

# Asepsis and Non-asepsis

Unit 3 Part 1

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# Asepsis

- Surgical asepsis
  - Protection against infection before, during and after surgery by using sterile technique
  - Complete removal of microorganisms and their spores
- Medical asepsis
  - Removal or destruction of infected material
- Hand washing is the first priority for proper sterile technique

# Sterilization

- Methods used to control microorganisms:
  1. Moist heat – autoclave steam under pressure
  2. Dry heat - longer process than moist heat, used for heat- stable, non-aqueous materials
  3. Gas - ethylene oxide destroys microorganisms (effective, but toxic to humans)
  4. Chemicals – used for objects that are high heat sensitive

\*Remember the growth requirements for a microorganism are the right nutrition, oxygen, pH, temperature, and moisture

# Disinfection

- As many microorganisms as possible are removed from surfaces by chemical or physical means
  - Boiling not always effective
    - Many microorganisms' spores can resist boiling heat

# Sterile Procedures

- These procedures require sterile technique
  - Angiography
  - Arthrograms
  - Hysterosalpingograms
  - X-ray in the O.R.
  - Myelograms

# Sterile Field

- Microorganism-free area that can receive sterile supplies
  - Established using a sterile drape
  - Confirm sterility of packaging
    - Package must be clean, dry and unopened
    - Check expiration date
- \*Do not reach across a sterile field
- \*A 1 inch border around the sterile field is not considered sterile

# Sterile Trays

- Different types of trays have different supplies
  - Myelogram (spinal tap) tray
  - Arthrogram tray

- May be packed commercially or by hospital

- Common tray supplies:

Needles

Connector tubing

Metal bowls

Collection tubes

Scalpel

Syringes

Sterile gauze

Sterile towels/drapes

Clamps

- Make sure tray is sterile before using it for a procedure
- Trays should be wrapped in autoclave indicator tape
  - Stripes appear when package is sterilized
- Check expiration date



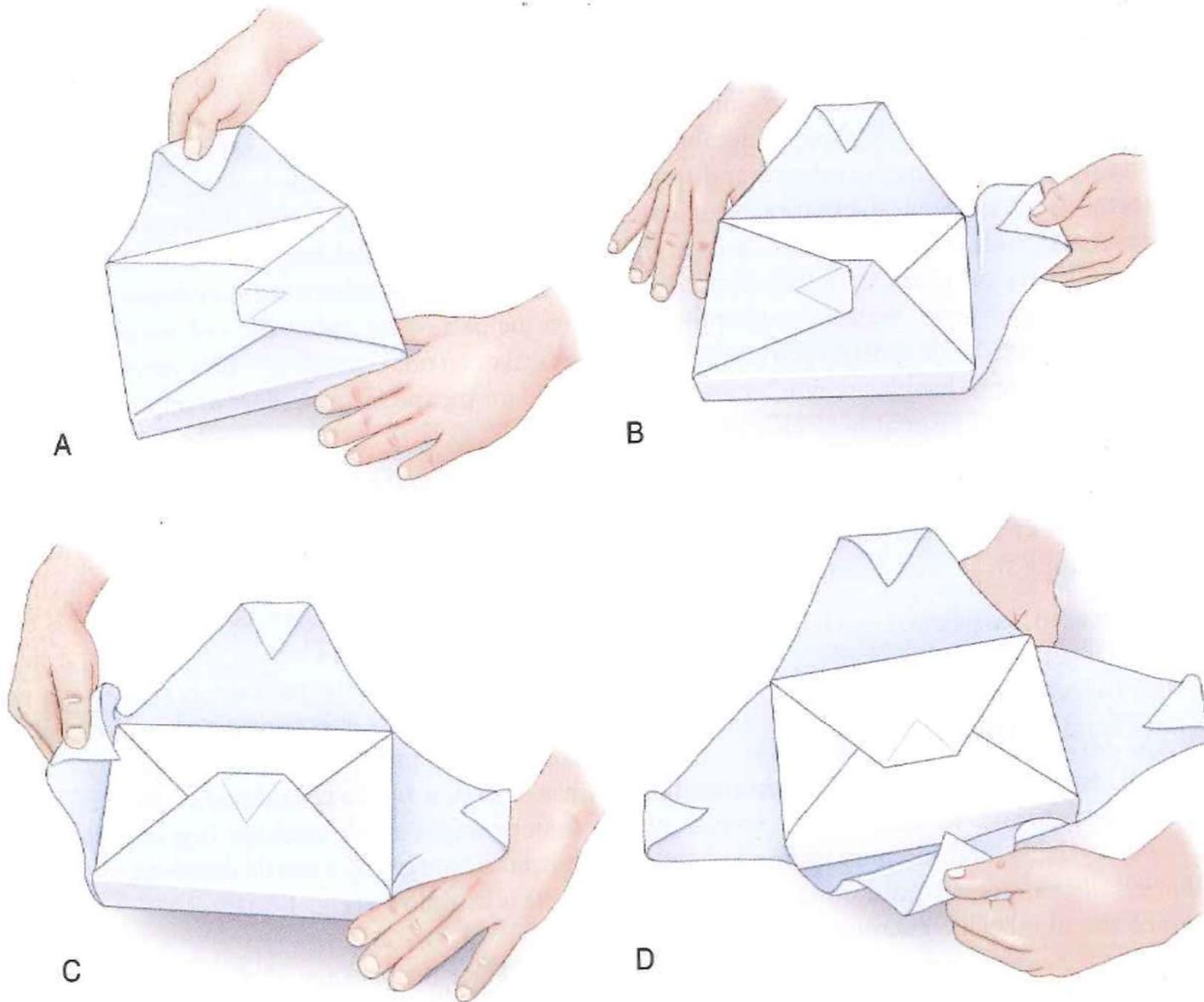
# Opening a Sterile Tray

- Place tray in center of table
- Only touch corners of flaps (unsterile)
- Grasp between thumb and index finger
- Top flap should face so it will open away from you
- Reach around tray and pull top flap open (away from you)
- Lay flap flat on far surface
- Use right hand to pull right flap out and lay it flat on surface
- Use left hand to pull left flap open and lay it flat on surface
- Pull bottom flap towards you
- If any part of inner surface touches an unsterile object (e.g. sleeve) the entire tray is considered unsterile
  - Discard

# Opening Sterile Package

- Hold package in one hand
- Top flap should face so it will open away from you
- Grasping corner of flap, pull it away from contents and away from sterile field
- Use free hand to hold flap against wrist of hand holding package
- Drop contents onto sterile field using a slight angle at a 6 inch distance
- If flap touches sterile field, all items in the pack and in the sterile field must be discarded





**FIG. 17-1** Opening a sterile package. **A**, Opening the first flap. **B** and **C**, Opening the side flaps. **D**, Pulling the last flap by grasping the corner.

