Management of MRSA in Ambulatory Surgical Facilities

Introduction

Hospitals, nursing homes, and ambulatory surgical facilities (ASFs) in Pennsylvania are required to develop and implement an internal infection control plan that includes procedures for identifying and designating patients known to be colonized or infected with multidrug-resistant organisms (MDROs), including methicillin-resistant Staphylococcus aureus (MRSA). This mandate is in line with the nationwide effort to reduce the acquisition of MDROs and other infections in healthcare settings. At the federal level, the Centers for Medicare and Medicaid Services’ conditions for coverage mandate that ASFs develop and implement an effective infection control program designed to prevent, control, and investigate infections and communicable disease based on nationally recognized infection control guidelines.

Infection Control in ASFs

In comparison to hospitalized patients, ASF patients spend limited time in the facility. Most have a shorter duration of anesthesia, are generally healthier, and undergo same-day procedures. However, the risk remains the same regarding the transmission of organisms during surgery and the acquisition of surgical site infections. With the exponential increase in community-acquired MRSA, the risk of patients presenting with the organism for same-day surgery exists. Their MRSA status may or may not be known. The primary mode of MRSA transmission is identical in any healthcare setting: MRSA spreads mainly via the contaminated hands of healthcare workers after contact with a colonized or infected patient and/or the environment. As such, infection prevention practices are necessary in ASFs to mitigate the risk of spreading infection.

Authority Data

Between January 2008 and March 2010, the Pennsylvania Patient Safety Authority received 37 reports from ASFs that were directly related to MRSA-positive patients. These cases included patients with a previously documented history of MRSA colonization or infection, positive screening results prior to same-day surgery, and postoperative wound infections attributed to surgical procedures conducted at ASFs. Of the 37 reports, 6 indicated cancelled or rescheduled procedures due to a positive history or preoperative screening results.

MRSA Management Workshops

In late 2008, various ASF Patient Safety Officers in Pennsylvania reached out to the Authority through its Patient Safety Liaison program for guidance on the management of MRSA patients in their facilities. In response to the request for guidance, the Authority conducted a series of MRSA management workshops between April and October 2009 for a total of 57 ASFs spanning three regions—northeast, central, and northwest. The ASF attendees provided feedback by means of verbal discussion and evaluations that revealed that close to 90% were highly satisfied with the workshop and felt that it was applicable to their facility. At the time of publication of this article, workshops are being scheduled for the southwest and southeast regions.

Highlights of these workshops are included below.

Facts and Clinical Features

MRSA is a potentially deadly strain of the common S. aureus bacteria that frequently inhabits the skin or nostrils. Because of its resistance to antibiotics commonly used in treatment, MRSA is among the most common and the most problematic of healthcare-acquired infections.

MRSA can present in the form of colonization, which is defined as the presence of microorganisms without tissue invasion or damage (i.e., causing no signs or symptoms). It can also present in the form of infection, which is the presence of microorganisms with tissue invasion and damage (i.e., causing symptoms). MRSA is transmitted mainly by direct contact via the hands of personnel from patient-to-patient or environment-to-patient. MRSA is the most common cause of community-acquired skin and soft tissue infection. However, it is easily eradicated by handwashing with soap and water or using alcohol-based hand sanitizers.

MRSA emerged in the United States soon after methicillin became commercially available in the early 1960s, and prevalence increased in the 1970s. In 2007, MRSA accounted for approximately 50% to 70% of all S. aureus clinical isolates from patients with healthcare-associated infections acquired in intensive care units (ICUs). About 85% of all invasive MRSA infections are connected with healthcare settings.

Risk Factors

General factors that place patients at risk for acquiring MRSA include wounds, prolonged hospital stays, and antibiotic usage, including duration of administration, use of broad spectrum drugs, and multiple antibiotics given to individual patients. In addition, severity of illness and the use of invasive lines in patients in ICUs, burn units, oncology units, and hemodialysis centers contribute to the acquisition of MRSA. Physical placement of patients with MRSA (particularly if they are in close proximity to at-risk patients) may also be a contributing factor.

Certain surgical procedures place patients at risk for MRSA and other infections. These include open procedures of the hip and knee; spine, including lumbar laminectomies; cardiac surgery with mediastinotomy, coronary artery bypass graft (CABG) surgery, and valve replacements; and spinal fusions, including anterior/posterior cervical fusions. (It is understood...
that the preceding procedures are not conducted in outpatient settings and are considered major surgery; however, they were introduced during the workshop as examples of general risk factors.)

Components of a MRSA Prevention Program

Active Surveillance
Screening of high-risk individuals (usually undertaken in the hospital setting) by conducting active surveillance cultures through various combinations of interventions (e.g., rapid PCR [polymerase chain reaction]-based versus agar culture-based screening) will identify positive patients early and provide the opportunity to reduce the potential for transmission. However, screening should be done as part of an overall infection prevention and control program, rather than as a stand-alone practice. Pennsylvania law requires hospitals to screen all patients received from nursing home facilities, as well as to identify other high-risk patients, as determined by the individual hospital (see “Risk Factors”).

