

# JoVE: Science Education

## Sterile Technique for the Operating Room

--Manuscript Draft--

<b>Manuscript Number:</b>	10157
<b>Full Title:</b>	Sterile Technique for the Operating Room
<b>Article Type:</b>	Manuscript
<b>Section/Category:</b>	Manuscript Submission
<b>Corresponding Author:</b>	Peter Morone UNITED STATES
<b>Corresponding Author Secondary Information:</b>	
<b>Corresponding Author's Institution:</b>	
<b>Corresponding Author's Secondary Institution:</b>	
<b>First Author:</b>	Peter Morone
<b>First Author Secondary Information:</b>	
<b>Order of Authors:</b>	Peter Morone Gabrielle White-Dzuro
<b>Order of Authors Secondary Information:</b>	

**Author Name:** Peter Morone and Gabrielle White-Dzuro  
**Title:** Sterile Technique for the Operating Room

**Overview:**

Post-operative infections are a significant problem facing the healthcare community and have been shown to prolong hospitalization from 5 to 20 days per infection.<sup>1,2</sup> Surgical site infections occur after 2.8% of procedures and have a significant cost associated with them.<sup>3</sup> With the shift toward a bundle reimbursement system for hospitalizations, decreasing the occurrence of post-operative infections has become even more important.

Sterile technique in the operating room (OR) is done to prevent post-operative infections by minimizing contamination of the patient with pathogens. There are two ways some of the steps in the described procedure can be done — alone or with the help of someone who is already sterile, usually the scrubbed technologist or nurse. These procedures are first described with the help of someone else and then described how they would be done alone.

**Commented [JS1]:** Based on the procedure below, the steps are first written as if the individual is alone. Side notes are provided afterwards, if an assistant is available.

Do you intend to show both methods?

**Procedure:**

1. Preparation and Handling of the Gown and Gloves

1.1 Conduct all preparation for the operating room (OR) prior to scrubbing in. This includes wearing the appropriate scrub attire, face mask, shoe covers, and protective eye gear.

1.2 Retrieve a surgical gown and gloves. A nurse or surgical technologist can help with sizing.

With Assistance:

1.3 If there is a scrubbed technologist to assist with this procedure, hand the gown and gloves to them in a sterile manner.

1.3.1 Open the gown by first removing the plastic covering.

1.3.2 Hold the gown in your left hand with the flaps side up.

1.3.3 Using your right hand, pull back each of the flaps and tuck them into your left hand. This leaves a portion of the sterile gown exposed, which can then be handed it to the scrubbed technologist without them touching the packaging.

1.3.4 To open the gloves, grab the top edges of the packet with both of your hands.

1.3.52-2 Pull your hands apart to open the package and tuck the edges of the package under itself. This exposes a portion of the sterile gloves and allows the scrubbed technologist to grab them without touching the packaging.

Solo:

1.464 The gown comes double packed, with an outer plastic layer and an inner wrapping paper. Tear the packet at the top and place the package covered with inner wrapping paper onto a surface.

1.575 Unfold the paper packaging by touching only the corners of the wrapping paper.

1.686 Extend the edges of the paper fully, so the paper is flat. This is now a sterile surface.

1.797 All surgical personnel should wear two sets of gloves, referred to as “double-gloving,” in an effort to prevent infection in the instance of glove perforation. Remove the gloves from their outer plastic layer by opening up the folds of the plastic.

1.8108 Drop the glove pack onto a sterile surface from a reasonable height foot above the sterile field.

1.99-11 Hand towels are usually pre-packaged with the gown. If they are not, open them in a similar manner to the gloves.

## 2. Drying the Hands

With Assistance:

2.1 Have your palms open and outstretched, so the scrubbed technologist can hand the towel to you -by laying it flat onto one of your outstretched palms.

2.1 While standing an appropriate distance from the created sterile field, pick the towel up off the sterile field by grabbing at its corner. If working with a scrubbed technologist, have them hand the towel to you.

Solo:

2.2 While standing an appropriate distance from the created sterile field, pick the towel up off the sterile field by grabbing at its corner.

2.3 Open the towel, and lay it flat onto one of your palms.

2.43 Holding it in this hand, dry the opposite arm by patting, starting at the hands and going to above the elbows.

**Commented [JS2]:** Can you state an approximate numerical range? To prevent dropping them or contaminating the sterile surface?