- Commercial packages have specific instructions
  - Partially sealed corners may need to be opened from a certain corner, which will be labeled
  - Partially sealed edges may need to be pulled open by grasping each edge with a hand and gently pulling apart
  - May have chemical indicator strips for sterility

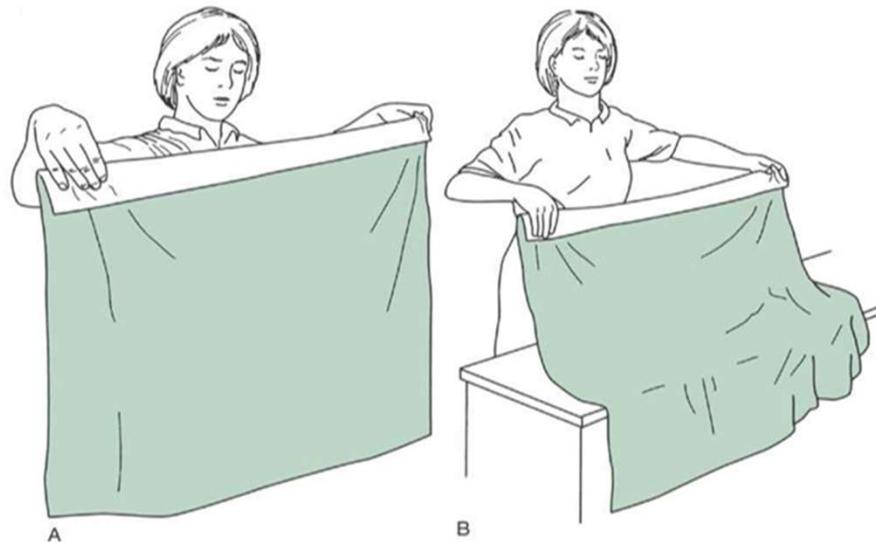




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# Creating a Sterile Field

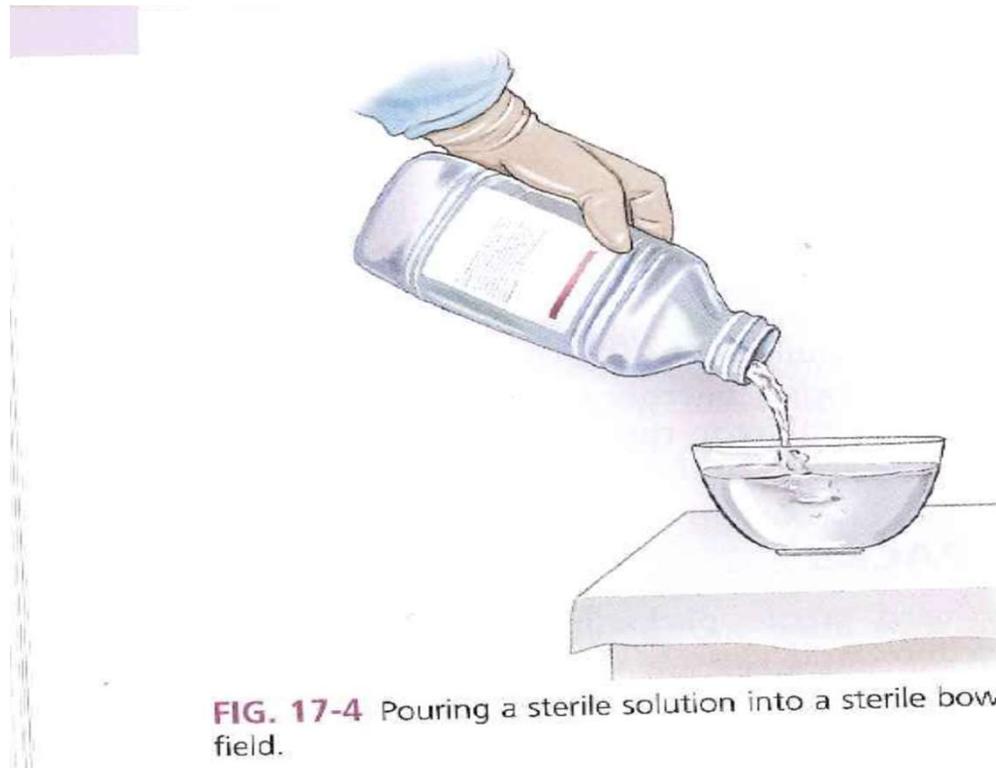
- Grasp sterile drape with one hand by the corner
- Use corner to fold back the top
- Lift drape out of the cover and open freely without touching anything
- Grasp the opposite corner with the other hand
- Lay on clean, dry surface with bottom away from person



# Pouring Sterile Solutions

- Sterile solutions may be poured into metal bowl on sterile field
- Although solution in bottle is sterile, outside of bottle is not sterile
- Confirm the name, strength and expiration date of solution before pouring
  - Show label to another person
- Remove or open lid to bottle
  - Place removed lid onto unsterile surface with topside down
    - Keep inside of lid sterile
- Hold bottle so label faces up
  - Solution won't stain label
- Hold bottle at an angle approximately 6 inches over the bowl

- Pour gently so solution doesn't splash
  - Splashing liquids allow microorganisms to move from unsterile tabletop through the wet drape
- Only pour as much solution as will be needed



