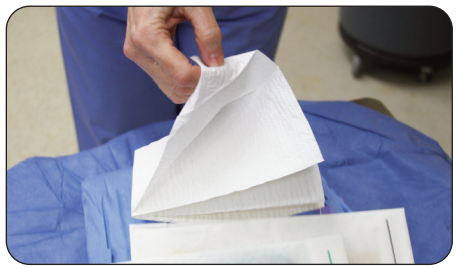
Hand Hygiene, Scrubbing, Gowning, and Gloving



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STUDY GUIDE

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LEARNING OUTCOME

After completing this study guide and viewing the accompanying video, the perioperative registered nurse (RN) and other perioperative team members will have increased their knowledge of effective hand hygiene, surgical hand antisepsis, and sterile gowning and gloving techniques.

OBJECTIVES

The participant will be able to

- recognize the importance of hand hygiene for the prevention of health care–associated infections,
- maintain fingernails and hands in healthy condition,
- use proper technique when performing hand hygiene,
- use proper technique when performing surgical hand antisepsis, and
- maintain asepsis during sterile gowning and gloving.

INTRODUCTION

Microorganisms on the hands of perioperative team members can be transmitted to patients and the environment, and this can lead to the development of health care–associated infections.[1] As many as one in 20 surgical patients develop a surgical site infection during hospitalization.[2] Health care–associated infections can result in poor patient outcomes, including morbidity, pain and suffering, longer lengths of hospital stay, delayed wound healing, increased use of antibiotics, higher costs of care, and even death.[1] Preventing these infections is a priority for all health care workers, and hand hygiene is widely recognized as an effective and cost-efficient method for prevention in the perioperative setting.[1]

Normal skin flora includes both resident and transient microorganisms. Transient microorganisms are found in the superficial layers of the skin. These microorganisms can colonize the hands of perioperative team members during patient care or through contact with contaminated environmental surfaces. The condition of the skin and fingernails and the presence of jewelry can contribute to the quantity of microorganisms on the hands. Hand hygiene is intended to remove these transient organisms. Surgical hand antisepsis is intended to remove transient microorganisms and suppress the growth of resident microorganisms for the duration of a surgical procedure.[1]

In addition to performing personal hand hygiene, the perioperative RN plays a crucial role in developing and implementing protocols for hand hygiene and surgical hand antisepsis in the perioperative setting, including the selection of surgical hand antiseptics and hand hygiene products.[1]

HAND HYGIENE

Hand hygiene can be defined as any activity related to hand cleansing and the condition of the hands.[1] Evidence shows that hand hygiene reduces the incidence of health care–related infections.[1] In health care settings, it may be the single most important practice for reducing the transmission of infectious organisms.[3]

Perioperative team members should perform hand hygiene at the following times:

- After contact with the patient's surroundings
- After any situation that creates risk for exposure to blood or other bodily fluids
- After using the restroom
- Before and after contact with a patient
- Before and after eating
- Before performing a clean or sterile task
- Whenever hands are visibly soiled[1]

Examples of contact with patient surroundings include, but are not limited to,

- inanimate surfaces and objects, including medical equipment, in the immediate vicinity of the patient;
- OR bed controls;
- patient's bed and linens; and
- the floor or items that have come in contact with the floor.[1]

Examples of situations that place perioperative team members at risk for exposure to blood or other bodily fluids include

- draining urinary catheter bags, colostomy bags, or other drains;
- having contact with blood, other bodily fluids, excretions, mucous membranes, nonintact skin, or wound dressings;
- handling surgical specimens;
- handling used surgical sponges;
- inserting or assessing an invasive device;
- performing airway manipulations (eg, intubation, suctioning);
- removing personal protective equipment; and
- removing surgical drapes.[1]

Examples of patient contact include

- assessing an invasive device (eg, vascular catheter [peripheral, central, arterial], urinary catheter);
- assessing wound dressings;
- marking a surgical site;
- performing a physical examination; and
- transferring or positioning a patient.[1]