Screening by Means of History Taking
Screening includes taking a verbal history from the patient prior to surgery (e.g., obtaining information from the patient and/or surgeon) for the purpose of identifying the patient’s physical status and his or her subsequent risk to others. In addition, patients may give a known MRSA history. Patients with uncontrolled or uncontrollable drainage and secretions have the potential to contaminate others, mainly via the environment, and could require additional precautions. Screening by this method enables facilities to identify both those patients who have a history of the organism, as well as those whose physical status may put others at risk in the event that they are unaware of harboring MDROs.

Isolation Precautions
Standard precautions and contact precautions apply to the outpatient setting for preventing transmission of MRSA.

Standard precautions include a group of infection prevention practices that apply to all patients, regardless of suspected or confirmed diagnosis or presumed infection status. These precautions are the primary strategy for preventing pathogen transmission and are recommended for implementation in all healthcare settings, including ambulatory care. Components of standard precautions include proper hand hygiene, use of personal protective equipment (PPE), and environmental cleaning. The following principles apply for hand hygiene:

- Perform hand hygiene before and after patient contact, including after gloves are removed.
- Perform hand hygiene any time there is a possibility that there has been contact with blood or other potentially infectious materials.
- Avoid direct contact with potentially contaminated surfaces (e.g., equipment, drapes, sponges, other patient care devices) whenever possible.

Make alcohol-based hand sanitizer products readily available.

Strictly adhere to the Joint Commission’s National Patient Safety Goal NPSG.07.01.01, which includes the prohibition of artificial nails.

Implement compliance monitoring programs.

The Centers for Disease Control and Prevention (CDC) defines PPE as a variety of barriers (e.g., gloves, gowns, masks, goggles, face shields) which protect mucous membranes, airways, skin, and clothing from contact with infectious organisms such as MRSA. PPE selection is based on the nature of the patient interaction and/or the likely mode(s) of transmission.

Contact precautions are transmission-based and are used as an adjunct to standard precautions for the purpose of further isolating the patient and taking extra precautions with the items and equipment used on the patient. Implementation of contact precautions is determined by the individual facility on a case-by-case basis. Components of contact precautions, as well as enhanced strategies for ambulatory surgery, include the following:

- House the patient in a private room at all times or in a specially designated room or area in the preoperative holding area and postanesthesia care unit (PACU). Keep the patient out of common areas.
- Ensure that the patient’s isolation status is communicated to all staff members.
- Don gown and gloves upon entering the patient’s room (including preoperative and PACU areas) and discard these items before exiting the room.
- Limit the movement and transport of the patient. When transporting the patient, wear gowns and gloves.
- Dedicate the use of noncritical patient care equipment and items (e.g., stethoscopes, blood pressure cuffs, electronic thermometers) to the patient in the preoperative area and PACU.
- Adequately clean and disinfect all surfaces and OR equipment, including anesthesia equipment, as well as noncritical patient care items (as described above if not discarded after use).

Pre- and Postpresentation Surveys
In order to develop the MRSA workshops, the Authority surveyed the registered participants to
gain insight into facility practices. A postpresentation follow-up survey was sent to those facilities that participated in the prepresentation survey to ascertain whether the information shared had any influence on ASF practices. Results of the pre- and postpresentation survey are shown in Tables 1 and 2. Results include only those facilities that completed both surveys.

Summary of Findings

Pre- and postpresentation surveys revealed the existence of certain practices that were either redundant or not based on guidelines or recommendations, including practices that had little or no bearing on patient safety (e.g., performing surgery on MRSA-positive patients at the end of the day). Shortly after the presentation, positive changes were made as evidenced by the summary of survey findings.

The following results obtained from the prepresentation survey stand out and were not repeated in the postpresentation survey as the high incidence of these practices among the facilities did not warrant surveying for changes:

- 96% use alcohol hand sanitizer products as a form of hand hygiene.
- 92% include a general policy for MRSA in the infection control plan.
- 100% do daily terminal cleaning of the operating rooms.

Results from the postpresentation survey helped the Authority determine the efficacy of the workshops.

Changes noted between the results of the prepresentation survey and the postpresentation survey include the following:

A decrease in the percentage of facilities that conduct preoperative screening (44% to 36%). A possible explanation for this change is that implementing standard precautions and contact precautions reduces the need to single out patients for the purpose of treating those known to be colonized or infected any differently than those with an unknown status.