2.54 Hold your arms away from your body to ensure the sterile towel never touches your surgical attire.

2.65 Lay the opposite side of the towel open on your other palm. Repeat the same step on the opposite side.

2.76 Once both hands are dry, drop the towel into the appropriate receptacle.

### 3. Gowning

#### With Assistance:

3.1 If there is a scrubbed technologist available to help, have them unfold the gown, so the non-sterile inside is facing toward you. Place both arms into their respective arm-holes and guide the gown over your shoulders by raising and spreading your arms.

#### Solo:

3.24 If this is being done alone, grasp the gown firmly, on the inside of it, and carry it away from the sterile table.

3.32 Holding the gown at the shoulders, allow it to unfold in front of you. It should open with the inside facing you. Remember ~~not~~ to not shake the gown open.

3.43 Extend both arms into their respective sleeves.

3.5 Guide the gown on by raising and spreading the arms, being careful not to drop the hands below the level of the umbilicus. Keep your hands within the sleeves at this point.

3.65 Have ~~Aa~~ non-sterile circulator ~~should~~ come behind you and help pull the gown over your shoulders and tie it in the back.

3.76 After gloves have been put on, secure the back flap of the gown. To secure the gown, grab the card that has two ties on it.

3.78 Holding the card in your right hand, pull the smaller tie out with your left hand.

3.98 Pass the card to the assistant, who should hold it far away from you.

3.109 Turn around 360° on the spot, so the tie wraps around you.

3.119 Pull the larger tie out of the card and use the two ties to make a knot.

### 4. Gloving

### With Assistance:

4.1 If there is a scrubbed technologist to help, they should extend the open glove toward you, protecting their hands on the sterile side of the glove. Slip your hand into the open glove.

4.2 Once one hand is gloved, use a finger of the gloved hand to help stretch the glove open and onto the ungloved hand. Ensure that your non-sterile hands don't touch their sterile gloves at any point.

### Solo:

4.34 Gripping the glove packet through the gown, open it and lay it flat on the table sterile field. This can be done by lifting both corners open and folding them under at the same time.

Commented [JS3]: Sterile field?

4.42 Grab the right glove with the left hand, and lay the glove palm down over the cuff of the gown, with the fingers of the glove facing toward you.

4.53 Working through the gown sleeve, grasp the cuff of the glove with the opposite hand covered by the gown, and bring it over the open cuff of the sleeve.

4.64 Unroll the glove cuff, so it fully covers the gown sleeve. Adjust the glove using your left hand through the gown to make it fit securely.

4.75 Repeat the same procedure on the opposite hand, using the same technique. Ensure that the bare hand never comes into contact with the gown cuff edge or the outside of the glove.

### 5. In the OR

5.1 Ensure that your hands never leave the sterile field. Gowns are only considered sterile in the front from the axilla to the level of the sterile field, usually the operating table. Also, the sleeves of the gown are sterile from 2" above the elbow to the cuff. The neckline, shoulders, under arms, sleeve cuffs, and back are all considered unsterile.

5.2 Rest your hands folded together at the level of the sternum or on the sterile field.

### Summary

This video reviewed the importance of sterile technique in the OR and how to maintain sterility.

The surgical hand scrub and sterile technique are both extremely important to preventing post-operative wound infections. The most important aspect of this technique is preventing contamination of the sterile equipment and surfaces, since this unnecessarily increases the risk of infection post-operatively.

Maintaining aseptic technique in the OR is a learned skill that, like other skills, takes time to master. The first few times in the OR are difficult and require attention and caution to one's self and the surroundings. It is very common to accidentally contaminate one's self during the learning process. If this occurs, another physician or the scrubbed technologist have to be notified.

### **References**

1. Young, P.Y. and R.G. Khadaroo, Surgical site infections. Surg Clin North Am, 2014. 94(6): p. 1245-64.
2. Bremmelgaard, A., et al., Computer-aided surveillance of surgical infections and identification of risk factors. J Hosp Infect, 1989. 13(1): p. 1-18.
3. Barie, Philip Steven. Surgical site infections: epidemiology and prevention. Surg Infect (Larchmt). 2002 Suppl 1:S9-21. Review.