STANDARDS AND ACCOUNTABILITY—cont’d

4.32 Compare careers within the health science career pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

4.4 Employability Preparation
4.41 Develop components of a personal portfolio.
4.42 Demonstrate the process for obtaining employment.

Foundation Standard 8: Teamwork
Healthcare professionals will understand the roles and responsibilities of individual members as part of the healthcare team, including their ability to promote the delivery of quality healthcare. They will interact effectively and sensitively with all members of the healthcare team.

Accountability Criteria
8.11 Understand roles and responsibilities of team members.
8.12 Recognize characteristics of effective teams.

8.2 Team Member Participation
8.21 Recognize methods for building positive team relationships.
8.22 Analyze attributes and attitudes of an effective leader.
8.23 Apply effective techniques for managing team conflict.


Notet: See also Further Appraoch National Commission for Health Science Education, National Health Science Career Cadre Models, Therapeutic Services Pathways Standards & Accountability Criteria, also available at http://www.nchce.org/standards.php.

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SKILL LIST 2-1
Assertive Behavior

1. Take a few long, deep breaths. Allow time to gain composure so that the message can be delivered in matter-of-fact, unemotional tones.
2. Describe the behavior you would like the other person to change. Be specific about one incident or action.
3. State the effect or how you feel when the behavior occurs.
4. State the positive behavior you would like to see rather than the one you do not like.
5. State the consequences that will occur if the behavior is not changed. These consequences must be timely, reasonable, enforceable, and clearly understood by the other person.
6. Follow through with the consequences if the behavior does not change.
7. Evaluate the success of the confrontation with the other person. Demonstrate appreciation for the change in the behavior.

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CHAPTER 3

Safety Practices

LEARNING OBJECTIVES

- Define at least 10 terms relating to safety practices in health care.
- Describe the infectious process and methods to prevent infection.
- Describe the methods of Standard and Transmission-Based Isolation Precautions that prevent the spread of microorganisms.
- Describe three levels of medical asepsis.
- List at least three principles of surgical asepsis.
- Identify the functions of the Omnibus Budget Reconciliation Act (OBRA) and the Occupational Safety and Health Administration (OSHA).
- Describe the guidelines for using good body mechanics.
- Describe the signs and symptoms of general and localized infection.

KEY TERMS

Anthrax (an-thrik-s) An infectious disease of warm-blooded animals (such as cattle and sheep) caused by a spore-forming bacterium (Bacillus anthracis) and characterized by external ulcerating nodules or lesions in the lungs

Antiseptic (an-sis-tik) Substance that deters the growth of microorganisms

Asepsis (a-sep-sis) Freedom from infection; the methods used to prevent the spread of microorganisms

Autoclave (AW-toe-klave) Unit that uses steam under pressure to sterilize materials

Contaminated (kon-TAM-in-ay-ted) Soiled, made unclean, or infected with pathogens

Disinfectant (dis-in-FEK-tant) Substance that kills microorganisms except viruses and spores

Ergonomics (er-go-nom-iks) Design of equipment for the workplace that maximizes productivity by reducing fatigue and discomfort

Local infection (LOH-kul in-FEK-shun) An infection limited to a small area of the body

OBRA (OH-bra) Law that requires training for nursing assistants including competency testing of skill performance
Disease Transmission

The Infectious Process

The infectious process is the interaction of microorganisms that cause disease with the environment and the host. Infection requires several elements:
- A disease microbe (agent)
- A reservoir where the microorganism can live
- A way of exit or escape from the reservoir
- A way for transmission or transfer to the host
- A way of entry into the host
- A susceptible (vulnerable) host

The reservoirs or agents include anything that can cause communicable disease, such as bacteria, virus, fungi, protozoa (protozoan), or animals like worms. The source or reservoir for the microbe may be the patient, other people, or nonliving (inanimate) objects. Five main methods of transmission include contact, droplet, airborne, common vehicle, and vectors. Contact transmission may be direct or indirect (through an inanimate object). Common vehicle transmission includes items such as water, food, or contaminated equipment. Vectors or organisms that can spread the agent include mosquitoes, flies, rats, and other such vermin (pests). The host that does not have enough resistance to (i.e., is susceptible to) the infecting agent will become sick. Resistance may be lowered by poor nutrition, open wounds, invasive therapies such as an intravenous line, or a suppressed immune system. For infection to occur, all six of the elements of the infectious process must be present in order. The chain of infection or transmission can be broken and the infection prevented at any of the links (Fig. 3-1).

Infection is a reaction caused by a microorganism. Infection may be symptomatic or asymptomatic (i.e., with or without expression of health). A local infection is an infection limited to a small area of the body. A systemic infection is an infection located throughout the body. Infection may occur in a general or local manner. Signs and symptoms of a general infection include a fever, chills, pain, an ache or tenderness, a general feeling of tiredness, and night sweats. A local infection in a wound or incision may be characterized by redness, heat, swelling, pain, or fluid that is white, yellowish, or greenish.

