The New SHEA/IDSA
Compendium Of Strategies for Detection and Prevention Of Healthcare Associated Infections

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Background: Impact of HAIs

- 5%-10% of hospitalized patients develop an HAI
  - 99,000 deaths per year
  - $20 billion per year\(^1\)
- Risk of serious HAI complications is highest for patients requiring intensive care
- Increasing number of HAIs
  - Sicker patient population
  - More complex procedures and equipment
  - Increasing antimicrobial resistance

\(^1\)Stone PW, et al. AJIC 2005; 33:501-505
Estimated Number of Healthcare-Associated Infections in U.S. Hospitals by Subpopulation and Major Site of Infection, United States, 2002

<table>
<thead>
<tr>
<th>Major site of infection</th>
<th>Well-baby nursery</th>
<th>High-risk nursery</th>
<th>Intensive care unit (adults and children)</th>
<th>Outside of intensive care units (adults and children)</th>
<th>Unadjusted total</th>
<th>Adjusted total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary tract</td>
<td>1,413</td>
<td>2,418</td>
<td>102,200</td>
<td>424,060</td>
<td>530,091</td>
<td>561,667</td>
<td>32</td>
</tr>
<tr>
<td>Bloodstream</td>
<td>5,652</td>
<td>14,797</td>
<td>81,942</td>
<td>133,368</td>
<td>235,759</td>
<td>248,678</td>
<td>14</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>1,785</td>
<td>4,400</td>
<td>100,689</td>
<td>129,519</td>
<td>236,393</td>
<td>250,205</td>
<td>15</td>
</tr>
<tr>
<td>Surgical site</td>
<td>21</td>
<td>967</td>
<td>28,725</td>
<td>244,385</td>
<td>274,098</td>
<td>290,485</td>
<td>22</td>
</tr>
<tr>
<td>Other</td>
<td>10,188</td>
<td>10,687</td>
<td>80,732</td>
<td>263,810</td>
<td>365,417</td>
<td>386,090</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>19,059</td>
<td>33,269</td>
<td>394,288</td>
<td>1,195,142</td>
<td>1,641,758</td>
<td>1,737,125</td>
<td>100</td>
</tr>
</tbody>
</table>

*aSee proportions applied from description in Figure.

bAdjusted for inclusion of federal hospitals by multiplying non-newborn values by 1.06

Calculation of estimates of healthcare-associated infections in U.S. hospitals among adults and children outside of intensive care units, 2002

274,098 TOTAL
-967 HRN
-21 WBN
-28,725 Non-newborn ICU
244,385 = SSI

<table>
<thead>
<tr>
<th>Infection Type</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSI</td>
<td>20%</td>
</tr>
<tr>
<td>UTI</td>
<td>36%</td>
</tr>
<tr>
<td>PNEU</td>
<td>11%</td>
</tr>
<tr>
<td>Other</td>
<td>22%</td>
</tr>
<tr>
<td>BSI</td>
<td>11%</td>
</tr>
</tbody>
</table>


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What are the Costs of Healthcare-Associated Infections?

- U.S.
  - Total excess costs $32 million to $825 million annually
  - Most costs not reimbursed when DRGs are used or if costs are capitated
  - Preventing 6% of nosocomial infections offsets cost of $60,000 I.C. program
- UK = cost £111 million/year and 950,000 lost bed days (1987)
- Decrease NI rate by 20%, saves $15 million – $16 million
The Financial Consequences of HAIs are Clear: APIC Review of HAI Cost Myths

The large impact these cases have on costs and operating margins is even more significant. A recent study of 1.69 million admissions from 77 hospitals found that patients with a healthcare-acquired infection reduced overall net inpatient margins by $286 million or $5,018 per infected patient. The study found that the average additional incremental direct cost for patients with an HAI was $8,832.

Myth: CMS “CC” code makes HAI cost-neutral or “profitable”
Are HAIs and Related Deaths Preventable?

- The million dollar question:
  If every preventative strategy is used every time, can we prevent all healthcare-associated infections?

- The answer:
  Probably not all of them

- The other answer:
  We should find out how many are preventable by using preventive strategies appropriately
How to Prevent HAIs

- Eliminate or mitigate risk factors
- Some risk factors can be reduced or eliminated
- Procedures and processes can be controlled
- Others are very difficult, if not impossible, to reduce at the time of procedure or hospitalization

- Implement evidence-based “best practices” and “bundles” of best practices
Why Write the Compendium?

- Very useful and comprehensive CDC/HICPAC guidelines available
  - 13 guidelines
  - 1,200 recommendations for preventing HAIs
- Hospitals are straining to accommodate an increasing number of infection prevention initiatives, regulatory obligations, and requirements for collecting and reporting performance measures
What’s Different about the Compendium?

