PRINCIPLES OF SURGICAL ASEPSIS

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SURGICAL ASEPSIS

- Surgical asepsis = Sterile/aseptic technique

Asepsis - Prevention of microbial contamination of living tissues or sterile materials by excluding, removing or killing micro-organisms including pathogens and spores.

It **prevents the cross contamination in surgery** which limits the patients exposure to a number of microorganisms that is not detrimental.

Surgical Asepsis

- Surgical asepsis involves
  - Proper preparation of facilities and environment
    - Anaesthesia area
    - Radiology
    - Examination room
    - Critical care etc
  - Surgical site
  - Surgical team and
  - Surgical equipments

Surgical Asepsis

Source of the organisms

Exogenous

- ✓Air
- ✓Surgical instruments
- ✓Surgical team
- ✓Patient

Endogenous

Organisms originate from the patient's body

RULES OF SURGICAL ASEPSIS

Surgical team members remain within the sterile area

Explanation:

To minimize the cross contamination

Cross-contamination:

The transfer of an infection directly from one person to another or indirectly from one person to a second person

Rules of Surgical Asepsis

Don’t talk, sneeze, laugh or cough over a sterile field or objects

Explanation:

To minimize the moist droplets with bacteria from these sources

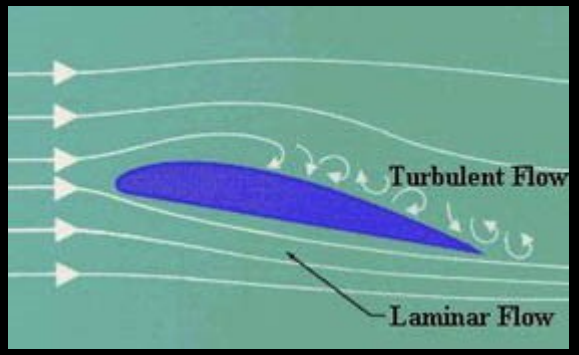
Sneeze

Rules of Surgical Asepsis

Movement in the operating room by all personnel is kept to a minimum except needed

Explanation:

To prevent cross contamination from turbulent air flow



Rules of Surgical Asepsis

Non-scrubbed personnel don't reach over the sterile Fields

Explanation:

To prevent the contamination from dust, lint, or other vehicles of bacteria.

Rules of Surgical Asepsis

- Scrubbed team members face each other and the sterile field at all times
- Never turn your back to the sterile field or leave it unattended

Explanation:

To prevent the contamination from the backside of a team member which is normally considered as non- sterile.

Rules of Surgical Asepsis

Equipments used during surgery must be sterilized

Explanation:

To prevent the source of contamination

Rules of Surgical Asepsis

- Scrubbed personnel handle only sterile items; non- scrubbed personnel handle only non-sterile items

- If necessary to leave the room cover the sterile field with a sterile towel

Explanation:
To prevent the source of cross contamination

Rules of Surgical Asepsis

- If the sterility of an item is questioned, it is considered contaminated
- A sterile object or field becomes contaminated by prolonged exposure to air.

Explanation:

To prevent the source of cross contamination

Rules of Surgical Asepsis

- Sterile tab

- One inch l the drape
  that hangs aminated.

Explanation:
Items hangin on-sterile
because they are out of the surgeon's vision

Rules of Surgical Asepsis

- Gowns are sterile from mid-chest to waist and from gloved hand to 2 inches above the elbow

- Object held below a person's waist is contaminated

Explanation:
The back of the gown is not considered sterile even if it is a wrap around gown

Rules of Surgical Asepsis

- Drapes covering instruments, tables or the patient should be moisture proof

- A sterile object or field becomes contaminated by capillary action when a sterile surface comes in contact with a wet contaminated surface

Explanation:
Moisture carries bacteria from a nonsterile surface to a sterile surface

Rules of Surgical Asepsis

If a sterile object touches the sealing edges of the pouch that holds it during opening, it is considered contaminated

Explanation :
Once opened, sealed edges of the pouches are not sterile

Rules of Surgical Asepsis

Sterile items within a damaged or wet wrapper are considered contaminated

Explanation:
Contamination can occur from perforated wrappers or from strike-through from moisture transport

Rules of Surgical Asepsis

Hands may not be folded into the axillary region; rather, they are clasped in front of the body above the Waist

Explanation:

The axillary region of the gown is not considered sterile

Rules of Surgical Asepsis

If the surgical team begins the surgery seated, they should remain seated until the surgery has been completed

Explanation:

The surgical field is sterile only from table height to the chest; movement from sitting to standing during surgery may increase cross contamination

PREPARATION OF SURGICAL PACK

Wrapping items: Choice based on the ease of sterilization

Sterilization method	Requirements	Acceptable materials
Stem autoclave	Allow steam to penetrate	Paper, Plastic, Cloth Paper peel packages
Dry heat	Not destroyed or insulate from heat	Paper bags, Aluminum foil Polyfilm plastic tubing Wrapped perforated cassettes
Unsaturated chemical vapor	-Vapor allowed -No react - materials NB:Plastics should not contact sides of sterilization	Wrapped perforated cassettes Paper Paper peel pouches