BOX 3-1
Evolution of Infection Control Procedures

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1877</td>
<td>Hospital handbooks recommended patients with infectious conditions be placed in separate facilities.</td>
</tr>
<tr>
<td>1910</td>
<td>Cubicle system introduced in multiple bed wards, also known as barrier nursing, required washing of hands and disinfecting contaminated materials between patient contacts.</td>
</tr>
<tr>
<td>1950-1960</td>
<td>Infectious-disease hospitals, except those for tuberculosis, were closed.</td>
</tr>
<tr>
<td>1970</td>
<td>Manual published by the CDC introducing a system of isolation procedures with seven categories: strict, respiratory, protective, enteric, wound and skin, discharge, and blood precautions.</td>
</tr>
<tr>
<td>1983</td>
<td>CDC manual for disease-specific isolation was revised to include strict contact, respiratory, tuberculosis, enteric drainage or secretions, and blood or body fluid precautions.</td>
</tr>
<tr>
<td>1985</td>
<td>Universal Precautions were instituted to combat the spread of HIV through needle sticks and skin contamination with patient blood. Emphasis was placed on applying infection precautions to each patient regardless of diagnosis. Hepatitis B vaccination of health care workers became a requirement.</td>
</tr>
<tr>
<td>1987</td>
<td>BSI was introduced to focus on all moist and potentially infectious body fluids regardless of diagnosis.</td>
</tr>
<tr>
<td>1989</td>
<td>OSHA published a ruling regarding bloodborne pathogens.</td>
</tr>
<tr>
<td>1990</td>
<td>CDC published Standard Precautions guidelines for all patients that combine Universal Precautions and BSI principles. It also combined the disease-specific categories into three sets of Transmission-Based Precautions.</td>
</tr>
</tbody>
</table>
TABLE 3-1
Transmission-Based Precautions

<table>
<thead>
<tr>
<th>Type</th>
<th>Sample Infection</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airborne</td>
<td>Measles, varicella, tuberculosis</td>
<td>Private room, respiratory protection (mask), special air handling and ventilation</td>
</tr>
<tr>
<td>Droplet</td>
<td>Diphtheria, pneumonia, pertussis, streptococcal pharyngitis, scarlet fever, adenovirus, influenza, mumps</td>
<td>Private room, mask, patients positioned at least 3 ft apart</td>
</tr>
<tr>
<td>Contact</td>
<td>Gastrointestinal, respiratory, skin or wound infections, diphtheria, herpes simplex virus, impetigo, pediculosis, viral or hemorrhagic conjunctivitis and infections (Ebola, Lassa, Marburg), methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant Enterococcus (VRE), vancomycin-resistant S. aureus (VRSA)</td>
<td>Private room, gloves, gowns, handwashing with antimicrobial soap after removal of gloves, cleaning and disinfecting equipment</td>
</tr>
</tbody>
</table>

*All Transmission-Based Precautions are used in addition to Standard Precautions.

BOX 3-2

Requirements of Standard Precautions

Handwashing
- Whenever visibly soiled
- Before and after patient contact
- After contact with body fluids or moist surfaces
- After removing gloves

Personal Protective Equipment and Attire
- Gloves
- Gowns
- Eye protection
- Head cover
- Footwear

Engineering and Work Practice Controls
- Leakproof sharps disposal
- No recapping of needles

Hepatitis B Vaccine
- Offered at no cost

Employee Exposure Protocol
- Injured employee seen and treated within 2 hours of incident
- Written exposure control plan

Records and Written Plans
- Employee medical records are kept confidential and maintained for 30 years

Housekeeping, Waste Disposal, and Laundry
- Surfaces cleaned and decontaminated
- Regulated or biowaste disposal
- Sharps disposal boxes
- Soiled laundry—minimum contact and agitation

Education
- Training records to be kept for 3 years

health care (Box 3-2). All body fluids of all patients are considered to be potentially infectious under the Standard Precautions guidelines. Body fluids that are included in the precautions include blood, semen, vaginal secretions, and tissues such as pleural, peritoneal, pericardial, cerebrospinal, amniotic fluids, and nonintact skin. Handling of feces, sweat, nasal secretions, urine, tears, and vomitus does not require Universal Precautions unless they contain visible blood. Contact with saliva only requires Standard Precautions when contaminated by blood and in the dental setting. Standard Precautions do not apply to breast milk except when contact is long such as in milk banking.