- Implementation-focused
- Collaborative effort involving experts in infection prevention and control
  - ✓ SHEA, IDSA, APIC, CDC
- Written in partnership with implementation-focused organizations
  - ✓ The Joint Commission
  - ✓ National Quality Forum
  - ✓ Institute for Healthcare Improvement
  - ✓ American Hospital Association
HAI SHEA/IDSA Compendium

- SHEA led in partnership with IDSA Standards and Practice Guideline Committee with a consortium consisting of CDC, APIC, Joint Commission, and others

- Performance Measures developed with IDSA Quality Measurement Task Force (QMTF)
  - Link to National Quality Forum (NQF) and AMA Performance Consortium
HAI Allied Task Force

- David Classen (IDSA Co-Chairman)
- Deborah Yokoe (SHEA Co-Chairman)
- Susan Coffin (VAP lead)
- Michael Klompas (VAP lead)
- Jonas Marshall (CLABSI lead)
- Leonard Mermel (CLABSI lead)
- Lindsey Nicole (CAUTI lead)
- Evelyn Lo (CAUTI lead)
- Deverick Anderson (SSI lead)
- Keith Kaye (SSI lead)
- David Calfee (MRSA lead)
- Cassandra Salgado (MRSA lead)
- Erik Dubberke (CDI lead)
- Dale Gerding (CDI lead)
- Robert Weinstein

- Victoria Fraser
- Trish Perl
- Sanjay Saint
- Kelly Podgorny (Joint Commission)
- Robert Wise (Joint Commission)
- Kathy Arias (APIC)
- David Pegues (HICPAC)
- Helen Burstin (NQF)
- Peter Gross (NQF)
- Fran Griffin (IHI)
- Jennifer Bright (SHEA)
- Annette Mucha (SHEA)
- Jennifer Padberg (IDSA)
Endorsing Organizations

- Association for Respiratory Care (AARC)
- HCA Health System
- AONE
- Pediatric Infectious Diseases Society (PIDS)
- Surgical Infection Society (SIS)
- Society For Critical Care Medicine (SCCM)
- Society for Hospital Medicine (SHM)
- Infusion Nurses Society
Supporting Organizations

- AARP
- Academy Health
- Agency for Healthcare Research and Quality (AHRQ)
- American Academy of Emergency Physicians
- American Association of Critical Care Nurses
- American College of Physicians
- American College of Surgeons
- American Medical Association
- Centers for Disease Control and Prevention (CDC)
- Council of State and Territorial Epidemiologists (CSTE)
- Healthcare Infection Control Practices Advisory Committee (HICPAC)
- Institute for Healthcare Improvement (IHI)
- International Society for Microbial Resistance (ISMR)
- National Foundation for Infectious Diseases (NFID)
- National Quality Forum (NQF)
- Society of Infectious Diseases Pharmacists (SIDP)
- Trust for America’s Health (TMAH)
- Numerous Health Systems
Infections in the Compendium

The 6 HAIs were selected since they frequently affect hospitalized patients, are potentially preventable, and carry a risk of mortality

- *Clostridium difficile* infections (CDI)
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Central line-associated bloodstream infections (CLABSI)
- Catheter-associated urinary tract infections (CAUTI)
- Surgical-site infections (SSI)
- Ventilator-associated pneumonia (VAP)
How the Compendium is Organized

- Six sections focused on HAIs that:
  - Occur relatively frequently
  - Can lead to serious complications
  - Have potential to modify risks
- Each section contains:
  - Statement of concern
  - Brief summary of previously described detection and prevention strategies
  - Prevention recommendations (graded)
  - Performance measures (for *internal* reporting)
Components of the Compendium

- Structure:
  - Performance Measures:
    - Describes performance measures for the specific HAI that can be used for internal and external reporting
    - There are no contradictory recommendations to any of The Joint Commission’s Core Measures or NQF Measures
  - Extensive reference list
  - All Recommendations are evidence-based and include evidence weighting
### Strength of Recommendation and Quality of Evidence

<table>
<thead>
<tr>
<th>Category/Grade</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td><strong>Strength of Recommendation</strong></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>Good evidence to support a recommendation for use.</td>
</tr>
<tr>
<td>B</td>
<td>Moderate evidence to support a recommendation for use.</td>
</tr>
<tr>
<td>C</td>
<td>Poor evidence to support a recommendation.</td>
</tr>
<tr>
<td><strong>Quality of Evidence</strong></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Evidence from &gt;1 properly randomized, controlled trial.</td>
</tr>
<tr>
<td>II</td>
<td>Evidence from &gt;1 well-designed clinical trial, without randomization; from cohort or case-controlled analytic studies (preferably from &gt;1 center); from multiple time-series; or from dramatic results from uncontrolled experiments.</td>
</tr>
<tr>
<td>III</td>
<td>Evidence from opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.</td>
</tr>
</tbody>
</table>
Example of HAI Accountability Section

The CEO and senior management are responsible for providing a healthcare system that supports an infection surveillance, prevention, and control program.
HAI Compendium – Implementation Focus

- Concept of grouping key practices into a “bundle”
  - Reduces HAIs — no single magic bullet for prevention — like active surveillance
  - Increase adherence of all
  - Pick limited number of practices ➔ those with strongest evidence and/or highest impact
  - Incorporated into process of care
  - Bundles derived from guidelines from HICPAC
  - Based on research from experts in SHEA, CDC, APIC, others

- For example: CVC Insertion
  - Hand Hygiene
  - Chlorhexidine to clean skin
  - Maximal Barrier Precautions
    - Sterile cap, mask, gloves, gown
    - Large full-body drape over patient
  - Subclavian insertion/avoidance of femoral insertion
  - Evaluate insertion site and need for CVC daily
How do we Measure Performance?

