chapter 17

Infection Prevention and Control in the Hospital and Home

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Objectives

Upon completing this chapter, you should be able to:

Theory

1. List the stages of an infectious process.
2. Identify five ways to decrease the occurrence of health care–associated infections (HAIs).
3. Explain how Transmission-Based Precautions are used with Standard Precautions.
4. Describe how procedures for Airborne Infection Isolation Precautions differ from those for Droplet Precautions.
5. Discuss the special requirements for Airborne Infection Isolation Precautions when the patient has pulmonary tuberculosis.
6. Compare infection prevention and control procedures appropriate for the hospital with those used in the home.
7. List techniques for handling specimens; disposing of soiled linen, trash, and sharps; and cleaning equipment in the isolation setting.
8. Give three examples of nursing measures used to provide for the psychosocial care of a patient in isolation.
9. State the four rules of surgical asepsis.

Clinical Practice

1. Use Standard Precautions when caring for patients.
2. Use Transmission-Based Precautions when caring for patients.
3. Properly bag and remove soiled linens and trash from an isolation room.
4. Teach a patient or family member how to properly dispose of soiled items at home.
5. Demonstrate performance of a surgical scrub.

Skills & Steps

Skill 17-1	Performing Surgical Hand Antisepsis: The Surgical Scrub
Skill 17-2	Performing Surgical Hand Antisepsis: The Surgical Hand Rub
Skill 17-3	Opening Sterile Packs and Preparing a Sterile Field
Skill 17-4	Sterile Gloving and Ungloving
Steps 17-1	Pouring Sterile Liquids

Key Terms

Airborne Infection Isolation Precautions (p. 236)
Contact Precautions (p. 236)
convalescent (p. 235)
Droplet Precautions (p. 236)
health care–associated infections (HAIs) (p. 235)
human immunodeficiency virus (HIV) (ĭ-mū-nō-dĕ-FĬ-shŭn-sē, p. 236)
impervious (p. 237)
incubation period (ĭn-kū-BĀ-shŭn, p. 234)
infection prevention and control (p. 235)
isolation (ī-sō-LĀ-shŭn, p. 235)
leukocytosis (lĕw-kō-sī-TŌ-sĭs, p. 235)
malaise (mă-LĀZ, p. 234)
prodromal period (prō-DRŌ-măl PĔR-ē-ŏd, p. 234)
Standard Precautions (p. 236)
Transmission-Based Precautions (p. 236)

INFECTION

STAGES OF INFECTION

Infection occurs when pathogenic microorganisms invade the body and multiply. The infectious process has four stages: the incubation period, the prodromal period, the illness period, and the convalescent period. The length of each period is influenced by many factors, including the organism itself, the host's overall health, and the environment in which infection has occurred.

The **incubation period** begins when the organism firsts enters the body and lasts until the onset of symptoms. During this period the organism multiplies, and the duration of the period varies depending on the type of microorganism. In many viral diseases the virus is transmitted during the incubation period.

The **prodromal period** is the short time from the onset of vague, nonspecific symptoms to the beginning of specific symptoms of infection. The patient may be irritable and experience fatigue, **malaise** (not feeling "right"),

Chapter 16 Worksheet:

4. Means to decrease *susceptibility* of individuals to infection include: *(Select all that apply.)*
   1. discouraging visitors who have an infectious illness.
   2. using gloves and hand hygiene techniques properly.
   3. giving antibiotics prophylactically at the time of surgery.
   4. providing immunization as available.
   5. promoting good nutrition and adequate rest.

5. Drug-resistant microorganisms are a problem within the community as well as within the hospital. Reasons for this include: *(Select all that apply.)*
   1. overprescription of antimicrobial agents by health care providers.
   2. lack of proper sanitation within communities.
   3. discharging patients with infected wounds before treatment is complete.
   4. patients who stop taking antimicrobial agents as prescribed.
   5. overuse of inappropriate antimicrobials causing mutations in the microorganisms.

6. Before entering the room of a patient in Airborne Infection Isolation and Contact Precautions, the nurse must don a cover gown, gloves, mask, and eyewear. Indicate the proper sequence for donning the PPEs: ____, ____, ____, and ____.
   1. Gown
   2. Gloves
   3. Mask
   4. Eyewear

7. Malnutrition contributes to the susceptibility to infection because:
   1. there is little energy for healing.
   2. it decreases immune function.
   3. it prevents sufficient exercise.
   4. it upsets homeostatic balance in the body.

8. Passive acquired immunity is obtained by:
   1. exposure to a disease.
   2. immunization with response to the antigen.
   3. recovering from a disease.
   4. receiving an antitoxin or antiserum.

9. Medical asepsis differs from surgical asepsis in that medical asepsis is aimed at:
   1. sterilizing all equipment.
   2. killing all microorganisms.
   3. preventing transmission of microorganisms.
   4. preventing entry of microorganisms into the body.

10. Considering the chain of infection, a vector might be:
    1. an uninfected patient.
    2. *Staphylococcus* bacteria.
    3. a tick carrying Lyme disease.
    4. a contaminated water supply.

Critical Thinking Activities

Read each clinical scenario and discuss the questions with your classmates.

Scenario A

Discuss specific ways in which a person with a cold who goes to the movies can transmit the virus to others.

Scenario B

You are assigned to care for a patient who has viral pneumonia, a disease of the respiratory tract. What precautions would be necessary?

Scenario C

A parent asks you why her teenage son should be immunized against tetanus when he received the vaccine as a baby. How would you respond?

Scenario D

An elderly neighbor keeps complaining about getting respiratory tract infections and small infected wounds. He asks you what he could do to prevent this. What would you tell him?

and elevated temperature. This period lasts a few hours to a few days. **Microorganisms are most likely to be spread during this highly infectious stage.** Typically, precautions against spreading the infection are not taken because people do not realize that they are ill until the more specific symptoms of infection appear.

During the **illness period,** localized and systemic signs and symptoms appear. The individual may have fever, headache, and malaise. Other specific signs of infection may be detected, such as rash, swollen lymph nodes, **leukocytosis** (increased white blood cells), purulent wound exudate, diarrhea, and vomiting. **The severity of the symptoms and the duration of the illness depend on the virulence of the pathogen and the person's susceptibility to the microorganism.** In this phase people perceive they are ill and may seek professional care.

The **convalescent** (recovery) period begins when the symptoms begin to subside and extends until the patient has returned to a normal state of health. This can take days to weeks, depending on the microorganism and the person's overall state of health.

HEALTH CARE–ASSOCIATED INFECTIONS (HAIs)

Infections transmitted to a person while receiving health care services are called **health care–associated infections (HAIs).** A health care worker can also contract an HAI (e.g., head cold, flu, staphylococcal skin infection) if appropriate precautions are not used consistently. The Centers for Disease Control and Prevention (CDC) estimate that HAIs in acute care hospitals cause yearly at least 2 million infections, contribute to at least 98,000 deaths, and cost as much as $31.5 billion to treat (Scott, 2009).

Many invasive procedures predispose patients to infection either because the integrity of the skin or mucous membrane is altered, or because an illness reduces the body's ability to defend itself against invading microorganisms. Patients at greatest risk for HAIs include those with:

- Surgical incisions with or without drains
- Artificial airways, including endotracheal tube or tracheostomy
- Indwelling urinary catheters
- Intravenous (IV) lines, particularly central venous or arterial lines
- Implanted prosthetic devices (such as heart valves; vascular grafts; or orthopedic joints, rods, and screws)
- Repeated injections or venipunctures for blood tests
- A compromised immune system from factors such as chemotherapy, HIV infection, or long-term steroid use

INFECTION PREVENTION AND CONTROL

Infection prevention and control rely on medical and surgical asepsis, Standard Precautions, and Transmission-Based Precautions to prevent or control the spread of microorganisms. The strict use of aseptic technique when performing all diagnostic and therapeutic procedures involving catheters, IV therapy, endotracheal and tracheostomy tubes, drainage tubes, and wound care reduces the incidence of HAIs. The current guidelines for infection precautions are delineated in Box 17-1. **Isolation** is a means of preventing contact between a patient and others to prevent the spread of infection. **Emphasis is placed on containing microorganisms and preventing their spread.**

Health Promotion

Specific Ways to Prevent Health Care–Associated Infections (HAIs)

- Perform hand hygiene before and after caring for the patient, before donning gloves, and after their removal.
- Cleanse hands and change gloves between procedures that involve contact with mucous membranes, the perineal area, feces, wound drainage, or other contaminated matter.
- Help all patients on bed rest turn, deep breathe, and cough effectively at least every 2 hours.
- Use correct aseptic technique for cleansing the skin before performing an invasive procedure.
- Assess IV line sites for signs of infection at least once per shift and each time you access the ports.
- Use aseptic technique when suctioning the airway.
- Keep urinary catheter drainage bag below the level of the bladder at ALL times (even when transferring or transporting a patient).
- Clean residual urine off the catheter bag drainage tube after emptying the bag; do not let the tube touch the collection container or floor.
- Clean incontinent patients promptly. Carefully cleanse feces from surface of indwelling catheters, the skin, and mucous membranes.
- Always cleanse from the urinary meatus toward the rectum (front to back).

Think Critically

What do you think are the most common types of HAIs? Why do you think this?

Infection prevention and control involve the following:

- Observing patients for signs of infection
- Recognizing individuals at high risk for infection and implementing appropriate precautions
- Implementing procedures to contain microorganisms when an infection is suspected
- Monitoring diagnostic reports related to infection
- Using approved sanitation methods
- Properly handling and sterilizing or disposing of contaminated items and equipment

The infection preventionist (IP) receives a report from the laboratory every time a culture is performed that is positive for a pathogenic microorganism. A report may also be sent to the IP from the nursing unit

Box 17-1 Transmission-Based Precautions Requirements

STANDARD PRECAUTIONS
Use for the care of all patients

AIRBORNE INFECTION ISOLATION PRECAUTIONS
Use in addition to Standard Precautions for patients with known or suspected serious illnesses transmitted by airborne droplet nuclei. Examples of such diseases are:

- Measles (rubella)
- Varicella (including disseminated zoster)
- Pulmonary tuberculosis

DROPLET PRECAUTIONS
Use in addition to Standard Precautions for patients with known or suspected serious illnesses transmitted by large-particle droplets. Examples of such illnesses are:

- Invasive *Haemophilus influenzae* type b disease, including meningitis, pneumonia, and epiglottitis
- Invasive *Neisseria meningitidis* disease, including meningitis, pneumonia, and sepsis
- Other serious bacterial respiratory tract infections spread by droplet transmission, including diphtheria (pharyngeal), *Mycoplasma* pneumonia, pertussis, and pneumonic plague
- Streptococcal (group A) pharyngitis, pneumonia, or scarlet fever in infants and young children
- Serious viral infections spread by droplet transmission, including adenovirus, influenza, mumps, parvovirus B19, and rubella

CONTACT PRECAUTIONS
Use in addition to Standard Precautions for patients with known or suspected serious illnesses easily transmitted by direct patient contact or by contact with items in the patient's environment. Examples of such illnesses include:

- Gastrointestinal, respiratory, skin, or wound infections or colonization with multidrug-resistant organisms
- Enteric infections with a low infectious dose or prolonged environmental survival, including *Clostridium difficile*
- For diapered or incontinent patients: enterohemorrhagic *Escherichia coli* O157:H7, *Shigella*, hepatitis A, or rotavirus infection
- Respiratory syncytial virus (RSV), parainfluenza virus, or enteroviral infections in infants and young children
- Skin infections that are highly contagious or that may occur on dry skin, including diphtheria (cutaneous), herpes simplex virus (neonatal or mucocutaneous), impetigo, major (noncontained) abscesses, cellulitis, decubitus ulcers, pediculosis, scabies, staphylococcal furunculosis in infants and young children, and zoster (disseminated or in the immunocompromised host)
- Viral or hemorrhagic conjunctivitis
- Viral or hemorrhagic infections (Ebola, Lassa, or Marburg virus)

Adapted from Centers for Disease Control and Prevention. (2007). *Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings.* Available at: www.cdc.gov/ncidod/dhqp/gl_isolation.html.

whenever a patient is identified as having an infectious disease or local infection. Appropriate precautions are then initiated for the type of organism present. The IP also investigates all HAIs, looking at possible causes, including breaks in the use of approved precautions. And the IP provides ongoing education regarding infection prevention and control for the health care staff.

