MODULE 1

ASEPSIS & INSTRUMENT IDENTIFICATION
Part One of Two

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I. OBJECTIVES

At the end of this session the resident will be able to perform:

1. Sterile gloving technique using the open method.
2. Sterile gloving technique using the closed method.
3. Correct prepping and draping for maintaining a sterile field.
4. Removal of dirty gown, gloves, and mask.
5. Identification of common instruments.

II. ASSUMPTIONS

This session is focused on the technical skills required to produce and maintain a sterile, aseptic operative field, safe patient positioning, and instrument identification.

Prerequisite knowledge:

- Principles of asepsis
- Surgical scrub

III. SUGGESTED READINGS

References:


IV. DESCRIPTION OF LABORATORY MODULE

After an overview of important indications and principles of aseptic technique participants will rotate through the following stations:

1) Gowning and Gloving
2) Prepping and Draping
3) Instrument Identification and Handling
V. DESCRIPTION OF TECHNIQUES AND PROCEDURE

Gowning and Gloving

Prepping and Draping

Head and Neck Prepping
PRINCIPLES OF ASEPTIC TECHNIQUE

Aseptic: the complete absence of living microorganisms

Methods to achieve sterility or asepsis:
   → Chemical methods (i.e. gas sterilization)
   → Physical methods (i.e. autoclaving)

Aseptic technique is based on the fundamental principle that infection is introduced into the body from the outside. Therefore, perform all procedures using a method that prevents the introduction of bacteria into a surgical wound.

1. **The procedure must be done in a sterile field from which all bacteria have been excluded, if possible.** The inadvertent use of unsterile items may introduce contaminants into the wound. Items of uncertain sterility must be considered unsterile. Any item that falls on the floor or into any area of questionable cleanliness must be considered unsterile. The circulating nurse should check the package integrity, the expiration date, and the chemical process indicator before dispensing a sterile item.

2. **Gowns worn by the surgical team are considered sterile at the front, from chest to the level of the sterile field.** The sleeves are also considered sterile from 2 inches above the elbow to the stockinet cuff. The cuff should be considered unsterile because it tends to collect moisture and is not an effective bacterial barrier. Therefore, the sleeve cuffs should always be covered by sterile gloves. Other areas of the gown that must be considered unsterile are the neckline, shoulders, areas under the arms, and back. These areas may become contaminated by perspiration or by collar and shoulder surfaces rubbing together during head and neck movements. The back of the gown is not sterile because it cannot be observed by the scrubbed person and protected from contamination.

3. **Sterile drapes are used to create a sterile field.** Only the top surface of a draped table is considered sterile. Although a bacterial barrier may be draped over the sides of a table, the sides cannot be considered sterile. Any item that extends beyond the sterile boundary is considered contaminated and cannot be brought back onto the sterile field. A contaminated item must be lifted clear of the operative field without contacting the sterile surface and must be dropped with minimum handling to an unsterile person, area, or receptacle. Interpretation of sterile areas versus unsterile areas on a draped patient requires astute observation and use of good judgment.

4. **Items should be dispensed to a sterile field by methods that preserve the sterility of the items and the integrity of the sterile field.** After a sterile package or container is opened, the edges are considered unsterile. Sterile and unsterile boundaries are often intangible. A 1-inch safety margin is usually considered standard on package wrappers, whereas the sterile boundary on a wrapper used to drape a table is at the table edge. On peel-
back packages, the inner edge of the heat seal is the line of demarcation. The edge of a bottle cap is considered contaminated once the cap has been removed from the bottle. The sterility of the bottle contents cannot be ensured if the cap is replaced on the bottle.

5. **Motions of the surgical team are from sterile to sterile areas and from unsterile to unsterile areas.** Scrubbed persons stay close to the sterile field. If they change positions, they turn face-to-face or back-to-back while maintaining a safe distance between. Accidental contamination is a threat to any scrubbed person who wanders into a traffic pathway or out of the clean area of the operating room. Approach sterile areas facing them and never walk between two sterile fields. Keeping sterile areas in view during movement around the area and maintaining at least a 1-foot distance from sterile fields help to prevent accidental contamination. All perioperative personnel must maintain a vigilant watch over sterile areas and point out any contamination immediately.

6. **Whenever a sterile barrier is permeated, it must be considered contaminated.** This principle applies to packaging materials as well as to draping and gowning materials. Obvious contamination occurs from direct contact between sterile and unsterile objects. Other less apparent modes of contamination are the filtration of airborne microorganisms through materials, the passage of liquids through materials and the undetected perforations in materials. When moisture soaks through a drape, gown, or package, **strike-through** occurs, and the item must be considered contaminated. Potential contaminants can be curtailed by the use of effective barrier materials, the characteristics of which are discussed later in this chapter.

7. Preparation of sterile set-ups hours before needed and the subsequent covering of these set-ups with sterile sheets are not recommended for two reasons: 1) the set-ups are usually left unguarded and thus become prey to sources of contamination and 2) removal of the cover sheets without contaminating the sterile set-ups is extremely difficult. **Therefore, sterile fields should be prepared as close as possible to the scheduled time of use.**

**Patient Positioning**

Patient positioning should:

- Ensure optimum exposure and access to the operative site.
- Sustain body alignment.
- Maximize circulatory and respiratory function.
- Not compromise neuromuscular structures.
OR Attire

Comfortable closed in shoes (Preferably OR dedicated)

Hint: Eat breakfast, and use restroom before the session begins!