Examples of clean or sterile tasks include

- accessing a vascular device (eg, port, stopcock, IV tubing);
- administering or preparing medication, including delivery of medications to the sterile field and preparation of IV fluids;
- administering regional anesthesia;
- drawing blood;
- inserting an invasive device;
- moving from a contaminated body site (eg, perineum) to a clean site (eg, face) on the same patient;
- opening sterile supplies;
- performing neuraxial procedures (eg, epidural, spinal); and
- performing preoperative patient skin antisepsis.[1]

Perioperative team members only need to perform hand hygiene once when multiple indications occur at the same time or when performing multiple sequential tasks (eg, opening multiple sterile items at once).[1]

Wearing gloves does not replace hand hygiene.[1]

In situations where patient safety is at risk, perioperative team members must assess the benefits of hand hygiene against the risk of delaying action, for example, a patient experiencing cardiac arrest. The benefits of hand hygiene may not outweigh the harms in all clinical situations, and patients may experience adverse outcomes if necessary interventions are delayed.[1]

Washing with Soap and Water

Options for hand hygiene include alcohol-based hand rubs and washing with soap and water. Alcohol-based rubs may not be effective if hands are soiled with organic material (eg, blood, other bodily fluids). Washing with soap and water might also be more effective for removing spores. For these reasons, perioperative team members should wash their hands with soap and water after hands have been exposed to blood or other bodily fluids, when hands are visibly soiled, after using the restroom, or when caring for patients with spore-forming organisms (eg, Clostridium difficile, Bacillus anthracis) or norovirus.[1]

Perioperative team members should follow a standardized protocol for hand washing with soap and water. The following steps should be performed in order:

1. Remove jewelry from the hands and wrists.
2. Adjust water to a comfortable temperature, avoiding hot water.
3. Wet hands thoroughly with water.
4. Apply the amount of soap needed to cover all surfaces of the hands.
5. Rub hands together vigorously covering all surfaces of the hands and fingers for at least 15 seconds.
6. Rinse with water to remove all soap.
7. Dry hands thoroughly with a disposable paper towel.
8. When hands-free controls are not available on the sink, use a clean paper towel to turn off the water.[1]

Alcohol-Based Hand Rubs

When hands are not visibly soiled or dirty, perioperative team members should perform hand hygiene using an alcohol-based hand rub according to the manufacturer's instructions for use.[1,4] Compared with soap and water, alcohol-based products dry the skin less and have superior antimicrobial activity.[4,5] Evidence indicates that alcohol-based rubs also have significantly better efficacy at removing some viruses.[4,5] The Centers for Disease Control and Prevention has determined that alcohol-based solutions containing 60% to 95% alcohol are the most effective.[4] Higher concentrations are less effective because proteins are not easily denatured if no water is present.[4]

A standardized protocol for using an alcohol-based hand rub includes the following steps, in order:

1. Remove jewelry from the hands and wrists.
2. Apply the amount of alcohol-based rub recommended by the manufacturer to cover all surfaces of the hands.
3. Rub hands together, covering all surfaces of the hands and fingers until dry.[1]

Health care organizations may permit perioperative team members to use personal dispensers of alcohol-based hand hygiene products.[1]

Hand Washing Stations and Sinks

A sufficient number of hand washing stations and alcohol-based rub dispensers should be placed in convenient locations. At least one hand washing station should be provided for every four patient care stations. Hand washing sinks should have hands-free controls to reduce the risk of cross-contamination, and hands-free paper towel dispensers should be provided.[1]