Infection prevention and control techniques have undergone many changes over the past three decades. In the United States, current precautions are based on guidelines and regulations developed by the CDC and the Occupational Safety and Health Administration (OSHA). Initially, isolation techniques focused on hospitalized patients, but the evolution of **human immunodeficiency virus (HIV),** hepatitis strains, and a variety of drug-resistant bacteria has broadened the focus related to infectious diseases. Infection prevention and control practices are focused on protecting patients, health care workers, family members, and social contacts in all settings.

Two premises underlie the current system of isolation. One is that **infection may be present before the diagnosis is made.** The second is that the **greatest risk of transmitting infection for most microorganisms comes from direct contact by the caregiver's hands or equipment and supplies that have been soiled by blood, body fluids, and other potentially infectious materials.** It is known that all body substances may harbor microorganisms and be infectious; therefore contact with body substances must be avoided.

Current standards consist of two tiers developed by the Healthcare Infection Control Practices Advisory Committee (HICPAC) of the CDC. Tier 1 is Standard Precautions, and Tier 2 is Transmission-Based Precautions. **Standard Precautions** (see Chapter 16) delineate methods for avoiding direct contact with all body secretions except sweat, whether or not visible blood is present. This includes the mucous membranes and all nonintact skin. **Transmission-Based Precautions** (see Box 17-1) are based on interrupting the mode of transmission by identifying the specific secretions, body fluids, tissues, or excretions that might be infective. **The different types of Transmission-Based Precautions may be used alone or in combination, but they are always used in addition to Standard Precautions.**

? Think Critically

Standard Precautions are to be used when there is possible or expected exposure to which body fluids?

CDC and OSHA guidelines also brought about the development of needleless IV connection systems and syringes with readily activated protective shields to

FIGURE 17-1 Biohazard trash and linen containers.

cover needles immediately after use. These systems decrease opportunities for needle stick injuries, one of the major factors in health care worker exposure to pathogenic organisms. Use of these devices has significantly reduced the number of needle stick injuries.

Although Standard Precautions and Transmission-Based Precautions can seem overwhelming at first, the concepts are actually relatively simple. For example, never touch with bare hands anything that contains fluids from a body surface or cavity. Wear gloves for all contact with body fluids of any sort, including blood, saliva, urine, and feces. The only time gloves are not worn is for contact with intact skin or unsoiled articles. Perform hand hygiene well and often, paying close attention to areas around and under the fingernails and between the fingers.

Another precaution is to wear impermeable gowns when clothing may become soiled with body substances while providing patient care. Wear masks when contact with respiratory droplet secretions is anticipated, such as during suctioning. Add protective eyewear when there is the possibility of splashing body fluids. Dispose of all sharps in puncture-resistant containers located in the patient's room, and activate the protective shield before disposal. Place trash and used linens in **impervious,** or moisture and particle-proof, plastic bags (Figure 17-1).

Elder Care Points

- The elderly are at greater risk for infection because their immune system is not as active as that of a younger person.
- An elderly person hospitalized for one infection has an increased risk of developing a second infection (an HAI) because the body's available defenses are already working to fight the first infection.

APPLICATION OF THE NURSING PROCESS

Assessment (Data Collection)

At the first encounter with the patient, assess for signs of infection that may require Transmission-Based Precautions. Assess wounds each shift for signs of infection. Monitor the patient's temperature. Admission laboratory studies may also give indications of possible infection, such as an increased white blood cell count or a urinalysis that is positive for bacteria. If cultures were performed, check the reports to see if any microorganism has been identified. Frequent voiding of small amounts, pain on urination, or a decrease in overall urine output may also indicate infection.

Nursing Diagnosis

The nursing diagnosis is Risk for Infection, related to surgical wound, open wound, or weakened condition.

Planning

Expected outcomes include "No HAI is evident." When using Transmission-Based Precautions that require putting on personal protective equipment (PPE), you must prepare before each entry into the patient's room. For example, will you need more linen? Are all the dressing supplies in the room? Does the patient need pain medication? Are routine medications due at this time? Is there drinking water in the room? Speaking to the patient in advance via the intercom can help ensure you will have everything necessary when you don your protective clothing and enter the room.

Implementation

Teach a patient with an infection about the disease process, modes of transmission, and precautions necessary to prevent spread of the infection (Nursing Care Plan 17-1). Explain Standard and Transmission-Based Precautions to any visitors.

Use Standard Precautions for each contact with every patient, regardless of whether infection is known to be present. Implement **Transmission-Based Precautions based on the individual patient's infection status.**

Hand Hygiene

Hand hygiene is the most important action in preventing the transmission of infection (see Chapter 16). Perform hand hygiene before and after contact with a patient, wound care, or any invasive procedure.

Patients with compromised immune status are often placed in protective isolation to reduce exposure to infectious organisms. People providing care for these individuals must wear gowns, gloves, and masks, and the patient needs to be in a private room. Specific guidelines vary with the facility and the degree of immunodeficiency. Know and follow your agency's policies and procedures.

Nursing Care Plan 17-1 Care of the Patient Under Airborne Infection Isolation Precautions

SCENARIO Doug Gamble, age 18, has pulmonary tuberculosis (TB). He is in a private isolation room. It is his tenth day of hospitalization. He has just told the nurse he is feeling rejected because everybody wears a mask when they come in to see him.

***PROBLEM*/NURSING DIAGNOSIS** *Does not understand infection precautions*/Deficient knowledge related to infection and mode of transmission.

Supporting Assessment Data ***Subjective:*** States he cannot understand why he has to stay in his room and why people have to wear masks to visit. ***Objective:*** PPD skin test positive. Sputum culture positive for acid-fast bacilli. Radiologic studies: cavitations in apex of right lung. Medical diagnosis: Active pulmonary TB.

Goals/Expected Outcomes	Nursing Interventions	Selected Rationales	Evaluation
Patient will voice understanding of the pathogen and need for Transmission-Based Precautions.	Teach regarding pathogen that causes pulmonary TB, transmission of the organism, and need for masks and staying in room.	Understanding of disease transmission will help patient adhere to Transmission-Based Precautions.	*Does patient understand the need for precautions?* States he understands need for precautions.
	Teach specifics of good hand hygiene and respiratory etiquette, including covering mouth when coughing and containment of used tissues and sputum.	Hand hygiene and proper respiratory etiquette will help prevent transmission of pathogen.	Attentive to hand hygiene. Covers mouth when coughing, disposes of tissues appropriately. Expected outcome being met.

***PROBLEM*/NURSING DIAGNOSIS** *Under visitor precautions*/Impaired Social Interaction related to transmission precautions.

Supporting Assessment Data ***Objective:*** In private isolation room for Airborne Infection Isolation Precautions. Visitors must wear a mask when in the room. No visitors except parents since admission.

Goals/Expected Outcomes	Nursing Interventions	Selected Rationales	Evaluation
Patient will have visits of family or friends at least daily.	Speak with parents about the need for social interaction. Remind that people may visit if they wear a mask in the room.	Understanding may promote cooperation and obtain visitors for patient.	*Are visitors coming?* Parents state they understand.
	Ask parents to call patient's friends and ask them to visit and arrange a visiting schedule.	A schedule for visiting will promote properly spaced visits that may increase social interaction without tiring the patient.	Mother is working on a visitor schedule. Continue plan.

***PROBLEM*/NURSING DIAGNOSIS** *Feels rejected*/Situational low self-esteem.

Supporting Assessment Data ***Subjective:*** States he feels rejected and dirty because people have to wear a mask whenever they are in his room. ***Objective:*** Standard Precautions call for a mask whenever in the room.

Goals/Expected Outcomes	Nursing Interventions	Selected Rationales	Evaluation
Patient will adjust to Transmission-Based Precautions requirements by showing less anxious behavior when someone with a mask enters the room.	Remind him of the route of transmission of the organism.	Understanding the virulence of the organism and that it is transmitted by airborne droplets will help him understand the need for masks to prevent transmission to others.	*Is patient less anxious?* States he understands the danger of the organism and how it is transmitted.
	Assure that the wearing of masks simply protects the visitors and caregivers.		
	Ask that each health care person entering the room show her face at the door before donning a mask.	Showing the patient the face behind the mask makes the interaction more personal and friendly.	Each caregiver shows face and introduces self at the door.
	Show warm interest in the patient as a person. Include ordinary conversation during interactions so he knows he is seen as a person, not a disease.	Interest in the patient bolsters feelings of self-esteem.	Talking with patient about his interests appears to decrease feelings of isolation and help him cope. Progressing toward expected outcome.

Critical Thinking Questions

1. How would you assess Doug's understanding of his illness?
2. Why is it important to schedule rest between activities for Doug?
3. Why is it important to keep Doug well nourished and hydrated?

Perform hand hygiene before donning gloves and after removing them. Even tasks like interviewing the patient requires that hand hygiene be performed before leaving the room, whether you touched the patient or not.

Safety Alert

Hand Hygiene

Always perform hand hygiene after touching the patient or anything in the patient's room. Methicillin-resistant *Staphylococcus aureus* (MRSA) and other pathologic organisms can survive for varying periods on almost any surface.

