Surgical asepsis: Maintaining a sterile field

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Introduction

One of the most important objectives for a surgical team is to prevent infection in a patient undergoing surgery. Following surgical asepsis practices for setting up and maintaining a sterile field ensures that infectious agents are kept away from the surgical incision, preventing microorganisms from entering the wound. The Association of PeriOperative Registered Nurses has developed standards and recommendations for setting up and maintaining a sterile field.[1]

Equipment

- Cap, mask, eye protection, and other necessary surgical attire
- Sterile drapes
- Sterile gloves
- Sterile gown
- Sterile supplies and instruments, as required for the procedure

Preparation of Equipment

Check each package carefully. Don't use any package that's open, has a hole or tear, or is wet or stained; instead, obtain a new package for use during the procedure. Check any item that has an expiration date *to ensure that it hasn't expired.* If a product is expired, is defective, or has compromised integrity, remove it from patient use, label it as expired or defective, and report the expiration or defect as directed by your facility. Ensure that the sterilization tape or external chemical indicator has turned the appropriate color before placing equipment on the sterile field. For trays packed in rigid containers, inspect the filters on the lid and in the body of the container. Prepare a clean surface to set up equipment for the sterile procedure.

Implementation

- Remove all jewelry from your hands and forearms.[1]
- Gather and prepare the necessary equipment and supplies.
- Perform surgical hand asepsis before putting on sterile attire *to reduce the number of infectious organisms on the hands and reduce the risk of transmitting infectious agents.* (See the "Surgical asepsis: Hand scrub" procedure.)[1][2]
- Put on surgical attire *to reduce the transmission of infectious agents from surgical team members to the patient.* (See the "Surgical asepsis: Surgical attire" procedure.)[1][3]
- Put on a sterile gown and sterile gloves in a sterile area away from the instrument table.[1]
- Keep your hands in front of your body and at the level of your chest to the level of the sterile field *because areas above the chest and below the sterile field aren't considered sterile.*[1]

- Set up the sterile field in the area in which it will be used as close to the time of use as possible *to reduce the risk of contamination.* Don't move the sterile field to another room.[1]
- Use only sterile items and instruments within the sterile field *to maintain the integrity of the field.*[1]
- Inspect all instruments for foreign materials, dried blood, tissue, and bone. If present, consider the entire tray of instruments contaminated and have it immediately replaced.[1]
- Place the sterile procedure pack on a clean, dry table, *because moisture under the sterile pack could result in moisture strikethrough, contaminating the sterile items.*
- Place sterile drapes over the patient, tables, and any equipment used in the sterile field *to avoid the transmission of microorganisms.*[1][4]
- Avoid touching and moving sterile drapes as much as possible *to reduce the risk of contaminating them. Air movement can cause currents that stir up dust and other particles.*[1]
- Place a sterile drape from the surgical site outward *to reduce contamination of the site.*[1]
- When placing a drape, cuff the drape over sterile-gloved hands *to avoid contaminating the gloves on unsterile surfaces.*[1]
- Add sterile items to the sterile field following basic sterile technique. (See the "Sterile technique, basic" procedure.)[1]
- Don't touch the drape extending over the side of the table, *because only the top surface of a sterile draped table is considered sterile.*[1]
- If direct contact, a tear in the wrapper, or moisture as a result of strikethrough to the package or drape permeates a sterile barrier, consider the item contaminated. Correct the situation immediately unless the patient's safety is at risk.[1]
- Don't touch the edges of a sterile package wrapper, *because they aren't considered sterile.* Use the inner edge of a heat-seal package as the line of demarcation.
- Secure all cables and tubing for equipment to the sterile field with nonperforating devices, *because a perforated barrier is considered contaminated.*[1]
- To pour a solution, the scrubbed (sterile) person should hold the labeled solution receptacle away from the table or set it to the edge of the waterproof draped table for the unsterile person to pour *so that the unsterile person doesn't have to reach across the sterile field.*[1][5]
- Control movement around the sterile field *to avoid contamination.* Unsterile people should face a sterile field when walking around it and should never walk between two sterile fields. If sterile people need to change positions, they should pass front-to-front or back-to-back.[1]
- Constantly monitor the sterile field. Notify other people in the operative suite of any breaks in sterile technique and correct the situation immediately.[1]
- Keep conversation to a minimum *to avoid the transmission of microorganisms through droplets.*[1]

Special Considerations

- At the start of the day, all horizontal surfaces must undergo damp-dusting with a facility-approved antimicrobial cleaning agent. Some facilities have environmental services staff members perform this task before the beginning of the day.[6]
- Sterile team members may touch only sterile items and areas. Unsterile team members may touch only nonsterile items and areas and must remain as far back from the sterile field as possible.[1]
- Limit the number of people and their movement in the operating suite, *because bacterial shedding increases with activity.*[1]