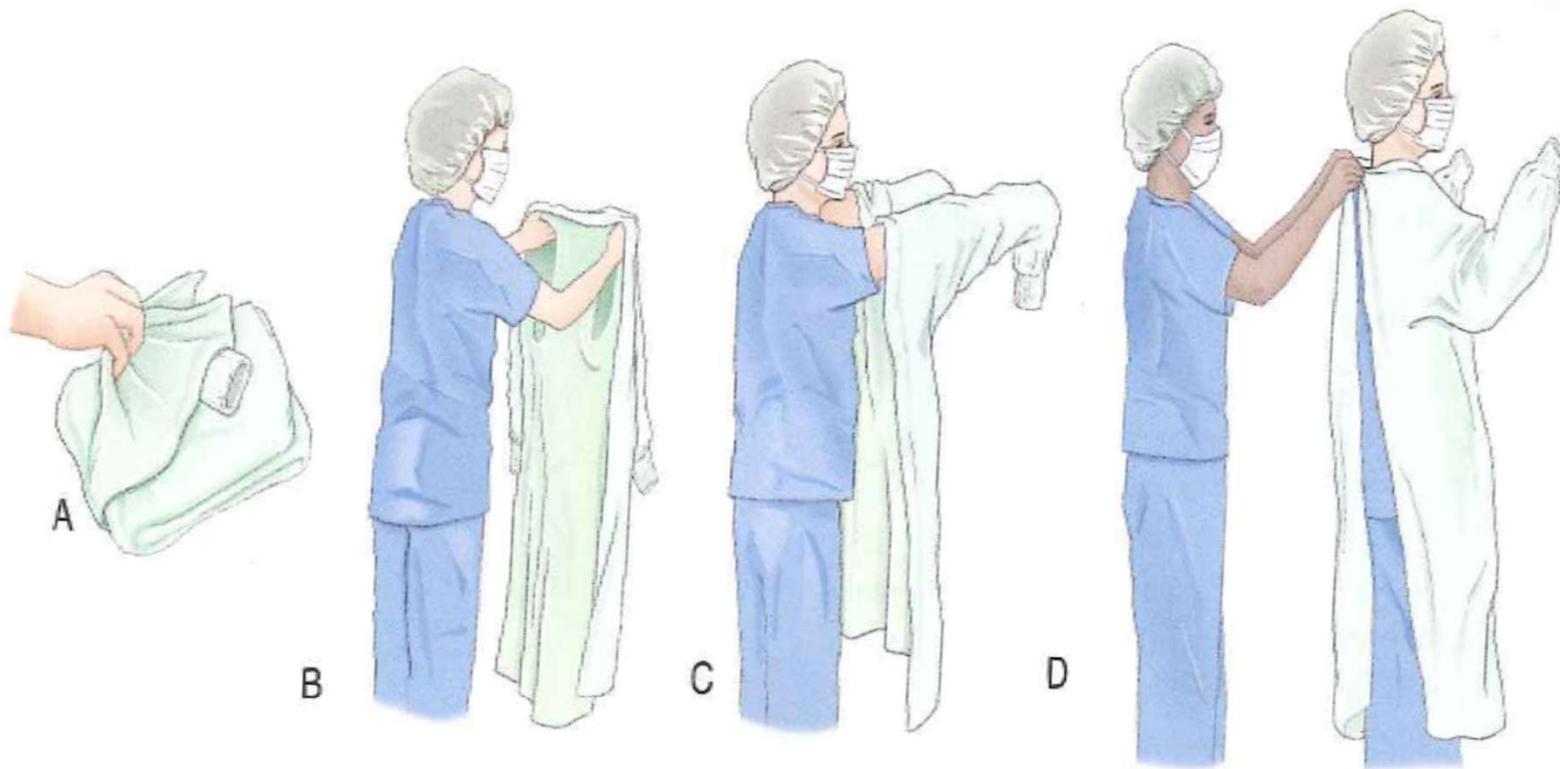
**FIG. 17-4** Pouring a sterile solution into a sterile bowl on a sterile field.

# Surgical Scrubbing

- Three purposes for surgical scrubbing
  1. Removes debris & transient microorganisms
  2. Reduces resident microbial count
  3. Inhibits rapid rebound growth of microorganisms
- 2 Methods:
  1. Numbered Stroke Method
  2. Timed Scrub
- Required for participation in many interventional procedures