Personal Protective Equipment

Standard Precautions guidelines state when PPE is to be worn (see Chapter 16). Use clean disposable gloves for most general care, such as bathing, perineal care, IV site care, and most dressing changes. Wear regular surgical masks when working within 3 feet of a patient under Droplet Precautions. (Refer to the Evolve website for Nursing Care Plan E17-1: Care of the Patient Under Droplet Precautions.) The nurse who is coughing should wear a mask when in contact with patients. CDC guidelines state that if full PPE is required, it is donned in the following order: gown, followed by the mask or respirator, then goggles or face shield, and finally gloves. The sequence for removing PPE is gloves, followed by face shield or goggles, then the gown, and finally the mask or respirator. Skill 16-2 shows the correct procedure for putting on a gown and mask. Skill 17-4 shows the correct procedure for putting on and removing sterile gloves. Always perform hand hygiene after removing gloves or any combination of PPE.

When the patient has known or suspected airborne infections such as pulmonary tuberculosis, you must wear a special particulate filter mask called an N95 (Figure 17-2). Use the same type of mask when caring for patients with known or suspected rubeola or varicella unless you are immune to these diseases.

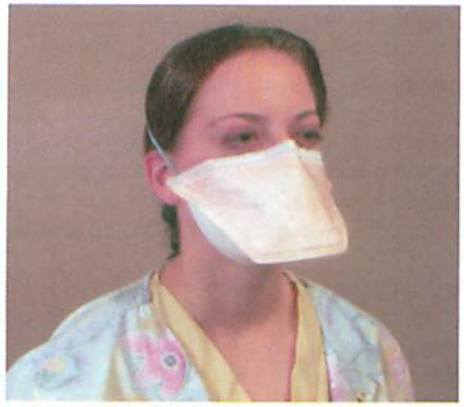


FIGURE 17-2 The N95 (particulate filter) mask.

Think Critically

What PPE would you don to take the vital signs of someone under Airborne Infection Isolation Precautions?

General Guidelines for Isolation Precautions

Specimen Preparation and Transportation. Before collecting body fluid or other potentially infectious material, verify the physician's order and fill out the correct laboratory requisition form. Next, label the specimen container with the patient's name and medical record number. Place the label on the container itself, not the lid, since once the lid is removed in the laboratory, the specimen would be unlabeled. Don gloves, explain to the patient what is needed, and collect the specimen without contaminating the outside of the container. Apply the lid, ensuring it is fully tightened. Clean or disinfect containers that are visibly contaminated before placing in the laboratory transport bag. Place secured laboratory specimen container in a plastic specimen bag and close the bag lock seal. Complete the laboratory requisition form and place it in the envelope pocket on the outside of the transport biohazard bag before leaving the patient's room. (Both OSHA and the Clinical Laboratory Improvement Act [CLIA] require that specimens be transported to the laboratory in a plastic bag marked "biohazard.") Remove gloves, perform hand hygiene, then following facility protocol, send the specimen to the clinical laboratory for processing.

Linens. Soiled linen is handled as little as possible. Roll it up and place it inside the linen hamper in the patient's room. Never carry unbagged soiled linens in the hallway, since it increases the risk of contaminating the surrounding environment. When the bag is two-thirds full, tie it closed and send it to the laundry according to agency policy. Double bagging is not necessary.

Trash. Place disposable soiled equipment and supplies inside the plastic bag lining the waste receptacle in the patient's room. Red bags marked with a biohazard symbol are for biohazardous waste only. Ordinary trash is to be placed in standard trash bags and disposed of in the routine manner. Biohazardous waste requires special disposition that is very costly, and non-biohazardous trash should never be mixed in with it. To determine the type of trash receptacle to use, if an item were squeezed, slung, flung, or flicked, such as a soiled dressing, and it could release blood or body fluids, then it goes in the red biohazard bag. The biohazard bag is sealed when it is two-thirds full, removed, and sent to waste collection. The only time double bagging is necessary is if the plastic bag is soiled on the outside. In this instance, another nurse standing just outside the room's doorway holds open a second plastic bag, placing her gloved hands under the edge of the bag, which is folded outward to cover the

nurse's hands. This further protects her hands from soiling. The nurse in the patient's room then places the first bag carefully inside the second one. The nurse outside the room ties the bag closed, being careful not to touch the inner first bag. Gloves are removed and the bag is taken to the soiled utility room for disposal, and hand hygiene is performed.

Sharps. Needles are not to be recapped before disposal. Drop all used needles, scalpel blades, IV cannulas, suture needles, and other sharp items into a puncture-resistant sharps biohazard container. **Never put your fingers inside the opening of the sharps container.** Shake the container gently to settle the contents and make more room if necessary. Replace sharps containers when they are two-thirds full. Seal the full sharps container and send to the biohazard waste storage area for later removal. Federal policy and state laws require that sharps containers be secured in patient care areas, and that holding areas for biohazards must be accessible by staff only.

Other Equipment. Clean reusable equipment if it is visibly soiled, and then send it to the central processing department to be disinfected. A stethoscope and blood pressure cuff are issued to the isolation patient, and only these are used within the isolation room. When the patient is discharged, return these items to central processing for disinfection. No special treatment is necessary for dishes. Some agencies use paper dishes and trays for a patient under Transmission-Based Precautions, but this is not a CDC requirement. Box 17-2 presents other general principles.

? Think Critically

What types of trash would you place in a red biohazard bag?

Natural Defenses. Institute measures to protect and enhance the patient's natural body defenses (see Chapter 16). Protect intact skin and mucous membranes, promote a balanced diet and sufficient fluids, provide opportunity for adequate sleep and rest, and decrease stress as much as possible.

Patient Placement. Place a patient in need of Transmission-Based Precautions in a private room. An exception can be made if another patient has the same type of infection: they can be roomed together. If the patient is under Airborne Infection Isolation Precautions, a private room with negative airflow or a portable HEPA (high-efficiency particulate air) filter machine is essential. Keep the door to the room closed except when someone is entering or leaving. This helps ensure the organism remains contained and does not enter the rest of the unit. Box 17-3 presents isolation precautions recommended for hospitals.

Transporting the Patient. Avoid transporting the isolation patient unless absolutely necessary. If transporting is unavoidable, give the patient a standard mask to wear while out of the room. For a patient under Droplet Precautions, take measures to prevent soiling of the environment. Notify the unit or department receiving the patient ahead of time that a patient under this particular type of Transmission-Based Precautions is coming to the area. Share information about any additional precautions required with those receiving the patient.

Box 17-2 General Principles Regarding Isolation

- Floors are contaminated. Anything dropped on the floor is contaminated and must be discarded or cleaned carefully before reuse.
- Patients with communicable diseases should be grouped according to the epidemiology of transmission:
  - Contact through respiratory spread
  - Transmission by the gastrointestinal tract
  - Direct contact with wound or skin infection
- Minimize dust. Sweeping compounds or wet mops with disinfectants and damp dusting must be used for this purpose.
- Protect the patient from drafts.
- Establish contaminated and clean zones. The clean areas include those used by the health care worker. The patient should not use items outside the unit such as telephones. There should be a clean area in the isolation unit where no contaminated articles are permitted. Items not in the clean area are considered contaminated.
- Anything that is brought into the isolation area must not be removed except in proper containers, which are then placed in an outside container labeled "Hazardous Materials—Biohazard."
- Never rub your eyes or nose or put your hands near your mouth when taking care of a patient in an isolation unit.
- Never shake linen when removing it or placing it on the bed.
- Change gloves and perform hand hygiene after handling contaminated items.
- Provide a clean area for placement of supplies by putting a paper towel or square of paper on a dry surface.
- Keep a water pitcher and glass in the room. Ice and fresh water are brought to the door and transferred.
- Faucets should be turned on and off using a dry paper towel to protect the hands from recontamination.
- The same nursing procedures are carried out for these patients as for any patient, but you must use the appropriate barrier precautions.
- Use the room clock for taking the patient's pulse and respirations. If the room does not have a clock, your watch can be taken in by putting it in a clear plastic bag. When leaving the room, it can be emptied onto a clean paper towel.
- You should monitor your own level of resistance to infection and report to the unit director or charge nurse any skin lesion, sore throat, or other evidence of infection you may have. (You may be reassigned to protect yourself and the patient.)

Box 17-3 Recommended Isolation Precautions in Hospitals: Transmission-Based Precautions (Tier 2)

AIRBORNE INFECTION ISOLATION PRECAUTIONS

Use the Tier 1 precautions (Standard Precautions) as well as the following:

1. Place the patient in a private room that has negative air pressure: 6 to 12 air exchanges per hour and discharge of air to the outside or a filtration system for the room air.
2. If a private room is not available, place the patient with another patient who is infected with the same microorganism. In select situations, approval from the local health department may be required (e.g., for pulmonary tuberculosis patient).
3. Wear a respiratory device (N95 respirator) when entering the room of a patient who is known to have or suspected of having primary tuberculosis.
4. Susceptible people should not enter the room of a patient who has rubella (measles) or varicella (chickenpox). If they must enter, they should wear an N95 respirator.
5. Limit movement of the patient outside the room to essential purposes. Place a surgical mask on the patient if possible.

DROPLET PRECAUTIONS

Use the Tier 1 precautions (Standard Precautions) as well as the following:

1. Place the patient in a private room.
2. If a private room is not available, place the patient with another patient who is infected with the same microorganism.
3. Wear a mask if working within 3 feet of the patient.
4. Transport the patient outside of the room only when necessary, and place a surgical mask on the patient if possible.

CONTACT PRECAUTIONS

Use the Tier 1 precautions (Standard Precautions) as well as the following:

1. Place the patient in a private room.
2. If a private room is not available, place the patient with another patient who is infected with the same microorganism.
3. Wear gloves as described in Standard Precautions.
   a. Change gloves after contact with infectious material.
   b. Remove gloves before leaving the patient's room.
   c. Cleanse hands immediately after removing gloves. Use an antimicrobial hand rub agent or soap and running water.
   d. After hand hygiene, do not touch possibly contaminated surfaces or items in the room.
4. Wear a gown when entering a room if there is a possibility of contact with infected surfaces or items, or if the patient is incontinent or has diarrhea, a colostomy, or wound drainage not contained by a dressing.
   a. Remove gown in the patient's room.
   b. Make sure clothing does not contact possible contaminated surfaces.
5. Limit movement of the patient outside the room.
6. Dedicate the use of noncritical patient care equipment to a single patient or to patients with the same infecting microorganisms.

From Hospital Infection Control Practices Advisory Committee (HICPAC). (2007). *Guidelines for Isolation Precautions in Hospitals*. Available at: www.cdc.gov/ncidod/dhqp/gl_isolation.html.

Infection Prevention and Control in the Home

The patient at home has less exposure to HAIs, but can still be at risk. The emphasis in the home environment is on containing pathogens and preventing transmission to health care personnel, caregivers, and others in the household. The home health nurse must teach patients and families about the importance of hand hygiene; how to dispose of contaminated medical supplies; and methods for cleaning the home environment, including how to dispose of dirty supplies in a safe manner (Box 17-4).