Packing materials based on device type

Medical device	Sterilization method	Packing materials
Stainless steel instruments/set	Steam	140-count muslin Woven pouches
Endoscopic instruments/set	Plasma EtO	Plasma: SMS, Polyester- band fabrics, Low temperature SMS pouches EtO: 140-count muslin, SMS, Polyester- band fabrics, Some crepe type papers,
Glass syringes or other medical devices made of glass	Steam EtO Plasma	Steam: SMS pouches EtO/Plasma: Low temperature SMS pouches, Thermoplastic polymers

* SMS=Spunbond, Meltblown, Spunbond

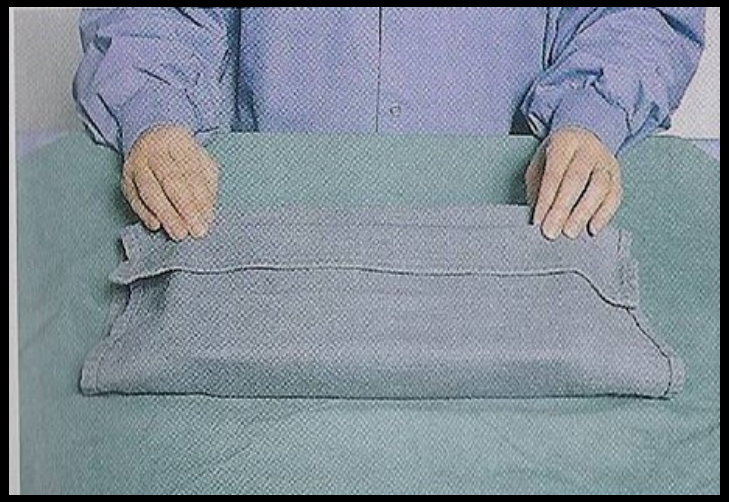
Advantages & disadvantages of wrapping materials for pack sterilization

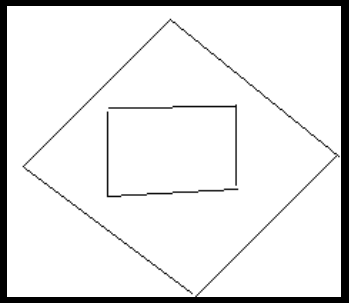
Material	Advantages	Disadvantages	Sterilization
Cotton muslin ; 140 or 270 thread counts	Durable, flexible, reusable, easily handled	Requires double layer and double wrap, generate lint, not moisture resistant	Steam, EtO
Nonoven barrier materials (i.e. paper)	Inexpensive	Single use, memory, not as durable, not moisture resistant, requires double wrap	Steam, EtO

Advantages & disadvantages of wrapping materials for pack sterilization

Material	Advantages	Disadvantages	Sterilization
Nonoven polypropylene fabric	Flexible, durable, excellent bacterial barrier, puncture resistant, lint free,	Single use, requires double wrap	Steam, EtO
Paper/Plastic pouches (heat sealed)	Convenient, long shelf life, water resistant	Instrument may puncture pouch	Steam, EtO
Plastic pouches (heat sealed)	Convenient, long shelf life, water proof, more puncture resistant	Instrument may puncture pouch	Plasma, EtO

Wrapping an instrument pack

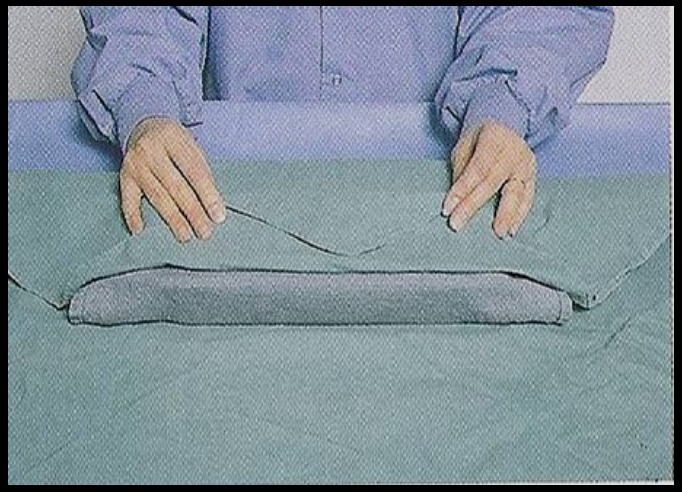




- Wrap the instrument pack in a clean huck towel
- Place a large, unfolded wrap in front of you
- Position the instrument tray in the center of the wrap