- Keep the door to the operating room suite closed and minimize traffic in and out of the suite *to decrease airborne contaminants*.[1]
- Consider any item that comes in contact with an area of questionable cleanliness contaminated. When in doubt about the sterility of an item, consider the item contaminated.[1]
- If a procedure involves different wound classifications, keep the sterile fields and instruments separated *to prevent contamination of the cleaner wound*.[1]
- Cover a sterile field with sterile drapes if it won't be used immediately because of a procedural delay, if the sterile field will be used for closure, or when multiple tables are in use *to decrease the risk of contamination.* Also use a cover when there is increased activity, such as before the first incision and during repositioning of the patient. A section of a sterile field that is in use may be covered to protect items not immediately necessary, such as surgical implants. If the sterile field is covered with a sterile drape, it should be done so that the drape can be removed without compromising the sterility of the field.[1]
- Correct any break in sterile technique immediately *to reduce the risk of transmitting microorganisms to the patient*.[1]

Documentation

Documentation associated with maintaining a sterile field for surgical asepsis includes breaks in the sterile field (if applicable) and measures taken to regain sterility and prevent infection, as directed by your facility.[1]

Related Procedures

- Draping for abdominal surgery
- Draping for bariatric surgery
- Draping for brain or cranial surgery
- Draping for cardiac surgery
- Draping for ear surgery
- Draping for gynecologic surgery
- Draping for nasal surgery
- Draping for ophthalmic surgery
- Draping for reconstructive surgery
- Draping for thoracic surgery
- Draping for throat surgery
- Draping for total joint surgery
- Draping for transplant surgery
- Draping for trauma surgery
- Draping for urologic surgery
- Draping the Mayo stand
- Drying hands and arms, OR
- Gowning and gloving, assisting
- Hand antisepsis, OR
- Immediate-use steam sterilization, OR
- Steam sterilization
- Steam sterilizer use and care, OR
- Sterile field management, OR
- Sterile technique, basic
- Sterile technique, basic, home care
- Sterilization of instruments using an autoclave, ambulatory care
- Surgical asepsis: Hand scrub
- Surgical asepsis: Surgical attire
- Surgical attire, donning
- Surgical hand scrub, neonatal

- Surgical scrub, OR

References

(Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions)

1. Guideline for perioperative practice: Guideline for sterile technique. (2025). In E. Kyle (Ed.), *Guidelines for perioperative practice, 2025 edition.* AORN, Inc. (Level VII)
2. Guideline for perioperative practice: Guideline for hand hygiene. (2025). In E. Kyle (Ed.), *Guidelines for perioperative practice, 2025 edition.* AORN, Inc. (Level VII)
3. Guideline for perioperative practice: Guideline for surgical attire. (2025). In E. Kyle (Ed.), *Guidelines for perioperative practice, 2025 edition.* AORN, Inc. (Level VII)
4. World Health Organization. (2018). *Global guidelines for the prevention of surgical site infection* (2nd ed.). Retrieved April 2025 from https://iris.who.int/bitstream/handle/10665/277399/9789241550475-eng.pdf?sequence=1 (Level VII)
5. The Joint Commission. (2025). Standard NPSG.03.04.01. *Comprehensive accreditation manual for hospitals.* (Level VII)
6. Guideline for perioperative practice: Guideline for environmental cleaning. (2025). In E. Kyle (Ed.), *Guidelines for perioperative practice, 2025 edition.* AORN, Inc. (Level VII)

Additional References

- Association of Surgical Technologists. (2019). *Guidelines for best practices for establishing the sterile field in the operating room.* Retrieved April 2025 from https://www.ast.org/uploadedFiles/Main_Site/Content/About_Us/Guidelines%20Est

Rating System for the Hierarchy of Evidence for Intervention/Treatment Questions

The following leveling system is adapted from *Evidence-Based practice in nursing & healthcare: A guide to best practice,* Fifth edition, by Bernadette Mazurek Melnyk and Ellen Fineout-Overholt (2023).

Level I	Evidence from a systematic review or meta-analysis of all relevant randomized controlled trials (RCTs)
Level II	Evidence from well-designed single RCTs (experimental)
Level III	Evidence from well-designed nonrandomized controlled trials (quasi-experimental), systematic reviews of a complete body of evidence, and intervention studies using mixed methods
Level IV	Evidence from well-designed case-control and cohort studies (observational)
Level V	Evidence from systematic reviews of qualitative and descriptive studies
Level VI	Evidence from single descriptive and qualitative studies, evidence-based practice implementation, and quality improvement projects
Level VII	Evidence from expert opinion, expert committee reports, and literature reviews

Data from Gyatt, G., & Rennie D. (2002). Users' guides to the medical literature. American Medical Association; Harris, R. P., et al. (2001). Current methods of the U.S. Preventative Services Task Force: A review of the process. American Journal of Preventative Medicine, 20, 21-35.