Home Care Considerations

Infection Prevention and Control Precautions for Patients in the Home Setting

- Teach patients and families the importance of hand hygiene. Stress that hands must be cleansed before caring for the patient and after care is finished. Gloves are needed in addition to hand hygiene for tasks such as tracheal suctioning and tracheostomy care, dressing changes and wound or drain care, tube feedings, and cleansing of personal areas of the body.
- Discard used dressings, tissues, wound-cleaning supplies, and any other item contaminated with body fluids into a plastic bag, then seal the bag before placing it in the household trash for pickup.

When the patient has an infection, keep his towels, sheets, and clothes away from contact by others until they can be washed. The patient's clothing and linens can in most cases be laundered with the rest of the household wash. Washing in warm water with standard laundry detergent is usually sufficient. Dry items thoroughly before use. Launder significantly contaminated clothing or linens separately from other household laundry.

Teach the patient to perform correct hand hygiene and to dispose of paper towels and facial tissues in an appropriate container. Instruct other family members to also perform hand hygiene frequently. The bathroom should be cleaned daily with standard household cleaning agent or a 1:10 solution of chlorine bleach and water. Dishes should be washed on the hot (or sanitize) cycle of the dishwasher or soaked in scalding hot water after washing and allowed to air dry. Dispose of soiled dressings and wound care supplies in plain, unlabeled plastic bags that are tied up securely and stored in an appropriate trash receptacle for pickup with the rest of the household trash. Trash marked with the biohazard symbol, in accordance with state and federal laws, cannot be placed in the household trash receptacles. If these bags are found in

Box 17-4 Infection Prevention in the Home

1. Wash your hands often.
   - **When:** Before eating; before, during, and after handling or preparing food; before dressing a wound, giving medicine, or inserting contact lenses; after contact with body fluids or blood; after changing a diaper; after using the bathroom; after handling animals or their toys, leashes, or waste; after handling anything contaminated, such as trash, drainage, soil.
   - **How:** Wet hands and apply soap, briskly rub hands together for 20 seconds, rinse thoroughly with warm water, and dry with a clean towel.
2. Routinely clean surfaces.
   - **In kitchen:** Clean counters, cutting boards, and all other surfaces before, during, and after preparing food, especially meat and poultry. Use hot, soapy water and scrub cutting boards well.
   - **In bathroom:** Clean and disinfect all surfaces routinely.
3. Handle and prepare food safely.
   - **Clean:** Clean hands and work surfaces often.
   - **Separate:** Don't cross-contaminate one food with another; use separate cutting boards for meat and fresh produce and keep food separate in the refrigerator.
   - **Cook:** Cook foods to proper temperatures; use a food thermometer. Find recommended food cooking temperatures at www.fightbac.org/safe-food-handling/cook or www.isitdoneyet.gov.
   - **Chill:** Refrigerate foods promptly.
4. Get immunized.
   - Make certain you and your loved ones get the necessary shots suggested by your health care provider at the proper time, and maintain immunization records for the family. Ask your physician about special programs that provide free shots for your child.
5. Use antimicrobials appropriately.
   - Take antimicrobials exactly as prescribed by your health care provider. Antimicrobials do not work against viruses such as colds or flu.
6. Be careful with pets.
   - Follow the immunization schedule for your pets as recommended by the veterinarian.
   - Clean litter boxes daily.
   - Make certain your child does not put any object or hands in the mouth after touching animals.
   - Wash hands thoroughly after contact with animals, especially after visiting farms, petting zoos, and fairs.
   - Use flea and tick prevention treatment on cats and dogs.
7. Avoid contact with wild animals.
   - Do not leave food around, and keep garbage cans sealed around your home.
   - Clear brush, grass, and debris around your home.
   - Seal any entrance holes to animal dens, if any are found inside or outside of your home.
   - Use insect repellent to prevent ticks.

From deWit, S. & Kumagi, C. (2013). *Medical-Surgical Nursing: Concepts and Practice* (2nd ed.). St Louis: Elsevier Saunders . Compiled from information on www.cdc.gov.

the trash that is taken to a public dump site, the homeowner could be heavily fined for violating this law. Handling or transporting biohazard trash requires special permits.

A heavy plastic jug, such as an empty bleach bottle, with a secure top can be used to contain needles, syringes, and other sharp objects used in the patient's care. Placing a 1:10 solution of chlorine bleach and water in the container helps kill microorganisms. Disposal of the jug is subject to local regulations in the city, county, or province where the patient lives.

Use clean gloves for wound care unless there is an order for sterile dressing changes. Teach patients and family members to properly remove and dispose of contaminated gloves. Emphasize that hands are to be cleansed before putting on gloves, and again after the gloves are discarded. Reinforce that gloves should not be reused.

The patient's room should be cleaned frequently, with dust kept to a minimum. Allow fresh air to circulate in the room. Sunshine through the windows can elevate the patient's mood and decrease the presence of some microorganisms. Keep trash, newspapers, and clutter to a minimum to discourage transfer of microorganisms. Keep clean supplies in one area, well away from any contaminated items or trash.

Protective Environment

When a patient is significantly immunocompromised, such as a bone marrow transplant recipient, it is important to protect him from exposure to potential pathogens. Place the patient in a special isolation room with its own ventilation system. Surfaces within the room are typically smooth to allow for thorough cleaning and disinfection. Do not allow anyone with an active infection, including health care workers, in the patient's room. In caring for this type of patient, all staff require detailed education and training on protocols and procedures to ensure the patient's health and safety. Remain aware of your facility's policies and procedures regarding the care of a patient in protective environment isolation, and follow them at all times (Figure 17-3).

Psychological Aspects of Isolation

The patient with Transmission-Based Isolation Precautions is at risk for both decreased self-esteem and sensory deprivation. This is particularly true for young children, who under normal circumstances are rarely alone and are often used to highly stimulating and entertaining environments. The elderly, too, can find isolation particularly trying, and it may lead to confusion secondary to the lack of normal stimulation and

FIGURE 17-3 Nurse in personal protective equipment caring for patient in protective isolation room.

interaction. Assessment for sensory deprivation needs to be ongoing. The signs can include boredom, slowness of thought, disorganized thoughts, excessive sleeping during the day, anxiety, hallucinations, or panic attacks.

Having visitors can be helpful in preventing sensory deprivation. They can talk with the patient about shared interests. A visitor at mealtime often encourages improved nutritional intake by making mealtime more enjoyable. The nurse should learn about the patient's interests and provide appropriate activities. These can include playing games, reading books, doing puzzles or crafts, making telephone calls, listening to music, using a laptop computer, and watching TV or a DVD. However, avoid overtiring the patient by also allowing periods of rest between activities.

Sensory deprivation may occur if visitors are intimidated by the isolation precautions. There also may be decreased interaction with the health care team because of the need to put on PPE to enter the room. All of this can lead to a loss of self-esteem because the patient begins to feel that he is somehow unclean or unworthy of attention.

Listen to the patient's feelings. Make positive comments on grooming and activity efforts. Try to engage the patient in meaningful conversation by asking about interests or hobbies. Make visitors feel welcome, and help them understand that the patient benefits greatly from their presence. Addressing self-esteem needs is important for complete recovery, regardless of patient age.

Cultural Considerations

Cleanliness

The idea of being "contaminated," "soiled," or "dirty" can make the patient feel at fault or inferior. The patient may blame himself. The nurse can help overcome this with a warm, caring, and accepting attitude, and by avoiding displaying any irritation about the precautions or any evidence of distaste in dealing with the infection.

Think Critically

How might you reassure a patient with pulmonary tuberculosis under Airborne Infection Isolation Precautions who states that he feels everyone is avoiding him because he is "dirty"?

Infection Prevention and Control for the Nurse

OSHA regulations protect health care workers from occupational exposure to blood-borne pathogens in the workplace. In Canada the Canadian Centre for Occupational Health and Safety addresses worker safety. These two agencies have determined that the three main modes of occupational exposure to blood-borne pathogens are as follows:

- Puncture wounds from contaminated needles or other sharps
- Skin contact, allowing blood, body fluids, and other potentially infectious materials to enter through damaged or broken skin
- Mucous membrane contact, allowing infectious materials to enter through the mucous membranes of the eyes, mouth, and nose

Actions that decrease the nurse's risk for infection include using good hand hygiene and other general medical aseptic techniques, wearing PPE, using needleless IV equipment and needles with guards, and avoiding carelessness in the clinical area.

It is also recommended that health care workers be immunized if they do not have an active immunity to certain diseases, including hepatitis B, influenza, mumps, measles, rubella, varicella (chickenpox), tetanus, diphtheria, pertussis, and meningococcal disease. In areas with high prevalence of pulmonary tuberculosis, yearly testing for tuberculosis is recommended for health care workers.

Surgical Asepsis

Surgical asepsis is another method used to prevent infection. Surgical asepsis is practiced in the operating room, obstetric areas, and special diagnostic areas and for procedures such as administering injections, changing wound dressings, performing urinary catheterization, and administering IV therapy. In the operating room, strict surgical asepsis is practiced, and head coverings, sterile gowns, masks, and gloves are worn. To perform a sterile dressing change outside the operating room, use sterile gloves, a mask, and a sterile field. Talking during the dressing change is discouraged.

The four rules of surgical asepsis are as follows:

1. Know what is sterile.
2. Know what is not sterile.
3. Separate sterile from unsterile.
4. Remedy contamination immediately.

The goal in surgical asepsis is to keep an area free of microorganisms. You must constantly be aware of which items and areas are sterile, clean, or contaminated to maintain surgical asepsis. The importance of

Box 17-5 Principles of Aseptic Technique

These principles form the basis of surgical asepsis:

1. A sterile surface touching a sterile surface remains sterile.
2. A sterile surface touching a nonsterile surface becomes contaminated.
3. Sterile materials must be kept dry; moisture transmits microorganisms and contaminates.
4. Only sterile items are used within the sterile field.
5. A sterile barrier must be considered contaminated after it has been penetrated.
6. The edges of a sterile package or container are considered contaminated after it is opened.
7. When there is a doubt about the sterility of any item, it must be considered nonsterile.
8. Avoid reaching across or above a sterile field with bare hands or arms or with other nonsterile items.
9. Avoid coughing, sneezing, or unnecessary talking near or over a sterile field.
10. When wearing sterile gloves, keep hands in sight, away from all unsterile objects, and above waist level.
11. Gowns are considered sterile only in front from shoulder level to table level and the sleeves to 2 inches above the elbow.
12. Open the wrapper of a sterile pack away from the body, the distal flap first, the lateral flaps next, and the proximal flap toward the body last, thus making it unnecessary to reach over the sterile field.
13. Only the horizontal surface of a table is considered sterile.
14. An area of 1 inch surrounding the outer edge of the sterile field must be considered unsterile.
15. The sterile field must be kept in sight at all times. Do not turn away from it or leave it. If this happens, you cannot be certain that it is still sterile.
16. The floor must be recognized as the most grossly contaminated area. Clean or sterile items that fall on to the floor should be discarded or decontaminated.

