



Health Assistant

Flexible Instruction Day

Assignment #3

Learning Standard	HEALTH/MEDICAL ASSISTING SERVICES, OTHER Code: 51.0899 Career Cluster: Health Science Safety
Task # & Description	101 Practice safety measures that prevent accidents 103 Demonstrate OSHA standards

CONTACT INFORMATION/ASSISTANCE

Instructor Name: Mrs. Blank

Instructor E-Mail: blankt@butlertec.us

I will be available by email and/or the Remind app from 7:40-12 and 12:30-3:10 to answer your questions. Please reach out if you are having difficulty completing your assignments.

INSTRUCTIONS

- ✓ All work is due on the day we return to school. This is counted towards your attendance **and** as a grade.
- ✓ Read chapter 14 then complete worksheet. Both are included in this packet.

Name: _____

Session: _____

____ / __20__ points

14



Promotion of Safety

CHAPTER OBJECTIVES

After completing this chapter, you should be able to:

- Define *body mechanics*
- Use correct body mechanics while performing procedures in the laboratory or clinical area
- Observe all safety standards established by OSHA, especially the Occupational Exposure to Hazardous Chemicals Standard and the Bloodborne Pathogen Standard
- Follow safety regulations stated while performing in the laboratory area
- Observe all regulations for patient safety while performing procedures on a student partner in the laboratory or clinical area, or on a patient in any area
- List the four main classes of fire extinguishers
- Relate each class of fire extinguisher to the specific fire(s) for which it is used
- Simulate the operation of a fire extinguisher by following the directions on the extinguisher and specific measures for observing fire safety
- Locate and describe the operation of the nearest fire alarm
- Describe in detail the evacuation plan for the laboratory area according to established school policy
- Define, pronounce, and spell all key terms

KEY TERMS

base of support

Bloodborne Pathogen Standard

body mechanics

ergonomics

fire extinguishers

Material Safety Data Sheet (MSDS)

Occupational Exposure to

Hazardous Chemicals Standard

Occupational Safety and Health
Administration (OSHA)

safety standards



FIGURE 14-2 Correct posture puts less stress on muscles and prevents fatigue. Copyright © Cengage Learning®. All Rights Reserved.

Good posture is also an essential part of correct body mechanics. Aligning the body correctly puts less stress on muscles and prevents fatigue (Figure 14-2). Basic principles include standing straight with stomach muscles pulled in, shoulders relaxed and pulled back, weight balanced equally on each foot and aligned with the shoulders, and chest and chin held up.

Some health care facilities may require health care workers to wear back supports while lifting or moving patients. The supports are supposed to help prevent back injuries, but their use is controversial. Back supports may provide a false sense of security as an individual tries to lift heavier loads. It is important to remember that a back brace does not increase strength. Back supports may also cause sweating, skin irritation, and increased abdominal pressure. They do remind the wearer to use good body mechanics. If a back support is used, it should be the correct size to provide the maximum benefit. When the worker is performing strenuous tasks, the support should fit snugly. At other times, it should be loosened to decrease abdominal pressure.

STUDENT: Go to the workbook and complete the assignment sheet for 14:1, Using Body Mechanics. Then return and continue with the procedure.

PROCEDURE 14:1

Using Body Mechanics

Equipment and Supplies

Heavy book, bedside stand, bed with wheel locks

Procedure

1. Assemble equipment.
2. Practice correct posture. Stand straight with your feet aligned with your shoulders and your weight supported equally on each foot. Pull in your stomach muscles. Relax your shoulders and pull them back. Hold your chin and chest up. Notice how this helps maintain your spine in a straight line while it balances all parts of your body.
3. Compare using a narrow base of support to using a broad base of support. Stand on your toes, with your feet close together. Next, stand on your toes with your feet farther apart. Then, stand with your feet flat on the floor but close together. Finally, stand with your feet flat on the floor but approximately 8–10 inches apart and with one foot slightly forward. Balance your weight on both feet. You should feel the best support in the final position because the broad base supports your body weight.
4. Place the book on the floor. Bend from the hips and knees (not the waist) and keep your back straight to pick up the book. Return to the standing position.
5. Place the book between your thumb and fingers, but not touching the palm of your hand, and hold your hand straight out in front of your body. Slowly move your hand toward your body, stopping several times to feel the weight of the book in different positions. Finally, hold the book with your entire hand and bring your hand close to your body. The final position should be the most comfortable.

PROCEDURE 14:1 (CONT.)

NOTE: This illustrates the need to carry heavy objects close to your body and to use the strongest muscles to do the job.

6. Stand at either end of the bed. Release the wheel locks on the bed. Position your feet to provide a broad base of support. Get close to the bed. Use the weight of your body to push the bed forward.
7. Place the book on the bed. Pick up the book and place it on the bedside stand. Avoid twisting your body. Turn with your feet to place the book on the stand.

NOTE: Remember that holding the book close to your body allows you to use the strongest muscles.

8. Practice the rules of body mechanics by setting up situations similar to those listed in the previous steps. Continue until the movements feel natural to you.

9. Replace all equipment used.

PRACTICE: Use the evaluation sheet for 14:1, Using Body Mechanics, to practice this procedure. When you believe you have mastered this skill, sign the sheet and give it to your instructor for further action.



Check

FINAL CHECKPOINT: Using the criteria listed on the evaluation sheet, your instructor will grade your performance.