No jewelery or nail polish

Short, clean nails

Hair tucked in

Duckbill mask facing out.

Mask tied securely.

Protective eyeware

Ready for the OR!
Review of Surgical Scrub

1. Scrub time - 5 min. for first scrub of the day and 3 min. for each subsequent scrub
2. Hands and forearms are to be held out from scrub clothes
3. Hands to be at higher level than elbows at all times
4. Scrub solution is applied to hands
5. Each nail is cleaned under running water with nail stick
6. Each nail is scrubbed against palm of opposite hand
7. Each finger is then scrubbed on all 4 sides - 5 strokes/side
8. Back of hand and palm is scrubbed from base of fingers to wrist
9. Small overlapping circles are used to scrub from wrist to 2 inches above elbow
10. Hands and forearms are rinsed from finger-tip to elbow

Hand Drying

1. Drying towel is lifted up and away from the sterile field without dripping water into that field
2. Bend forward at the waist, fingers and hand are dried thoroughly, then the same part of towel is used to dry remainder of the forearm
3. The other end of the towel is then used to dry the other hand and forearm

Throw all linen into linen hamper!

Throw all garbage into garbage bag!
**Gowning and Gloving**

1. The sterile gown is lifted out of its sterile wrapper without contamination.
2. The individual then moves into an area where the gown may be opened without contamination of self or gown.
3. The gown is held away from the body and unfolded so that the inside is toward the wearer.
4. The hands are slipped into the gown while keeping them away from the body and at shoulder level.
5. The hands are advanced up the sleeves of the gown to the proximal end of the cuffs.
6. “Gloving” is performed by the closed or open method.
7. The surgeon then hands the sterile right tab of the gown to the scrub nurse, turns left 280° and then takes back this tab. He/she then ties this to the other sterile tab to wrap the gown.
Gloving - Closed Method
**Gloving - Open Method**

In this technique, the scrub nurse assists the scrubbed individual with gloving:

1. The glove (right first) is grasped under the everted cuff by the scrub nurse
2. The palm of the glove is turned towards your hand so that the thumb of the glove is opposite your thumb.
3. The cuff is stretched by the scrub nurse to open the glove widely.
4. Insert your right hand into the glove while pulling up on the palm side of the everted cuff of the glove with your left hand, which is still in the sleeve of the gown
5. Do the same with your left hand
6. Adjust the cuffs and ensure that they are fully covered by your gloves
Removal of Dirty Gown, Gloves and Mask

This is recommended to prevent contact with soiled outer layer of gown, gloves and mask.

1. The waist tie of the gown is untied by the surgeon.
2. The surgeon turns away from the circulating nurse to allow him/her to undo the back closures of the gown.
3. The surgeon then grasps a shoulder of the gown and pulls it inside out off one gloved arm, pulls that sleeve off leaving the glove on, but with the cuff now everted.
4. This step is repeated with the other arm.
5. The gown is pulled off completely, held away from the body, and placed into the appropriate linen container.
6. The gloved fingers of one hand are placed under the everted cuff of the contralateral glove. The glove is pulled off and inverted at the same time.
7. The everted cuff on the remaining glove is then grasped with the bare free fingers of the other hand and is pulled off in the same way.
8. The surgeon then goes back to the scrub area and removes his/her mask, taking care to touch only the ties at the back. (A new mask should be worn for each case.)
9. The hands and arms should then be washed carefully.
**Antiseptics**

**Antiseptic:** Agent applied to living tissue

**Disinfectant:** Agent applied to inanimate surface

1. Chlorhexidine Gluconate, 4% wv (Hibitane®, SolvahexTM, Clenz 4 Chlorhexidine) Acetate and Diacetate, 2% (Nolvasan®)
   - Broadest spectrum
   - Better residual activity than iodophors
   - Occasional skin sensitivity (mucous membranes)

2. Iodophors (Betadine®, Duraprep®)
   - Excellent spectrum, contains iodine
   - Less residual activity than Chlorhexidine
   - Partially inactivated by organic debris
   - Occasional skin sensitivity

3. Isopropyl Alcohol 70% (or Ethyl Alcohol 90%)
   - Protein coagulant
   - Degreases skin
   - Ineffective against spores

4. Hexachlorophene Phisohex® (no longer recommended)
   - Very potent against Gram positive bacteria (e.g., Staphylococcus)
   - Poor effect against enteric bacteria (Gram negative)
   - Inactivated by organic debris and alcohol
   - Long residual action
Skin Preparation

1. A scrub detergent and/or solution of providone are usually used to clean all surface dirt.
2. A sterile towel is placed over the cleaned field to dry the area.
3. The towel is removed from end to end rather than being lifted up from the center.
4. A non-detergent antiseptic, non-alcoholic iodophor is then painted on, leaving a thin film of iodophor on the skin. This is done from the center of the field, working outwards.

5. After the antiseptic solution on the skin has been allowed to dry, sterile drapes or towels are placed around the field and are held in place by self-adhesive or by the use of towel clips. Remember to CUFF your hands with the drape when passing drapes away from the sterile field.