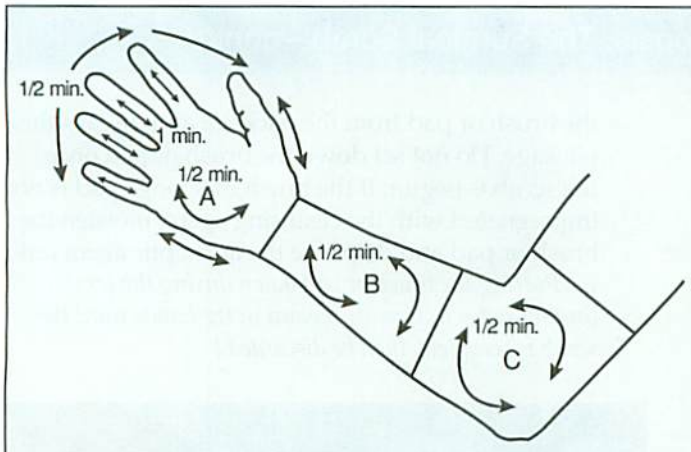
maintaining sterility must become ingrained, and you must consistently maintain principles of surgical asepsis to protect patients (Box 17-5). By being constantly sensitive as to what is sterile, what is clean, and what becomes contaminated, you can catch and rectify breaks in sterile technique before microorganisms are transferred to the patient.

Surgical Scrub. The surgical scrub (Skill 17-1) is more lengthy and vigorous than normal handwashing. Its purpose is to remove as many microorganisms as possible without damaging the skin of the hands. Water, a nail stick, an antiseptic agent, a scrub brush or sponge pad, and friction are used to mechanically cleanse the hands and forearms. The scrub begins at the tips of the fingers, working up the hands, and ends 2 inches above the elbows. All rinsing is done under warm, flowing water (Figure 17-4). The timing for the scrub does not include the rinsing time. Some agencies allow the use of the counted-stroke method of scrubbing rather than by-the-clock timing (Figure 17-5). Current standards regarding the time for the traditional scrub are based on the recommendations of the antiseptic agent manufacturer, and consequently the recommended time varies from one agency to another, depending on the product used. A 2- to 4-minute scrub is average.

A newer brushless technique, which may be done with or without water, uses an antimicrobial agent that is at least 60% alcohol. This method was shown to be equally effective compared with a standard surgical scrub in a research study (Howe et al., 2006). For the brushless scrub technique, dispense 2 mL of antimicrobial agent into the palm of one hand. With the fingertips of the opposite hand, work some of the alcohol-based agent under the nails. Spread the remaining portion of the agent over all surfaces of the hand and arm to just above the elbow. Dispense another 2 mL of the antimicrobial agent into the palm of the other hand; repeat the procedure on the opposite hand and arm. Techniques vary depending on the product used. **Check the manufacturer's directions for the correct technique.** Allow the hands and arms to dry before gloving (Skill 17-2 on p. 248).

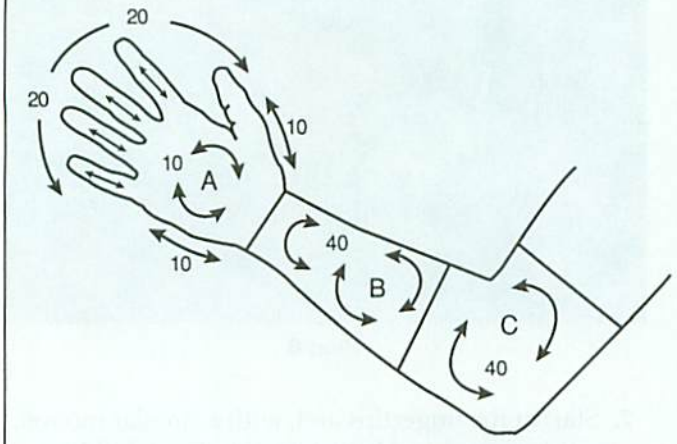
FIGURE 17-4 Nurse performing surgical scrub.

Opening Sterile Packs and Packages and Setting Up a Sterile Field. Many sterile supplies are prepared commercially and are disposable, or one-time use, items. The package, set, or kit provides all the items commonly required in a variety of nursing procedures, such as catheterization, suture removal, dressing change, and irrigation. Individually wrapped items can be obtained to supplement the packs as needed.



ANATOMIC TIMED SCRUB METHOD

AREA	TIME
1. Nails (A)	30 seconds w/brush
2. Fingers, each side and web space (A)	1 minute w/sponge
3. Palmar surface (A)	15 seconds w/brush
4. Dorsal surface (A)	15 seconds w/sponge
5. Forearm, divided in half to 2" above elbow (B and C)	1 minute w/sponge (30 seconds each half)
6. Repeat process for other hand	



COUNTED BRUSH STROKE METHOD

AREA	TIME
1. Nails (A)	20 strokes w/brush
2. Fingers, each side and web space (A)	10 strokes w/brush
3. Palmar surface (A)	10 strokes w/brush
4. Dorsal surface (A)	10 strokes w/sponge
5. Forearm, divided in half to 2" above elbow (B and C)	40 strokes each half (10 strokes each side w/sponge)
6. Repeat process for other hand	

FIGURE 17-5 Surgical scrub techniques.

Skill 17-1 Performing Surgical Hand Antisepsis: The Surgical Scrub

The purpose of the surgical hand scrub is to remove dirt, skin oil, and microorganisms from the hands and lower arms and to reduce the microorganism count to as near zero as possible. The antiseptic residue remains on the skin to prevent the growth of microorganisms for several hours. A timed scrub is performed for the interval recommended by the manufacturer of the antiseptic agent used. Some agencies may allow a counted-stroke scrub.

A surgical scrub is performed before entering the operating room, the labor and delivery area, the newborn nursery, or the neonatal intensive care unit (NICU). The scrub is repeated before the next surgical procedure or delivery, or any time that the hands become visibly soiled or contaminated. A 5-minute scrub is presented here.

A brushless surgical scrub using an antimicrobial agent that is at least 60% alcohol may be substituted in some hospitals for the traditional surgical hand scrub (see Skill 17-2).

Supplies

- Sterile towels
- Foot faucet control
- Warm running water
- Antiseptic soap in dispenser with foot control
- Scrub brush or sponge pad
- Nail stick

Review and carry out the Standard Steps in Appendix D.

Continued

Skill 17-1 Performing Surgical Hand Antisepsis: The Surgical Scrub—cont'd

ACTION *(RATIONALE)*

Assessment (Data Collection)

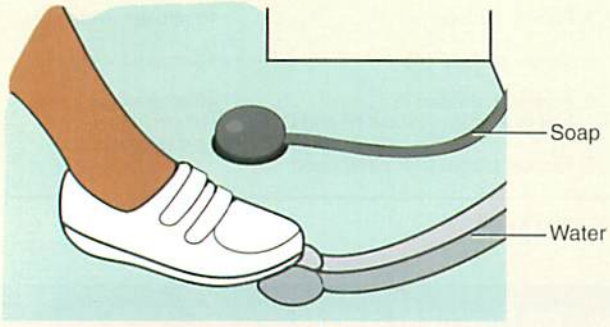
1. Determine whether all supplies needed are available before beginning. *(Missing supplies can mean interrupting the scrub to collect them and then having to start the scrub over.)*

Planning

2. Remove rings and watch. *(These items are unsterile and cannot be worn during a sterile procedure. Fasten them with a large safety pin inside a pocket of your scrub clothes on the front of the scrub shirt or gown. Jewelry harbors microorganisms. No objects may be touched after beginning the surgical scrub.)*

Implementation

3. Adjust the water to a comfortable temperature using the foot control. *(The water remains running during the scrub and should be comfortably warm.)*



Step **3**

4. Wet your hands and arms from above the elbows to the fingertips, with the hands kept higher than the elbows throughout the scrub. *(Moisture aids the formation of the cleansing lather. Keeping the hands higher than the elbows prevents microorganisms from draining over the cleansed hands.)*
5. Dispense the soaping agent onto the palms using the dispenser foot control, and rub hands together to work up a lather. Clean the fingernails with a nail stick. Wash the hands and forearms to a point at least 2 inches above the elbow. *(The soaping agent assists in cleaning dirt from under the nails and assists in removing microorganisms.)*
6. When using a prepackaged scrub brush or sponge pad, open the package, remove the nail cleaner, and clean the nails. Hold the nail stick until the nails have all been cleaned, and then discard it. Remove the brush or pad from the package and discard the package. Do not set down the brush or pad once the scrub is begun. If the brush or sponge pad is not impregnated with the cleansing agent, moisten the brush or pad and dispense the antiseptic agent onto it. *(Putting the brush or pad down during the scrub contaminates it. It must remain in the hands until the scrub is complete, then be discarded.)*

Step **6**

7. Start at the fingertips and, with a circular motion, work around and between each finger, holding the scrub brush or sponge pad perpendicular to the fingers and nails. Use light to moderate friction. Scrub the back of the hand, the palm, and then the wrist with circular strokes. Scrub each hand and arm for 2½ minutes. Take care not to abrade the skin. *(Achieving the desired degree of skin asepsis requires an extended cleansing time. Excessive pressure can injure the skin and should be avoided.)*

Step **7**

Skill 17-1 Performing Surgical Hand Antisepsis: The Surgical Scrub—cont'd

8. Continue up the arm to the elbow using circular scrub strokes on all surfaces, holding the brush or sponge pad parallel to the arm. *(Dirt and microorganisms need to be removed from portions of the arm that will be working in the surgical field even though these skin areas will be covered by a sterile gown and sterile gloves.)*
9. Rinse each hand and arm thoroughly, holding the hand above the level of the elbow and allowing the water to run from the fingertips down the hand to the wrist, then the forearm, and off the elbow area. *(Maintains the hands as the cleanest area by not rinsing dirt from the arms over them.)*

Step 9

10. Turn off the faucet using the foot control. *(Prevents contamination of the hands from the faucet handle. Maintains the sterility of the scrub.)*
11. Dry the hands with a sterile towel. Step away from the sterile field, lean slightly forward from the waist and unfold the towel, holding it by a corner and allowing it to unfold downward. Do not let the towel reach below waist level or come in contact with the body or any object in the room. *(When the towel is taken from a sterile field, it is lifted straight up and away from the sterile field, which keeps water from dripping on the sterile field. Maintaining the arms and hands above waist level and the hands above the elbows protects the scrubbed area. The hands are dried away from the sterile field. When working in the operating room or delivery room, the hands are dried on entering that room.)*
12. Keep the arms and hands above waist level and away from the body with the hands and fingers pointed up. Use the top half of the towel to blot the opposite fingers and hand dry, and move to the forearm. Use a rotary motion to move the towel from the forearm to the elbow. Do not go back over an area already dried. *(Starting with the fingers maintains the hands as the cleanest area. Moving back over an area previously dried contaminates it.)*
13. Grasp the lower end of the towel with the dried hand, and use the same procedure to dry the other hand and forearm. Discard the towel by dropping it into the proper receptacle when finished. Keep your hands and arms above waist level. *(Touching a damp part of the towel with the dried hand will contaminate that hand. Gowning and gloving are done next.)*

Evaluation

14. Ask yourself the following questions: Did the hands refrain from touching any part of the sink during the scrub? Were the hands higher than the elbows throughout the scrub? Was each hand and arm scrubbed for a full 2½ minutes? Were the hands dried without breaking technique? *(If the answer is yes to all of the questions, the scrub is complete. If contamination occurred, the scrub is done over from the beginning.)*

Documentation

No documentation is required for this procedure.