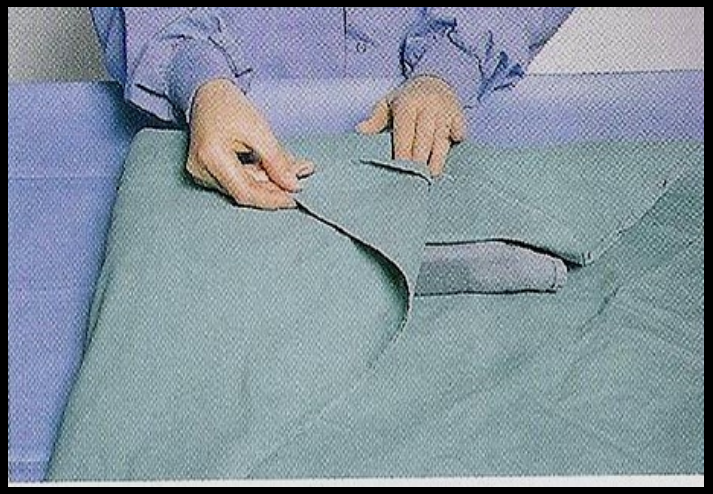
NB: Imaginary line is perpendicular to the long axis of the instrument tray

Wrapping an instrument pack



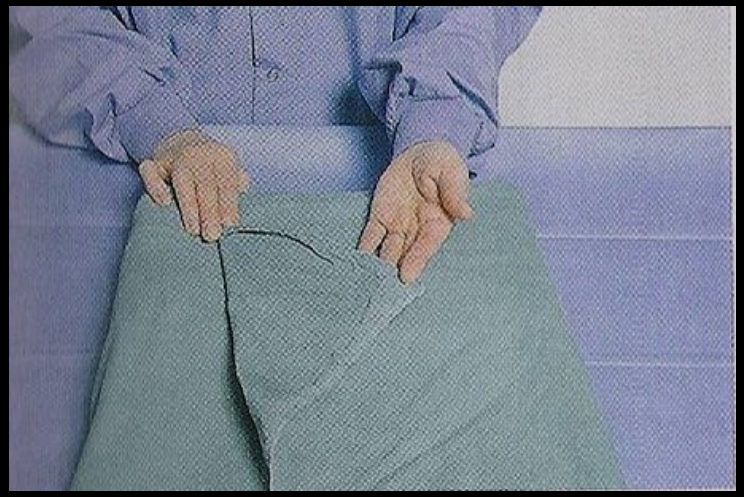
- Fold the corner of the wrap that is closest to you over the instrument tray and to its far edge
- Fold the tip of the wrap over so that it is exposed for easy unwrapping