# Self-Gowning

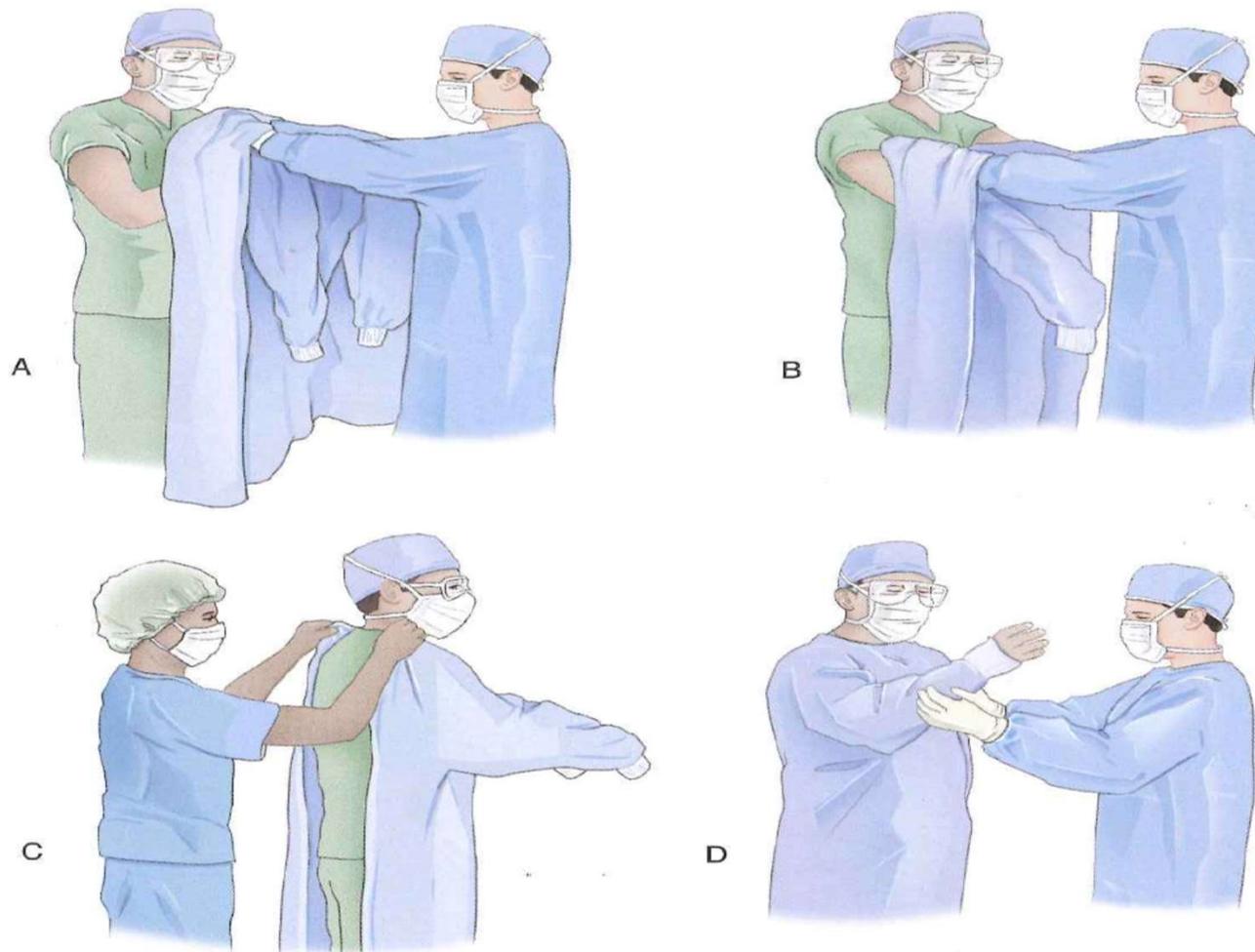
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**FIG. 17-7** Self-gowning. **A**, Grasp the gown firmly and bring it away from the table. It has been folded so that the outside faces away. **B**, Holding the gown at the shoulders, allow it to unfold gently. Do not shake the gown. **C**, Place hands inside the armholes and guide each arm through the sleeves by raising and spreading the arms. Do not allow hands to slide outside cuff of gown. **D**, The circulator assists by pulling the gown over the shoulders and tying it.

- Unsterile assistant fastens the back and waistband of gown
- Only sleeves and front of gown down to the waist are considered sterile
- Gowned persons should pass each other back to back

# Gowning Another Person



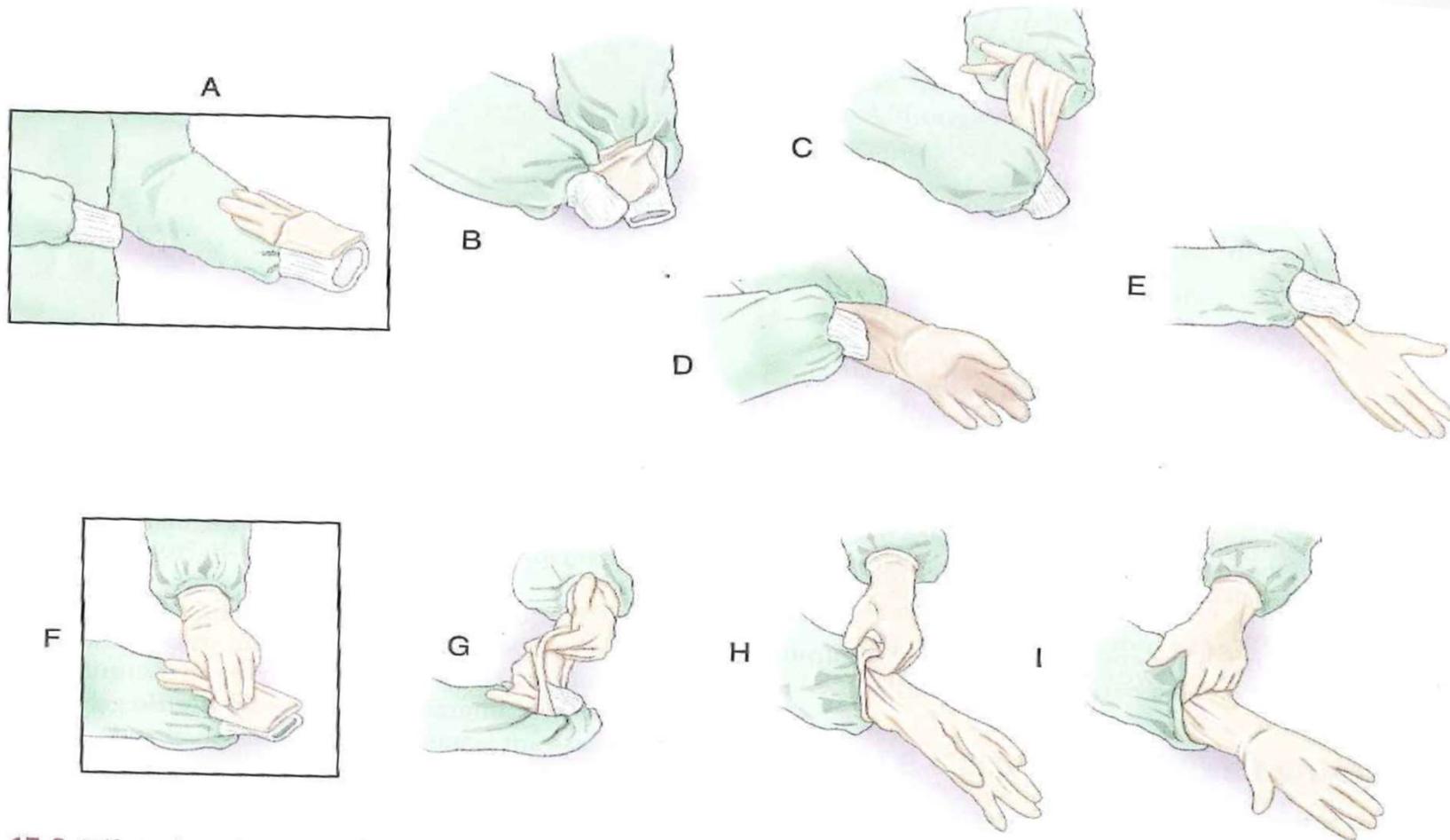
**FIG. 17-10** Gowning another person. **A**, Grasp the gown so that the outside faces toward you. Holding the gown at the shoulders, cuff your hands under the gown's shoulders. **B**, The person steps forward and places his or her arms in the sleeves. Slide the gown up to the mid-upper arms. **C**, The circulator assists in pulling the gown up and tying it. **D**, Gently pull the cuffs back over the person's hands. Be careful that your gloved hands do not touch his or her bare hands.

