

Surgical Site Infections

An Update



Bronwen H. Garner, MD, MPH, Deverick J. Anderson, MD, MPH*

KEYWORDS

- Surgical site infection • Health care–acquired infection • Risk • Prevention
- Outcome

KEY POINTS

- Surgical site infections (SSIs) lead to adverse patient outcomes, including prolonged hospitalization and death.
- Wound contamination occurs with each incision, but proven strategies exist to decrease the risk of SSI.
- In particular, improved adherence to evidence-based preventative measures related to appropriate antimicrobial prophylaxis can decrease the rate of SSI.
- Aggressive surgical debridement and effective antimicrobial therapy are needed to optimize the treatment of SSI.

INTRODUCTION

Attempts at reducing the rate of surgical site infection (SSI) date to the early nineteenth century with the study of the epidemiology and prevention of “surgical fever” by James Young Hamilton.¹ Thereafter, Joseph Lister pioneered his use of antiseptic for the prevention of orthopedic SSIs in 1865. Fortunately, many other advances have been made in the field of surgery and infection control over the past 150 years. As medicine has advanced, however, new types of infection risks have developed. For example, over the past 50 years, the frequency of surgical procedures has increased, procedures have become more invasive, a greater proportion of operative procedures include insertion of foreign objects, and procedures are performed on an increasingly morbid patient population. As a result, SSIs remain a leading cause of morbidity and mortality in modern health care.

EPIDEMIOLOGY AND OUTCOMES

Epidemiology

SSIs are a devastating and common complication of hospitalization, occurring in 2% to 5% of patients undergoing surgery in the United States.² Approximately 160,000 to

Division of Infectious Diseases, Duke University Medical Center, Durham, NC, USA

* Corresponding author. Duke University Medical Center, DUMC Box 102359, Durham, NC 27710.

E-mail address: dja@duke.edu

Infect Dis Clin N Am 30 (2016) 909–929

<http://dx.doi.org/10.1016/j.idc.2016.07.010>

0891-5520/16/© 2016 Elsevier Inc. All rights reserved.

id.theclinics.com

300,000 SSIs occur each year. SSI is the most common type of health care–associated infection.^{3,4} *Staphylococcus aureus* is the most common cause of SSI, occurring in 20% of SSIs among hospitals that report to the Centers for Disease Control and Prevention (CDC) (**Table 1**),⁵ and causes as many as 37% of SSIs that occur in community hospitals.⁶ Methicillin-resistant *S aureus* (MRSA) remains a common pathogen in both tertiary care and community care settings; however, the prevalence rate of MRSA SSI is falling.⁷ SSIs due to gram-negative bacilli continue to comprise about 30% of overall SSI.

Outcomes

Surgical site infections cost

SSIs lead to increased duration of hospitalization, cost, and risk of death. Each SSI leads to more than 1 week of additional postoperative hospital days.^{8,9} The costs attributable to SSI range from \$10,000 to \$43,000 per patient per SSI, depending on the type of procedure and organism involved.^{10,11} In total, SSIs cost the US health care system approximately \$10 billion annually.¹⁰ SSI increases mortality risk 2- to 11-fold.¹² Moreover, 77% of deaths in patients with SSI are attributed directly to the SSI.¹³ SSIs caused by resistant organisms such as MRSA lead to even worse outcomes.^{14,15}

DIAGNOSIS

Most SSIs that do not involve implants are diagnosed within 3 weeks of surgery.¹⁶ The CDC’s National Healthcare Surveillance Network (NHSN) has developed standardized criteria for defining SSI (**Box 1**).¹⁷ SSIs are classified as either incisional or organ/space (**Fig. 1**). Incisional SSIs are further classified into superficial (involving only skin or subcutaneous tissue of the incision) or deep (involving fascia and/or muscular layers). Organ/space SSIs include infections in tissue deep to the fascia that was opened or manipulated during surgery. For all classifications, infection can occur within 30 days after the operation if no implant was placed or within 90 days if an implant was placed and the infection is related to the incision.¹⁸ NHSN defines

Table 1
Ten most common pathogens in surgical site infections among hospitals that report to the Centers for Disease Control and Prevention

Pathogen	Percent of Infections
<i>Staphylococcus aureus</i>	23
Coagulase-negative staphylococci	17
Enterococci	7
<i>Pseudomonas aeruginosa</i>	5
<i>Escherichia coli</i>	5
Streptococci	4
<i>Enterobacter</i> species	3
<i>Proteus</i> species	3
<i>Klebsiella pneumoniae/Klebsiella oxytoca</i>	3
<i>Serratia</i> species	3

Data from Berrios-Torres SI, Yi SH, Bratzler DW, et al. Activity of commonly used antimicrobial prophylaxis regimens against pathogens causing coronary artery bypass graft and arthroplasty surgical site infections in the United States, 2006-2009. *Infect Control Hosp Epidemiol* 2014;35(3):231–9.

Download English Version:

<https://daneshyari.com/en/article/8745971>

Download Persian Version:

<https://daneshyari.com/article/8745971>

[Daneshyari.com](https://daneshyari.com)