Wrapping an instrument pack



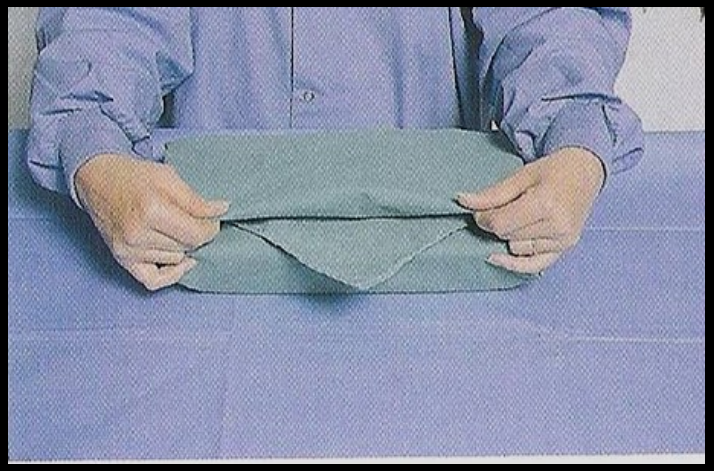
Fold the right corner over the pack

Wrapping an instrument pack



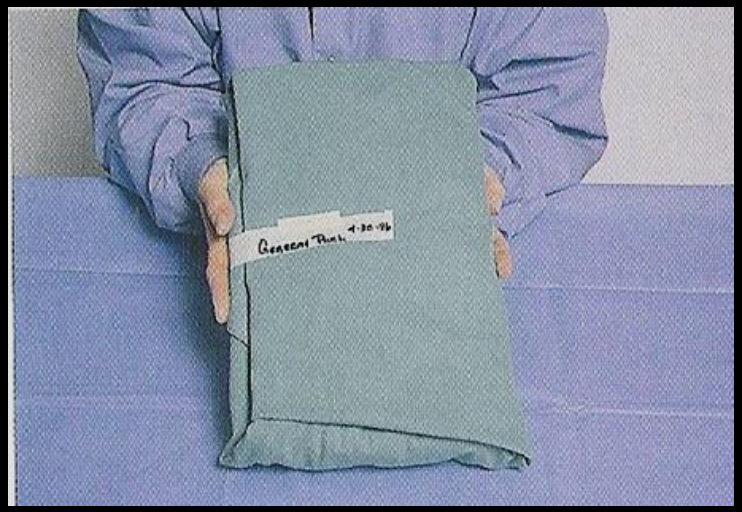
Fold the left corner similarly

Wrapping an instrument pack



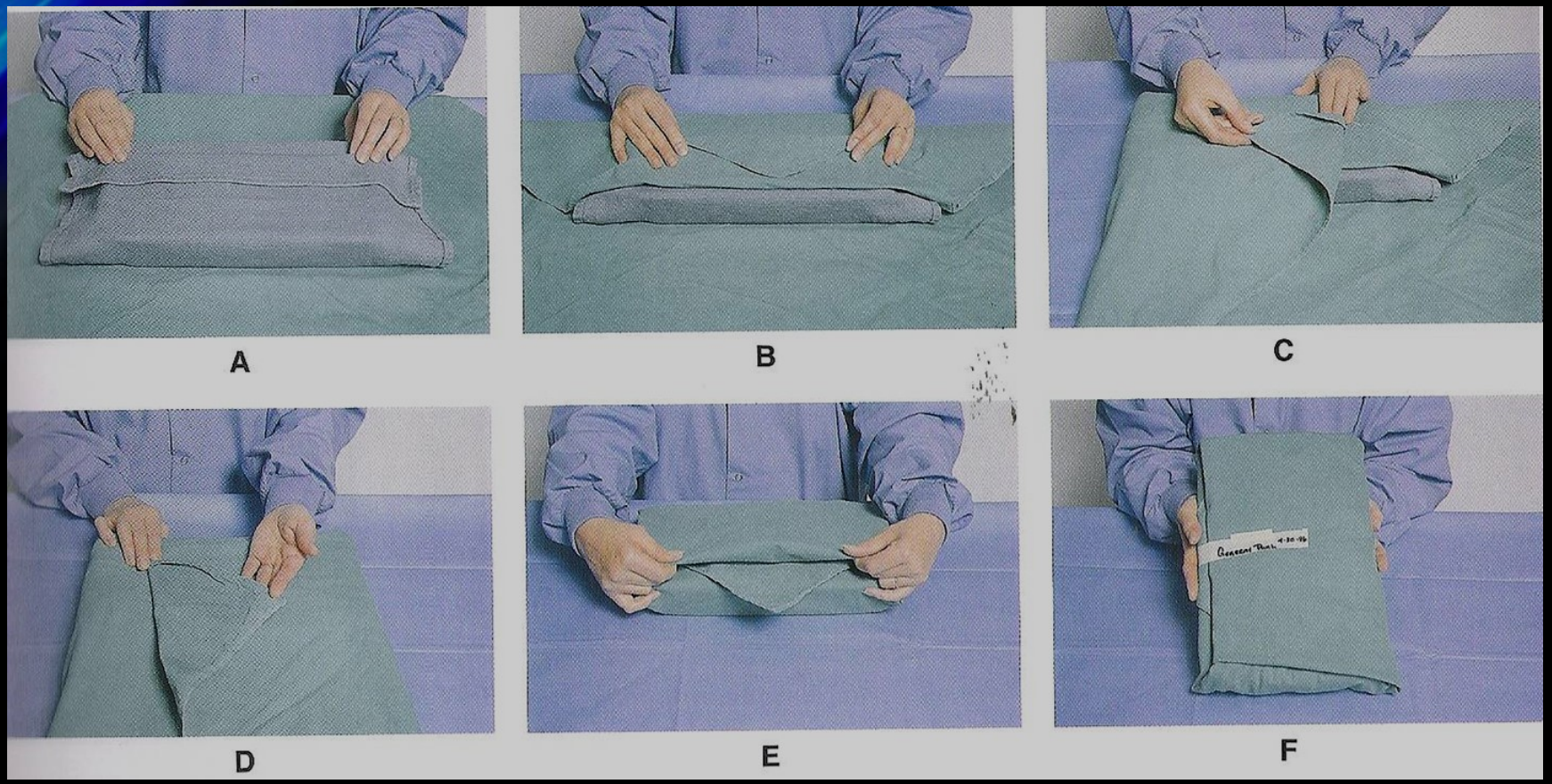
- Turn the pack around and fold the final corner of the wrap over the tray
- Tucking it tightly under the previous two folds

Wrapping an instrument pack



- Wrap the pack in a second layer of cloth or paper in a similar manner
- Secure the last corner of the outer wrap with masking tape and a piece of heat-sensitive indicator tape