- **Process measures**: processes that, when adhered to, improve healthcare outcomes
  - ✓ Clear goal of 100% adherence
  - ✓ No need to risk adjust
- **Outcome measures**: can be appropriate for internal tracking; multiple institution comparisons are challenging
  - ✓ Definitions can be open to inter-rater variability and inconsistent methods and data sources
  - ✓ Risk adjustment needed: no well-validated method for infection outcomes
HAI Patient Education Materials

- Patient education material has been developed for each HAI in the Compendium
- Uses a question and answer format
- Example of patient education format:
  - What is a catheter-associated bloodstream infection?
  - What are hospitals doing to prevent catheter-associated bloodstream infections?
  - What can I do to prevent a catheter-associated bloodstream infection?
What is MRSA?

Staphylococcus aureus (pronounced stah-fil-oh-KOK-us AW-ree-us), or “Staph” is a very common germ that about 1 out of every 3 people have on their skin or in their nose. This germ does not cause any problems for most people who have it on their skin. But sometimes it can cause serious infections such as skin or wound infections, pneumonia, or infections of the blood.

Antibiotics are given to kill Staph germs when they cause infections. Some Staph are resistant, meaning they cannot be killed by some antibiotics. Methicillin-resistant Staphylococcus aureus” or “MRSA” is a type of Staph that is resistant to some of the antibiotics that are often used to treat Staph infections.

Who is most likely to get an MRSA infection?

In the hospital, people who are more likely to get an MRSA infection are people who:

- have other health conditions making them sick
- have been in the hospital or a nursing home
- have been treated with antibiotics.

People who are healthy and who have not been in the hospital or a nursing home can also get MRSA infections. These infections usually involve the skin. More information about this type of MRSA infection, known as “community-associated MRSA” infection, is available from the Centers for Disease Control and Prevention (CDC).

http://www.cdc.gov/mrsa

How do I get an MRSA infection?

People who have MRSA germs on their skin or who are infected with MRSA may be able to spread the germ to other people. MRSA can be passed on to bed linens, bed rails, bathroom fixtures, and medical equipment. It can spread to other people on contaminated equipment and on the hands of doctors, nurses, other healthcare providers and visitors.

Can MRSA infections be treated?

- Visitors may also be asked to wear a gown and gloves.
- When leaving the room, hospital providers and visitors remove their gown and gloves and clean their hands.
- Patients on Contact Precautions are asked to stay in their hospital rooms as much as possible. They should not go to common areas, such as the gift shop or cafeteria. They may go to other areas of the hospital for treatments and tests.

May test some patients to see if they have MRSA on their skin. This test involves rubbing a cotton-tipped swab in the patient’s nostrils or on the skin.

What can I do to help prevent MRSA infections?

In the hospital

- Make sure that all doctors, nurses, and other healthcare providers clean their hands with soap and water or an alcohol-based hand rub before and after caring for you.

If you do not see your healthcare providers clean their hands, please ask them to do so.

When you go home

- If you have wounds or an intravascular device (such as a catheter or dialysis port) make sure that you know how to take care of them.

Can my friends and family get MRSA when they visit me?

The chance of getting MRSA while visiting a person who has MRSA is very low. To decrease the chance of getting MRSA your family and friends should:

- Clean their hands before they enter your room and when they leave.
- Ask a healthcare provider if they need to wear protective gowns and gloves when they visit you.

What do I need to do when I go home from the hospital?

To prevent another MRSA infection and to prevent spreading MRSA to...
Overarching HAI Prevention Strategies
1. Perform Hand Hygiene

Create a clear written protocol:

- **Before** and **after** all patient contact
- Before donning gloves
- Before performing invasive procedures
- Before inserting or manipulating urinary catheters, IV catheters, respiratory equipment, or other invasive devices
- After contact with contaminated equipment or other objects in the immediate vicinity of the patient
- After removing gloves
- When moving from a contaminated to a clean body site
2. Use Appropriate Isolation Precautions

- Use CDC Isolation Precautions: Standard, Contact, Droplet, Airborne
- Use **Contact Precautions** for patients known to be colonized or infected with epidemiologically important organisms (e.g., MRSA, *Clostridium difficile*)
  - Single-patient room when available, or cohort
  - Gown and gloves on entry into the patient’s room. Ensure that supplies are readily available
  - Be aware of and address potential adverse effects
3. Ensure Adequate Cleaning of the Environment and Equipment