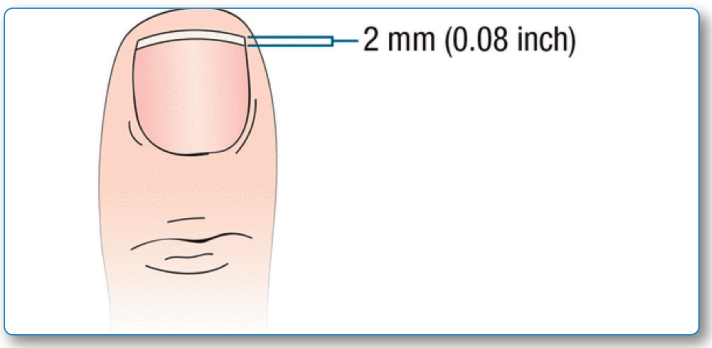
Sinks that are designed and intended for hand hygiene should only be used for that purpose. Using a hand hygiene sink for other purposes could contaminate the sink, the faucet, and the hands of team members who subsequently use it.[1]

CONDITION OF FINGERNAILS AND SKIN

Unhealthy skin or fingernails can interfere with the removal of dangerous microorganisms during hand hygiene. To maximize the effectiveness of hand hygiene, all perioperative team members should maintain healthy fingernails and keep the skin on their hands in healthy condition.[1]

Fingernails

Perioperative team members should maintain short, natural fingernails. Fingernail tips should be no longer than 2 mm (0.08 inch).[1]



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The World Health Organization has found that high concentrations of bacteria, including coagulase-negative staphylococci, gram-negative rods, and yeasts, can be harbored under the fingernails.[6] These potentially dangerous organisms can remain present even when hand hygiene or surgical hand antisepsis is properly performed.[1] Maintaining short fingernails reduces the risk for harboring microorganisms under the nails.[1] In addition, long nails have the potential for puncturing gloves, interfering with the proper performance of hand hygiene, or injuring the patient during handling.[1]

Perioperative team members should not wear artificial fingernails or extenders. Artificial nails have been associated with hand contamination and implicated in outbreaks of gram-negative bacteria and yeasts.[1]

The health care organization should form a multidisciplinary team composed of perioperative RNs, physicians, and infection preventionists to determine whether nail polish, including ultraviolet-cured nail polish (eg, gel, Shellac®), may be worn in the perioperative setting. Current evidence is inconclusive about the effect of nail polish on hand hygiene, and professional organizations offer differing recommendations. Potential hazards of nail polish might include interference with hand hygiene or transmission of pathogens harbored in chipped or old nail polish. Potential harms of ultraviolet-cured nail polish might include damage to natural fingernails or harboring pathogens in gaps created as the nails and cuticles grow.[1]

Skin

Perioperative team members should take measures to prevent hand dermatitis.[1] Team members with hand dermatitis and eczema may be less likely to perform hand hygiene.[1] Damage to the skin may change skin flora and increase colonization of staphylococci and gram-negative bacilli.[1],[6]

To optimize skin health, perioperative team members should do the following:

- Ensure hands are completely dry before putting on gloves after hand washing or using an alcohol-based rub. Wearing gloves with wet hands can increase skin irritation.[1]
- Ensure water used for hand hygiene is between 70° F and 80° F (21° C and 27° C). Repeated exposure to excessively hot water can irritate the skin and may lead to dermatitis and bacterial colonization.[1]

- Use an alcohol-based hand rub instead of soap and water when hands are not visibly soiled.[1] Alcohol-based hand rubs are associated with less irritant contact dermatitis than washing with soap and water.[5]

Perioperative team members should use moisturizing products approved by the health care organization after hand cleansing to minimize the risk of irritant contact dermatitis and to maintain healthy skin. It is important to use only approved products. Some types of lotion have been associated with altered integrity of latex rubber gloves, reduced persistent effects of hand antiseptics, and bacterial contamination of the lotion.[1]

Cotton glove liners may be worn under nonsterile gloves, and sterile cotton liners may be worn under sterile gloves. Glove liners may be helpful for maintaining healthy skin when extended use of gloves is anticipated. Single-use liners should be discarded after each use. Reusable liners should be reprocessed according to the manufacturer's instructions.[1]

It may be necessary to restrict the activities of team members with dermatitis, infections, exudative lesions, or nonintact skin if the activities pose a risk for transmission of infection to patients or other health care providers. Such activities might include providing direct patient care, entering the patient's environment, or handling instruments or devices that might be used during a procedure. Medical clearance may be required before the perioperative team member can return to his or her usual activities.[7]

