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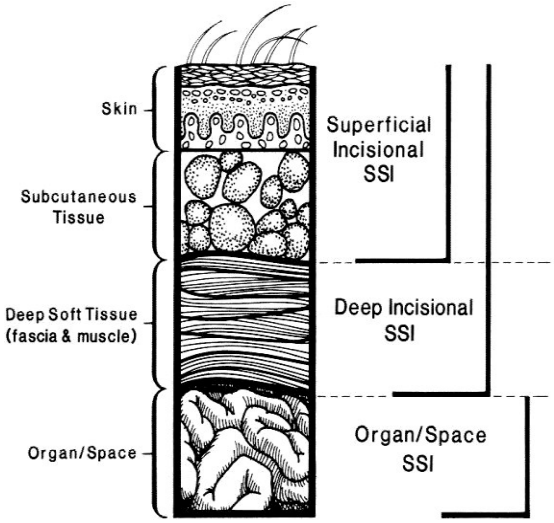
UCSF Surgical Site Infection Prevention Guidelines: Adult Services

I. Introduction

Surgical site infections (SSIs) are common and can be associated with substantial morbidity, mortality, increased length of hospital stays, and can require reoperations and readmissions. Up to 60% are preventable using evidence-based SSI prevention practices. Based on the Centers for Disease Control and Prevention's (CDC) National Healthcare Safety Network (NSHN) definitions, SSIs are classified as superficial incisional, deep incisional, and organ-space infections. UCSF Hospital Epidemiology and Infection Prevention (HEIP) performs ongoing SSI surveillance for 31 NHSN procedure categories.



Modified from: Horan TC et al. CDC

II. Prior to surgery

a. Preoperative chlorhexidine (CHG) bathing/showering

   i. Patients at home: Instruct patients to shower with 4% CHG soap at home at least two times during the days leading up to surgery (ideally the night before and the morning of surgery). See appendix A for detailed patient instructions.
      1. Patients who have access to 2% CHG-impregnated wipes can use these instead of 4% CHG soap.
   ii. Patients hospitalized prior to surgery: Use 2% CHG-impregnated wipes to fully bathe patients (including, ideally, the night before and the morning of surgery). One full set of CHG cloths should be used for each bath using the UCSF Chlorhexidine Gluconate Therapy nursing procedure. Also see appendix B.

b. Colorectal surgery: Mechanical bowel preparation and oral antibiotics
   i. Instruct patients scheduled for colorectal surgery to perform a preoperative mechanical bowel prep and to take 3 doses of oral neomycin + metronidazole prior to surgery. See details here.

III. Preoperative—Day of surgery

a. Preoperative CHG bathing
   i. For patients who have not showered/bathed with CHG prior to surgery, bathe the patients with 2% CHG-impregnated wipes in the preoperative holding area, if feasible. See appendix B for detailed instructions.

b. Nasal decolonization for select surgical procedures at relatively high risk for severe *Staphylococcus aureus* SSIs (e.g., cardiac surgery, hip and knee arthroplasty, spinal fusion, orthopedic trauma surgery, and craniotomy)
   i. On the day of surgery, administer nasal povidone iodine prior to leaving the preoperative holding area.

ii. Postoperatively, patients should ideally continue to receive nasal povidone iodine twice daily to complete a total of 5 days or until hospital discharge (whichever comes first).

c. Do not remove hair at the operative site unless the presence of hair will interfere with the surgical procedure.

IV. Perioperative

a. Perioperative antimicrobial prophylaxis
   i. Administer perioperative antimicrobial prophylaxis in accordance with UCSF adult antimicrobial surgical prophylaxis guidelines.
   ii. Discontinue antimicrobial prophylaxis after incision closure in the OR.

b. Surgical hand hygiene and surgical attire
   i. Adhere to the UCSF Hand Hygiene Policy and Surgical Attire Policy for Operating Rooms and Procedural Areas.

c. Skin preparation prior to incision
   i. Use a preoperative skin prep agent that combines alcohol and a long-acting skin antiseptic (e.g., Chloraprep, Duraprep) unless there are contraindications.
   ii. Apply the antiseptic skin prep in accordance with manufacturer's instructions.

d. Preoperative vaginal preparation prior to cesarean section and hysterectomy
   i. In addition to skin prep at the incision site, use either a chlorhexidine- or povidone-iodine-containing (without alcohol) vaginal prep agent immediately before cesarean section or elective hysterectomy.

e. Wound protectors for gastrointestinal and biliary tract surgery
   i. Use impervious plastic wound protectors for gastrointestinal and biliary procedures.

f. Normothermia
   i. For procedures not requiring hypothermia, maintain normothermia (temperature ≥36°C/96.8°F) during the perioperative period. See Perioperative Warming of Patients Policy for details.

g. Intraoperative antiseptic lavage of deep incisions
   i. Consider performing intraoperative deep incisional wound irrigation with sterile dilute povidone-iodine lavage (e.g., 30 mL sterile 10% povidone-iodine (from a sterile pack) mixed with 1 liter of 0.9% saline).

h. Glycemic control
   i. Maintain postoperative blood glucose levels between 110-150 mg/dL during the 24-48 hours following surgery.

