

Surgical Site Infection: A Challenge for Nursing

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Abstract

Surgical site infection (SSI) is defined as an infection that occurs in the part of the body where the surgery is done. It can be superficial, deep, and organ/space SSI. Surgical site infections lead to increased morbidity, mortality, length of stay, and cost of money each year. Our skin is a natural barrier against infection, and any surgery which causes breakage in the skin may lead to an infection. The chances of developing surgical site infection are 1% to 3% if you have surgery. Most SSIs can be treated with antibiotics, and sometimes additional procedures or surgery may be needed to treat them. Surgical site infection (SSI) usually occurs within 30 days after surgery if there is no implant or within 1 year if the implant is placed and involves any part of the anatomy other than the incision which was opened or manipulated during the surgery. There is a chance for SSI for the patient who is hospitalized 7 days longer, is 55% more likely to spend time in ICU, and is times more likely to be re-admitted.

Keywords: Surgical Site Infection; Superficial; Organ or Space SSI; Barrier; Surgery; Skin Preparation.

INTRODUCTION

Types of Surgical Site Infection

According to The Centers for Disease Control and Prevention (CDC) and National Nosocomial

Infections Surveillance System (NNIS), surgical site infection is divided into three types which are superficial SSI, deep SSI, and organ or space SSI.¹ Literature Survey conducted by Isik et al. reports the incident rate in superficial incisions is found to be 42.19%, which is more frequent, followed next in frequency by deep incisions having an SSI of 40.1%, while organ space shows a 17.71% rate of infection.

Superficial Incisional SSI

This infection occurs in the area of the skin where the incision was made. This involves the skin or subcutaneous tissue and occurs 30 days after surgery. These infections occur in more than 50% of all surgical infections. This can be diagnosed by a surgeon by doing the following observations. Signs and symptoms of localized pain or edema. Purulent

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drainage from the incision site should be done laboratory test (Culture). Isolated organism found in the laboratory test.²



Fig. 1: Source: <https://www.jaypeedigital.com/book/9789351527220/chapter/ch8>

Deep Incisional SSI

This infection occurs in muscle and the tissue surrounding the muscle beneath the incisional area. It mainly involves deep tissues, including muscles and facial planes.

Deep SSI occurs within 30 or 90 days after surgery, and the surgeon should identify this by checking the following things, the patient has signs and symptoms of fever, localized pain, or tenderness. Purulent drainage from the deep incision. The deep incision spontaneously dehisces. An organism is identified by a laboratory test, an abscess, or evidence of infection detected on an anatomical or histo-pathogenic exam.³

Organ or Space SSI

Organ or space surgical site infection occurs in any of the body other than skin, muscle, and surrounding tissue that was involved in the surgery, and it appears within 30 or 90 days after surgery. The patient has at least one of the following criteria to identify this type of SSI.

Purulent drainage from the drain, Organisms are identified by laboratory test. An abscess or evidence of infection is detected on anatomical or histo-pathogenic examination.

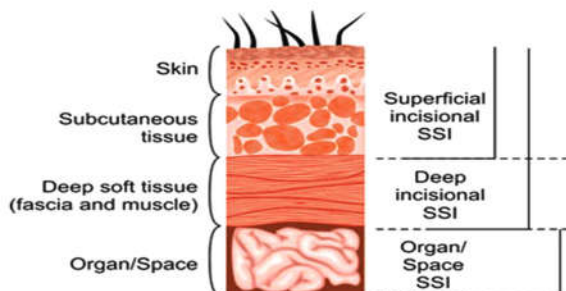


Fig. 2: Source: <https://www.jaypeedigital.com/book/9789351527220/chapter/ch8>

Risk Factors of Surgical Site Infection

The main risk factors of SSI related to the patient are increasing age, poor glucose control, obesity, renal failure, and immune suppression.⁴ The operation factors for SSI include preoperative shaving, length of operation, use of antimicrobial prophylaxis, appropriate skin preparation, and appropriate gowning and sterile technique during surgery. Other risk factors include a Compromised state of health before surgery, chronic illnesses, an unhealthy lifestyle, and advanced age. Most infections are due to germs found on and in a patient's body that enter the surgical site. Outside sources of contamination-surgical personnel, surgical environment, instruments, and air.⁵

PREVENTION

Prevention can be done in three stages preoperative, intraoperative, and post-operative.