JEWELRY

Perioperative team members should not wear jewelry on the hands or wrists in patient care areas.[1] Jewelry can interfere with the effective removal of microorganisms by shielding them underneath the jewelry or within crevices.[1] These microorganisms might then be transmitted to patients and cause health care–related infections.[1] Jewelry has been associated with increased bacterial counts on skin both while it is worn and after it is removed.[8] It can also interfere with hand hygiene during washing or disinfection with alcohol-based rubs.[1]

SURGICAL HAND ANTISEPSIS

Perioperative team members should perform surgical hand antisepsis before putting on sterile gowns and gloves for operative and invasive procedures. Surgical hand antisepsis is the primary line of defense to protect the patient from transmission of pathogens. Gloves can fail and should be considered a secondary line of defense. When using surgical hand scrubs or rubs to perform antisepsis, the manufacturer's instructions for use should be followed.[1]

Surgical Hand Rubs

Team members should follow a standardized protocol for hand antisepsis when using a surgical hand rub. The protocol should include the following steps, in order:

1. Remove jewelry from hands and wrists.
2. Put on a surgical mask.
3. Wash hands with soap and water if visibly soiled.
4. Clean underneath the fingernails using a disposable nail cleaner under running water.
5. Dry hands and arms thoroughly with a disposable paper towel.
6. Apply the surgical hand rub to the hands and arms.
7. Allow hands and arms to dry completely before putting on a surgical gown and gloves.[1]

Surgical Hand Scrubs

A standardized protocol for hand antisepsis using a surgical hand scrub should include the following steps, in order:

1. Remove jewelry from hands and wrists.
2. Put on a surgical mask.

3. Wash hands with soap and water if visibly soiled.
4. Clean underneath the fingernails using a disposable nail cleaner under running water.
5. Apply the hand scrub to the hands and forearms using a soft, nonabrasive sponge.
6. Visualize each finger, hand, and arm as having four sides, and wash all four sides thoroughly while keeping hands elevated.
7. Scrub for the length of time recommended by the manufacturer; the scrub should be timed to ensure adequate contact of the scrub product with the skin.
8. Whenever possible, turn off the water when it is not being used.
9. Avoid splashing surgical attire.
10. Discard sponges.
11. Rinse hands and arms under running water in one direction from fingertips to elbows.
12. Hold hands higher than elbows and away from surgical attire.
13. In the OR or procedure room, dry hands with a sterile towel using sterile technique before putting on a surgical gown and gloves.[1]

Brushes may damage skin and increase bacterial shedding from the hands. For these reasons, team members should not use brushes to perform a surgical hand scrub.[1]

Hand Scrub Sinks

Hand scrub sinks should be located in the semi-restricted area near the entrance to the OR or procedure room. One sink with two scrub positions can serve two rooms if the sink is located next to the entrance for each room. The sinks should have foot, knee, or electronic sensor controls to facilitate sterile technique during hand antisepsis.[1]

GOWNING AND GLOVING

To reduce the risk of wound contamination and surgical site infections, perioperative team members should use sterile technique when putting on and wearing sterile gowns and gloves. Perioperative team members should perform surgical hand antisepsis before putting on a sterile gown and gloves.[9]

Perioperative team members should dry their hands as follows:

1. Use one hand to reach down to the opened sterile package to pick up the towel by one corner, being careful not to drip water onto the gown.