Protective barriers or personal protective equipment (PPE) used in the Standard Precautions include gloves, gowns, aprons, masks, and protective eyewear. Gloves are worn when touching body fluids and when handling items or touching surfaces that are soiled with body fluids. They are changed after contact with each patient. The hands are washed immediately after removing gloves. PPE may also be worn when in contact with hazardous chemicals and some medicines. In some situations, protective hats and footware may also be used. Disposable aprons, goggles, and masks are worn when there is the possibility of splatterings. The type of PPE used is determined by assessing the risk of transfer of microorganisms and from the patient. Signs are placed outside the patient’s room to indicate which type of PPE is needed.

Prevention of injury from needles, scalpels, and other sharp devices is also included in the Universal Precautions. Needles should not be recapped or removed from syringes by hand. Sharp instruments such as needles and scalpels should be disposed of in puncture-resistant containers.

**CASE STUDY 3-1** While providing care for a patient, you find that someone has left an uncapped needle on the bedside tray. What should you do?

Answers to Case Studies are available on the Evolve website: http://evolve.elsevier.com/Gerding

Transmission-Based Precautions are used for patients with known or suspected infections. They are used in addition to Standard Precautions. The three categories of Transmission-Based Precautions guidelines are airborne, droplet, and contact precautions. Airborne precautions are used for infections spread through the air, such as chickenpox. Droplet precautions are used for infections spread in large droplets by coughing, sneezing, or talking, such as the flu. Contact precautions are used when an infection, such as the herpes simplex virus, can be spread via skin to skin contact or by contact with surfaces. The precautions are combined when the infection can be transmitted by more than one method.

**CASE STUDY 3-2** You are using Transmission-Based Precautions to care for a patient. When care is completed, you notice that one of your gloves ripped sometime during the care. What should you do?

Answers to Case Studies are available on the Evolve website: http://evolve.elsevier.com/Gerding

The primary method of protection from infection is good handwashing technique (Fig. 3-2). The hands are washed thoroughly at the beginning of the work period, between each patient contact, before and after eating, before and after using the restroom, and before
leaving the work environment. Although state standards vary, the hands should be washed for a minimum of 20 seconds. Sterile gloves may be required to protect the patient during care or procedures (Fig. 3-3). Nonsterile gloves are worn when contact is made with body fluids, mucous membranes, or wet secretions. When removed, nonsterile gloves are placed directly in the designated receptacle to prevent contamination of any environmental surface. The hands are washed thoroughly immediately after removal of the sterile or nonsterile gloves. (See Skill List 3-1, Handwashing, and Skill List 3-2, Sterile Gowning, p. 56).

Infections acquired by the patient as a result of the care or as a result of pathogens in the facility are called nosocomial. In the United States, about two million people acquire a nosocomial infection while in the hospital each year. Epidemiology is a science devoted to studying health-related events in the human population. Principles of epidemiology are used to trace the source and minimize the risk of nosocomial and other infections. Of the infections acquired in the hospital, the CDC reports that 70% are resistant to at least one of the drugs commonly used to treat them. The most relevant nosocomial pathogen in the United States is methicillin-resistant *Staphylococcus aureus* (MRSA). The main mode of transmission of MRSA to patients is by the hands, usually of the health care worker. Box 3-3 provides more information about MRSA.

When antibiotics are used to treat infection, there is a chance that microorganisms will develop resistance to them. Antibiotic-resistant microorganisms are created when some but not all of those being treated are killed. The few pathogens that survive an antibiotic treatment may develop resistance to it. That resistance is passed on to the generations of the pathogens that follow. Two factors associated with development of antibiotic resistance are exposure to antibiotic treatment and incomplete cycles of prescribed antibiotics. In 2005 the CDC listed eight diseases that have been connected to antibiotic resistance (Box 3-4). Special Transmission-Based Precautions or isolation may be used for antibiotic-resistant microorganisms (superbugs) and patients with immunosuppressed conditions. Isolation guidelines may also be used in the event of the use of bioterrorism agents such as anthrax (Box 3-5).

The most common method of transfer of pathogenic organisms that cause serious illness in the health care worker is contact with a contaminated needle or sharp instrument. To prevent contamination, needles should not be recapped but should be disposed of in a container specifically designed for that purpose. Other environmental risk factors are minimized with the use of hepatitis B vaccination and devices for cardiopulmonary resuscitation that eliminate mouth-to-mouth contact with mucous membranes during the procedure. Methods that are not considered effective include disposable eating utensils, "protective" isolation, disinfectant fogging, and double bagging for the removal of waste and linens. Waste and linen should all be disposed of according to individual agency specifications designed to prevent contact with secretions. More information regarding the infection process and disease transmission is found in Chapter 22.