- Provide housekeeping with written room cleaning guidelines
- Consider using checklists and periodic observations to ensure consistent good practice
- Educate and engage housekeeping staff
4. Remove Non-Essential Catheters and Other Invasive Medical Devices Promptly

- Applies to all invasive medical devices
  - Central lines and other intravascular catheters
  - Urinary catheters
  - Mechanical ventilation
- Consider daily assessment of the need for the device and removal as soon as no longer needed
  - Build this into daily rounds and flowsheets
  - Use computerized reminders
5. Education

- Educate healthcare personnel about strategies to prevent HAIs
- Educate patients and their families, as appropriate
2009 NQF Report

Consent & Disclosure

Work Force

Information Management & Continuity of Care

Medication Management

Healthcare-Associated Infections

Condition- & Site-Specific Practices

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Hand Hygiene – Safe Practice 19

Statement

Comply with current Centers for Disease Control and Prevention Hand Hygiene Guidelines.

Additional Specifications

At a minimum, this practice should include all of the following elements:

- Implement all Centers for Disease Control and Prevention (CDC) guidelines with category IA, IB, or IC evidence
- Encourage compliance with CDC guidelines with category II evidence
- Ensure that all staff members know what is expected of them with regard to hand hygiene, and ensure compliance
CAUTI Prevention – Safe Practice 25

Statement

Take actions to prevent catheter-associated urinary tract infection by implementing evidence-based intervention practices.

Additional Specifications

- Document the education of healthcare personnel involved in the insertion, care, and maintenance of urinary catheters about catheter-associated urinary tract infection (CAUTI) prevention, including alternatives to indwelling catheters and procedures for catheter insertion, management, and removal. Education should occur upon hire and annually thereafter, and when involvement in these procedures is added to an individual’s job responsibilities.
- Prior to insertion of a urinary catheter, educate the patient, and his or her family, as appropriate, about CAUTI prevention.
- Identify the patient groups or units on which surveillance should be conducted, using risk assessments that consider frequency of catheter use and potential risk.
- Implement policies and practices that are aimed at reducing the risk of CAUTI, that meet regulatory requirements, and that are aligned with evidence-based standards (e.g., CDC and/or professional organization guidelines).
CAUTI Prevention – Safe Practice 25

Additional Specifications (cont’d)

- Evidence-based practices include, but are not limited to, the following:
  - Perform hand hygiene immediately before and after catheter insertion and any manipulation of the catheter site or apparatus
  - Ensure that the supplies necessary for aseptic technique for catheter insertion are readily available
  - Insert catheters following an aseptic technique and using sterile equipment
  - Insert urinary catheters only for appropriate indications, and leave them in place only as long as indications remain
  - Obtain a urine culture before initiating antimicrobial therapy for urinary tract infection in a patient with a urinary catheter

- Measure compliance with best practices or evidence-based guidelines, and evaluate the effectiveness of prevention efforts for internal performance improvement

- Provide CAUTI surveillance data, including process and outcome measures, to key stakeholders within the organization, including senior hospital leadership, physicians, nursing staff, and other clinicians
SUMMARY OF MAJOR RECOMMENDATIONS

Basic Practices — Recommended for Use

- Provide and implement written guidelines for catheter-use (indications), insertion, and maintenance (A II)
- Implement a system for documenting in the patient record: indications of catheter insertion, date and time of insertion, individual who inserted catheter, and date and time of catheter removal (A II)
- Insert urinary catheters only when necessary for patient care, and leave in place only as long as indications remain (A II)
- Practice hand hygiene immediately before insertion and before any manipulation if catheter site or apparatus (A III)
SUMMARY OF MAJOR RECOMMENDATIONS

**Basic Practices — Recommended for Use**

- Properly secure catheter after insertion to prevent movement and urethral traction (A III)
- Maintain a sterile, continuous closed drainage system (A I)
- Do not disconnect the catheter and drainage tube is unless the catheter must be irrigated (A I)
- Maintain unobstructive urine flow (A II)
- Cleaning of the meatal area with antiseptic solutions is unnecessary; routine hygiene is appropriate (A I)
- Empty the collection bag regularly using a separate collecting container for each patient, and avoid allowing the drainage spigot to touch the collecting container (A II)
SUMMARY OF MAJOR RECOMMENDATIONS

**Special Approaches Recommended for Use**

- Perform a CAUTI risk assessment. These special approaches are recommended for use in locations and/or populations within the hospital with unacceptably high CAUTI rates despite implementation of the basic CAUTI prevention strategies listed above
  - Implement an organization-wide program to identify and remove catheters that are no longer necessary, using 1 or more methods documented to be effective (A-II)
  - Develop a protocol for management of postoperative urinary retention, including nurse-directed use of intermittent catheterization and use of bladder scanners (B-I)
  - Establish a system for analyzing and reporting data on catheter use and adverse events from catheter use (B-III)
SUMMARY OF MAJOR RECOMMENDATIONS