2. Grasp the opposing corner of the towel with the other hand and open the towel to full length.
3. Use one end of the towel to dry one hand and arm with a circumferential motion to absorb moisture, moving from the hand to the upper arm. Bend slightly forward to avoid letting the towel touch the attire.
4. Hold the dry end of the towel in the dry hand to dry the second arm, using the same technique as for the first arm.
5. Discard the towel with the hand that is currently holding the towel without letting it touch the scrub attire.[10]

Scrubbed team members should put on sterile gowns and gloves in a sterile area away from the main instrument table. Putting on gowns and gloves in a separate area may help to prevent contamination of the instrument table from droplets of water or antiseptic solution on the team member's wet hands or by contact with unprotected skin and clothing.[9]

Additional considerations for sterile gowning and gloving include the following:

- Follow the manufacturer's instructions for donning gowns and gloves (if available).
- Sterile gloves should not be opened directly on top of an opened sterile gown.
- Hands and arms should be completely dry before the gown is put on.
- Only the inside of the gown should be touched when it is picked up to prevent contamination of the front of the gown.
- The sterile glove wrapper or gloves should not be touched until the gown has been put on.[9]

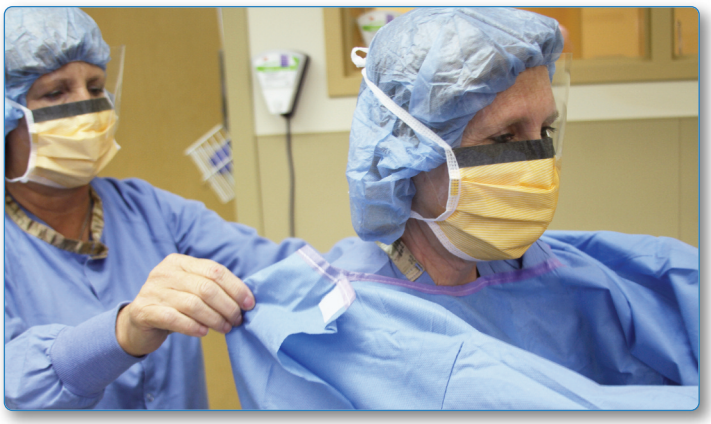
The front of a sterile gown from the chest to the level of the sterile field and the gown sleeves from 2 inches above the

elbow to the cuff circumferentially are considered sterile. The back of the surgical gown is considered unsterile. The neckline, shoulders, and axillary regions of the gown are considered contaminated. Sleeve cuffs are considered contaminated when the scrubbed team member's hand passes through and beyond the cuff. Cuffs should be completely covered by sterile gloves and should not be exposed.[9]

Self-Gowning

To properly self-gown, the perioperative RN should do the following:

1. Grasp the folded gown at the neckline and lift it directly upward from the sterile package.
2. Step back from the table to an unobstructed area.
3. Carefully locate the gown's neckband and hold the inside front of the gown just below the neckband with both hands.
4. Let the gown unfold, keeping the inside of the gown facing the body without touching the sterile exterior of the gown.
5. Hold the hands at shoulder level and slip both arms into the sleeves of the gown until the hands reach the nearest edge of the cuff.[10]



At this point, the RN circulator should assist the scrubbed person:

- Reach inside the gown and adjust the inside shoulder seam to bring the gown over the scrub person's shoulders.
- Touch only the ties, snaps, or hook-and-loop fasteners to secure the back of the gown at the neck and waist.
- Adjust the gown by grasping the bottom edge and pulling it down to eliminate any blousing.[10]

After the scrubbed person has put on his or her gloves, the RN circulator can assist with completing the gowning process by grasping the tab attached to the front tie presented by the scrubbed person and holding it firmly while the scrubbed person makes a three-quarter turn to wrap the back panel of the gown. The scrubbed person then carefully retrieves the tie by pulling it out of the tab held by the circulator and secures the gown by tying the long tie to the short tie on the waist of the gown.[10]

Assisted Gowning

A gowned and gloved person may assist another team member in drying his or her hands by grasping and open the towel that the other team member will use to dry his or her hands and laying the open towel on one of the team member's hands without touching the hand.[9,10]