Critical Thinking Questions

1. Why should you avoid excessive pressure on the skin during the scrub?
2. If you are finished with the surgical scrub and are rinsing your hands and arms and accidentally touch the faucet spout, what would you do?

Skill 17-2 Performing Surgical Hand Antisepsis: The Surgical Hand Rub

The surgical hand rub is an approved alternate method for removing dirt, skin oil, and microorganisms from the hands and lower arms and reducing the microorganism count to as near zero as possible. Antiseptic residue remains on the skin to prevent the growth of microorganisms for several hours.

A surgical hand rub is performed before entering the operating room, the labor and delivery area, the newborn nursery, or the neonatal intensive care unit (NICU). The rub is repeated before the next surgical procedure or delivery or any time that the hands become contaminated. It uses an antimicrobial agent that is at least 60% alcohol.

Supplies

- Sterile towels
- Foot faucet control
- Antiseptic soap
- Running water
- Antiseptic rub in dispenser with foot control
- Scrub brush or sponge pad
- Nail stick

Review and carry out the Standard Steps in Appendix D.

ACTION *(RATIONALE)*

Assessment (Data Collection)

1. Determine whether all supplies needed are available before beginning. *(Missing supplies can mean interrupting the scrub to collect them and then having to start the scrub over.)*

Planning

2. Remove rings and watch. *(These items are unsterile and cannot be worn during a sterile procedure. Fasten them with a large safety pin inside a pocket of your scrub clothes on the front of the scrub shirt or gown. Jewelry harbors microorganisms. No objects may be touched after beginning the surgical scrub.)*

Implementation

3. Adjust the water to a comfortable temperature using the foot control. *(The water remains running during the prewash and should be comfortably warm.)*
4. Wash hands and forearms thoroughly with antimicrobial soap and running water; cleanse under nails with nail stick. *(Removes surface soiling and dirt that might provide a barrier for microorganisms.)*
5. Rinse hands and arms under running water with hands held above the elbows. Dry thoroughly with paper towels. *(Removes soil loosened in the washing process without washing the soap down over the hands and possibly carrying microorganisms from the upper arms to the hands. Excess water on the skin may interfere with the action of the rub solution.)*
6. Dispense the antiseptic rub onto the palms using the dispenser foot control, and spread over hands and arms per manufacturer's instructions, which may vary depending on the product. Make certain that all surfaces are fully covered, paying particular attention to the thumbs, fingers, and space between each finger. Rub with the hands over all surfaces until they are dry. Begin rub at the fingers and end 2 inches above the elbows. Hold hands above the elbows and the arms away from the body. *(For the product to effectively reduce microorganisms, it must dry on the skin surfaces being disinfected. Working from the fingertips to the upper arms prevents carrying microorganisms or soil downward to the hands. Positioning the hands above the elbows and the arms away from the body prevents contamination from your body or the sink or countertop.)*
7. When the rub is dry, proceed immediately to the operating or procedure room to gown and glove. Keep the arms and hands above waist level and away from the body with the hands and fingers pointed up when moving from room to room. *(This keeps the hands and arms visible, preventing contamination by accidentally brushing against the body, doorway, or other personnel or surfaces.)*

Evaluation

8. Ask yourself the following questions: Did the hands refrain from touching any part of the sink or counter during the washing and rub? Were the hands higher than the elbows throughout the process? Was each hand and arm rubbed until the surface was fully dry? Were the hands and arms in full view and kept away from contact during the movement from the scrub area to the procedure or operating room? *(If the answer is yes to all of the questions, the rub is complete. If contamination occurred, the rub is done over from the beginning.)*

Documentation

No documentation is required for this procedure.

Critical Thinking Questions

1. Why should you pay particular attention to the fingers and thumbs during the procedure?
2. If you are finished with the surgical hand rub and accidentally brush your elbow against the door frame when moving into the procedure or operating room, what would you do?

FIGURE 17-6 Know how to find the expiration date on a variety of supplies.

Open packs and kits by removing the outer plastic or paper covering, take out the inner package, and aseptically unfold the wrapper to form a sterile field (Figure 17-6). The principles of asepsis apply regardless of whether the package is disposable or a wrapped tray is prepared by the central supply department of the hospital. Skill 17-3 shows the steps for opening sterile packs and preparing a sterile field.

The principles to observe when opening sterile packages are as follows:

- Perform hand hygiene.
- Open the sterile package away from the body.
- Touch only the outside of the wrapper.
- Do not reach across a sterile field; go around the sterile field if necessary to reach the other side.
- Always face the sterile field, even when moving to the other side.
- Allow sufficient space (at least 6 inches) between the body and the sterile field.

Skill 17-3 Opening Sterile Packs and Preparing a Sterile Field

When sterile procedures are to be performed, sterile equipment and supplies are set up on a sterile field. Commercial disposable sterile sets of equipment and supplies are available for most standard procedures. Hospitals also wrap reusable equipment and cloth towels in packs that are sterilized before use. Hospital-prepared sterile packs are dated and are returned for re-sterilization if not used by the expiration date. Check the date before using a hospital-prepared sterile pack. Commercially prepared packs may also have expiration dates that need to be checked before use.

A sterile field is set up by using the inside of the wrapper on the sterile pack or by opening and draping a tabletop or instrument tray with sterile drapes and then placing the sterile items to be used on the field. The field is considered sterile to within 1 inch of its horizontal, or flat, border. The portion of the sterile drape that falls over the table or tray edge is always considered unsterile.

Supplies

- Sterile disposable equipment and supply tray
  or
- Hospital-prepared sterile pack and sterile drapes

Review and carry out the Standard Steps in Appendix D.

ACTION *(RATIONALE)*

Assessment (Data Collection)

1. Select a dry tabletop or instrument tray that is above waist level. *(Moisture can travel upward from the surface and contaminate the sterile field and supplies. Anything below waist level is considered contaminated according to principles of surgical asepsis.)*

Planning

2. Obtain the equipment tray and supplies to be used for the procedure, and explain the procedure to the patient if appropriate. *(Ensures that all needed equipment is on hand before scrubbing and gloving. Ensures patient is prepared for the procedure.)*

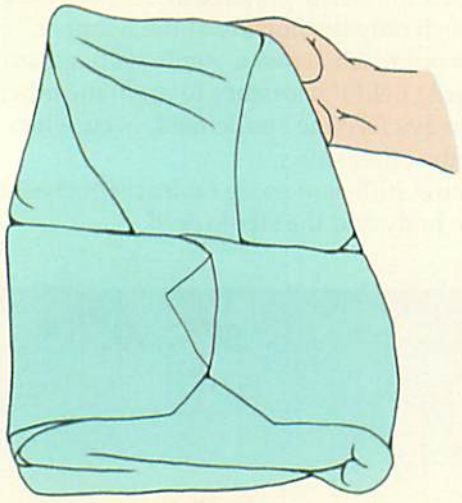
Implementation

3. Perform hand hygiene. *(Removes microorganisms.)*
4. Remove the plastic outer wrap, leaving the inner wrap in place. If a hospital-prepared pack does not have a plastic wrap, remove the tape holding it closed. When setting up a field at the bedside, you can use the plastic wrapper for discards. Place the pack so that the flap that opens to the back of the table is on top. *(The outside of the sterile pack is not considered sterile and can be touched. The first flap is to be opened away from the nurse's working area.)*
5. Facing the table, move to the far side and open the initial flap by lifting it upward away from the pack,

Continued

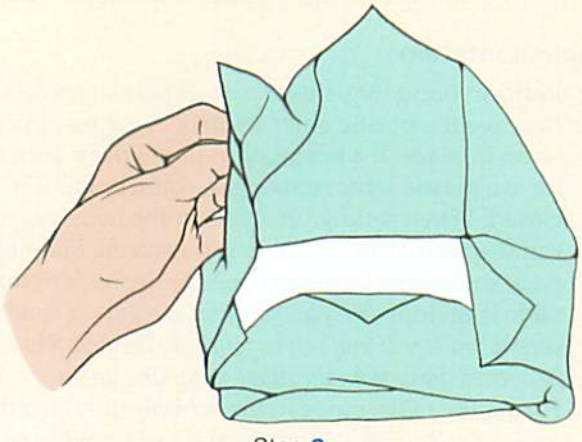
Skill 17-3 Opening Sterile Packs and Preparing a Sterile Field—cont'd

then outward and down over the edge of the table. If the pack is small enough, this can be done by reaching around the pack and opening the distal flap rather than moving to the other side of the field. *(Opening the distal flap first prevents contaminating the pack by reaching over the exposed sterile contents after the other flaps are opened.)*



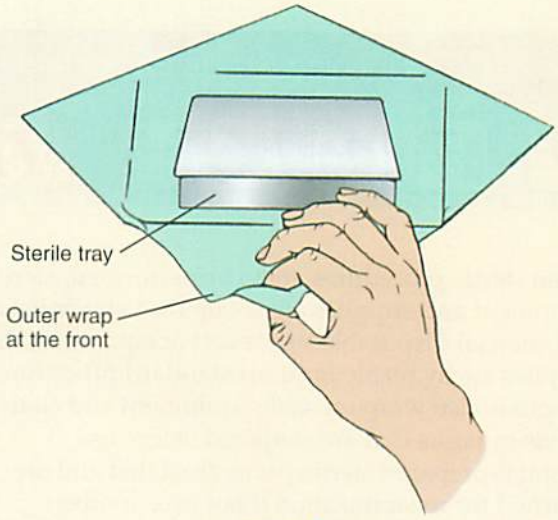
Step **5**

6. With the left hand, move the flap on the left up and laterally away from the package. Pull edge down over the edge of the table. Then open the right flap with the right hand in the same manner. Be careful to touch only the outside of the wrapper and not to reach across any area of exposed sterile supplies. *(Maintains the sterility of the inside of the pack and its equipment and supplies. Pulling the drape edges downward over table edges ensures that the wrap does not fall back over the field and contaminate it.)*



Step **6**

7. Lift the front (proximal) flap up and toward you, handling only the outside of the wrapper or pull-tabs. If the entire pack is to be handed off to someone in sterile gown and gloves, grasp the contents firmly in one hand from the underside, and pull each flap down over the hand that is grasping the contents of the package. Secure the flaps with your other hand when offering the pack contents to the sterile person who needs them. If the pack has an inner wrap, this is sterile and need not be opened before handing off the tray. *(Maintains the sterility of the pack contents. Holding back the flaps prevents them from falling forward and touching the gloved hands of the sterile person, or the hands of the nonsterile person from touching the sterile gloves.)*