### Principles of Asepsis

Asepsis is the absence of disease-causing microorganisms (*pathogens*). Asepsis also includes the methods used to prevent the spread of microorganisms. Medical asepsis is a state of cleanliness or the use of clean technique. Some indications for the use of aseptic technique include the following:

- Open wounds
- Urinary catheters
- Insertion or dressing of intravenous lines
- Any procedure requiring the skin be broken (invasive)

An area or object that becomes unclean is considered contaminated. Medical asepsis can be evaluated on three levels:

1. **Antiseptic:** Antiseptics inhibit the growth of bacteria. They can be used on the skin.
2. **Disinfectant:** Disinfectants are agents that destroy most bacteria and viruses. They can be caustic or harmful to the skin. Disinfection can be accomplished by boiling, as well as by using chemical agents.
3. **Sterile:** Surgical asepsis is a state of sterility or the use of sterile technique. Sterilization is the removal of all microorganisms including viruses and endospores. Sterilization can be accomplished by...
using an autoclave. One type of autoclave is a pressure cooker that uses steam and pressure to destroy microorganisms. Other autoclaves use dry heat or chemical vapor to kill all microorganisms. Sterile technique also includes special methods of handling sterile equipment, maintaining sterile fields, changing dressings, and disposing of contaminated materials. Clean technique does not require a sterile environment and equipment. It is also called nonsterile technique. Barriers are used to provide a "no-touch" or clean field by preventing contact with an infected area. Gloves and other protective equipment may be used to prevent the spread of microorganisms. Disinfectants are used to clean the environment and equipment. Clean technique is used in home care more often than in hospital care. Some indications for the use of clean technique in the health care setting include the following:

- Removing sutures
- Removing drains
- Dressing secondary wounds (wounds that will be left open, like stoma)
- Endotracheal suctioning

**OBRA and OSHA Regulations**

**OBRA**

In 1987 Congress passed a law that requires training for nursing assistants, including competency testing of skill performance. In addition to completing a written examination, the nurse assistant must demonstrate the ability to perform skills correctly. OBRA applies to all states and facilities in which nursing assistants are employed. Other requirements of OBRA include continuing education, periodical evaluation of performance, and retraining if the nursing assistant does not work in the field for 2 years or more at one time. In addition to training for nursing assistants, the act also requires long-term care and home health facilities to provide specific care for the residents. For example, it requires the provision of a doctor for each resident and limits the use of restraints.

**OSHA**

OSHA was established in 1970 as one of the agencies of the Department of Labor. OSHA’s two functions are to establish standards of safety for the workplace and to enforce those standards. In 1971 the NIH established the branch called the National Institute of Occupational Safety and Health (NIOSH) to research and provide documentation to OSHA regarding the safe level of exposure to hazards in the workplace. OSHA must prove to the Office of Management and Budget that the health standards set are economically feasible for the industries to which they apply.

In 1985 regulations established by the federal government began requiring employers to tell employees of potential hazards in the workplace. This "right-to-know" information includes details of any health and safety hazards related to working with hazardous or toxic materials. The information is often described in the Material Safety Data Sheet (MSDS; Box 3-6). To reduce the incidence of needle sticks, OSHA defined "sharps" and reporting requirements in a broader manner in 2001.

There is always a risk of injury or loss due to hazards in the workplace (Box 3-7). Risk management works to identify the risks and develop methods to avoid or reduce them. Some risks cannot be removed and are accepted as part of the management plan. For example, nursing staff must use sharp needles to give medications. There is always a risk of puncture. Providing training and protective equipment reduces the risk of that injury.

**Safe Movement**

**Body Mechanics and Ergonomics**

Body mechanics is the way the body is moved to prevent injury to oneself and to others. It is accomplished by using knowledge of proper body alignment, balance, and movement. Ergonomics refers to the design of equipment for the workplace that minimizes fatigue and discomfort and maximizes productivity. Posture is the position of body parts in relation to each other. Balance is the ability to maintain a steady position that does not tip. Six principles of movement can be used to maintain good body mechanics (Fig. 3-4). Chapter 24 provides more information regarding positioning the patient. (See Skill List 3-3; Good Body Mechanics, p. 57.)

In addition to the use of correct body mechanics, assistive devices can also be used to allow mobility while preventing injury. The gait belt is a safety device that may be worn by the patient when being transferred or ambulating. The gait belt is a strong cloth belt that provides a firm grasping area for the health care worker and protects the patient from trauma to the skin (Fig. 3-5). The health care worker may also use the gait belt to lower the patient gradually to the floor if necessary (Fig. 3-6). The health care worker may also wear this type of belt to prevent back injury.
NIOSH reports that female nursing assistants and licensed practical nurses are more than twice as likely to suffer a back injury as other female workers. Other assistive devices include postural supports such as the pelvic holder, torso support, and elevated arm rests (Fig. 3-7). For moving patients, mechanical lifts, sliding sheets, and boards may be used (Fig. 3-8). It is the health care worker’s responsibility to obtain and use assistive devices to prevent injury to the patient or worker. Chapter 24 provides more information regarding procedures for moving patients. (See Skill List 3-4, Ambulation with a Gait Belt; Skill List 3-5, Moving the Patient up in Bed; Skill List 3-6, Turning the Patient to the Side; and Skill List 3-7, Transferring the Patient from the Bed to a Chair, pp. 57-59).