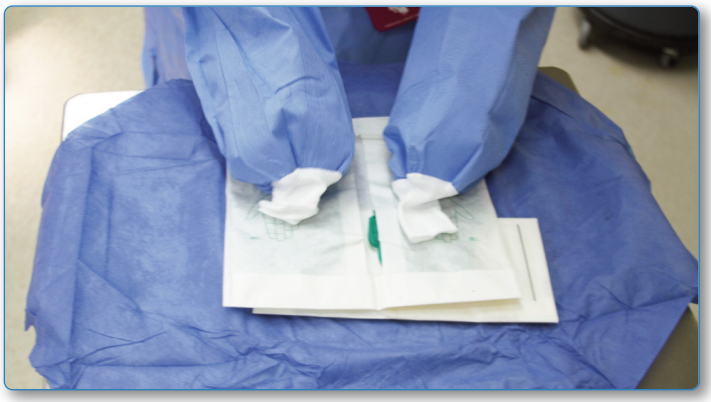
After the team member has finished drying his or her hands, the scrubbed person can assist him or her with gowning:

1. The scrubbed person holds the gown open at the shoulders and neckline by cuffing it over his or her hands and carefully unfolding it with the inside held away from the body.
2. The person being gowned extends both arms.
3. The scrubbed person offers the inside of the gown to the other team member so that team member can slip his or her hands into the sleeves.
4. The scrubbed person releases the gown when the team member's hands are in the sleeves.
5. An unscrubbed person can then tie up the back of the gown and help the newly gowned individual finish securing the gown.[10]

Gloving Without Assistance

When initially putting on a sterile gown and gloves, the scrub person should :

1. Keep both hands within the gown cuff so that the hands do not extend beyond the cuff edges.



2. Open the inner glove wrapper and grasp the folded cuff of the glove.
3. Hold the top edge of the glove cuff above the palm.
4. Place the palm of the glove against the palm of the hand and along the forearm of the same hand—the glove fingers should point up the forearm.
5. Grasp the back of the cuff and turn it over the open end of the sleeve and hand while holding the top of the glove and underlying gown sleeve with the covered hand.
6. Pull the glove over the extended fingers onto the wrist by pushing the hand through the glove until it completely covers the cuff of the gown.
7. Glove the other hand in the same manner.
8. Inspect the gloves for integrity after putting them on.
9. Put on a second pair of gloves over the first pair.[9,10]

Gloving -- Assisted gloving with gown cuffs at the fingertips should be used for initial gowning and gloving of another team member.

When gloving another team member, the scrub person does the following:

1. Picks up the glove with his or her fingers positioned under the cuff
2. Holds the palm of the glove toward the person being gloved
3. Stretches the cuff to open the glove and holds his or her thumbs out to keep them from touching the other team member's bare hands
4. Exerts upward firm pressure as the other person inserts his or her hand into the glove, making sure the hand does not go below the other person's waist
5. Unfolds the everted glove cuff over the cuff of the sleeve
6. Gloves the other hand by repeating the steps[9,10]

During gloving with assistance, the gown cuff should remain at or beyond the person's fingertips. The glove should be held open by a scrubbed team member as the team member being gloved inserts his or her hand into the glove. The cuff of the gown should only touch the inside of the glove.[9]

Gloving -- Assisted gloving with gown cuffs at the wrist

During assisted gloving and the gown cuff is at wrist level, and the fingers and hand are exposed, the scrubbed team member should hold the glove open and the team member donning the glove should insert his or her hand into the glove with the gown cuff touching only the inside of the glove.[1]

Perioperative team members should wear two pairs of surgical gloves, one over the other, during procedures with potential for exposure to blood, other bodily fluids, or other infectious material. Surgical gloves must be intact and without perforations to provide an effective sterile barrier and prevent microbial transfer. Wearing two pairs of gloves helps to reduce the chance of perforation of the inner glove. Scrubbed team members should inspect their gloves for damage and punctures after they are put on, before contact with the sterile field, and throughout use.[9]

Perioperative team members should change their surgical gloves:

- After each patient procedure
- When suspected or actual contamination occurs
- After touching surgical helmet system hoods and visors
- After adjusting optic eyepieces on the operative microscope
- Immediately after direct contact with methyl methacrylate
- When a visible defect or perforation is noted
- When a suspected or actual perforation from a needle, suture, bone, or other object occurs
- When gloves swell, expand, or become loose
- Every 90 to 150 minutes[9]

Removing Gowns and Gloves

At the end of the procedure, the scrubbed person grasps the front of the gown and pulls it away from the body to so that the ties break and downward from the shoulders and off the arms. The sleeves should be turned inside out. The scrubbed person then rolls the contaminated surface of the gown to the inside, rolls it away from the body, touching only the outside of the gown with gloved hands.[9-19-12].