PRE-OPERATIVE PHASE

- In the preoperative phase, the main preventive methods are as follows
- Identify and treat all infections before elective operations.
- Good control of diabetics.
- Keep hospital stay minimum.
- Remove hair before surgery on the incision site. Hair has often been perceived to be associated with a lack of cleanliness, and its removal is linked to infection prophylaxis. Numerous randomized controlled trials have evaluated the practice of preoperative hair removal and its association with surgical site infections.⁶
- Use an antiseptic for skin preparation. The purpose of preoperative skin antiseptics is to remove dirt and transient organisms from the skin. The skin is a dynamic home for a large number of bacteria, with up to 3 million microorganisms on every square centimeter of skin.⁷
- Perform preoperative surgical scrub before surgery using an appropriate antiseptic.
- Administer prophylactic antibiotics according to local policy.
- Determine the level of experience of the

surgeon.

- Encourage smoking cessation 30 days before elective surgery.

INTRA-OPERATIVE PHASE

The intra-operative phase is as follows

- Always use a surgical checklist before surgery to ensure compliance with best practices.
- Limit the duration as much as possible.
- Sterile all surgical instruments with the proper sterilization technique.
- Maintain a positive pressure ventilator in the operating room. Keep the operating room closed and restrict entrance to the operating room to necessary personnel only and minimize the movement as much as possible.
- Wear a sterile gown and gloves. Wear a surgical mask and cap or hood to fully cover your hair. Several studies have questioned whether the routine use of surgical masks in the operating room reduces the risk of surgical site infection.⁸
- Keep the patient body temperature between 36.5 and 37 degrees Celcius during the surgical procedure.
- Maintain effective homeostat, and minimize devitalized tissue and foreign bodies.⁹ Keep the glycemia level to below 200 mg/dl during operation.
- Avoid artificial nails among the surgical



Fig. 3: Source: <https://www.dreamstime.com/photos-images/surgery-hand-washing.html>



Fig. 4: Source: <https://www.dreamstime.com/photos-images/surgery-hand-washing.html>

team.

- Do not perform special cleaning or closing of the operation room after contaminated surgeries.

Post-Operative Phase

- Do not touch the wound site unnecessarily and always wear sterile gloves and sterile technique to dress the wound.
- Check the drain regularly and empty it regularly.
- Maintain Normothermia (>96.8)- Hypothermia impairs the patient's immune function and causes vasoconstriction at the incision site.
- Use proper hand hygiene.

- Maintain sterile dressing as directed. Ensure delivery of antibiotics as directed.
- Monitor and Maintain adequate blood glucose control.

Provide Balanced Nutrition operation room and Equipment Cleaning

- Clean operation room between each procedure, Terminal cleaning daily is critical in preventing healthcare associated infections.
- Dust contains human skin and hair, fabric fibers, pollens, mold, fungi, glove powder, and paper fibers.
- Disinfect non-critical equipment. Equipment should be disassembled, cleaned, disinfected, cleaned with an EPA-registered disinfectant, and dried before reuse and/or storage.
- Sterilization of Critical equipment/ supplies.
- High.level disinfection.

Discharge Instructions

- Dressing maintenance
- Proper incision care
- Symptoms and reporting of SSI
- Hand Hygiene at home before and after dressing changes and any contact with the incision site
- Nutrition guidelines
- Medications
- Blood glucose monitoring
- Bathing instructions
- Follow-up appointments

CONCLUSION

Surgical site infections result in significant patient morbidity and mortality and increased hospital costs. The infection can be achieved by strict adherence to standard surgical guidelines and proper use of surgical prophylaxis crucial to maintaining a low rate of SSIs. Surgical site infections can be reduced with several interventions. With these encouraging results, good practices should be sustained and promulgated. Such an SSI prevention program must be embedded in the work processes of all surgical disciplines.

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