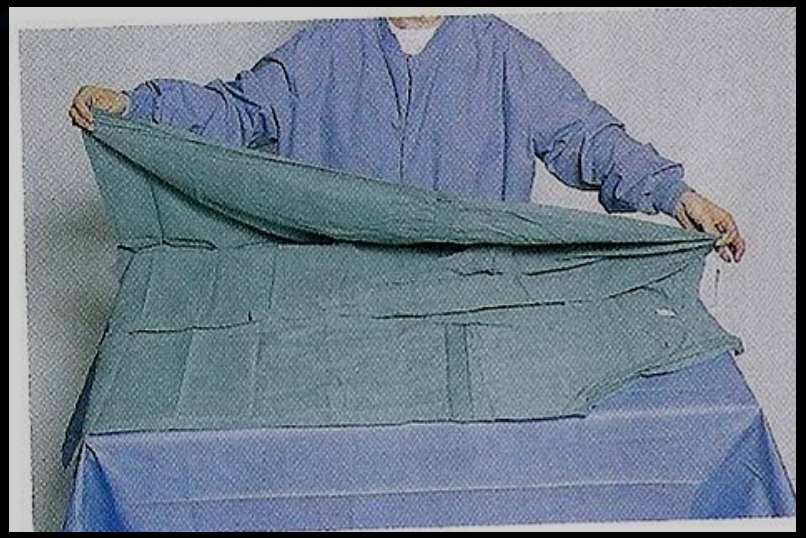
Wrapping an instrument pack



Folding and Wrapping the Gowns

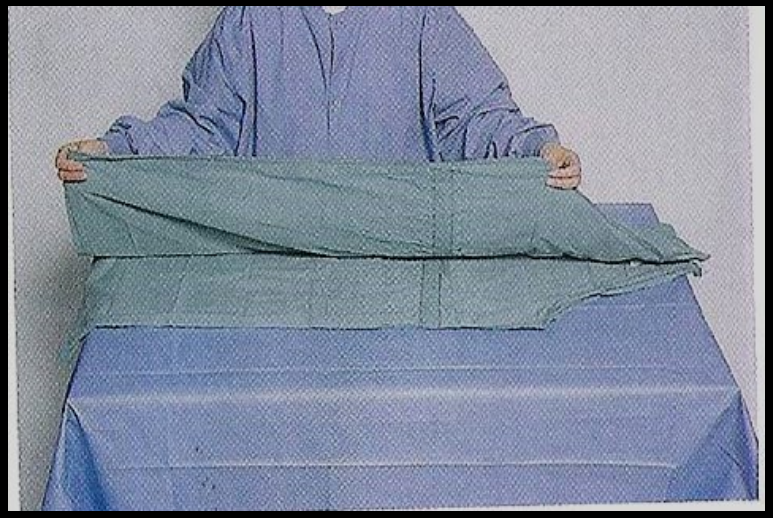
- Place the gown on a clean, flat surface with the front of the gown facing up
- Fold the sleeves neatly toward the center of the gown with the cuffs of the sleeves facing the bottom hem (border)

Folding and wrapping the gowns



Fold the sides to the center so that the side seams are aligned with the sleeve seams (Stratum)

