

APGO Basic Clinical Skills Curriculum



Sterile Technique



Association of Professors of Gynecology and Obstetrics (APGO)

Undergraduate Medical Education Committee ©2008

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DESCRIPTION

Health care-associated infection is a major problem for patient safety, and its prevention is a high priority. Surgical site infection accounts for 20% of hospital-wide infections, and rigorous adherence to the principles of asepsis by all scrubbed personnel is the foundation of surgical site infection prevention. General hand hygiene is critical to preventing health care-associated infection; health care providers should always practice hand-washing before and after every patient contact, even after wearing gloves.

The goal of sterile, or aseptic, technique is to minimize possible sources of infection. Sterile technique is the use of practices that restrict microorganisms in the environment and prevent contamination of the surgical field. Sterility will apply to surfaces of some objects or to substances that will be introduced into a patient's body. There are objects that do not have the potential to be made sterile. For example, hands can be made clean but not sterile. "Scrubs" from the locker room dispenser are not sterile, nor are surgical masks. Only specific, deliberately prepared surfaces or substances are considered sterile. The space in which sterile objects may interact—undisrupted by non-sterile objects—is a sterile field. An important point to bear in mind is that a person or thing will have only a particular portion of its surface designated as sterile and, therefore, within a sterile field. Every other surface is considered non-sterile, and any non-sterile surface may contaminate a sterile surface.

Sterile fields are defined by the sterile surfaces of two operating room (OR) components (for example, a sterile instrument on a sterile tray). Typically, on scrubbed surgical personnel (by "scrubbed," meaning hands washed according to OR protocol, donning sterile gown and sterile gloves), the sterile surface would extend approximately from the chest to the waist on the torso and from elbows to the tips of gloved fingers on the upper limb. The rest of the scrubbed person is not sterile and is a possible source of contamination for the sterile area.

On a patient, only the prepared surface of the body and the sterile drape are considered within the sterile field. Note that edges of otherwise sterile surfaces are not sterile because they must contact (or appose) non-sterile objects. Therefore, the physical edges of a sterile drape—or any surface of the drape below the space defined by the other sterile objects of the field—are not considered sterile.

INTENDED LEARNING OUTCOMES

This clinical skills module provides a framework for teaching the importance of and the principles behind sterile (or aseptic) technique. Following participation in this module, learners should be able to:

1. Discuss the rationale behind the importance of sterile technique
2. Perform appropriate surgical hand preparation
3. Demonstrate appropriate assisted gowning and gloving techniques in preparation for surgery or vaginal delivery

BEST PRACTICES

Scrubbing In

Medical students should be offered scrub training to learn sterile technique prior to entry into any operating room. Students who opt to attend surgical cases during the pre-clinical years ought to be fully trained prior to their first operating room experience and then offered a refresher course or video prior to any clinical clerkships or electives that are surgically based.

A typical OR visit may be as follows:

1. Obtain scrubs from hospital location (not from home).
2. Change into scrubs, being sure not to wear anything under scrubs that would be visible (such as a long-sleeved T-shirt).
3. Wash hands or use rapid-drying water-free washes prior to examining or touching any patients and prior to surgery (or any patient encounter with your hands or stethoscope).
4. Obtain and don a surgical hair cap. All hair must be covered. Be sure you choose a cap that covers your hair, or a special cap if you have a beard.
5. Obtain and don surgical shoe covers or have a dedicated pair of operating room shoes. Caps and shoe covers are usually found at the entrance to the Operating Room area.
6. Remove hand jewelry, including rings, watches and bracelets.
7. Obtain and don a surgical mask prior to entering the operating room. You should have eye protection, either attached to or separate from your surgical mask.
8. Enter the operating room. Introduce yourself to the team members in the room. Be aware of the scrub nurse's location and any sterile areas to avoid contamination of the nurse or the instruments. Write your name on the dry erase board, if available. Offer to get your gown and gloves.
9. Perform any duties with non-sterile objects (including patient preparation).
10. Scrub in.

Generally, scrubbing in means a sequence of procedures wherein one attains a sterile surface, including:

1. Surgical hand scrub
2. Gowning (putting on sterile, surgical gown)
3. Gloving (putting on sterile, surgical gloves)

The surgical hand scrub is a process to reduce skin flora of hands, nails and forearms, and is performed outside the OR at the scrub station. Once completed, one must carefully reenter the OR for gowning and gloving.

Finally, once gowned and gloved, a person's movements must take into consideration the sterile fields. Remember that the sterile field is considered from the nipple line to waist on the anterior chest. Typically, when moving, hands should be kept directly in front of the chest, but clear of the face or other non-sterile areas. When passing OR personnel or non-sterile things, one's back should be directed toward the non-sterile surfaces of these OR obstacles. Never reach around someone's back. Once part of the sterile field, the sterile surface must face the prepared surface of the patient or other sterile surfaces.