Approaches that Should Not Be Considered a Routine Part of CAUTI Prevention

- Do not routinely use silver coated or other antibacterial catheters (AI)
- Do not screen for asymptomatic bacteruria in catheterized patients (A II)*
- Do not treat asymptomatic bacteruria in catheterized patients except prior to invasive urologic procedure (A I)
- Do not change catheters routinely (A III)
- Avoid catheter irrigation (AI)
SUMMARY OF MAJOR RECOMMENDATIONS

Unresolved Issues

- Use of antimicrobial coated catheters for selected patients at high risk
- Use of antiseptic solution versus sterile saline for meatal cleaning before catheter insertion
1. Compliance with documentation of catheter insertion and removal dates
   • Conduct random audits of selected units and **calculate compliance rate**
   • Numerator: number of patients on unit with catheters with proper documentation of insertion and removal dates
   • Denominator: number of patients on the unit with catheter in place
   • Standardization factor: 100 (i.e., multiply by 100 so that measure is expressed as a percentage)

2. Compliance with documentation of indication for catheter placement
   • Conduct random audits of selected units and **calculate compliance rate**
   • Numerator: number of patients on unit with catheters with proper documentation of indication
   • Denominator: number of patients on the unit with catheter in place
   • Standardization factor: 100 (i.e., multiply by 100 so that measure is expressed as a percentage)
External Measures Reporting

• Many challenges exist in providing useful information to consumers and other stakeholders and in preventing unintended consequences of public reporting. Recommendations for public reporting of HAIs have been provided by the Hospital Infection Control Practices Advisory Committee (HICPAC) and the Healthcare-Associated Infection Working Group of the Joint Public Policy Committee. *Am J Infect Control* 2005; 33:217

• Because the validity of using the current CDC/NHSN definition for CAUTI for comparison of facility-to-facility outcomes is not established, external reporting of CAUTI rates is not recommended.
What is “catheter-associated urinary tract infection?”
An infection in the bladder and the kidneys is known as a urinary tract infection or UTI. If you have a urinary catheter and you get an infection in your bladder or your kidney it is called a catheter-associated urinary tract infection or CAUTI.

What is a urinary catheter?
A urinary catheter is a thin, tube placed in the bladder to drain urine. Urine drains through the tube into a bag that collects the urine. A urinary catheter is used:
If you are not able to urinate on your own.
To measure the amount of urine that you make
To collect a sterile urine specimen for a test
During and after some types of surgery
Testing of the kidneys and bladder

People with urinary catheters have a higher chance of getting a urinary tract infection than people who don’t have a catheter.

How do I get a catheter-associated urinary tract?
Central Line-Associated Bloodstream Infection Prevention – Safe Practice 21

Statement

Take actions to prevent central line-associated bloodstream infection by implementing evidence-based intervention practices.

Additional Specifications

Before insertion:
- Educate healthcare personnel involved in the insertion, care, and maintenance of central venous catheters (CVCs) about central line-associated bloodstream infection (CLABSI) prevention

At insertion:
- Use a catheter checklist to ensure adherence with infection prevention practices at the time of CVC insertion
- Perform hand hygiene prior to catheter insertion or manipulation
- Avoid using the femoral vein for central venous access in adult patients (Subclavian or internal jugular are the preferred sites, unless contraindicated)
- Make available and easily accessible for use a catheter cart or kit that contains all necessary components for aseptic catheter insertion

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Central Line-Associated Bloodstream Infection Prevention – Safe Practice 21

Additional Specifications (cont’d)

At insertion (cont’d):
- Use maximal sterile barrier precautions during CVC insertion to include a mask, cap, sterile gown, and sterile gloves worn by all healthcare personnel involved in the procedure. The patient is to be covered with a large sterile drape during catheter insertion.
- Use chlorhexidine-based antiseptic for skin preparation in patients over two months of age.

After insertion:
- Use a standardized protocol to disinfect catheter hubs, needleless connectors, and injection ports before accessing the ports.
- Remove nonessential catheters.
- Use a standardized protocol for nontunneled CVCs in adults and adolescents for dressing care, such as changing transparent dressings and performing site care with a chlorhexidine-based antiseptic every five to seven days, or earlier if the dressing is soiled, loose, or damp; change gauze dressings every two days, or earlier if the dressing is soiled, loose, or damp.
- Perform surveillance for CLABSI and report the data on a regular basis to the units, physician and nursing leadership, and hospital administrators overseeing the units.

Pediatric Specificity:
- Chlorhexidine may be contraindicated for use in very low birth-weight (VLBW) infants. Optimal catheter site selection is specific to the size and condition of the infant or child and accessibility factors.
Surgical-Site Infection Prevention – Safe Practice 22

Statement

Take actions to prevent surgical-site infections by implementing evidence-based intervention practices.