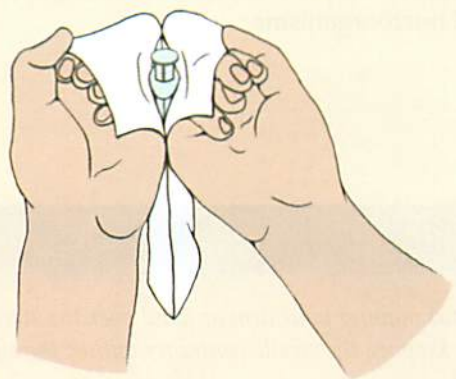
Step **7**

8. The inside of the outer wrap is used as the sterile field. Using gloves and/or sterile forceps, arrange the equipment and supplies on the sterile field in the order in which they will be used. Keep all items at least 1 inch from the edge boundary. *(The inside of the wrapper that has not been touched is still sterile. Only sterile items may touch or move over the sterile field, or it will be contaminated. The outside 1-inch edge of the horizontal surface of the wrapper or field is considered contaminated because the edge is in contact with an unsterile surface or is hanging below waist level and subject to contact contamination. The entire field must remain dry to maintain sterility. You must continue to face the field. If your back is turned to the field or it is outside your line of vision, it is considered contaminated because it was not within your visual limits and something nonsterile could have fallen on it or touched it.)*

Skill 17-3 Opening Sterile Packs and Preparing a Sterile Field—cont'd

Adding Supplies or Equipment to the Sterile Field

9. Inspect the disposable package to see which edge is to be opened. Bring both hands together, and grasp the small flaps at the edge to be opened. *(Establishes the grip to open the package at the intended point.)*
10. Peel the two parts of the package apart by turning the hands outward to separate the sealed edges. *(Opens the package, exposing the sterile contents. Allows the sterile person to extract the sterile contents of the package without being contaminated, or allows you to gently toss the supply item or piece of equipment onto your sterile field without contaminating it.)*



Step 10

11. Alternately, for supplies you will use yourself, after starting the peeling process, lay one side of the package flat on a clean, dry surface and peel the top part of the package all the way back. *(The bottom inside of the package serves as a sterile field until the item is used.)*
12. Perform the sterile procedure, maintaining the principles of surgical asepsis (see Box 17-5). *(Any break in sterile technique contaminates the field, supplies, and equipment.)*

Evaluation

13. Ask yourself: Was the pack opened while maintaining sterile technique? Has the sterile field been within my line of vision during the whole procedure? Have I added supplies to the field in an aseptic manner? *(Answers will determine whether the field has been kept sterile.)*

Documentation

Example

9/17 1435 Straight catheterization performed using sterile technique with 14-Fr. catheter. No problems encountered; 190 mL clear, yellow urine drained; sterile specimen obtained.

_____
(Nurse's signature)

Special Considerations

- In the operating room, supplies are added to the field by being opened by the nonsterile (circulating) nurse and handed off to the sterile (scrub) nurse as described in point 7 above.
- In the patient's room, after the kit for a procedure is opened, extra supplies can be opened and positioned around the outside of the sterile field on their own wrappers, where they will be within reach.
- When offering a peeled package of supplies, keep the opened flaps over your hands so that the sterile person will not touch your nonsterile skin or the nonsterile flaps.

Critical Thinking Questions

1. You have opened a sterile Foley catheter kit and are gloved. While cleansing the meatus (the hand touching the patient is now nonsterile, the hand with the swab is sterile), you accidentally contaminate the glove on your sterile hand. What do you do if you are there alone? What do you do if you have someone assisting you?
2. What do you do if a package of 4 × 4 gauze you have opened and dropped into the field lands right at the edge of the field?

Most sterile items are available as individually wrapped or separate items, such as sterile packages of cotton-tipped applicators, tongue blades, 4 × 4 gauze dressings, ABD (abdominal) dressings, alcohol swabs, syringes, needles, Foley catheters, sterile gloves, and IV catheters. Instructions often appear on the outside of the package directing you where to open it, indicating the direction in which to tear, or showing where to peel at a certain point. Follow these instructions to avoid contaminating the contents.

When sterile supplies have been brought to the patient's bedside, never return them to the unit stock

shelves. The outsides of these items are contaminated, and returning such supplies carries organisms from the patient's room back to the store of supplies for the unit. Do not stockpile supplies in the patient room to avoid costly waste.

The procedure for pouring sterile liquids is listed in Steps 17-1.

Sterile Gloving. Sterile gloves must be used for sterile procedures. These gloves are made of various substances, including latex and nitrile, and are less permeable than the disposable plastic gloves. The method of donning and removing sterile gloves is presented in Skill 17-4.

Correcting Breaks in Asepsis. Whenever it becomes apparent that a break in surgical asepsis has occurred, you must rectify the error. A scrub is begun again if the hands touch the sink, which is always considered contaminated; sterile gloves are discarded and new gloves donned when any part of a glove touches a nonsterile area or item. Discard or put aside for re-sterilization any sterile supplies if they become contaminated, and open new packs or packages aseptically to replace them.

It is up to every nurse to point out breaks in sterile technique that occur when others seem unaware that they have contaminated themselves or the sterile field. Surgical asepsis is used in every aspect of nursing.

▪ Evaluation

If the patient is recovering without additional instances of infection from other organisms, or infection of other body areas with a resident organism, goals are being met. Evaluation also includes assessing whether the patient's infection has been transmitted to any health care worker or any other patient on the unit or in the hospital. The IP monitors for this and, if it occurs, usually works in conjunction with the unit manager to ensure that staff members are correctly implementing infection prevention and control procedures.

Infection prevention and control are the responsibility of every nurse. The principles and techniques learned here will protect you and your patients from harmful microorganisms.

Steps 17-1 Pouring Sterile Liquids

Sterile liquids are used during surgical procedures, for wound irrigations, and for cleansing during sterile procedures.

ACTION *(RATIONALE)*

1. Perform hand hygiene and, using sterile technique, set up the sterile field with a sterile container for the solution. Properly opened, the wrapper from a sterile kit such as an irrigation kit makes an appropriate sterile field at the bedside. *(Prepares an area where the sterile solution can be safely poured.)*
2. Check the solution label to verify that it is the ordered solution. Check the expiration date. *(Prevents using the wrong solution or an outdated solution. Sterile solutions are not considered sterile if the expiration date has passed.)*
3. Unscrew and remove the bottle cap without touching the inside of the cap or the opening of the bottle. *(The inner surface of the cap is considered sterile.)*
4. Place the cap with the inner surface facing up on the table outside the sterile field. *(Prevents contamination of the inside of the cap.)*
5. With sterile gloved hands or sterile transfer forceps, move the empty sterile container for the solution to 1 inch inside the edge of the sterile field. *(Positioning the container to 1 inch inside the edge of the sterile field allows you to pour the liquid without moving your arm or hand over the sterile field, while keeping the sterile container within the sterile field.)*
6. Hold the bottle about 6 inches above the empty sterile container and pour liquid into the container in a steady stream, preventing splashing of the liquid onto the sterile field. *(Pouring the liquid from this height and maintaining a steady stream prevents splashing. If splashing occurs, the field is contaminated, and a new sterile field must be prepared.)*
7. When pouring is completed, pick up the cap by the outside and recap the bottle. Set it down outside the sterile field. *(In patient rooms and in the home setting, recapped solutions may be used if they have not become contaminated during recapping. In the operating room, remaining solution is discarded.)*
8. Write the date the solution was opened on the label and your initials. *(Solutions are considered unsterile after being open for a particular number of days, and some are single use only. Follow agency policy regarding discard dates for open solutions.)*
9. When pouring liquids from a previously opened bottle, pour a bit of solution over the lip of the bottle into a discard container, and then pour the solution into the sterile container. *(This washes the edge of the bottle and aids in preventing contamination of the solution being poured.)*

Skill 17-4 Sterile Gloving and Ungloving

Sterile gloves are used for performing sterile procedures and handling sterile equipment and supplies. Sterile gloves are to be removed and replaced any time they become contaminated when performing a sterile procedure.

Supplies

- Package of sterile gloves in correct size

Review and carry out the Standard Steps in Appendix D.

ACTION *(RATIONALE)*

Assessment (Data Collection)

1. Determine what size gloves are needed. *(Gloves should fit snugly, but not be so tight that they are extremely difficult to put on.)*

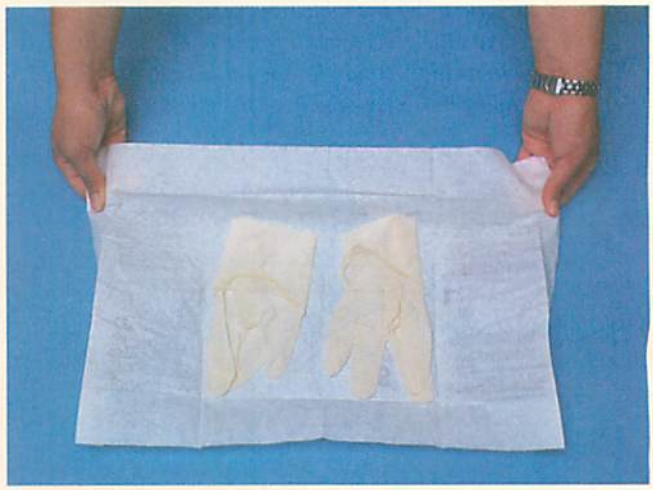
Planning

2. Select a clean, flat, dry surface above waist level on which to open the glove package. *(Glove package should remain stationary and easily accessible while putting on the gloves to decrease chance of contamination from contact with surface of table.* A *wet surface will contaminate the gloves.)*

Implementation

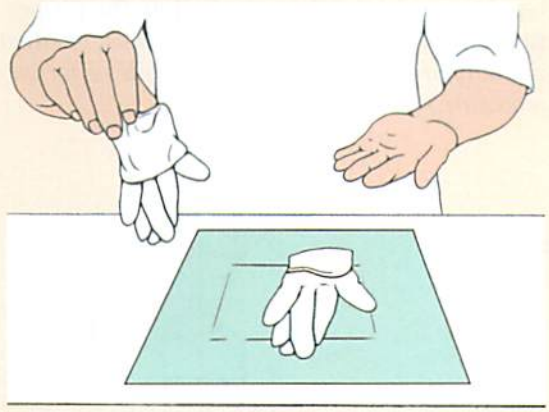
Gloving

3. Place the package of correctly sized gloves on the flat surface. Perform hand hygiene. *(Hands must be clean and dry before gloving to reduce the transfer of microorganisms.)*
4. Peel open the outside wrapper, exposing the sterile glove package. *(The outer package keeps the inner pack sterile until opened.)*
5. Position the package so that the designation of right ("R") and left ("L") is visible right side up if this is indicated on the package. *(This places the gloves in correct association with the right and left hand, facilitating proper gloving. Some gloves can be used on either hand; those packages will not be marked R and L.)*
6. Use sterile technique, and open the glove package, handling only the outer wrapper. Handle the wrapper by the underneath part of the folded-back flaps. Pinch the corners of the flaps after pulling them open so that they remain open. *(Handling the outside of the wrapper only prevents contamination of the inner surface and the gloves. Allowing the wrapper to fall back on the gloves contaminates them.)*



