Infection Prevention In the Surgical Suite

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Objectives

- Understand the multidisciplinary factors impacting infection control in the OR.
- Define guidelines for prevention of surgical site infections.
- Identify common infection control related breaches in the OR.
Recommendation I

“A multidisciplinary team should establish cleaning procedures and frequencies in the perioperative practice setting.” (AORN, 2014, pg 256)

Recommendation II

“The patient should be provided with a clean, safe environment.” (AORN, 2012, pg 258)

Who’s on Your Team?

Recommendation III

“A clean environment should be reestablished after the patient is transferred from the area.” (AORN, 2014, pg 260)
Recommendation IV

“Perioperative areas should be terminally cleaned.” (AORN, 2014, pg 263)

Recommendation V

“All areas and equipment that are not terminally cleaned should be cleaned according to an established schedule.” (AORN, 2014, pg 264)

Recommendation VI

“All personnel should take precautionary measures to limit transmission of microorganisms when performing environmental cleaning and handling waste materials.” (AORN, 2014, pg 265)
Recommendation VII

“Procedures for environmental cleaning and disinfection should be established for circumstances that may require special cleaning procedures (ie, multidrug-resistant organisms, C difficile, prion diseases, construction, environmental contamination).” (AORN, 2014, pg 266)

Recommendation VIII

“Perioperative and environmental services personnel should receive initial and ongoing education and competency verification on their understanding of the principles and the performance of the processes for environmental cleaning in perioperative areas.” (AORN, 2014, pg 269)

Recommendation IX

“Policies and procedures for environmental cleaning processes and practices should be developed, reviewed periodically, revised as necessary, and readily available in the practice setting.” (AORN, 2014, pg 270)

Recommendation X

“Perioperative personnel should participate in a variety of quality assurance and performance improvement activities that are consistent with the health care organization’s plan to improve understanding of and compliance with the principles and processes of environmental cleaning.” (AORN, 2014, pg 270)
The Patient

Morbidity Obesity
- Extremes of Age
- Prolonged Preoperative Hospital Stay
- Infection at other sites
- Low albumin
- Cancer
- Poor Vascular supply to the wound

Your Patient After Surgery

Neutropenia
- Diabetes Mellitus
- Nicotine Use
- Steroid Use
- Preoperative Nasal Colonization of Staph Aureus
- Perioperative Transfusion
- Immunosuppressive Therapy

Pre-operative Assessment

Who’s in Your OR?
Are They Healthy?

- Staff with infectious disease should not be providing care
- Ensure everyone in your OR has had required immunizations and vaccinations
- Perform testing as needed to determine if staff are the carriers of MDROs

“S. aureus is carried in the nasal nares of 20% to 30% of healthy individuals, and this carriage has been found to be “the most powerful independent risk factor for SSI” in patients undergoing cardiothoracic surgery.” (AORN, 2014, pg 397)

Pharmacy

- Has the pharmacy staff been trained on sterile technique?
- Does your pharmacy comply with required testing for sterility especially in the hood room?
- Are sterile procedures actually performed in the designated areas?
- If you acquire compounded drugs, is the pharmacy accredited?

In 2013, JC issued 13 immediate threat to life discoveries. Seven of those situations were failures of sterilization or high-level disinfection.

Education

- Consider required certification for central sterile techs
- Education is required on hire and annually
- Encourage membership to AAMI
- Budget for outside educational opportunities
- Use your vendors

Joint Commission Alert

Studies are beginning to link infection rates to instrumentation and supplies not being ready in the OR when the patient arrives.
“Essentially every surgical site is contaminated with bacteria by the end of the procedure, but only a minority gets infected.”

Expansion of surveillance

- Historical focus of surveillance was focused on what happened during hospitalization
- Surveillance period extends beyond hospitalization because:
  - Patients spend a shorter time in the hospital
  - More surgeries are done in an ambulatory setting
- Capturing more data allows us to monitor changes in rate and improve our prevention strategies

“The probability of infection is determined by the interaction of four clinical variables:

- Inoculum of bacteria
- Virulence of bacteria
- Adjuvants in the microenvironment
- Efficiency of the host defenses”

Manage the events associated with causing infections and you will prevent Surgical Site Infections

- H—Hand Hygiene
- E—Environmental Cleanliness
- L—Leadership
- P—Proper Use of Personal Protective Equipment
- C—Consistent Evidence-Based Practices
- A—Antimicrobial Resistance Campaign
- R—Respiratory Hygiene and Cough Etiquette
- E—Evaluation

http://www.ahrq.gov/professionals/clinicians-providers/resources/nursing/resources/nurseshdbk/CollinsA_PHCAI.pdf
Minimize bacteria in the surgical site

Standard Precautions

“Standard Precautions include: 1) hand hygiene, 2) use of personal protective equipment (e.g., gloves, gowns, masks), 3) safe injection practices, 4) safe handling of potentially contaminated equipment or surfaces in the patient environment, and 5) respiratory hygiene/cough etiquette.”