Steps Before Starting Surgical Hand Preparation:

1. Keep nails short and pay attention to them when washing your hands—most microbes on hands come from beneath the fingernails.
2. Remove all hand jewelry (rings, watches, bracelets) before entering the operating room.
3. Wash hands and arms with a non-medicated soap before entering the operating room or if hands are visibly soiled.
4. Clean subungual areas with a nail file.

Protocol for Surgical Scrub with a Medicated Soap:

1. Start timing. Scrub each side of each finger, between the fingers and the back and front of the hand for two minutes.
2. Proceed to scrub the arms, keeping the hand higher than the elbow at all times. This helps to avoid recontamination of the hands by water from the elbows and prevents bacteria-laden soap and water from contaminating the hands.
3. Wash each side of the arm from wrist to the elbow for one minute.
4. Repeat the process on the other hand and arm, keeping hands above elbows at all times. If the hand touches anything at any time, the scrub must be lengthened by one minute for the area that has been contaminated.
5. Rinse hands and arms by passing them through the water in one direction only, from fingertips to elbow. Do not move the arm back and forth through the water.
6. Proceed to the operating room, holding hands above elbows.
7. At all times during the scrub procedure, care should be taken not to splash water onto surgical attire.

8. Once in the operating room, hands and arms should be dried using a sterile towel. Use a separate sterile area of the towel for each hand. Drop towel.

Surgical Hand Preparation Technique with an Alcohol-based Handrub Formulation:

1. For the first preparation of the day, prewash hands and forearms with antimicrobial soap and water as above.
2. Dry hands completely.
3. Dispense one to two pumps (2-5 ml) of antiseptic hand prep into the palm of one hand.
4. Dip the fingers of the opposite hand in the hand prep to decontaminate under nails.
5. Smear the remaining hand prep evenly on hand and forearm to elbow.
6. Dispense another one to two pumps (2-5 ml) of antiseptic hand prep into the palm of the other hand and repeat above.
7. Dispense another 2-5 ml of antiseptic hand prep into either hand and reapply to all aspects of both hands, up to the wrists, rubbing hand prep for 15 to 25 seconds until hands are dry before donning gloves.

Gowning Technique Procedural Steps:

1. If your hands are wet from using a medicated soap wash, wait for a scrub nurse to hand you a towel from the sterile field. If you pick up a towel from the sterile field to dry hands, be very careful not to let your hands drip onto the sterile field. Use a separate sterile area of the towel for each hand. Drop towel.
2. Slide arms into armholes of gown. Do not pass hands through gown cuffs.
3. While hands are inside of gown, pass hand into first glove, allowing fingers to become exposed once inside of glove.
4. Pass hand into second glove in a similar fashion.
5. Put on second set of gloves.
6. Have nonsterile team member tie back of gown.
7. Hand gown card to nonsterile team member to hold while you turn around.
8. Tie gown in front at waist.

CHECKLIST

The following checklist may be used as a component of the training session and/or as a component of a performance assessment as part of an objective structured clinical examination.

	DONE	NOT DONE
Remove jewelry		
Correctly place the surgical cap, mask and eye protection		
Correctly open the packet of surgical scrub soap		
Turn on the water correctly		
Correctly clean beneath fingernails		
If using surgical scrub brush, scrub hands and forearms correctly		
Keep hands and forearms elevated and avoid contamination while entering door to OR		
Accept the drying towel properly, without contaminating it against his or her body		
Dry hands properly, using a separate sterile area of the towel for each hand		
Properly dispose of the used towel		
Receive and don the surgical gown properly		
Receive and don gloves without contaminating gown or gloves		
Turn properly to close off the back of the gown		

PERFORMANCE ASSESSMENT

Direct observation of the learner performing appropriate surgical hand preparation and demonstrating appropriate assisted gowning and gloving techniques is the best way to assess a learner's mastery of sterile technique. Using the provided checklists to assess important points of surgical preparation can assist in scoring learner performance and assessing competence. This can be done in an OSCE or as an isolated training and evaluation.

PRACTICAL TIPS

There are a number of videos or DVDs available that many medical schools and hospitals use for further understanding of this process. If learners feel they need more help, they should ask if these are available at their institution. Many institutions will automatically show them, or learners will be given a practice session by an experienced OR nurse.

The first time in the OR can be an anxiety-provoking experience because of the learner's fear of making an error. If learners make a mistake, they should understand that teachers have been in the same situation, and learners should understand that they are learning.

RESOURCES

1. WHO guidelines on hand hygiene in health care. WHO Press, World Health Organization, Geneva, Switzerland, 2009.
2. Meeker, M and Rothrock J. *Alexander's care of the patient in surgery*, 14th ed. Mosby, Inc. 1999.
3. Fortunato, N. Berry and Kohn's *operating room technique*, 9th ed., Mosby, Inc. 2000.