Step 6

7. Pick up one glove by slipping the thumb into the opening and grasping the glove with the thumb and fingertips at the folded-over cuff edge, and lift it up at least 12 inches off the wrapper, being careful not to touch the glove to yourself or any surrounding objects. *(Only the inside of the glove, which will be against the skin, is touched, leaving the outside sterile.)*



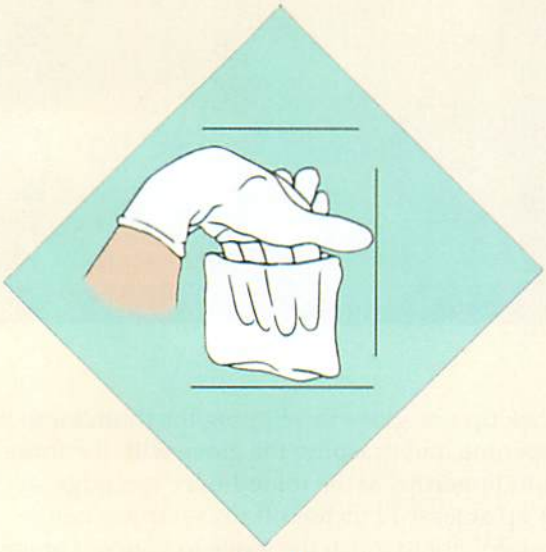
Step 7

8. Insert the fingers of the other hand into the glove, and extend and hold the fingers slightly apart. Pull the cuff outward as you slip your hand into the glove. *(Touching only the inside surface of the glove prevents contaminating the outside sterile surface.)*
9. Pick up the second glove by placing the (sterile) gloved fingers under the cuff fold; slip the bare hand into the glove, being careful not to touch the outside

Continued

Skill 17-4 Sterile Gloving and Ungloving—cont'd

of the glove or the other gloved hand with your bare skin. Once the hand is settled in the glove, slide the glove cuff up carefully over the wrist. *(Keeping the gloved fingers under the folded-over cuff of the second glove prevents the gloved hand from being contaminated by bare skin as the second glove is pulled on. Sliding up the cuff covers the exposed skin of the wrist.)*



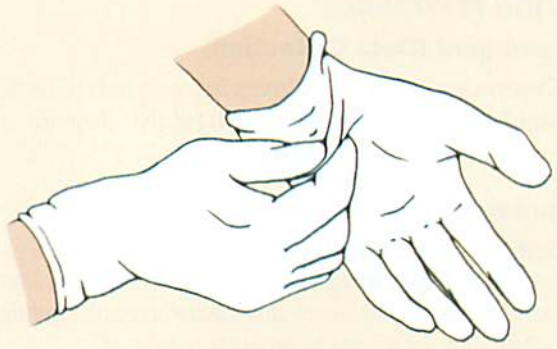
Step **9**

10. Adjust the fingers in the gloves as needed by pulling the glove fingers out with the opposite hand to straighten them and allow the proper finger to enter the space. *(Fingers must be situated correctly to permit hand dexterity while performing the procedure.)*

Step **10**

Ungloving

11. When finished with the sterile procedure, unglove by grasping the outside surface of one glove about 2 to 3 inches below the cuff edge with the opposite gloved hand. *(Grasping the glove in an area away from exposed skin prevents contaminating the skin with the now contaminated glove.)*
12. Pull the glove off the hand while turning it inside out and rolling it into the palm of your other gloved hand. *(This technique prevents organisms on the contaminated gloves from coming into contact with your skin.)*



Step **12**

13. Still holding the first glove in the remaining gloved hand, place the fingers of your ungloved hand under the cuff of the remaining glove next to your skin. Slide the glove off, turning it inside out as you

Step **13**

Skill 17-4 Sterile Gloving and Ungloving—cont'd

remove it. *(Touching only the skin of the hand with your bare hand prevents contaminating yourself with the outside of the now contaminated glove. The first glove's contaminated surface is now encased in the second.)*

14. Dispose of the contaminated gloves in the proper receptacle. *(Because the contaminated surfaces of the gloves are on the inside of the gloves, they can be discarded in the trash.)*
15. Perform hand hygiene. *(This removes glove powder, if present, and removes any organisms that might have traveled through the gloves. Hand hygiene after removing gloves is required by Standard Precautions.)*

Evaluation

16. At all times during the wearing of sterile gloves, ask yourself: Have I touched a glove surface to an unsterile object? Have my gloved hands dropped below waist level? Do I need to reglove? *(If hands drop below waist level, they are considered contaminated because they are generally out of the field of vision.)*

Documentation

No documentation is required for this procedure.

Critical Thinking Questions

1. You are preparing to do a dressing change with the patient in bed, and set up the sterile field and supplies on the over-the-bed table. Where would you place the sterile glove pack to don the sterile gloves?
2. When donning sterile gloves, in what ways might the gloves become contaminated?

Get Ready for the NCLEX® Examination!

Key Points

- Illness progresses through an incubation period, a prodromal period, an illness period, and a convalescent period.
- The present system of infection prevention and control consists of two tiers: Standard Precautions, to be used for all patients; and Transmission-Based Precautions, to be used for patients who have an organism that is transmissible.
- Transmission-Based Precautions are always used along with Standard Precautions.
- PPE is used to protect patients and health care workers. PPE includes head covering, protective eyewear, masks, gowns, gloves, and shoe covers. The mode of transmission of a microorganism determines which PPE is necessary.
- Hand hygiene is the best method of preventing HAIs.
- A special respirator (N95) mask is necessary to care for a patient under Airborne Infection Isolation Precautions who has or may have pulmonary tuberculosis, varicella, rubeola, or severe acute respiratory syndrome (SARS).
- Laboratory specimens are labeled and bagged before removal from an isolation room.
- Linens and trash are deposited in specially marked biohazard bags before removal from an isolation room. Sharps are placed in a puncture-resistant container marked "biohazard."
- If a patient under Airborne Infection Isolation Precautions must be transported, he wears a mask.
- Emphasis in the home environment is on preventing the transmission of microorganisms to others and on containing pathogens.
- Protective isolation is used for severely immunocompromised patients. Full use of PPE is required for all people entering the patient's room.
- The nurse should oversee appropriate activities and opportunities for contact with friends and family to prevent adverse psychological consequences for the isolation patient.
- Nurses must be knowledgeable about and strictly follow the principles of surgical asepsis and the use of sterile technique.

Additional Learning Resources

SG Go to your Study Guide for additional learning activities to help you master this chapter content.

evolve Go to your Evolve website (http://evolve.elsevier.com/deWit/fundamental) for the following FREE learning resources:

- Animations
- Answer Guidelines for Think Critically boxes and Critical Thinking Questions and Activities
- Answers and Rationales for Review Questions for the NCLEX® Examination
- Glossary with pronunciations in English and Spanish
- Interactive Review Questions for the NCLEX® Examination and more!

Review Questions for the NCLEX® Examination

*Choose the **best** answer for each question.*

1. The nurse is delivering a meal tray to a patient who is under Droplet Precautions for bacterial pneumonia. Which articles of personal protective equipment (PPE) need to be worn?
   1. Gown, mask, gloves, shoe covers
   2. Special filtration mask and gloves
   3. Only a mask is needed
   4. No PPE required

2. The nurse is preparing to assist a patient with his bath. He has an infected, draining wound. What PPE would be required for these tasks? *(Select all that apply.)*
   1. Gown
   2. Mask
   3. Eyewear
   4. Gloves

3. Which step(s) are to be taken when preparing a sputum specimen to go to the laboratory? *(Select all that apply.)*
   1. Label the container.
   2. Collect the specimen and secure the lid.
   3. Place the container in a sealed plastic bag marked "biohazard."
   4. Place the biohazard bag in another plastic bag.
   5. Place the completed laboratory slip in the pocket on the bag.
   6. Put the container in the rack for the laboratory courier.

4. A nurse is working in a small hospital with a combined medical-surgical unit. The only beds available are in two-bed rooms, and each room already has a patient. The recovery room nurse is about to send up a 25-year-old woman who just had her tonsils removed. Who would be the most appropriate roommate?
   1. A 60-year-old woman newly diagnosed with bacterial pneumonia
   2. A 23-year-old woman with a draining wound
   3. A 15-year-old girl who had oral surgery yesterday
   4. A 50-year-old woman recovering from an alcohol overdose

5. A home care nurse has a patient with a wound infection who is also under Airborne Infection Isolation Precautions. The patient's wife changes the dressing on the days that the nurse does not visit. The wound must be cleansed and then dressed. The nurse must teach the wife to: *(Select all that apply.)*
   1. maintain strict surgical asepsis.
   2. cleanse her hands and be careful to touch only the corners of the dressing with her bare hands.
   3. store the used dressings and supplies in a sealed plastic bag before placing them in the trash.
   4. wear a mask as well as gloves when changing the dressing.

6. A patient under Contact Precautions wants to know if he may have visitors. The nurse tells him that:
   1. visitors may come but they must wear a mask and gown.
   2. there are no special requirements for people visiting a patient under Contact Precautions.
   3. visitors should check with the nurse to see whether they need to wear PPE.
   4. visitors may come but should wash their hands before and after socially touching the patient.

7. When performing a sterile dressing change on a patient, correct technique must be regarded as broken if: *(Select all that apply.)*
   1. supplies are placed touching the edge of the sterile field.
   2. a gloved hand touches the dressing table below tabletop surface.
   3. a sterile glove touches one of the sterile dressings on the field before the procedure is begun.
   4. the nurse reaches over the sterile field when placing a swab used to clean the wound in the discard bag.

8. Standard Precautions are used:
   1. for all patients.
   2. for all patients unless they are under Transmission-Based Precautions.
   3. for all patients except those in protective environment isolation.
   4. for any patient the nurse believes might be infectious.

9. The correct actions when donning a pair of sterile gloves include: *(Select all that apply.)*
   1. picking up the first glove by placing the fingers of the opposite hand under the cuff.
   2. smoothing the first glove over the hand before putting on the second.
   3. picking up the first glove by grasping it on the fold of the cuff.
   4. holding the glove with its fingers downward.

10. When making up the bed in an isolation room, the nurse: *(Select all that apply.)*
    1. places and unfolds linen carefully.
    2. wears gloves and a cover gown.
    3. checks on items the patient might need before entering the room.
    4. places dirty linens on the floor until finished.