- Nonsterile person pulls gown up and fastens the back and waistband
- Gently pull cuff over person's hands
  - Do not allow gloved hands to touch bare hands

# Gloving

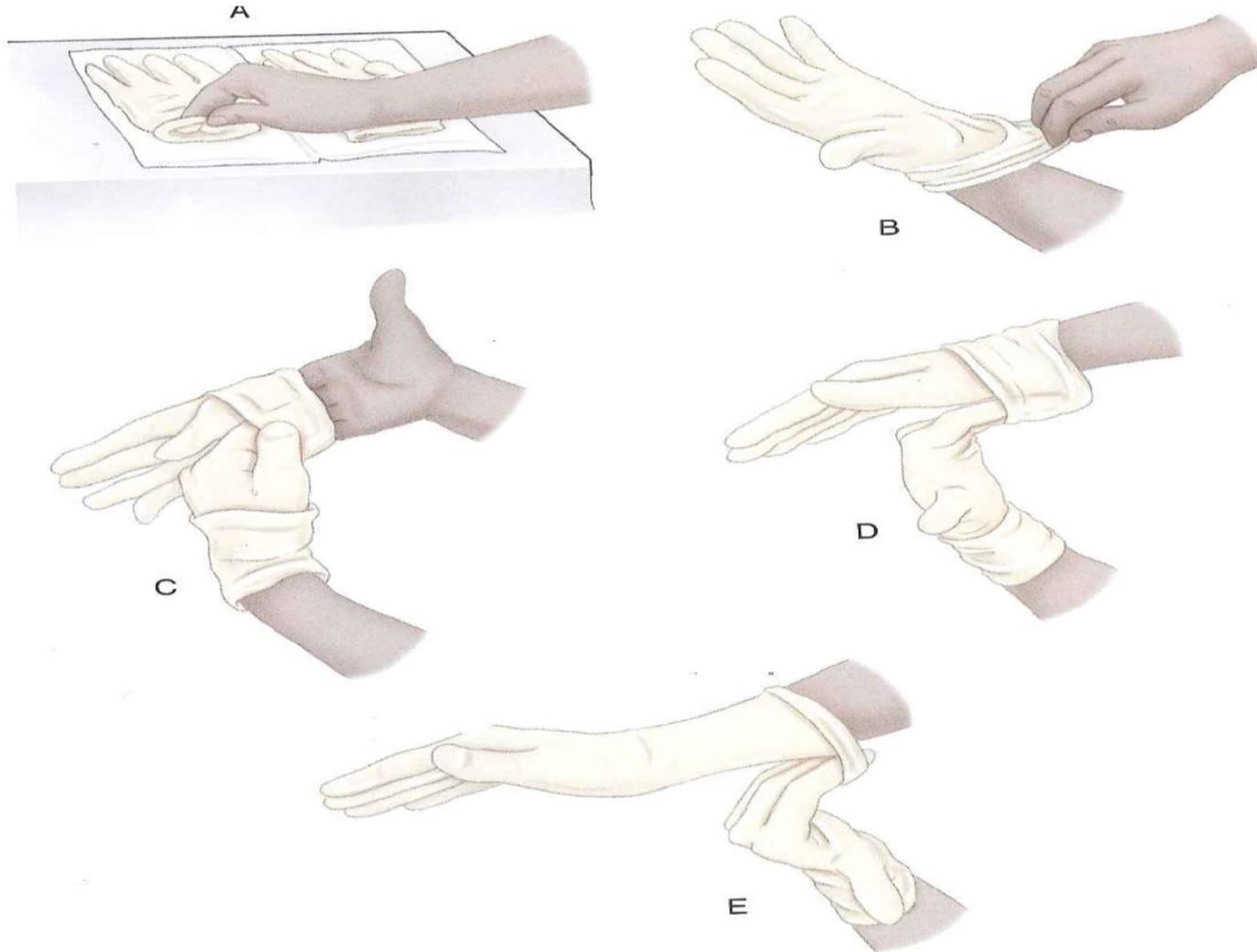
- Gloves have two surfaces: Inside and outside
- Before glove is touched, entire glove is sterile
- Once touched, inside is considered unsterile
- All jewelry should be removed when gloving
- Open package so it is facing the person who is going to wear them