**BRAIN BYTE**

Health care workers represent six of the top 10 occupations at risk for back injuries; nursing assistants are at the top.

**CASE STUDY 3-3** As part of his daily care, you need to help an obese patient move from the bed to a chair. You ask one of your coworkers to help you. She responds that she moves that man by herself every day. What should you do?

Answers to Case Studies are available on the Evolve website: [http://evolve.elsevier.com/Gerdin](http://evolve.elsevier.com/Gerdin)

The international symbol of access in more than 60 countries indicates that a person with a disability can enter and use a building without being blocked by architectural design (Fig. 3-9). The symbol indicates, for example, that wheelchair ramps are available, doors are wide enough to accommodate a wheelchair, the elevators have Braille indicators, and telephones and drinking fountains are placed at a lower height. Physical devices that are used to provide better access by disabled individuals include the walker, cane, wheelchair, and crutches. Hydraulic mechanical lifts may be used so that a small force can lift a heavy object or person. With environmental adjustments and devices, the disabled individual may be able to perform activities of daily living such as eating, bathing, dressing, and moving about independently.

**FIGURE 3-4** Principles of good body mechanics include keeping the back straight.

**FIGURE 3-5** Injury to the patient and health care worker may be prevented by use of a gait or safety belt.

**FIGURE 3-6** Transferring the patient to a chair by using a transfer belt. A. The patient’s feet and knees are blocked by the assisting person’s feet and knees. This prevents the patient from sliding or falling. B. The assisting person pulls the patient to a standing position and supports the patient by holding the transfer belt and blocking the patient’s knees and feet.

**FIGURE 3-7** Postural supports help the patient maintain good alignment. (From Sorrentino SA: Mosby’s textbook for nursing assistants, ed 7, St Louis, 2008, Mosby. Images courtesy J.T. Posey Co., Arcadia, Calif.)
Identifying and Reporting Hazards

Fire and Electrical Hazards

Fire may occur in the home or health care facility as a result of equipment that is damaged or circuits that are overloaded. Smoking can also cause fires. For a fire to burn, it must have oxygen, fuel, and heat. A fire can be controlled or extinguished by removing any one of these elements. Health care workers are responsible for preventing and reacting to fires to protect their patients. Avoiding the accumulation of flammable materials and waste products may prevent hospital fires. Some facilities have fire sprinklers that activate when a fire occurs. Additionally, all employees should be familiar with the policy for fire response.

Although each facility has a procedure to follow in the case of fire, it is common practice to sound the alarm, notify the switchboard, and move any patient who is in danger first. If the fire is small, a fire extinguisher may then be used to extinguish it. To decrease the amount of air supply to the fire, all windows and doors should be closed and oxygen and electrical equipment turned off. Exits are kept clear at all times to allow patients and workers to leave if necessary. If smoke is present, the workers and patients should crawl or move close to the floor toward the exit because the smoke will rise. A damp towel or similar cloth can be used to cover the mouth and nose for breathing.

Each health care facility has a procedure for response to fire. The fire plan may vary and should be displayed in all departments and patient-care areas. One basic protocol that is used to respond to a fire emergency is known as RACE (Fig. 3-10). The “R” stands for “rescue.” The first concern in case of fire is to move everyone from the point of origin of the fire. Critically ill patients are removed while in their beds. Ambulatory patients may walk to safety with supervision. Ambulatory and semibedridden patients are removed from the area of the fire before the nonambulatory patients. Patient charts are moved with the appropriate patient. Evacuation may be either horizontal or vertical. Horizontal evacuation (used first) consists of moving patients through at least one set of fire doors on the same floor. Vertical evacuation consists of moving patients down stairs to a lower level or out of the building. Rescue may be performed simultaneously with the “A” of RACE, “alarm.”

The fire emergency call box or pull station may be used to sound the alarm. In some institutions there is an emergency phone number to dial. The extent, origin, and location of the fire or smoke are reported to an operator at this number. The sound of the fire alert allows health care workers in nearby areas to prepare for any action necessary in that area.

The “C” in RACE stands for “confine” or “contain.” Burning and combustible materials should be contained or confined in one area if possible. By closing doors and windows, the smoke may be contained and the oxygen supply cut off from the fire.