Additional Specifications

- Document the education of healthcare professionals, including nurses and physicians, involved in surgical procedures about healthcare-acquired infections, surgical-site infections (SSIs), and the importance of prevention. Education occurs upon hire and annually thereafter, and when involvement in surgical procedures is added to an individual’s job responsibilities
- Prior to all surgical procedures, educate the patient and his or her family as appropriate about SSI prevention
- Implement policies and practices that are aimed at reducing the risk of SSI that meet regulatory requirements, and that are aligned with evidence-based standards (e.g., CDC and/or professional organization guidelines)
- Conduct periodic risk assessments for SSI, select SSI measures using best practices or evidence-based guidelines, monitor compliance with best practices or evidence-based guidelines, and evaluate the effectiveness of prevention efforts
Surgical-Site Infection Prevention – Safe Practice 22

Additional Specifications (cont’d)

- Ensure that measurement strategies follow evidence-based guidelines, and that SSI rates are measured for the first 30 days following procedures that do not involve the insertion of implantable devices, and for the first year following procedures that involve the insertion of implantable devices
- Provide SSI rate data and prevention outcome measures to key stakeholders, including senior leadership, licensed independent practitioners, nursing staff, and other clinicians
- Administer antimicrobial agents for prophylaxis with a particular procedure or disease according to evidence-based standards and guidelines for best practices
- Administer intravenous antimicrobial prophylaxis within one hour before incision to maximize tissue concentration (two hours are allowed for the administration of vancomycin and fluoroquinolones)
- Discontinue the prophylactic antimicrobial agent within 24 hours after surgery (within 48 hours is allowable for cardiothoracic procedures)
- When hair removal is necessary, use clippers or depilatories. Note: Shaving is an inappropriate hair removal method
- Maintain normothermia (temperature >36.0°C) immediately following colorectal surgery
- Control blood glucose during the immediate postoperative period for cardiac surgery patients
Care of the Ventilated Patient – Safe Practice 23

Statement

Take actions to prevent complications associated with ventilated patients: specifically, ventilator-associated pneumonia, venous thromboembolism, peptic ulcer disease, dental complications, and pressure ulcers.

Additional Specifications

- Educate healthcare workers about the daily care of ventilated patients and the necessity for the prevention of associated complications such as ventilator-associated pneumonia (VAP), venous thromboembolism (VTE), peptic ulcer disease (PUD), dental complications, and pressure ulcers [Note 23-1]
- Implement policies and practices for disinfection, sterilization, and maintenance of respiratory equipment that are aligned with evidence-based standards (e.g., CDC and professional organization guidelines) [Tablan, 2004]
- Provide ventilated patient data on VAP, VAP-related process measures, and general care process measures to key stakeholders, including senior leadership, LIPS, nursing staff, and other clinicians
- Educate patients, as appropriate, and their families about prevention measures involved in the care of ventilated patients

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Care of the Ventilated Patient – Safe Practice 23

Additional Specifications (cont’d)

- For adult patients, institute a ventilated patient checklist and a standardized protocol for the following prevention measures:
  - Adherence to hand hygiene guidelines
  - Perform regular antiseptic oral care according to product guidelines
  - Maintain patients in semi-recumbent position: 30 - 45° elevation of head of bed (unless medically contraindicated)
  - Perform daily assessment of readiness to wean and sedation interruption
  - Use weaning protocols
  - Implement PUD prophylaxis based on patient risk assessment. (PUD prophylaxis data remain controversial. Clinical judgment should be used based on individual patient needs)
  - Provide VTE prophylaxis (unless contraindicated) (refer to Safe Practice 28)
  - Implement a pressure ulcer prevention program based on patient risk assessment (refer to Safe Practice 27)

- For pediatric patients (less than 18 years of age), institute a ventilated patient checklist and a standardized protocol for the following prevention measures:
  - Elevate airway opening between 15°-30° for neonates and 30°-45° for infants through pediatric ages, unless clinically inappropriate for the patient
  - Assess readiness to extubate daily
Multidrug-Resistant Organism Prevention — Safe Practice 24

Statement

Implement a systematic multidrug-resistant organism (MDRO) eradication program built upon the fundamental elements of infection control, an evidence-based approach, assurance of the hospital staff and independent practitioner readiness, and a re-engineered identification and care process for those patients with or at risk for MDRO infections.