# Closed Technique (self)



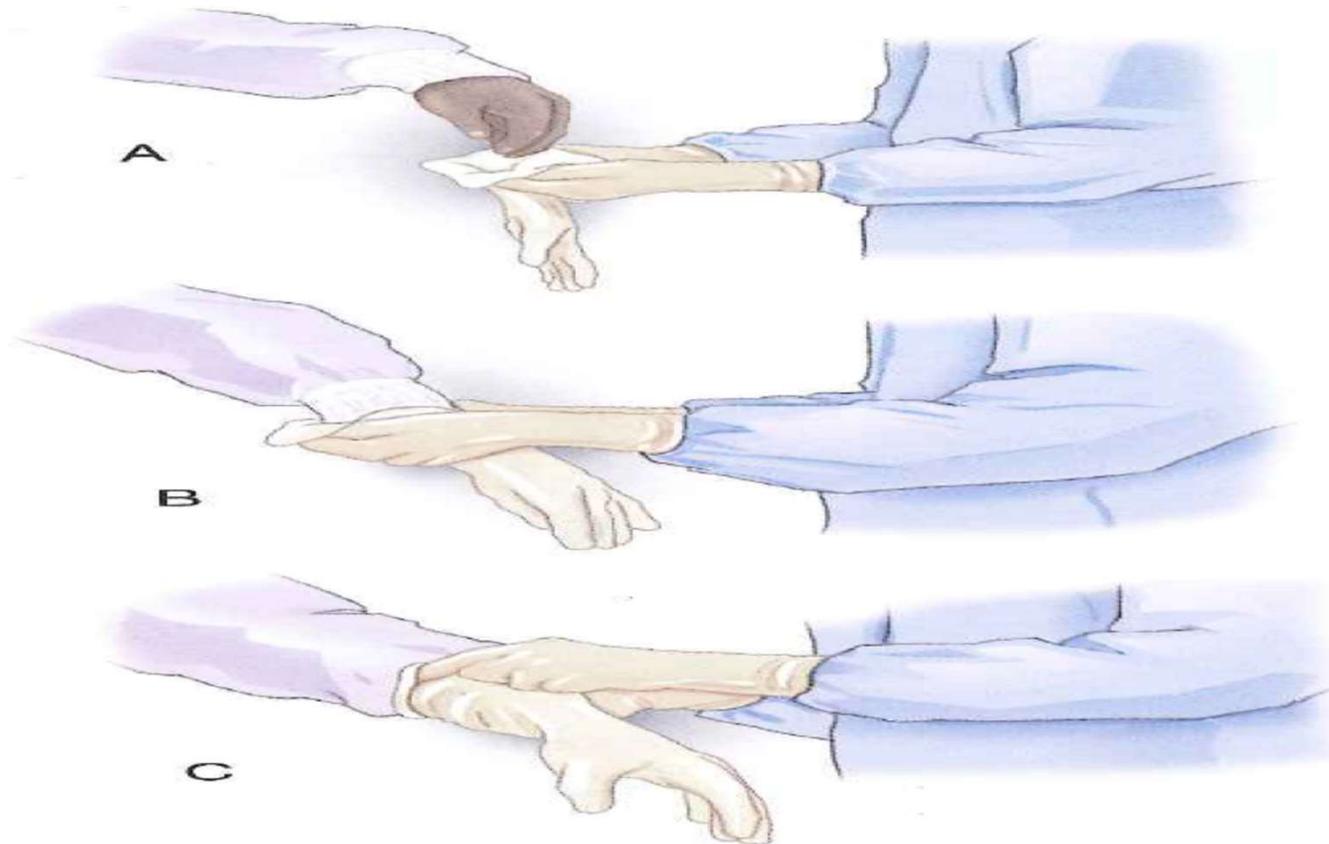
**FIG. 17-8** Self-gloving, closed technique. **A**, Lay the glove palm-down over the cuff of the gown. The fingers of the glove face toward you. **B** and **C**, Working through the gown sleeve, grasp the cuff of the glove and bring it over the open cuff of the sleeve. **D** and **E**, Unroll the glove cuff so that it covers the sleeve cuff. **F** through **I**, Proceed with the opposite hand, using the same technique. Never allow the bare hand to contact the gown cuff edge or outside of glove.

# Open Technique (self)



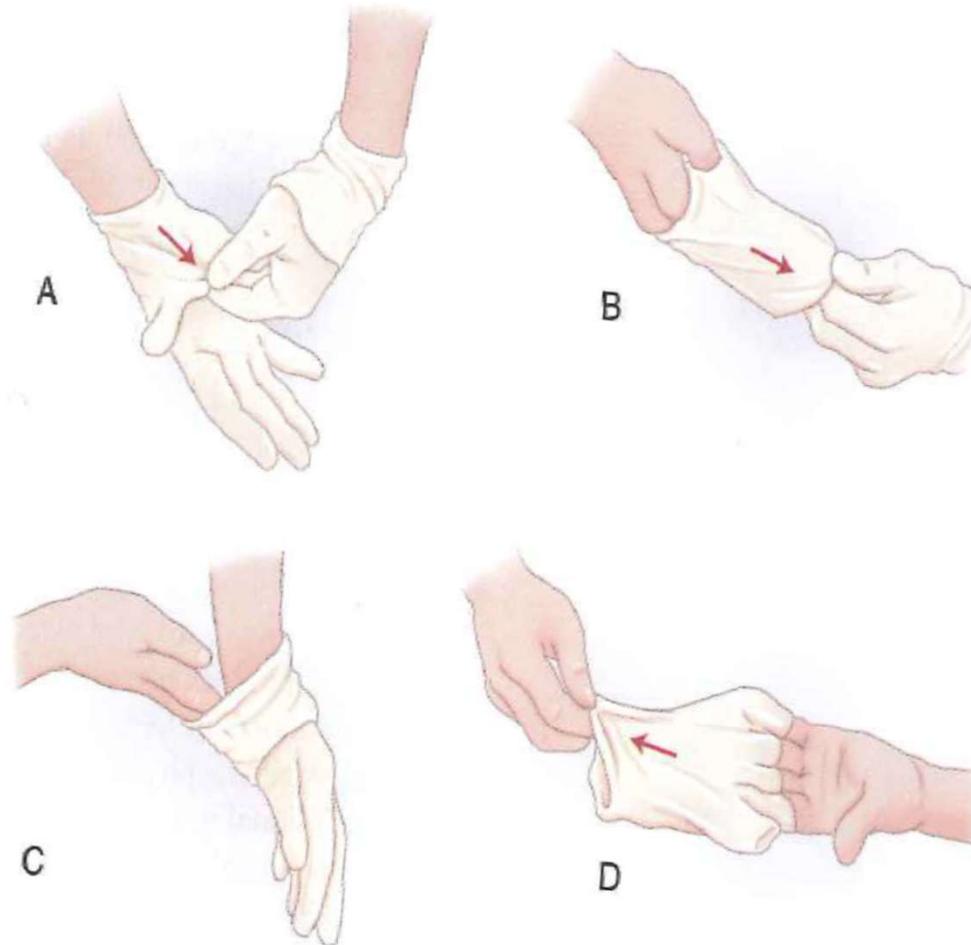
**FIG. 17-9** Self-gloving, open technique. **A**, Pick up the glove by its inside cuff with one hand. Do not touch the glove wrapper with the bare hand. **B**, Slide the glove onto the opposite hand. Leave the cuff down. **C**, Using the partially gloved hand, slide the fingers into the outer side of the opposite glove cuff. **D**, Slide the hand into the glove and unroll the cuff. **E**, With the gloved hand, slide the fingers under the outer edge of the opposite cuff and unroll it gently, using the same technique.