The “E” in RACE stands for “extinguish.” Hand-held fire extinguishers may be used in case of small, contained fire such as a wastebasket. This is attempted only after patients are removed from the area and the person using the extinguisher has a clear route of escape. Even if the fire is safely extinguished, the incident is reported to the emergency number.
TABLE 3-2  
PASS Guidelines for Fire Extinguisher Use

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P = Pull</td>
<td>Pull the pin on the handle of the top fire extinguisher without squeezing the handle.</td>
</tr>
<tr>
<td>A = Aim</td>
<td>Take three steps back from the fire (8 to 10 ft from the fire). Aim the hose or nozzle at the base of the fire. Do not aim at the smoke or flames.</td>
</tr>
<tr>
<td>S = Squeeze</td>
<td>Squeeze the top handle toward the bottom handle to discharge the extinguisher contents.</td>
</tr>
<tr>
<td>S = Sweep</td>
<td>Sweep the nozzle from side to side across the base of the fire.</td>
</tr>
</tbody>
</table>

FIGURE 3-11 A biohazard symbol.

Chemicals in the health care workplace should be stored in a way that prevents exposure, property damage, and liability by the facility. Chemicals should be purchased and stored in amounts that will be used in a reasonable time. Some chemicals may change over time. The amount stored should also meet fire code limits. Containers used to store chemical should be made of the correct material and clearly labeled with the contents. Workers using chemicals must be aware of the correct use, proper disposal, and risk associated with them. Additionally, emergency treatment and procedures should be known for improper exposure.

Emergency Disaster Procedures

A disaster may be caused by nature or by humans and is considered to be any catastrophic event that injures or kills many people at one time. Some examples include earthquakes, explosions, plane crashes, and earthquakes. Policies and procedures for actions to be followed in a health care facility during a disaster depend on the type of facility. Some personnel may be asked to work in another area, such as the emergency department or at an unscheduled time. In hospitals some patients may be asked to go home or to move to another facility.

Personnel from all areas of health care are asked to assist the community during a natural disaster or severe weather (Box 3-8). Additionally, incidents involving bioterrorism or outbreaks of contagious illness may activate emergency plans that include many health care workers. The Department of Homeland Security has established the National Response Plan to be implemented in the event of a domestic incident such as a bioterrorist attack. It provides a management structure that integrates the emergency responders, medical sector, law enforcement, private sector, and other agencies to help in a large-scale disaster. To provide medication to the public on a large scale, the plan includes points of distribution or designated places and personnel trained for that purpose. Individual preparedness for emergencies is also a focus of the plan. Items that an individual or family might need to survive in an emergency can be stored in a cool, dark place or central location for easy access (Box 3-9).

Summary

- Standard Precautions includes the procedures used to prevent the spread of microorganisms. The primary method used is good handwashing technique.
- Transmission-Based Precautions used in addition to Standard Precautions are determined by the type of infection present.
- Three levels of asepsis include antiseptic, disinfectant, and sterile.
- OBRA is the federal agency that regulates training of nursing assistants. OSHA establishes and enforces standards of safety for the workplace.
- Guidelines for maintaining good body mechanics include using bent knees, keeping a broad base, and keeping the back straight.
- Local infection is limited to a small area of the body and may cause redness or warmth at the site. A systemic infection may cause fever, chills, or a feeling of tiredness.

Hazardous Waste

In health care, waste is divided into two categories: biomedical and general. Infectious and hazardous waste produced in health care facilities may sometimes be introduced into the sewage system or disposed of by incineration. One concern that has been raised because of local incineration of wastes is the production of toxic gases containing dioxin, acid gases, and heavy metals. According to the federal Office of Technology Assessment, hospitals release 10 to 100 times more of these elements into the air than other incinerators found in a city.

In health care facilities, hazardous and infectious waste is usually placed in sealed bags before removing it from the area of use. The bag is labeled and sealed to indicate the kind of waste hazard that may exist and to alert other workers in the facility (Fig. 3-11). Some general guidelines for bagging waste for disposal include separating items into categories such as lines, plastics, glass, and wet or dry. If the bag is contaminated during loading, it may be double bagged.

Equipment Maintenance

Equipment is routinely cleaned and maintained in the health care facility. Any equipment that is not working properly (malfunctions) or is defective in any way is reported to the supervisor. Some examples that should be reported include frayed or bent wires. If the defect is hazardous, the equipment is not used for patient care until it is repaired or replaced. The health care work area and equipment are kept clean to prevent the spread of infection. Equipment is returned to a designated storage area after use so that it can be located quickly. Emergency equipment is restocked immediately after use and checked routinely to ensure that all contents are ready for use when necessary. All personnel should be trained on the proper use of equipment that is unfamiliar to the worker.

