

MRSA How-To Guide

General Comments: Overall, a very good resource.

The Case for Reducing Methicillin-Resistant *S. aureus* Infection (pages 3-4)

A newer article that could be added to this section is:

Klevens RM, Morrison MA, Nadle J, et al. Invasive methicillin-resistant *S. aureus* infections in the United States. *JAMA* 2007;298(15):1763-71.

Pg 4, first full paragraph that begins with “Infection control efforts directed at MRSA may also have an impact against other antibiotic-resistant pathogens ...” Are there studies to support that statement? It is true that several of the bundle components may also have an impact against other antibiotic-resistant pathogens, but these components (such as hand hygiene, environmental decontamination, and device bundles) are not directed at MRSA specifically but rather are basic, general infection control practices. Those interventions that are directed against MRSA, such as active surveillance cultures, may not have an impact on other pathogens. A report of the impact if an active surveillance program for MRSA in a Chicago hospital indicated that nosocomial MRSA bacteremia was substantially reduced but the incidence of nosocomial gram-negative bacteremia was unchanged. (Robicsek A. 44th Annual Meeting of the Infectious Diseases Society of America 2006; Abstract 142)

What Is Possible?

(Update) The VA initiative has now become a system-wide initiative.

An additional reference for this section, if desired, could include the following: West TE, Guerry C, Hiott M, et al. Effect of targeted surveillance for control of MRSA in a community hospital. *Infect Control Hospital Epidemiology* 2006;27(3):233-8. This article describes a targeted ASC program that resulted in control of MRSA as well as cost savings.

Reducing MRSA Infection: Five Components of Care

The recommendation for ASC is made, but it is unclear what patient population is recommended for screening (e.g., all patients, high-risk, or ICU). While there is some discussion of this decision point on pages 22-26, the recommendation could be made clearer. Even if the recommendation is for each hospital to determine if active surveillance cultures are needed and, if so, in what population surveillance will be performed, this should be stated clearly.

One of the recommended changes “that will result in improvement” is to measure transmission, i.e., the number or rate of patients who convert from negative to positive. While this makes inherent sense, this measure has not been validated (e.g., converting from negative to positive could also be the result of sampling error or performance characteristics of the screening test). It also requires a patient to have been in the hospital long enough for a subsequent surveillance

culture to be obtained. Thus, this metric may not provide useful information in hospitals or on specific hospital units where the length of stay is relatively short.

The following recommendation that does not absolutely recommend contact precautions for MRSA colonized patients seems inadequate given the discussion of previous studies and recommendations of the document.

“Patients infected with MRSA should always be placed on contact precautions and there is general agreement that patients known to be colonized with MRSA, or detected by ASC on admission or thereafter, should be placed on precautions as well.”

It should be specified that the three culture specimens should be obtained only after the patient is no longer on antibiotic therapy, as this may influence the cultures. It would also be worth mentioning that cultures should be obtained from known sites of prior infection/colonization as well as one or more common cutaneous sites of colonization (e.g., nares, axillae, groin).

Prevent Ventilator-Associated Pneumonia How-To Guide

Defining the Problem

One could consider adding more discussion about the subjectivity associated with the NHSN VAP surveillance definition. This is controversial and warrants discussion, especially given the risk of “eliminating” a problem by redefining it. This is relevant even for internal monitoring and comparison. A reference for this point could include:

Klompas M, Platt R. Ventilator-associated pneumonia-The wrong quality measure for benchmarking. *Ann Intern Med* 2007;147:803-5.

The title of the document, this section, and the following section (“The Case for Preventing Ventilator-Associated Pneumonia”) address only the issue of ventilator-associated pneumonia. The issues of stress ulcers and DVT are not mentioned; however, two of the four bundle components address these issues rather than VAP (and one (stress ulcer prophylaxis) may, in fact, increase the risk of VAP). If these elements are to remain in the ventilator bundle, then it would seem appropriate for stress ulcers and DVTs to be discussed in the introductory statements. It may also be more technically correct for the guide to be renamed so that the name does not imply that all components of the bundle are intended to reduce VAP.

The Ventilator Bundle

As described above, not all components of the ventilator bundle could be expected to reduce VAP but page 7 includes the following statement: “The ventilator bundle is a group of evidence-based practices that, when implemented together for all patients on mechanical ventilation, result in dramatic reductions in the incidence of ventilator-associated pneumonia.” This implies that all four components are needed to reduce VAP. It would be more technically correct to

say that the bundle components may decrease the incidence of complications associated with mechanical ventilation.

After the second sentence, the meaning and intention of the paragraph becomes somewhat unclear.

Potential Impact of the Ventilator Bundle

Can a reference be provided so that interested individuals can read more about the 45% reduction in VAP observed in the IHI collaborative that is mentioned?

Preventing Ventilator-Associated Pneumonia: Four Components of Care

Regarding the use of peptic ulcer disease prophylaxis, is it reasonable to suggest that this is appropriate for all mechanically ventilated patients (especially given the concerns that this may increase the risk of *C. difficile* and other infectious complications, including VAP) or should this recommendation be for those patients who are at increased risk of ulcer disease? (The emergence of a more virulent strain of *C. difficile* was mentioned in the MRSA guideline (page 4), should it not also be mentioned here?) Even though the guide indicates that the PUD prophylaxis component should be scored as “met” if it is discussed and it is determined that the risks outweigh the benefits, this is difficult to document and may result in overuse of PUD prophylaxis.