# Gloving another person



**FIG. 17-11** Gloving another person. **A**, Pick up the right glove and place the palm away from you. Slide the fingers under the glove cuff and spread them so a wide opening is created. Keep thumbs under the cuff. **B**, The person thrusts his or her hands into the glove. Do not release the glove yet. **C**, Gently release the cuff (do not let the cuff snap sharply) while unrolling it over the wrist. Proceed with the left glove, using the same technique.

# Removal of Gloves



**FIG. 17-12** Removing contaminated gloves aseptically. **A**, Grasp the edge of the glove. **B**, Unroll the glove over the hand. Discard the glove (not shown). **C**, With the bare hand, grasp the opposite glove cuff on its inside surface. **D**, Remove the glove by inverting it over the hand. Discard the glove (not shown).

- During sterile procedures the following are considered sterile:
  - Patient
  - Table and other furniture covered with sterile drapes
  - Personnel wearing sterile attire

# Basic Principles of Sterile Technique

- Only sterile items used in sterile fields
- If in doubt about sterility of an object, consider it unsterile
  - Remove, cover or replace object
- Sterile field must be continually monitored
- Create sterile fields as close to the time of use as possible
- Sterile persons should avoid unsterile areas
- Anything below the level of the table or the level of the waist, including the undersurface of the drape, is considered unsterile
  - Any item falling below this level is contaminated
- Gowns are considered sterile on the sleeves and the front from the waist up
  - Back of gown and area below waist are unsterile

- Persons in sterile gowns must pass each other back to back
- Sterile person may touch only what is sterile
- Unsterile person cannot reach above or over sterile field

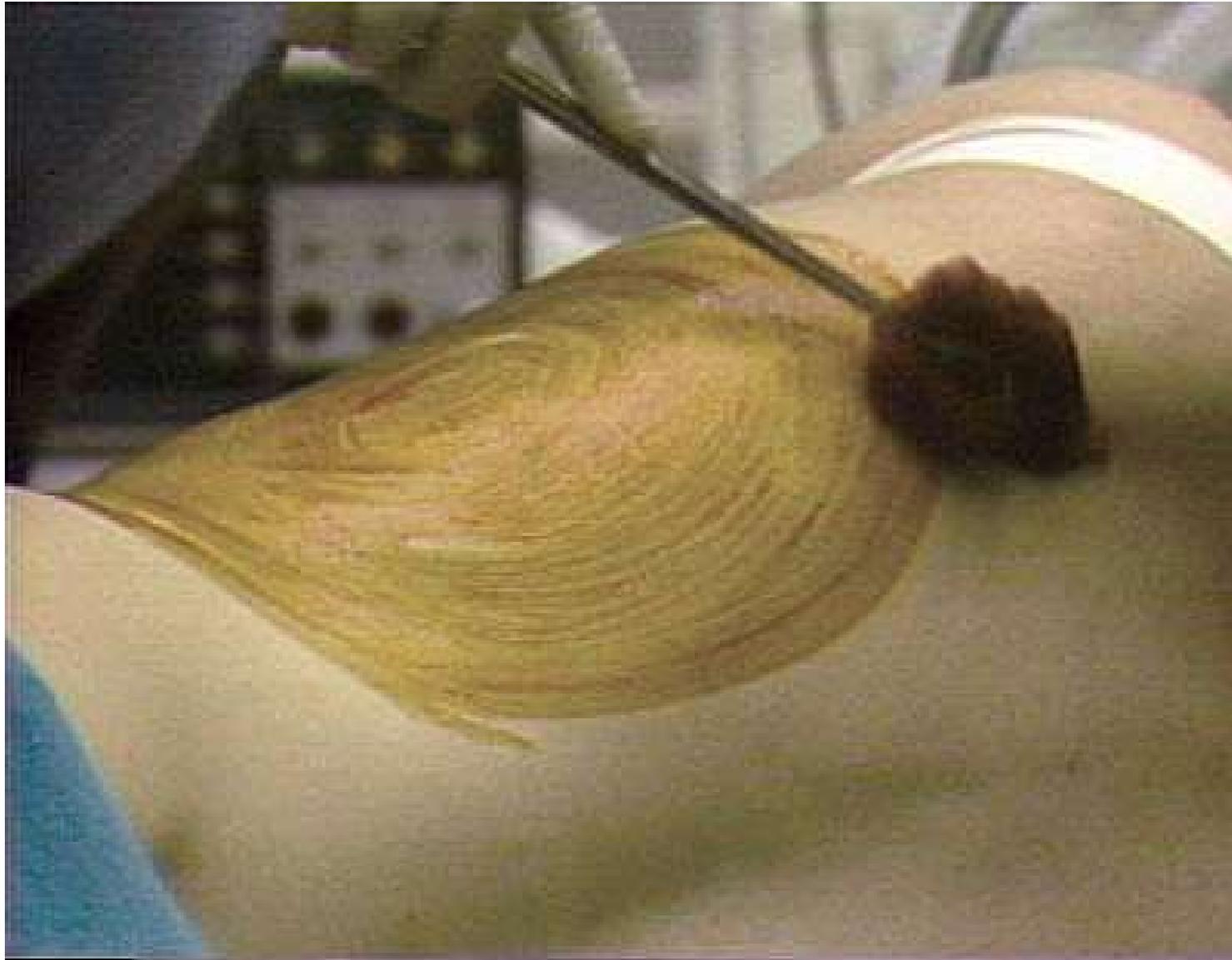
# Dressing Changes

- Must be ordered by a physician
- Wear gown if wound is purulent
- Treat all wounds as if they are infected
  - Always wear gloves!
- Wash hands before beginning
- Ensure privacy for the patient
- Remove adhesive tape from dressing
  - Use limited amount of solvent (baby oil)
- Remove dressing with forceps or gloved hands
- Wrap dressing and place in plastic bag
- Reapply dressing with sterile technique
  - Wash hands
  - Use sterile towel for field
  - Place dressings on sterile field