Review Questions

1. Describe the six elements of the infectious process.
2. Compare the signs and symptoms of localized and general infections.
3. Compare standard and transmission-based precautions.
4. List and describe three levels of asepsis.
5. Use the following terms in one or more sentences that correctly relate their meaning: asepsis, sterile, disinfect, contaminate, and antiseptic.
6. Describe the functions of OBRA and OSHA.
7. List the six guidelines for maintaining good body mechanics.
8. Describe the meanings of RACE and PASS in relation to fire emergencies.

Critical Thinking

1. Describe the type of precautions that might be used for a person with an infection of a surgical wound. Identify which of the elements of the infectious process is being broken.
**Box 3-9**

**Emergency Preparedness: Survival for 3 Days**

**Medical**
- Medication supply for 1 week to 1 month
- Medical records such as vaccinations and copies of prescriptions
- Medical contact such as doctor's names and numbers

**Food**
- Nonperishable canned and dry food supplies, including dry milk or juice
- Water for 3 days (1 gallon/person)
- Utensils including a can opener

**Documents in Waterproof Bag**
- Cash (including coins) and credit cards
- Birth certificates
- Credit card, insurance, and bank account numbers
- Memorabilia (e.g., photos, jewelry)
- Contact phone numbers
- Paper, pencils, or pens
- Map of area

**Clothing**
- Change of clothing
- Sturdy, closed-toe shoes and socks
- Blankets
- Rain gear
- Jacket or coat
- Heavy gloves
- Hat and sunglasses

**Pets**
- Records
- Food (2-week supply canned or dry)
- A 3-day supply may be placed in waterproof plastic bags and stored in portable, closed containers.

**Tools**
- Litter box supplies
- Leash, collar, and travel cage
- Pliers, hammer, broom, and wrench
- Utility knife
- Plastic sheeting
- Duct tape
- Shovel
- Garbage bag with ties
- Dust mask
- First aid kit including nonsteroidal anti-inflammatory drugs, antibiotic cream, and antacid
- First-aid manual
- Whistle
- Clock or watch with extra batteries
- Signal flare
- Moist towelettes
- Disposable camera
- Plastic bucket with lid
- National Oceanic Atmospheric Administration weather radio with extra batteries
- Candles
- Flashlight with extra batteries
- Scissors
- Bleach
- Hygiene products (sanitary napkins, soap, toothbrush, toothpaste)
- Nail clippers, nail file
- Spare glasses, contact solutions
- Matches
- Practice the fire safety in a health care setting.
- Apply principles of basic emergency response in natural disasters and other emergencies.
**SKILL LIST 3-1**  
Handwashing

1. Maintain medical asepsis by using good handwashing technique and wearing gloves according to Standard and Transmission-Based Precautions.
2. Hands should be washed at the beginning of the workday, between each contact with a patient, and at the end of the day. They should also be washed before and after eating and using the restroom.
3. Wet the hands completely with water before applying the soap. Keep the hands lower than the arms during the procedure. The hands are washed and rinsed from the least contaminated area to the most (clean to dirty).
4. Rinse the soap bar before using it and replacing it in the dish. Soap can carry microorganisms to another person. In addition to the soap and water, friction or rubbing actually cleans the skin.
5. Using a circular motion, rub the surface of each wrist at least 2 inches above the hand. Friction helps to remove the dirt from the skin surface.
6. Wash the palms and back of the hands after both wrists are cleaned. After they are cleaned, the wrists are not retouched to prevent contamination by microorganisms from the less clean areas of the hands.
7. Clean each finger and thumb of each hand. Do not retouch the less clean areas (backs of the palms). The fingers are considered to have four sides. Special attention should be given to the area underneath the nails and between the fingers. The hands should be washed for at least 20 seconds.
8. Rinse each hand from the wrist to the fingers, keeping the hands below the level of the arms.
9. Using a circular motion, dry each hand thoroughly from the wrist to the fingertips. Use a separate towel or dry portion of the towel for each hand. Most skin irritations result from soap or moisture that remains on the skin after washing.
10. Use a dry towel to turn off the faucet handle and clean the sink area. Faucets and other metal fixtures (tubulars) can also transmit microorganisms.

**SKILL LIST 3-2**  
Sterile Goving

1. Maintain medical asepsis by using good handwashing technique and wearing gloves according to Standard and Transmission-Based Precautions.
2. The hands can never be sterile. If any part of the hand touches the sterile outside of the gloves, the gloves are contaminated.
3. Touching only the outside and edges of the wrapper, open the sterile glove wrapper on a clean, dry surface. The inside of the wrapper creates a sterile field.
4. Remove one glove from the wrapper by grasping only the inside surface of the glove. Avoid touching the glove on the edges of the sterile field.