Folding and wrapping the gowns

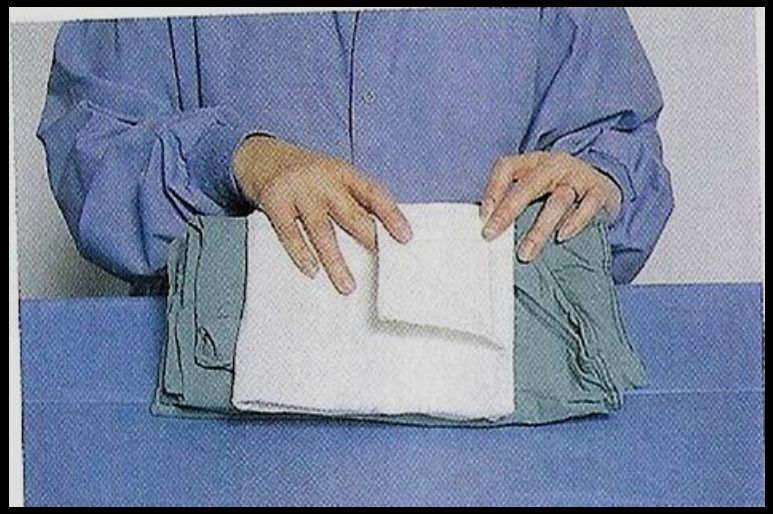


- ❑ Fold the gown in half longitudinally
- ❑ The sleeves will be inside the gown

Folding and wrapping the gowns

- Starting with the bottom hem
- Fanfold the gown toward the neck

Folding and wrapping the gowns

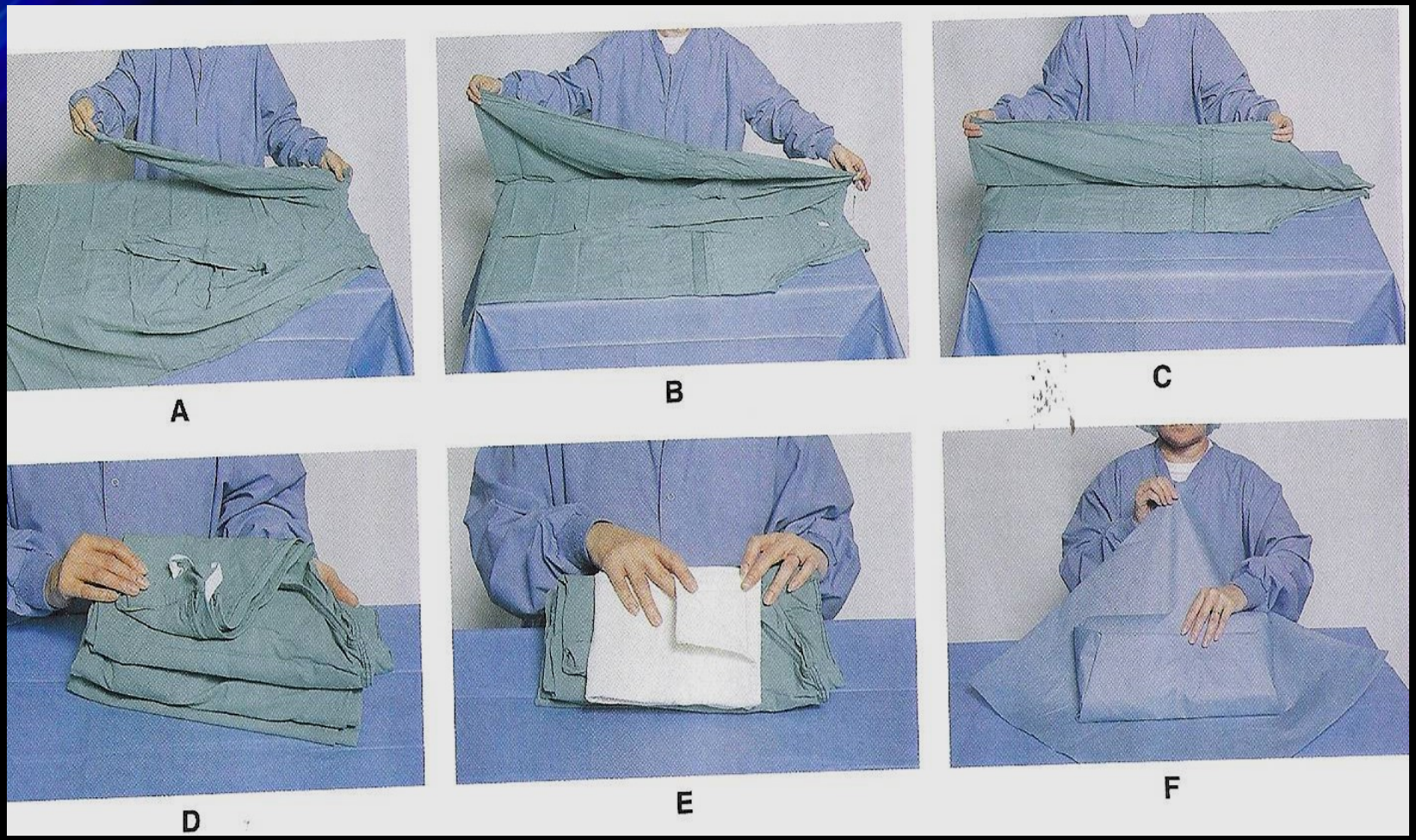


- Fold a hand towel in half horizontally
- Fanfold the gown it into about four folds
- Place it on top of the folded gown
- Leave one corner turned back so that it can be easily grasped

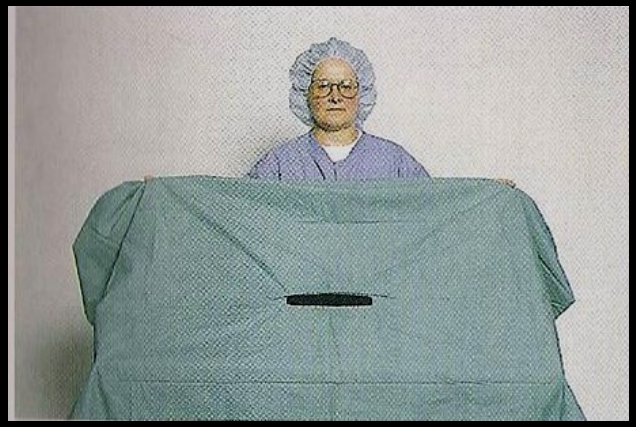
Folding and wrapping the gowns

Wrap the gown and towel in two layers of paper or cloth wrap as instrument packing

Folding and wrapping the gowns



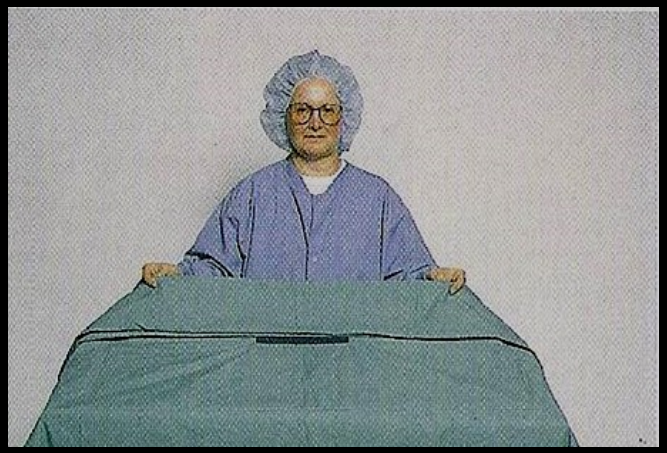
Folding and Wrapping Drapes



- Lay the drape flat with the ends of the fenestration perpendicular to you
- The sides of the fenestration parallel to you