- Cut tape into lengths that will be used
  - Tape is not sterile
  - Place near, but not on, sterile field
- Put on gloves and apply dressing
- Secure dressing with adhesive tape
- Wash hands again
- Discard waste appropriately

# Skin Preparation

- Skin preparation of the patient must take place before any invasive procedure
- Hair removal not always recommended
  - Causes injury to dermal layer of skin
  - If done, should be performed as close as possible to start of procedure
- Usually done with razor, clippers or depilatory agent
- After hair removal, skin is disinfected
- Cleaning person should wear sterile gloves
- Antiseptic soap applied from the center out, using firm circular motion
  - Do not go back over any areas
- Repeat procedure with another sponge
- Cleaning should take about 5 minutes
- Sterile drapes placed after skin prep





# Urinary Catheters

- Insertion of a tube into the bladder using aseptic technique
- Two types: Foley and Straight
- Foley – has a balloon which is filled with sterile water to hold the catheter in place
  - Indwelling catheter – remains in place
- Used for:
  - Empty bladder
  - Relieve retention of urine or bypass obstruction
  - Irrigate the bladder or introduce drugs
  - Permit accurate measuring of urine output relieve incontinence
  - Relieve incontinence

- Sizes range from 8 to 20 in even numbers based on the French system
  - System equals the outer diameter of the catheter
  - Choose a larger size when possible
- Urine collection bag should be kept below the level of the bladder
- There are long and short term catheters
- Patient may be monitored for fluid intake and output
  - May need to contact RN and even document information

# Other Catheters

(Alternative methods of urinary drainage)



- Suprapubic catheter- closed drainage system inserted approximately 1" above the symphysis pubis into the distended bladder
  - \*\*Reason: long term, urethral injury, obstruction
- Condom catheter- specially designed condom with a catheter at the end attached to a collecting bag



# NONASEPTIC TECHNIQUES

- Students need to develop exceptional patient care skills to become competent in nonaseptic technique
- As well as understanding and sensitivity to patient needs to provide excellent care
- Nonaspetic techniques used for:
  - NG tubes
  - Male urinals
  - Bedpans
  - Enemas
  - Colostomies

# Urinals

- Made of plastic or metal
- Shaped so a patient is able to use it lying:
  - Supine
  - On his right or left side
  - Fowler's position
- Always provide privacy!
- When patient is done, put gloves on, dispose of urine and then dispose urinal
- Offer patient hand rub or wet wash cloth
- May need to document amount of urine output



# If assistance is needed....

- Wear gloves
- Raise cover to permit adequate visibility
- Spread patient's legs and place urinal between them
- Place penis adequately into the urinal so that it does not slip out
- Hold urinal in place by handle until patient is done voiding
- Dispose everything appropriately

# Bed Pans



- Offered to patients who are not ambulatory
- Used for urine and fecal collection
- Our bedpans at RH are sent to be sterilized between uses
- Two Types:
  - Standard bedpan
    - Made of metal or plastic
    - Approximately 2 inches high
  - Fracture bedpan
    - Shallower (1/2" high)
    - Contoured for patient comfort

- To reduce infectious spread -----Handwashing
  - Before and after
- HINT: if bedpan is cold, run warm water over in and then dry it prior to giving it to a patient
- Must maintain patient privacy (respect and secured)
- ALWAYS place a sheet over the patient

# How to assist with a bedpan...

- If patient is able to move
  - place one hand under lower back, asking the patient to raise his or her hips
  - Place bedpan under the hips and position in properly
- If patient is able to sit up
  - Elevate to 60 degrees
- Don't leave the patient alone for long, let patient know how to get you if you are needed for assistance
- When the patient is finished:
  - Put on gloves
  - Have patient lie back and place one hand under lumbar and ask patient to raise hips
  - Remove bedpan and properly dispose contents and pan
  - Remove gloves and wash hands

# If 2 techs are needed to assist...

- Both put on non-sterile gloves
- Stand at opposite sides of the table
- Assist patient into lateral position
- Place pan against the patient's hips and turn patient back to supine position while holding the pan in proper position
- Ensure hips are in proper alignment on the pan
- Provide pillows under the patient's shoulders and head
- Remain nearby for assistance
- Use the reverse process to remove the pan

# This patient may need further assistance

- Cleaning the perineum
  - Wear gloves
  - Fold tissue paper into several thicknesses
  - Wipe patient's perineum clean and dry
    - For females- wipe her from front to back

# Enemas

- Used for:
  - Cleansing enema
    - To promote defecation
    - Breaks up fecal mass, stretches rectal wall, and initiates defecation reflex
  - Barium enemas
    - To demonstrate pathologic abnormality
    - To verify normal structures and function

- Different types of cleansing enemas may be used
  - Tap water (hypotonic)
  - Hypertonic
  - Saline
  - Soapsuds
  - Oil retention
- Performing doctor will have preference



# Barium Enemas

- Have patient assume Sims position
- Lubricate enema tip
- Instruct patient to exhale
- Insert towards umbilicus (anterior and superior) about 3 – 4 inches
- Once tip is inserted, inflate balloon with air
  - No more than 10 cc



- May use single contrast
  - Barium or Omnipaque only
- May use double contrast
  - Air and thick barium



- Type of contrast used will be determined by reason for exam
  - Single
    - Good for gross pathology, fistulas, appendicitis, obstruction
  - Double
    - Considered routine
    - Allows good visualization of bowel walls
    - Air allows distention of colon
- When procedure is finished, place bag on floor to drain barium from colon
- Deflate balloon
- Remove enema tip