Note: This practice applies to, but is not limited to, epidemiologically important organisms such as methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant enterococci, and *Clostridium difficile*. Multidrug-resistant gram-negative bacilli, such as *Enterobacter* species, *Klebsiella* species, *Pseudomonas* species, and *Escherichia coli*, and vancomycin-resistant *Staphylococcus aureus*, should be evaluated for inclusion on a local system level based on organizational risk assessments.
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Additional Specifications

- The organization’s leadership has assigned responsibility for oversight and coordination of the development, testing, and implementation of an MDRO prevention program
- Conduct a risk assessment for MDRO acquisition and transmission
- Upon hire and annually thereafter, educate staff and licensed independent practitioners about MDROs, including risk factors, routes of transmission, outcomes associated with infection, prevention measures, and local epidemiology
- Educate patients who are infected with methicillin-resistant *Staphylococcus aureus*, vancomycin-resistant enterococci, or *Clostridium difficile*, or who are colonized with MRSA, and their families, as needed, about healthcare-associated infections and infection prevention strategies
- Implement a surveillance program for MDROs based on risk assessment
- Measure and monitor MDRO prevention processes and outcomes, including:
  - Infection rates using evidence-based metrics
  - Compliance with evidence-based guidelines or best practices
  - Evaluation of the education program provided to staff and licensed independent practitioners
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Additional Specifications (cont’d)

- Provide MDRO surveillance data, prevention processes, and outcome measures to key stakeholders, including senior hospital leadership, physicians, nursing staff, and other clinicians
- Implement a laboratory-based alert system to provide immediate notification to infection control and clinical personnel about newly diagnosed MDRO-colonized or -infected patients
- Implement an alert system that identifies readmitted or transferred MRSA-colonized or -infected patients
- Promote compliance with hand hygiene recommendations
- Use contact precautions for MDRO colonized or infected patients
- Ensure cleaning and disinfection of equipment and environment
Strategies to prevent transmission of MRSA

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Components of an MRSA program

- Conduct an MRSA risk assessment
  - Proportion of *Staphylococcus aureus* isolates resistant to methicillin/oxacillin
  - The number of new MRSA cases over a given time period (incidence)
  - The number of new MRSA bloodstream infections (or other specific infection) over a given time period
  - Point prevalence surveys of MRSA colonization or infection based on clinical isolates
Components of an MRSA program

- Implement an MRSA monitoring program
  - Daily review of microbiology results to identify new MRSA patients
  - Keep a line list of patients with MRSA
- Promote compliance with hand hygiene
- Use contact precautions for MRSA-colonized or infected patients
- Ensure cleaning and disinfection of equipment and the environment
Components of an MRSA program

- Implement a laboratory-based alert system to notify infection preventionists and clinical personnel about:
  - New MRSA-colonized or –infected patients
  - Readmitted MRSA patients
- Patient is overdue for Pap smear (rec: q 3 years).
Precaution: MRSA  Date: 12/27/
Precaution: VRE  Date: 02/02/

Contact Precautions for Methicillin-Resistant Staphylococcus aureus (MRSA) and Vancomycin-Resistant Enterococci (VRE) To Prevent Transmission to Other Patients

1. Private Room Required
2. Disinfect Hands with alcohol-based waterless hand gel (Purell)
3. Gloves to Enter Room
4. Gowns for Any Contact with Patient or Environment
5. Remove Gloves and Gown
6. Disinfect Hands with Purell (or wash hands with soap and water, then use Purell)

MRSA colonizes the anterior nares and gradually decreases over time, in most patients not receiving antibiotics. Some MRSA patients may no longer carry the organism.

VRE colonizes the intestinal tract and decreases gradually over time in patients
Components for an MRSA Program

- Educate healthcare personnel about MRSA
- Educate patient and their families about MRSA

FAQs about “MRSA” (Methicillin-Resistant Staphylococcus aureus)

**What is MRSA?**

*Staphylococcus aureus* (pronounced staff-il-oh-KOK-us AW-re-us), or “Staph” is a very common germ that about 1 out of every 3 people have on their skin or in their nose. This germ does not cause any problems for most people who have it on their skin. But sometimes it can cause serious infections such as skin or wound infections, pneumonia, or infections of the blood.

Antibiotics are given to kill Staph germs when they cause infections. Some *Staph* are resistant, meaning they cannot be killed by some antibiotics. “Methicillin-resistant *Staphylococcus aureus*” or “MRSA” is a type of *Staph* that is resistant to some of the antibiotics that are often used to treat *Staph* infections.

- Visitors may also be asked to wear a gown and gloves.
- When leaving the room, hospital providers and visitors remove their gown and gloves and clean their hands.
- Patients on Contact Precautions are asked to stay in their hospital rooms as much as possible. They should not go to common areas, such as the gift shop or cafeteria. They may go to other areas of the hospital for treatments and tests.
- *May test* some patients to see if they have MRSA on their skin. This test involves rubbing a cotton-tipped swab in the patient’s nostrils or on the skin.

What can I do to help prevent MRSA infection?

Answer:

- Wash your hands frequently with soap and water.
- Use hand sanitizer when soap and water are not available.
- Cover your mouth and nose when you cough or sneeze.
- Clean and disinfect high-touch surfaces regularly.
- Be careful when using antibiotics to prevent MRSA from becoming resistant.
Special Approaches: MRSA Active Surveillance Testing Program

- Why is this not a basic recommendation?