An increase in the percentage of facilities admitting MRSA-positive patients for surgery (48% to 56%). Feedback indicates increased comfort with including MRSA-positive patients on surgical schedules, versus turning them away. Some respondents expressed interest in obtaining permission from their administrators to include these patients during future scheduling.

A decrease in the percentage of facilities performing surgery on MRSA-positive patients at the end of the day (24% to 12%). Again, a possible explanation for this is that standard and contact precautions reduce the need to single out patients.

An increase in the placement of MRSA-positive patients on contact precautions (52% to 60%). Choosing to introduce contact precautions in addition to standard precautions in certain settings and under certain circumstances may be warranted. The workshops discussed assessing each patient individually for the purpose of using additional precautions.

Table 1. Pennsylvania Patient Safety Authority PrePresentation Survey of MRSA Practices in ASFs (N = 25)*

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>YES</th>
<th>%</th>
<th>NO</th>
<th>%</th>
<th>NON-RESPONSES</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your facility require preoperative MRSA screening?</td>
<td>11</td>
<td>44%</td>
<td>14</td>
<td>56%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Does your facility perform surgery on MRSA-positive patients?</td>
<td>12</td>
<td>48%</td>
<td>13</td>
<td>52%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Is surgery on MRSA-positive patients done at the end of the day?</td>
<td>6</td>
<td>24%</td>
<td>13</td>
<td>52%</td>
<td>6</td>
<td>24%</td>
</tr>
<tr>
<td>Do your staff members use alcohol-based hand sanitizer products?</td>
<td>24</td>
<td>96%</td>
<td>1</td>
<td>4%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Does your facility’s infection control plan include a general policy for MRSA?</td>
<td>23</td>
<td>92%</td>
<td>2</td>
<td>8%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Does your facility place MRSA-positive patients on contact precautions?</td>
<td>13</td>
<td>52%</td>
<td>5</td>
<td>20%</td>
<td>7</td>
<td>28%</td>
</tr>
</tbody>
</table>

*Survey dates were March 2009 and September 2009.

Table 2. Pennsylvania Patient Safety Authority Postpresentation Survey of MRSA Practices in ASFs (N = 25)*

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>YES</th>
<th>%</th>
<th>NO</th>
<th>%</th>
<th>NON-RESPONSES</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does your facility require preoperative MRSA screening?</td>
<td>9</td>
<td>36%</td>
<td>16</td>
<td>64%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Does your facility perform surgery on MRSA-positive patients?</td>
<td>14</td>
<td>56%</td>
<td>11</td>
<td>44%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Is surgery on MRSA-positive patients done at the end of the day?</td>
<td>3</td>
<td>12%</td>
<td>18</td>
<td>72%</td>
<td>4</td>
<td>16%</td>
</tr>
<tr>
<td>Does your facility place MRSA-positive patients on precautions?</td>
<td>15</td>
<td>60%</td>
<td>6</td>
<td>24%</td>
<td>4</td>
<td>16%</td>
</tr>
</tbody>
</table>

*Survey dates were June 2009 and October 2009.
Additional results not included in the tables are as follows:

For known MRSA-positive patients, 90% of the responding facilities dedicate equipment to the specific OR, and 100% clean nondedicated equipment between treating patients. About 67% do not isolate MRSA-positive patients from the common areas, and 56% dedicate a private room pre- and postoperatively for MRSA patients.

Conclusion

Pennsylvania ASFs are required to develop and implement an internal infection control plan that includes procedures for identifying and designating patients known to be colonized or infected with MRSA. Implementing and sustaining changes in practice, including new approaches to infection prevention and control, takes time and effort at all levels. The Authority plans to continue conducting educational programs on infection control for healthcare facilities, including ASFs, to foster improving best practices for the benefit of patient safety.

Notes

7. Joint Commission. NPSG.07.01.01 [online]. 2009 Jun 4 [cited 2010 Apr 26]. Available from Internet: http://www.jointcommission.org/AccreditationPrograms/LaboratoryServices/Standards/09_FAQs/NPSG/Healthcare_associated_infections/NPSG.07.01.01/Hand+hygiene.htm.
The Pennsylvania Patient Safety Authority is an independent state agency created by Act 13 of 2002, the Medical Care Availability and Reduction of Error (“Mcare”) Act. Consistent with Act 13, ECRI Institute, as contractor for the Authority, is issuing this publication to advise medical facilities of immediate changes that can be instituted to reduce Serious Events and Incidents. For more information about the Pennsylvania Patient Safety Authority, see the Authority’s Web site at http://www.patientsafetyauthority.org.

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The Institute for Safe Medication Practices (ISMP) is an independent, nonprofit organization dedicated solely to medication error prevention and safe medication use. ISMP provides recommendations for the safe use of medications to the healthcare community including healthcare professionals, government agencies, accrediting organizations, and consumers. ISMP’s efforts are built on a nonpunitive approach and systems-based solutions.