To remove the gloves, the wearer removes the gloves as the gown is being removed and touching only the inside of the gloves and gown with bare hands. This approach protects the hands from the contaminated glove. The gown and gloves should be placed in a waste container. Team members should always remember to perform hand hygiene after removing their gowns and gloves.[11, 12]

If the scrubbed team member is unable to break the ties of the gown and there is no assistant available to untie the gown, the scrubbed team member should remove the gloves and perform hand hygiene, unfasten the ties taking care the gown sleeves do not contact the body, touch only the inside of the gown and pull the gown away from the body while rolling the gown inside out, and place the gown in a waste container and perform hand hygiene.

PATIENTS AND VISITORS

Hand washing stations and products should be accessible to patients in unrestricted areas (eg, waiting room, preoperative area, postoperative area). Providing opportunities for hand hygiene engages patients and their families. Patient engagement can help promote hand hygiene in the perioperative setting and may help reduce contamination in the patients' environment. Patients and visitors should be encouraged to remind team members to perform hand hygiene before patient care.[1]

MULTIDISCIPLINARY TEAM

The health care organization should establish a multidisciplinary team to select the hand hygiene products to be used in the perioperative setting. The team should include perioperative RNs, other perioperative team members, and personnel with knowledge of infection prevention. The multidisciplinary team should develop a mechanism for evaluating hand hygiene products that includes assessment of safety and efficacy. A variety of products may be required to meet the needs of team members with skin sensitivities and allergies. The team should evaluate the compatibility of hand hygiene products with other skin care products (eg, lotions, moisturizers) and with gloves used at the facility.[1]

Selected products should meet the requirements of the US Food and Drug Administration (FDA). To be considered efficacious, the FDA requires surgical hand antiseptic products to be fast acting, broad spectrum, and persistent (no return to baseline flora count 6 hours after application). Health care hand wash or rub products must reduce the bacteria on the hands within 5 minutes. The FDA evaluates the safety of products by reviewing human safety studies, nonclinical safety studies, data on hormonal effects, and data on the development of antimicrobial resistance.[1]

The multidisciplinary team should not select soaps containing triclosan for evaluation.[1] The Society for Healthcare Epidemiology of America and the Infectious Diseases Society of America recommend avoiding the use of soaps containing triclosan in the health care setting.[5] Evidence is lacking to establish clinical benefit from triclosan compared to other antiseptics.[1] Harms of triclosan may include environmental contamination and the potential for development of bacterial resistance.[1]

End-User Evaluations

Acceptability of hand hygiene products is a key factor that influences compliance among health care personnel. End-user evaluations should be conducted to determine acceptability of products to perioperative team members. Evaluations should include skin tolerance, skin reactions, ease of use, feel (eg, consistency, texture), color, and fragrance. Patients may be especially sensitive to the fragrance of hand-hygiene products, so patients and their aesthetic preferences should be included in the end-user evaluations.[1]

QUALITY ASSURANCE AND PERFORMANCE

Perioperative team members should participate in quality assurance and performance improvement activities to improve understanding and compliance with principles and processes of hand hygiene. These programs assist in evaluating and improving the quality of patient care and in making plans for any needed corrective actions. Barriers to performing hand hygiene in the perioperative setting should be identified and addressed. Adherence to policies and procedures for hand hygiene should be monitored by the health care organization.[1]

Hand hygiene in the perioperative setting should be measured by direct observation.[1] Additional measures for evaluation of compliance with hand hygiene might include assessment of product usage or automated monitoring.[1,5] Team members should receive feedback on hand hygiene performance.[1]