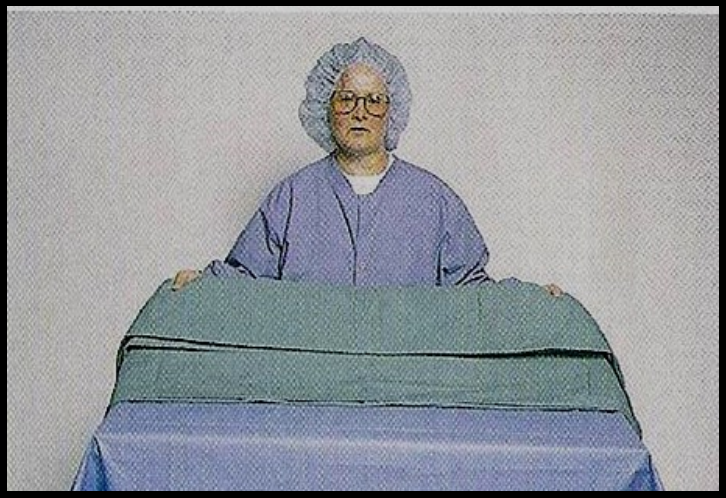
Fenestration: Literally, the making of a window -- fenestra in Latin (and fenetre in French) is a window -- fenestration refers to the creation of a new opening

Folding and wrapping drapes



- Grasp the edges of the drape nearest
- Fanfold the drape to the center

Folding and wrapping drapes



Turn the drape around and fanfold the other half the same way

Folding and wrapping drapes

- ❑ Fanfold one end of the drape to the center
- ❑ The fingers are through the fenestration
- ❑ Repeat with the other end

