A surgical wound is a cut or incision in the skin that is made by a sharp surgical instrument during a surgical procedure.
Surgical wounds
Surgical Site Infections (SSI) are the most common and costly of all hospital acquired infections, accounting for 20 percent and causes increase in the length of hospital stay by 9.7 days. Incidence of SSIs in the U.S. is costing approximately $3.5 billion to $10 billion annually.
A surgical site infection is an infection that occurs after surgery in the part of the body where the surgery took place.
Surgical site infections

SSIs are associated with considerable morbidity and mortality, it can range from a relatively insignificant wound discharge with no other complications to a life-threatening condition.
Surgical site infections

Other clinical outcomes of SSIs include poor scars that are cosmetically unacceptable, hypertrophic or keloid, persistent pain and itching, restriction of movement, particularly when over joints, and a significant impact on emotional wellbeing.
Surgical site infections
Surgical site infections
Surgical site infections
Surgical site infections
Surgical technology

Advanced medical technology has introduced laparoscopic and other minimally invasive surgical procedures; which are performed through a small incision, thereby reduces the morbidity and complications associated with large open wounds.
Surgical technology

Laparoscopy is a surgical procedure performed through a small incision (usually 0.5–1.5 cm) with the aid of a camera. This procedure is also called minimally invasive surgery (MIS).
The classes of surgical wounds allow health care professionals to better predict the risk of infections and wound healing outcomes, thereby allowing optimal treatment for each type of surgical wound.
According to the American College of Surgeons; there are four classes of surgical wound types based on the wound’s level of contamination:

1. Clean
2. Clean-Contaminated
3. Contaminated
4. Dirty-Infected
Classes of surgical wounds

CLASS I : CLEAN SURGICAL WOUNDS

Surgical wounds in which no signs of sustained inflammation is encountered and do not involve the respiratory, gastrointestinal or genitourinary tracts. These wounds are primarily closed and drained with closed drainage, if necessary. Laparoscopic surgeries, surgeries involving the skin (such as biopsies), eye or vascular surgeries are good examples.
Classes of surgical wounds

CLASS I: CLEAN SURGICAL WOUNDS
Classes of surgical wounds
CLASS II: CLEAN-CONTAMINATED SURGICAL WOUNDS

Class II Surgical wounds are with a higher risk of infection such as gastrointestinal, respiratory or genitourinary tracts, as long as the surgery is uncomplicated. The surgical procedures involving the biliary tract, appendix, vagina, and oropharynx are included in this classification if no evidence of infection is encountered and no major break in technique happens. Any wound opened to remove pins or wires, chest procedures, ear surgeries or gynecologic procedures are also considered as Class II Surgical Wounds.
Classes of surgical wounds

CLASS II: CLEAN-CONTAMINATED SURGICAL WOUNDS
Classes of surgical wounds

CLASS III: CONTAMINATED SURGICAL WOUNDS

Class III Surgical wounds are open or accidental wounds; involving outside object’s contact with the wound such as, bullet, knife blade or other pointy object. Further; surgical procedures in which a major break in sterile technique happens or when gross spillage from the gastrointestinal tract and the incisions in which acute, non purulent inflammation is encountered are included in this category.
Classes of surgical wounds

CLASS III: CONTAMINATED SURGICAL WOUNDS
Classes of surgical wounds

CLASS III: CONTAMINATED SURGICAL WOUNDS
Classes of surgical wounds

CLASS IV: DIRTY OR INFECTED SURGICAL WOUNDS

Class IV Surgical wounds includes traumatic wounds with retained or devitalized tissue and wounds that involve existing clinical infection or perforated viscera.
Classes of surgical wounds

CLASS IV: DIRTY OR INFECTED SURGICAL WOUNDS
SKIN: A PROTECTIVE BARRIER

Skin, a cutaneous membrane covers the external portion of the human body. As long as skin remains intact, it provides an effective barrier against the entry of potential pathogens into the body.
SURGICAL INCISIONS: RISKS

Regardless of the size and location, all incisions carry the risk of wound infection.
SURGICAL INCISIONS: RISKS

CONTAMINATION

COLONIZATION

CRITICAL COLONIZATION

Infection
FACTORS AFFECTING WOUND HEALING

1) Malnutrition
2) Immunosuppression
3) Recent Chemotherapy
4) Chronic Anti Inflammatory Therapy
5) Smoking
6) Uncontrolled Diabetes Mellitus
7) Obesity
8) Advanced Age
9) Long term use of Anticoagulation medications
TYPES OF WOUND HEALING