SUMMARY

Health care–associated infections are a serious concern and can result in poor patient outcomes and increased costs of health care.[1] Preventing infections is a high priority for all health care workers, and hand hygiene may be the single most important practice for reducing the transmission of infectious organisms.[3] Perioperative team members should perform hand hygiene with soap and water or alcohol-based hand rubs when indicated.[1] Fingernails and hands should be maintained in healthy condition.[1] Perioperative team members should perform surgical hand antisepsis and maintain aseptic technique when gowning and gloving for surgical and other invasive procedures.[1] By carefully performing personal hand hygiene and by participating in teams and initiatives for selection of products and monitoring of compliance, the perioperative RN can help reduce the risk for transmission of infectious agents and improve patient outcomes and satisfaction.[1]

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POST-TEST

HAND HYGIENE, SCRUBBING, GOWNING, AND GLOVING

Multiple choice. Please choose the word or phrase that best completes the following statements.

1. Hand hygiene should be performed after which of the following?
   a. Touching the operating room bed controls
   b. Adjusting a patient's bed linens
   c. Eating
   d. Marking the surgical site
   e. All of the above

2. When should perioperative team members use an alcohol-based rub for hand hygiene?
   a. After hands have been exposed to blood or other bodily fluids
   b. After using the restroom
   c. When the hands are not visibly soiled
   d. When caring for patients with spore-forming organisms

3. What is the minimum length of time perioperative team members should spend performing hand hygiene by washing with soap and water?
   a. 7 seconds
   b. 15 seconds
   c. 20 seconds
   d. 30 seconds

4. How much of an alcohol-based hand rub should be used when performing hand hygiene?
   a. A dime-sized amount
   b. A quarter-sized amount
   c. 10 drops
   d. The amount recommended by the manufacturer

5. Perioperative team members should maintain fingernails at a maximum of what length?
   a. 2 mm (0.08 inch)
   b. 6 mm (0.24 inch)
   c. 10 mm (0.4 inch)
   d. 12 mm (0.5 inch)

6. Which of the following measures is helpful for maintaining healthy skin and minimizing the risk of hand dermatitis?
   a. Completely drying hands before putting on gloves
   b. Avoiding water hotter than 80° F (27° C)
   c. Using approved moisturizing products
   d. Using glove liners
   e. All of the above

7. Which of the following types of jewelry is acceptable for perioperative team members to wear in patient care areas?
   a. One ring per hand
   b. Watch
   c. Loose bracelet
   d. Fitness monitor
   e. No jewelry is acceptable

8. Which of the following is a primary line of defense for protecting the patient from the transmission of pathogens during surgical procedures?
   a. Sterile gloves
   b. Sterile gowns
   c. Surgical hand antisepsis
   d. Surgical masks

9. Which of the following parts of the surgical gown is considered sterile?
   a. The axillary region
   b. The back
   c. The cuff of the gown sleeve
   d. The front from the chest to the level of the sterile field
   e. The shoulders

10. Which method of gloving should be used by team members during the initial gowning and gloving process for surgical procedures?
    a. Assisted gloving with gown cuffs at fingertips
    b. Assisted gloving with gown cuffs at wrists
    c. Open gloving
    d. Open assisted gloving
    e. Any of the above

11. How often should surgical gloves be changed during an invasive surgical procedure?
    a. Every 60 to 90 minutes
    b. Every 90 to 150 minutes
    c. Surgical gloves only require changing if a known or suspected break in technique occurs or a tear is identified in the glove.
    d. There is no recommended time for changing gloves.
12. Which of the following is the preferred method for assessing hand hygiene in the perioperative setting?
    a. Direct observation
    b. Measurement of product usage
    c. Automated monitoring
    d. Self-reporting

POST-TEST ANSWERS

HAND HYGIENE, SCRUBBING, GOWNING, AND GLOVING

1. e
2. c
3. b
4. d
5. a
6. e
7. e
8. c
9. d
10. a
11. b
12. a