three primary goals: (1) developing and improving an antibiotic stewardship program; (2) creating a culture of safety around antibiotic prescribing; and (3) learning and disseminating best practices for the diagnosis and treatment of common infectious disease syndromes.
* Highlighted below are tools which are particularly relevant to MRSA prevention.
* [Team Antibiotic Review Form](https://www.ahrq.gov/antibiotic-use/acute-care/improve/team-review.html)
* [Antibiotic Time Out Tool](https://www.ahrq.gov/sites/default/files/wysiwyg/antibiotic-use/improve/antibiotic-time-out-tool.docx)

All resources can be accessed in the [**Antibiotic Stewardship section**](https://www.ahrq.gov/hai/tools/mrsa-prevention/toolkit/antibiotic-stewardship.html) on the AHRQ Toolkit for MRSA Prevention website.

# References

1. Centers for Disease Control and Prevention (CDC). Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019. <https://www.cdc.gov/antimicrobial-resistance/media/pdfs/2019-ar-threats-report-508.pdf>. Accessed July 23, 2024.
2. Fabre V, Carroll KC, Cosgrove SE. Blood culture utilization in the hospital setting: a call for diagnostic stewardship. J Clin Microbiol. 2022 Mar 16;60(3):e0100521. PMID: 34260274.

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