Serious about Hand Washing

MetroHealth Medical Center in Cleveland, OH had an infection outbreak 2010 causing them to become more serious about hand washing. They hired 4 hand washing monitors. They now have 97.6% compliance with hand washing and have lowered their SSI rate by 64%.


Aseptic Technique

In the early 1800's hospitals were referred to as “houses of death” and surgical mortality was about 50% due to infections.

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2943454/

Caroline Hampton...future wife of Dr. William Halsted...was the first nurse to wear gloves in the operating room in 1889.

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2943454/


http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2943454/

Maybe doctors should wear gloves, too?

“In 1899, Bloodgood published a report on over 450 hernia operations with a near 100% drop in the infection rate by using gloves.”

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2943454/

<table>
<thead>
<tr>
<th>Major Site of Infection</th>
<th>Estimated No.</th>
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<tbody>
<tr>
<td>Pneumonia</td>
<td>157,500</td>
</tr>
<tr>
<td>Gastrointestinal Illness</td>
<td>123,100</td>
</tr>
<tr>
<td>Urinary Tract Infections</td>
<td>93,300</td>
</tr>
<tr>
<td>Primary Bloodstream Infections</td>
<td>71,900</td>
</tr>
<tr>
<td>Surgical site infections from any inpatient surgery</td>
<td>157,500</td>
</tr>
<tr>
<td>Other types of infections</td>
<td>118,500</td>
</tr>
<tr>
<td>Estimated total number of infections in hospitals</td>
<td>721,800</td>
</tr>
</tbody>
</table>

A 2012 study of traffic during total joint arthroplasties, it was determined that the door opened about 60 times during a 92 minute primary joint arthroplasty. During a 161 minute revision the door opens 135 times on average.


Minimize Traffic

A study discussed in the AORN text suggests “a relationship between the number and activity of team members in the periphery of the OR and the number of particulates and colony forming units at the surgical site.”
Consider delaying elective surgery when patient is hospitalized

Hospitalization prior to surgery appears to be a factor in the patient’s resistance to colonization and a predictor of higher infection rates.

Antibiotics

- SIP/SCIP has been in place for 10+ years
- No real impact on SSI rates
- Should be considered an adjunct to other methods of infection prevention

Neutralize bacteria that does access the surgical site

Other neutralizers...

- Antimicrobial suture
- Antibiotic or saline irrigation
Optimize host immune responses to potential pathogens

Maintain Core Temperature

Supplemental Oxygen

Blood Glucose Control
Delayed Wound Closure

Most Critical Component of Infection Prevention in the OR

- Surgical Scrub/Hand Antiseptic: 40%
- Patient Skin Prep: 35%
- Maintaining the Sterile Field: 25%
- Proper Barrier Protection/PPE: 20%
- Other: 15%

http://www.infectioncontroltoday.com/galleries/2013/03/infection-control-breaches-in-the-operating-room.aspx?pg=3#gallery

What would the OR like from you, the Infection Preventionist?

- Communicate More/Better with Perioperative Staff, 45%
- Provide More/Better Education for Perioperative Staff, 41%
- Conduct More/Better Observational Rounds in the OR, 61%
- Other, 15%

http://www.infectioncontroltoday.com/galleries/2013/03/infection-control-breaches-in-the-operating-room.aspx?pg=6#gallery

Common Breaches

- Too Much Traffic in the OR: 25%
- Sterile Field-Related Breach: 20%
- PPE-related Breach: 15%
- Breach of Infection Control Practices Overall: 10%
- Break in Technique: 5%

http://www.infectioncontroltoday.com/galleries/2013/03/infection-control-breaches-in-the-operating-room.aspx?pg=6#gallery
Resources
For the Presentation and For You

1. APIC Text of Infection Control and Epidemiology
3. Multiple online sources noted on individual slides