PRIMARY INTENTION

Describes a wound closed by approximation of wound margins or by placement of a graft or flap, or wounds created and closed in the operating room.
SECONDARY INTENTION

Describes a wound left open and allowed to close by granulation, contraction and epithelialization.
TERTIARY INTENTION

Delayed closure or partial closure. Often used for infected wounds where bacterial count contraindicates primary closure. Wound edges are approximated within 3–4 days and tensile strength develops as with primary closure.
PHASES OF WOUND HEALING
FOUR (4) PHASES

- HEMOSTASIS
- INFLAMMATION
- PROLIFERATION
- MATURATION
PHASES OF WOUND HEALING

HEMOSTASIS

Hemostasis occurs within minutes of the initial injury. The platelets' primary role is to form a stable clot sealing the damaged vessel. Platelets also secrete factors which in turn initiate the formation of fibrin from fibrinogen. The fibrin mesh strengthens the platelet aggregate into a stable hemostatic plug.
PHASES OF WOUND HEALING

INFLAMMATION

Redness, swelling, warmth and pain. Duration up to 4-7 days post injury, the neutrophils; aided by local Mast cells, phagocytize debris and microorganisms and provide the first line of defense against infection.
PHASES OF WOUND HEALING

PROLIFERATION

Starts on the 4th day and lasts for up to 21 days in acute wounds. Clinically characterized by the presence of granulation tissue and wound contraction. Marginal epithelial cells migrate to proliferating over the connective tissue to fill the wound.
PHASES OF WOUND HEALING

MATURATION

The maturation phase starts around day 21 and can last up to 2 years after the injury. Fibroblasts continue to synthesize collagen and make the scar tissue stronger. Scar tissue gains 80% of the tensile strength after the completion of maturation phase. Maturation phase is also called “Remodeling Phase”.

www.woundcarenurses.org
POST SURGICAL WOUNDS

The sterilizing prep to the skin prior to the incision destroys any bacteria presence on the surface, however new bacteria migrate up from the intradermal glands within hours. The use of electrocautery shall be minimized during the surgery since necrotic fat also promotes postop infections. Subcutaneous fat is poorly vascularized and provides ideal conditions for bacterial growth and abscess formation.
Assessment: signs & symptoms

POST SURGICAL WOUNDS

Erythema (Redness), Edema,
Moderate to Severe Pain (>5),
High or low temperature, Low Blood Pressure, or
a fast heart rate (Tachycardia)
Discharge & odor from the wound
Increased swelling & warmth
Assessment: **signs & symptoms**

POST SURGICAL WOUNDS
## Management strategies

### POST SURGICAL WOUNDS

**Anti-microbial wound cleansers**

The use of topical antimicrobial cleansing solution is proven to be an important step in minimizing surgical site infections. Further, normal saline cleansing is not effective in reducing wound bioburden, and comparatively, a broad spectrum antimicrobial topical solution is proved to be effective measure in reducing bioburden and stimulate healthy wound healing.
Management strategies

POST SURGICAL WOUNDS

Anti-microbial wound cleansers

* Betadine Solution
* Hypochlorous Acid
* Sodium Hypochlorite
* Allantoin 0.5%, benzethonium chloride 0.1% Solution
* Chlorhexidine Gluconate (CHG) Solution
* PHMB (Polyhexanide), Betaine Solution
* Benzalkonium Chloride
Management of Surgical Wounds

POST SURGICAL WOUNDS

Management strategies

Anti-microbial dressings

Surgical site dressing must be carefully considered based on following criteria:

- **Location of the Wound** | Dressings available in different shapes
- **Drainage** | Dressing shall be able to accommodate drainage.
- **Anti-microbial Dressing** | Allows dressing to be change q 72 hrs.
- **Promotes Vapor Transfer** | Occlusive dressings are not preferred.
Management strategies

POST SURGICAL WOUNDS

Anti-microbial dressings

- 8cm x 8cm
- 10cm x 10cm
- 12.5cm x 12.5cm
- 17.5cm x 17.5cm
- 25cm x 30cm

- 8cm x 13cm
- 10cm x 20cm
- 10cm x 25cm
- 10cm x 30cm
- Heel 19.8cm x 14cm
- Sacral 20cm x 16.9cm
- Sacral 24cm x 21.5cm
Management strategies
POST SURGICAL WOUNDS
Management strategies
POST SURGICAL WOUNDS
REFERENCES

Loyola University Health System. Surgical site infections are the most common and costly of hospital infections: Guidelines for preventing surgical site infections are updated." ScienceDaily. 19 January 2017. https://www.sciencedaily.com/releases/2017/01/170119161551.htm