**SKILL LIST 3-3**  
Good Body Mechanics

1. Maintain medical asepsis by using good handwashing technique and wearing gloves according to Standard and Transmission-Based Precautions.
2. Identify the patient and explain the procedure.
3. Size up the load to be moved. Get help if necessary.
4. Keep a broad base of stance, with feet 12 to 18 inches apart.
5. Bring the object or patient close before attempting the move.
6. Squat by bending at the knees, and keep the back straight.

7. Do not lift anything that can be pushed or pulled.
8. Turn the body as a unit by pivoting the feet, not turning at the waist.

**SKILL LIST 3-4**  
Ambulation with a Gait Belt

1. Maintain medical asepsis by using good handwashing technique and wearing gloves according to Standard and Transmission-Based Precautions.
2. Select the correct gait belt for the patient. Gait belts may range from ½ to 4 inches in diameter and 54 to 60 inches long.
3. Inspect the gait belt to ensure it is clean and intact.
4. Place the gait belt around the patient’s waist (over clothing) so that it fits snugly but allows room for your fingers under it.
5. Secure it in place by threading the belt through the teeth of the buckle. Thread the belt through openings to lock it in place.
6. If possible, instruct the patient to push with the arms while rising to a standing position.
7. Bend at the knees to use leg muscles, and keep the back straight while assisting the patient to stand.
8. Place one hand at the patient’s back to grasp the gait belt and stabilize the patient.
9. Place the other hand under the patient’s forearm to guide and provide support.
10. If necessary, draw the patient close with bent knees to help the patient to the floor.
11. Assist the patient to the designated location.
12. Use correct body mechanics to lower the patient to a sitting or lying position.
13. Remove the gait belt and return it to the proper location for storage.

**SKILL LIST 3-5**  
Moving the Patient up in Bed

1. Maintain medical asepsis by using good handwashing technique and wearing gloves according to Standard and Transmission-Based Precautions.
2. Identify the patient and explain the procedure.
3. Remove the pillow and extra linens that might prevent easy movement.
4. Lower the head of the bed to a flat position. Continued
**SKILL LIST 3-5—cont’d**

Moving the Patient up in Bed

5. Lower the side rail on the near side.
6. Lower or raise the bed to a comfortable working height so that the back may be kept straight.
7. Place one arm under the patient’s axilla and the other arm across the patient’s back to guide the patient toward the top of the bed.
8. Allow the patient to assist, if possible, by bending the knees and pushing into the bed to lift the weight of the buttocks.

9. Glide the patient toward the top of the bed. Repeat if necessary.
10. Reposition the patient for comfort and safety. Raise the side rails.
11. Replace the pillow and call bell.
12. Practice good medical asepsis by washing the hands before leaving the area.

**SKILL LIST 3-6**

Turning the Patient to the Side

1. Maintain medical asepsis by using good hand-washing technique and wearing gloves according to Standard and Transmission-Based Precautions.
2. Identify the patient and explain the procedure.
3. Remove the pillow and extra linens that might prevent easy movement.
4. Lower the head of the bed to a flat position.
5. Lower the side rail on the near side.
6. Lower or raise the bed to a comfortable working height so that the back can be kept straight.
7. Place two arms under the patient’s neck and back, and slide the upper torso toward the near edge of the bed.
8. Place two arms under the patient’s back and upper legs, and slide the hips toward the near edge of the bed.

9. Place two arms under the patient’s legs, and slide them into alignment with the head and hips.
10. Position the far arm above the patient’s head.
11. Cross the patient’s ankles.
12. Roll the patient onto one side toward the far edge of the bed.
13. Support the patient’s back and cushion areas of pressure with pillows or linens.
14. Raise the side rail.
15. Replace the pillow and call bell.
16. Practice good medical asepsis by washing the hands before leaving the area.

**SKILL LIST 3-7—cont’d**

Transferring the Patient from the Bed to a Chair

6. Lower the side rail on the near side.
7. Lower or raise the bed to a comfortable working height so that the back can be kept straight.
8. Place two arms under the patient’s neck and back, and slide the upper torso toward the near edge of the bed.
9. Place two arms under the patient’s back and upper legs, and slide the hips toward the near edge of the bed.
10. Place two arms under the patient’s legs, and slide them into alignment with the head and hips.
11. Raise the head of the bed to a 45-degree angle.
12. Place one arm on the patient’s back and one under the patient’s knees.

13. Pivot the patient to a sitting position.
14. Face the patient while assisting him or her to stand.
15. When the patient feels steady, pivot him or her to the wheelchair.
16. If necessary, move the patient back in the wheelchair by placing an arm under each of the patient’s axillae from the back of the chair and lifting him or her up and back.
17. Adjust the footrests and place the safety belt on the patient.
18. Practice good medical asepsis by washing the hands before leaving the area.

19. Place the chair or wheelchair next to the head of the bed with brakes on.
20. Remove the pillow and extra linens that might prevent easy movement.
21. Lower the head of the bed to a flat position.

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