i. Antiseptic-impregnated sutures
   i. Consider the use of antiseptic (i.e., triclosan)-impregnated sutures.

j. Handling of surgical instruments
   i. Consider using a separate, dedicated sterile incision closure tray for incision closure for colorectal surgery.

ii. During the procedure, prevent accumulation and drying of blood and tissue by wiping surgical instruments with a sponge moistened with sterile water or rinsing in a basin of sterile water.
iii. Use sterile water to irrigate instruments with lumens to keep lumens free of debris.
iv. Promptly clean surgical instruments handed off the surgical field by removing visible blood and tissues, ensuring that hinged devices are open, and coating instruments with a hospital-approved surfactant-based product (e.g., Ecolab OptiPro gel spray) before transport to the Sterile Processing Department (SPD). See Instrument Care and Handling Procedure for details.

k. Minimize traffic in the OR
   i. See Traffic Patterns for Restricted and Semi-Restricted Areas in the Operating Rooms Policy.

V. Postoperative

a. Glycemic control
   i. Maintain postoperative blood glucose levels between 110-150 mg/dL during the 24-48 hours following surgery.
b. Continue daily CHG therapy until hospital discharge.

VI. Environmental cleaning and disinfection of the OR environment

a. Hospitality Services and perioperative personnel, including nursing, surgeons/surgical technicians, and anesthesiologists/anesthesia technicians, are responsible for ensuring adequate environmental cleaning and disinfection of the ORs.
   i. Required cleaning and disinfection procedures include those outlined here.

References

1) Berrios-Torres SI, Umscheid CA, Bratzler D, et al. Centers for Disease Control and Prevention guideline for prevention of surgical site infections. JAMA 2017;152:784-791.
2) Calderwood MS, Anderson DJ, Bratzler DW, et al. SHEA/IDSA/APIC Practice Recommendations. Strategies to prevent surgical site infections in acute care hospitals: 2022 Update. Infect Control Hosp Epidemiol 2023;44:s100-2125.

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Appendix A: Patient instructions for showering with 4% CHG soap at home

If possible, use a new **mesh sponge** instead of a bathing cloth. This will help the soap to lather.

1. Use your usual shampoo/conditioner. When rinsing, try to keep off skin.
2. Wet the **mesh sponge** and apply CHG soap. Rub to make bubbly. The mesh sponge helps make bubbles and is the best way to apply the soap.
3. Firmly massage the CHG soap onto your face with the sponge.
    - **Avoid eyes and ear canal, as with any body wash.**
    - If you get soap into your eyes, flush with water.
4. Rinse face with water.
5. **Turn OFF the water** and **FIRMLY MASSAGE** CHG soap onto body skin with the mesh sponge in the following order:
    a. Neck, with special attention to all skin folds
    b. Chest and back
    c. Arms and legs
    d. Hip and groin
    e. Genitals and buttocks
7. Massage the CHG soap for **2 minutes** to all body parts. 2 minutes is the time it takes to apply body wash to the entire body **TWICE** before rinsing.
8. Rinse body and pat dry with clean towel.
    - **IMPORTANT:** When washing towels or bathing cloths in the laundry, use hot water and **DO NOT ADD BLEACH** until you are no longer using the CHG soap. When mixed together, bleach and this CHG soap can sometimes form a brown stain due to a chemical interaction. It is not dangerous, but it is a stain.
    - You do not have to worry about this interaction once you are dry. Your clothes and bed sheets will not have problems with bleach.
9. Rinse mesh sponge and hang dry.

Appendix B: Staff instructions for use of CHG wipes prior to surgery

- Remove one set of warmed packets (3 packets in a set, 2 cloths per packet for a total of 6 cloths) of 2% CHG cloths from the warmer.
- If the patient wishes to self bathe, provide verbal instructions, and assist with hard to reach areas. Self-bathers will need assistance with cleansing of any wounds and devices.
- Use ALL of the 6 cloths for bathing the following body areas. Both sides of the cloth should be used.
- Ensure that cloths are applied to skin by firm massage to ensure binding of CHG to skin proteins, which allows it to continue to kill germs for a minimum of 24 hours.
    - Cloth 1: Neck, and chest. Avoid eyes and ears.
    - Cloth 2: Both shoulders, arms, and hands
    - Cloth 3: Abdomen and then groin/perineum
    - Cloth 4: Right leg and foot

    - Cloth 5: Left leg and foot
    - Cloth 6: Back of neck, back and then buttocks
- After use on assigned part of body, use a clean part of the cloth to clean devices on that part of the body within 6 inches of the patient, including central lines, urinary catheters, drains, G-tube/J-tubes, rectal tubes, chest tubes.
- Wipe over non-gauze dressings. This will help remove bacteria where devices penetrate the skin. CHG is safe on devices and can be used over occlusive and semi-occlusive dressings.
- Allow to dry naturally. Do not wipe off.
- CHG cloths have moisturizers. If additional moisturizer or lotion is needed, only use lotions that are compatible with CHG.
- Dispose of CHG cloths in trash. Do not flush in toilet.