Surgical Site Infection Prevention: International Consensus on Process

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Key Elements in Reducing SSI

- Administrative Leadership and Support for Patient Safety Initiatives
- Staff Communications and Commitment to Patient Safety
  - Cleaning, Decontamination, and Sterilization
  - Patient Preparation
  - Standardized Perioperative Care
- Prevention of Surgical Site Infection
- Surveillance Activity Including Post-Discharge Follow-Up
Surgical Site Infection (SSI)

Surgical site infections (SSIs) have been an adverse outcome from surgery over the ages.
Surgical Site Infection Rates Through Time

- Hand hygiene
- Site preparation
- Delicate technique
- Antibiotic prophylaxis
- ICP training
- Surveillance
- SCIP
- SUSP

Timeline:
- 1850
- 1880
- 1900
- 1920
- 1940
- 1980
- 1990
- 2005
- 2010
- 2020
Who Develops SSIs?

- Age
- Sex
- Transfusion
- COPD
- Coagulopathy
- Diabetes
- Obesity
- malnutrition

- Smoking
- Prolonged Pre-Hospital Stay
- Remote Infection
- Colonization
- Dehydrated
- Cold
- Operative site unprepared
An Outline of the Lecture

• Surgical site infections are recognized as the most frequent and most costly healthcare associated infections
• Improving results depends upon measuring infection rates
• There is now a focus on process of care, checklists and other means of ensuring that key measures are provided
Effect of a Surveillance Program with Feedback

One point given for each of the following:

1. patient having an **American Society of Anesthesiologists (ASA)** preoperative assessment score of 3, 4, or 5
2. an operation classified as either **contaminated or dirty-infected**
3. an operation with **duration of > \( T \) hours**, where \( T \) is the 75\(^{th} \) percentile for the operative procedure being done
# Surgical Site Infection Rates in the US: NNIS 1992-2004

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Risk 0</th>
<th>Risk 1</th>
<th>Risk 2</th>
<th>Risk 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CABG</td>
<td>1.25</td>
<td>1.5</td>
<td>5.4</td>
<td>9.8</td>
</tr>
<tr>
<td>Small bowel</td>
<td>4.97</td>
<td>7.1</td>
<td>8.63</td>
<td>11.6</td>
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<tr>
<td>Abd hyster</td>
<td>1.36</td>
<td>2.3</td>
<td>5.17</td>
<td>---</td>
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<tr>
<td>Hip prosthesis</td>
<td>0.86</td>
<td>1.65</td>
<td>2.52</td>
<td>---</td>
</tr>
<tr>
<td>Laminectomy</td>
<td>0.88</td>
<td>1.35</td>
<td>2.46</td>
<td>---</td>
</tr>
<tr>
<td>Colorectal</td>
<td>3.98</td>
<td>5.66</td>
<td>8.54</td>
<td>11.25</td>
</tr>
</tbody>
</table>

Draft Guideline for the Prevention of Surgical Site Infection

Sandra I. Berríos-Torres, MD, Craig A. Umscheid, MD, MSCE, Dale W. Bratzler, DO, MPH, Brian Leas, MA, MS, Erin C. Stone, MS, Rachel R. Kelz, MD, MSCE, FACS, Caroline Reinke, MD, MPH, Sherry Morgan, RN, MLS, PhD, Joseph S. Solomkin, MD, John E. Mazuski, MD, PhD, E. Patchen Dellinger, MD, Kamal Itani, MD, Elie F. Berbari, MD, John Segreti, MD, Javad Parvizi, MD, Joan Blanchard, MSS, BSN, RN, George Allen, PhD, J. W. Kluytmans, MD, Rodney Donlan, PhD, William P. Schecter, MD and the Healthcare Infection Control Practices Advisory Committee
Preoperative Care

8A. Advise patients to shower or bathe (full body) with either soap (antimicrobial or non-antimicrobial) at least the night before the operative day (Category IB)

8B. Perform intraoperative skin preparation with an alcohol-based antiseptic agent, unless contraindicated. (Category IA)

8D. Use of plastic adhesive drapes with or without antimicrobial properties, is not necessary for the prevention of surgical site infection. (Category II)
Antibiotic Prophylaxis

• Optimal timing for administration is begin the infusion within 60 minutes of the incision (**Category IB**)

• Adjust dose based upon actual body weight (**No recommendation**)

• Administer additional antibiotics every 1-2 half-lives of agent used (**No recommendation/unresolved issue**)

• In clean and clean-contaminated procedures, do not administer additional prophylactic antimicrobial agent doses after the surgical incision is closed in the operating room, even in the presence of a drain. (**Category IA**)
What to Put In or On the Wound

9A. Consider intraoperative irrigation of deep or subcutaneous tissues with aqueous iodophor solution for the prevention of surgical site infection. Intra-peritoneal lavage with aqueous iodophor solution in contaminated or dirty abdominal procedures is not necessary. (Category II)

9B. Use of antimicrobial coated sutures is not necessary for the prevention of surgical site infection. (Category II)

9C. Do not apply antimicrobial agents (i.e., ointments, solutions, powders) to the surgical incision for the prevention of surgical site infection (Category IB)
Other Recommendations

• use blood glucose target levels <200mg/dL in diabetic and non-diabetic patients. (Category IA)

• To preserve blood flow to the wound, maintain perioperative normothermia (Category IA) and adequate volume replacement. (Category IA)

• For patients with normal pulmonary function undergoing general anesthesia with endotracheal intubation, administer increased fraction of inspired oxygen (FiO2) both intraoperatively and post-extubation in the immediate postoperative period for colorectal procedures.
How to Perform Surveillance with Limited Resources

• Choose a target procedure
  – Common
  – Clean/contaminated
  – High morbidity/mortality
SSI’s Following Cesarean Section

• Recent systematic reviews from the WHO have shown particularly high SSI rates in Sub-Saharan Africa, which appear due in large part to limited resources and a lack of access to information on appropriate perioperative care
• Cesarean section (CS) is one of the most common operations performed in Sub-Saharan Africa
• It accounts for as much as 30% of the surgical workload
• CS operations have been shown to be associated with high rates of infection
• CS operations in Sub-Saharan Africa have two to three times greater risk of infections than CS in high income countries
C/section Infection Rates from a Systematic Review

<table>
<thead>
<tr>
<th>(n)</th>
<th>Perinatal Deaths</th>
<th>SSI</th>
<th>Wound Infection</th>
<th>Endometritis</th>
<th>Sepsis, Wound Infection and Endometritis</th>
</tr>
</thead>
<tbody>
<tr>
<td>8278</td>
<td>6%</td>
<td>17.6%</td>
<td>9%</td>
<td>10.14%</td>
<td>21.30%</td>
</tr>
</tbody>
</table>

To be presented by Dr. Wanyoro
SSI Prevention Guidelines – WHO Perspectives

- Need for updated, evidence-based guidelines
- Valid for any country, but including specific issues depending on regional differences and/or peculiar to low-/middle-income countries
- Strong component on *implementation strategies and surveillance*
- Associated *implementation tools*
Conclusions

- Absence of data makes planning hierarchy of recommendations difficult
- Not obvious there is easy extrapolation of high income data (clean elective background) to low/middle income settings
- Implementation strategies will likely require surgical champions
Survey for Surgical Site Infections and Raffle for Mini-iPads