If peptic ulcer disease prophylaxis will continue to be recommended for all patients (see above) we suggest eliminating the phrase “because preventing VAP must be accomplished in concert with other key therapies for ventilated patients,…” This phrase is somewhat confusing and, because it does not provide new data, removing it may clarify the intended meaning of the sentence.

Peptic ulcer disease prophylaxis is not necessary for all ICU patients.

Can specific data (with references, if possible) be provided to support the IHI observation that “when DVT prophylaxis is applied as part of a package of interventions for ventilator care, the rate of pneumonia decreases precipitously?”

Appendix

Inclusion of the NSHN definitions for pneumonia might be useful to users.

Fact Sheet for Patients and Family Members

This document may overstate the incidence and mortality associated with VAP. As written, the document suggests that about 7.5% of all ICU patients who require mechanical ventilation will die from VAP.

The document also suggests that provided peptic ulcer disease prophylaxis and DVT prophylaxis can decrease the risk of VAP. It would be more technically correct to state that these latter two interventions may decrease the risk of complications in critically ill patients who require mechanical ventilation.

To be consistent with the How-To Guide (and scientific evidence) that states that in some cases the risks of ulcer prophylaxis may outweigh the potential benefits, the second question that family members are encouraged to ask should be revised. One possible alternative would be: Does something need to be done to prevent stomach ulcers?

Preventing Central Line Infections How-To Guide

Defining the Problem of Interest

Consistent use of “central line” or “central venous catheters (CVCs)” throughout the document would add clarity.

A definition of primary bloodstream infection should be provided.

Inclusion of the complete NHSN definition of a central line could be of value to users of this document. Specifically, the following are not listed in the current version of the Guide:

- An introducer is considered an intravascular catheter.
- In neonates, the umbilical artery/vein is considered a great vessel.
- Pacemaker wires and other nonlumened devices...are not considered central lines.

The reader is referred to Appendix C for “details on the required definitions;” however, such definitions are not provided in Appendix C. The appendix does provide a link to the definitions but this is not useful if the reader is not using the electronic format of the Guide. (When I tried the link, it did not work. I am not sure if this is a problem on my end or a problem with the link.)

The Case for Preventing Catheter-Related Bloodstream Infections

Based on the “case for preventing catheter-related bloodstream infections” peripheral and arterial catheters also disrupt the integrity of the skin, making infection with bacteria and/or fungi possible. It would help to indicate why these are not included.

The Central Line Bundle

A new term, “nosocomial bloodstream infections” is introduced. For general readers it is not necessarily clear if nosocomial bloodstream infections have the same meaning as “primary catheter-associated bloodstream infections” or represent a superset. Consistent use of terms (i.e., CDC/NHSN nomenclature) would add clarity.

Four of the five components of the bundle are specific, individually measurable events. Hand hygiene, however, is a recurring event that cannot be measured at all points at which it is indicated (e.g., prior to all catheter use and access events). This prohibits an “all or none” compliance measurement, unless the compliance measurement is to include only hand hygiene prior to catheter insertion. This should be discussed in the Guide.

Potential Impact of the Central Line Bundle

An additional example that could be added to this section is the success reported in ICUs across the state of Michigan. (REF: Pronovost P, Needham D, Berenholtz S, et al. New Engl. J Med 2006; 355(26):2725-32)

Preventing Catheter-Related Bloodstream Infections – Five Components of Care

This sentence should specify that sterile gloves (not just gloves) should be worn for the insertion procedure.

In the discussion of skin antisepsis and their use, would consider providing some information about acceptable alternative agents when CHG cannot be used.

The checklist should include (a) that chlorhexidine antisepsis was used and (b) that the solution was allowed to dry completely before line insertion. Helpful changes to the document include (a) indicate generally how long drying of the chlorhexidine should be expected to take, and (b) what to do if there is some intolerance to chlorhexidine or shortage of it. As stated, if chlorhexidine is not used but another agent used in its place, the entire bundle is deemed non-compliant. Are there alternatives that can represent compliance, and what are the criteria for their use?

Optimal Catheter site selection... - Optimal site selection is a good recommendation. Since there are patient-specific factors and physician team factors that can increase or decrease risk, and since subclavian sites may not be available for various reasons, monitoring is helpful but measurement for compliance quite prone to patient and staff severity adjustment concerns. While the site should clearly be included in the central line checklist and as a part of the record, it seems that the checklist would need to indicate “subclavian site not chosen because.....” and include a pre-selected set of choices and/or a free text field. How measurement will be valuable for this item is unclear.

While the empowerment of nurses is an important part of this (and other) quality improvement initiatives, recommendations for creating a culture where it is acceptable and safe for nurses to stop a procedure may be useful for many users of the IHI Guide.

Under “Plan for collection of data,” “when” should indicate “at line insertion” and “daily” – some of the data elements include daily checklist items.

Measurement

Calculation of all central line bundle items – the expectation is a random sample or a single day walkthrough of all patients with central lines. The text does not indicate if this is ICU only for reporting to IHI, nor how ICU is defined to create

the sample. Note that, if the checklist is part of routine nursing documentation in an EHR, ICU-wide or hospital-wide surveillance could be a routine process by analyzing all available data. The electronic surveillance should be taken into account as an option as it would reduce the burden of random sampling, data collection cards, etc. With random sampling or given day assessment, the statistical robustness of results needs to be addressed. This is especially true since tracking over time is expected.