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**Effective:**

*Annals of Internal Medicine*

**Article**

Universal Screening for Methicillin-Resistant *Staphylococcus aureus* at Hospital Admission and Nosocomial Infection in Surgical Patients

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**Not effective:**

- Experts and policy makers have repeatedly called for universal screening at hospital admission to reduce nosocomial methicillin-resistant *Staphylococcus aureus* (MRSA) infection.
- **Objective** To determine the effect of an early MRSA detection strategy on nosocomial MRSA infection rates in surgical patients.
- **Design, Setting, and Patients** Prospective, interventional cohort study conducted between July 2004 and May 2006 among 21,754 surgical patients at a Swiss teaching hospital using a crossover design to compare 2 MRSA control strategies (rapid screening on admission plus standard infection control measures vs standard infection control alone). Twelve surgical wards including different surgical specialties were enrolled according to a prespecified agenda, assigned to either the control or intervention group for a 9-month period, then switched over to the other group for a further 9 months.
- **Interventions** During the rapid screening intervention periods, patients admitted to...
MRSA AST Program

- Multidisciplinary team to plan and provide oversight
- Select the patient population to be screened
- Decide when to perform screening tests
  - On admission
  - At regular intervals or on discharge
151. Following orders from order set named: ...

152. NARES for Send bilateral nares swab for MRSA ..., NEXT AVAILABLE

153. RECTAL SWAB for Send rectal or stool swab for VRE ..., NEXT AVAILABLE

154. End of order set.

155. RENEW REGLAN 10 MG IV Q6H

156. RENEW MICONAZOLE NITRATE 2% CREAM TP BID <0>

157. RENEW FLOVENT HFA 88 MCG NEB BID

158. RENEW LAB MG, Q12H TODAY (01/13)

159. POTASSIUM CHLORIDE Replacement Scale IV (intravenously) Scale Free

NARES for ,
Send bilateral nares swab for MRSA
culture and label "Screening MRSA
Culture." For concerns page Infection
Control at 11482. "Ordering MD SH69"

Use arrow keys or mouse to select. Alt-Z for full view. Esc or Alt-C to close
MRSA AST Program

- Decide which anatomic sites to swab
  - Anterior nares
  - Perianal, pharyngeal, wound, umbilicus swabs
MRSA AST Program

- Decide on laboratory testing methods and assess resource requirements
  - Culture
  - Molecular testing methods (PCR)
- Clarify how to manage patients while waiting for results
  - Await screening results and implement contact precautions if positive
  - Place patient on empirical contact precautions until a negative screening results is documented
MRSA AST Program

- Assess the availability of single rooms
  - Prioritize MRSA-positive patients at greatest risk for transmission (e.g., those with draining wounds)
  - If cohorting is needed, don’t cohort patients with other reasons for isolation (e.g., other MDROs)
- Assess the availability of gloves, gowns, hand hygiene products and other supplies
  - Requires coordination between purchasing, laundry/linen and unit-based personnel
- Assess compliance with the screening protocol
  - Ensure that screening tests are collected
Special Approaches: MRSA Decolonization

- Provide decolonization therapy to MRSA-colonized patients in conjunction with an active surveillance testing program
  - Optimal decolonization regimen is unknown
    - Nasal mupirocin twice daily for 5 days
    - CHG bathing daily for 7 days
    - +/- Systemic antimicrobials
  - Downside: May lead to increasing mupirocin resistance
Special Approaches: CHG Bathing

- Bathe adult ICU patients with chlorhexidine

Process Measures: MRSA

For all hospitals:

- Compliance with hand hygiene
  - Observations of practice
- Compliance with contact precautions
  - Observations of practice

For settings where MRSA AST has been implemented:

- Compliance with the AST program
  - Proportion of patients from whom appropriate screening test specimens were collected
Outcome Measures: MRSA

- Methicillin resistance among *S. aureus* isolates
  - Number of nonduplicate methicillin-resistant isolates per total number of *S. aureus* isolates x 100
- Incidence (incidence density) of hospital-onset MRSA bacteremia
  - Number of first bloodstream MRSA isolates per infectious episode that occur ≥3 days after admission/100 patient admissions (1000 patient-days)
Outcome Measures: MRSA

- Incidence (incidence density) of hospital-onset MRSA
  ✓ Number of first MRSA isolates regardless of source per patient obtained ≥3 days after admission /100 admissions (or 1000 patient-days)

- Point prevalence of MRSA
  ✓ Number of MRSA isolates per patient for each unit/100 patients on the unit at the time of the survey
Outcome Measures: MRSA

For settings where MRSA AST has been implemented

- MRSA transmission incidence
  - Number of patients with a previously negative screening test and no previous history of MRSA with a positive screening or clinical MRSA result/1000 patients during the surveillance period
Questions?

Comments