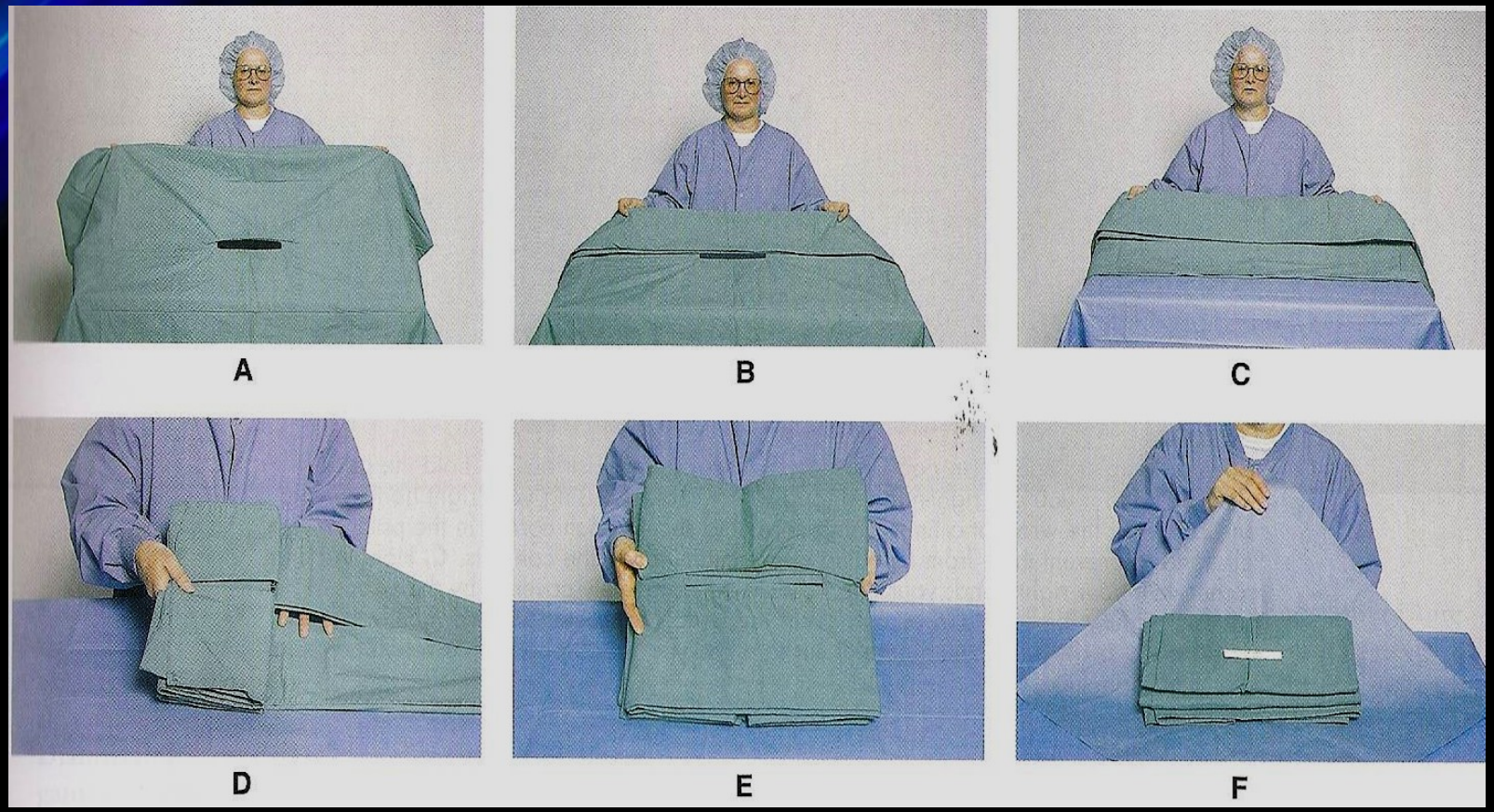
Folding and wrapping drapes

If the drape has been folded properly, the fenestration is on the ventral outmost aspect

Folding and wrapping drapes

- Fold the drape in half
- Wrap it in two layers of paper or cloth

Folding and wrapping gowns



HANDLING AND STORAGE OF STERILIZED INSTRUMENTS AND EQUIPMENT

- Dry individually on rack not pack on each other- prevent :strike-through contamination
- When dry- put in water proof dust covers in closed cabinet to protect from moisture or exposure from particle matter (i.e. dust borne bacteria)

Sterile shelf life

Recommended storage times for sterilized packs

Wrapper	Shelf life
Double-wrapper, two-layer muslin	4 weeks
Double-wrapped, two-layer muslin, heat sealed in dust covers after sterilization	6 months
Double-wrapped, two-layer muslin, tape sealed in dust covers after sterilization	2 months
Double-wrapped, nonwoven barrier materials (i.e paper)	6 months
Paper/plastic peel pouches, heat sealed	1 year
Plastic peel pouches, heat sealed	1 year

Handling sterile items

- Sterile items have dated labels or chemical tapes to ensure sterility- *always check expiration dates*

- If the sterile pack is damaged, it should not be used
  - Damage is defined as when the pack is
    - Place in dirty environment
    - Store near to source of an air current
    - Items that have been dropped, bent, crushed, compressed, torn, punctured or broken seal

Unwrapping and opening sterile items

There are three popular methods of distributing sterile items

- ❑ Unwrapping large sterile linen/paper/polypropylene packs that cannot be held during distribution
- ❑ Unwrapping sterile linen/paper/packages that can be held during distribution
- ❑ Unwrapping sterile items in paper/plastic plastic peel-back pouches

Unwrap the linen pack

- It can be held during distribution
- Hold the pack in your left hand (right handed)

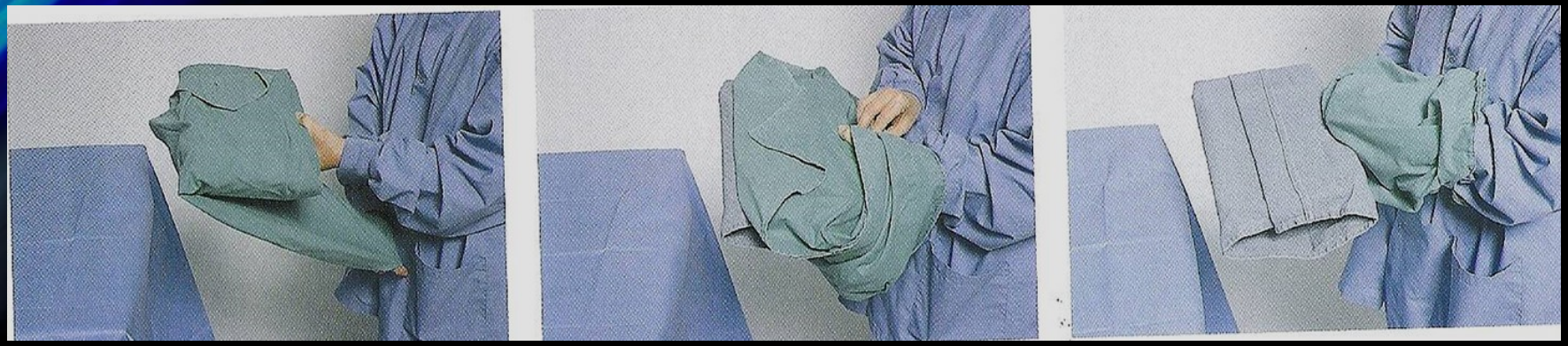
Unwrap the linen pack

- Unfold one corner of the wrap at a time
- Careful to secure each corner in the palm of left hand to prevent them from recoiling and contaminating the contents

Unwrap the linen pack

- ❑ Hold the final corner with right hand should be completely covered by wrap
- ❑ When the pack is fully exposed and all corners of the wrap have been secured, gently set the pack on the sterile field
- ❑ No allow your hand and arm to reach across or over the sterile field

Unwrap the linen pack



Pouring solutions into basins

- Solutions (i.e. sterile saline and antiseptics) are poured into basin away from surgical table
- The solution container should not touch the sterile basin

THANK YOU