14:2 Preventing Accidents and Injuries

The **Occupational Safety and Health Administration (OSHA)**, a division of the Department of Labor, establishes and enforces **safety standards** for the workplace. Two main standards affect health care workers:

- The Occupational Exposure to Hazardous Chemicals Standard
- The Bloodborne Pathogen Standard

Chemical Hazards

The **Occupational Exposure to Hazardous Chemicals Standard** requires that employers inform employees of all chemicals and hazards in the workplace. In addition, all manufacturers must provide **Material Safety Data Sheets (MSDSs)** with any hazardous products they sell (Figure 14-3A). The MSDSs must provide the following information:

- Product identification information about the chemical
- Protection or precautions that should be used while handling the chemical (for example, wearing protective equipment or using only in a well-ventilated area)
- Instructions for the safe use of the chemical
- Procedures for handling spills, cleanup, and disposal of the product
- Emergency first-aid procedures to use if injury occurs

Chemicals must also be labeled with a hazardous category classification according to the National Fire Protection Association's (NFPA) color code (Figure 14-3B). This code alerts the user to health, fire, reactivity, or other specific hazards of the chemical.

The Occupational Exposure to Hazardous Chemicals Standard also mandates that all employers train employees on the proper procedures or policies to follow with regard to:

- Identifying the types and locations of all chemicals or hazards
- Locating and using the MSDS manual containing all of the safety data sheets
- Reading and interpreting chemical labels and hazard signs
- Using personal protective equipment (PPE) such as masks, gowns, gloves, and goggles
- Locating cleaning equipment and following correct methods for managing spills and/or disposal of chemicals
- Reporting accidents or exposures and documenting any incidents that occur

Bloodborne Pathogen Standard

The **Bloodborne Pathogen Standard** has mandates to protect health care providers from diseases caused by exposure to body fluids. Examples of body fluids include blood and blood components, urine, stool, semen, vaginal secretions, cerebrospinal fluid, saliva,

MATERIAL SAFETY DATA SHEET
I – PRODUCT IDENTIFICATION

COMPANY NAME: We Wash Inc.

ADDRESS: 5035 Manchester Avenue
Freedom, Texas 79430

PRODUCT NAME: Spolfree

Synonyms: Warewashing Detergent

Tel No: (314) 621-1818
Nights: (314) 621-1399
CHEMTREC: (800) 424-9343

Product No.: 2190

II – HAZARDOUS INGREDIENTS OF MIXTURES					III – PHYSICAL DATA	
MATERIAL:	(CAS#)	% By Wt.	TLV	PEL	Vapor Pressure, mm Hg: N/A Evaporation Rate (other=1): N/A Solubility in H ₂ O: Complete Freezing Point F: N/A Boiling Point F: N/A Specific Gravity H ₂ O=1 @ 25C: N/A	Vapor Density (Air=1) 60–90F: N/A % Volatile by wt N/A pH @ 1% Solution 9.3–9.8 pH as Distributed: N/A Appearance: Off-White granular powder Odor: Mild Chemical Odor
According to the OSHA Hazard Communication Standard, 29CFR 1910.1200, this product contains no hazardous ingredients.						
IV – FIRE AND EXPLOSION					V – REACTIVITY DATA	
Flash Point F: N/A Extinguishing Media: The product is not flammable or combustible. Use media appropriate for the primary source of fire. Special Fire Fighting Procedures: Use caution when fighting any fire involving chemicals. A self-contained breathing apparatus is essential. Unusual Fire and Explosion Hazards: None Known					Stability—Conditions to Avoid: None Known Incompatibility: Contact of carbonates or bicarbonates with acids can release large quantities of carbon dioxide and heat. Hazardous Decomposition Products: In fire situations heat decomposition may result in the release of sulfur oxides. Conditions Contributing to Hazardous Polymerization: N/A	
Spotfree VI – HEALTH HAZARD DATA					VII – EMERGENCY AND FIRST AID PROCEDURES	
EFFECTS OF OVEREXPOSURE (Medical Conditions Aggravated/Target Organ Effects) A. ACUTE (Primary Route of Exposure) EYES: Product granules may cause mechanical irritation to eyes. SKIN (Primary Route of Exposure): Prolonged repeated contact with skin may result in drying of skin. INGESTION: Not expected to be toxic if swallowed, however, gastrointestinal discomfort may occur. B. SUBCHRONIC, CHRONIC, OTHER: None known.					EYES: In case of contact, flush thoroughly with water for 15 minutes. Get medical attention if irritation persists. SKIN: Flush any dry Spotfree from skin with flowing water. Always wash hands after use. INGESTION: If swallowed, drink large quantities of water and call a physician.	
VIII – SPILL OR LEAK PROCEDURES					IX – PROTECTION INFORMATION/CONTROL MEASURES	
Spill Management: Sweep up material and repackage if possible. Spill residue may be flushed to the sewer with water. Waste Disposal Methods: Dispose of in accordance with federal, state and local regulations.					Respiratory: None needed Other Clothing and Equipment: None required Ventilation: Normal	
					Eye: Safety glasses Glove: Not required	
X – SPECIAL PRECAUTIONS						
Precautions to be taken in Handling and Storing: Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Keep container closed when not in use. Additional Information: Store away from acids.						

Prepared by: D.Martinez

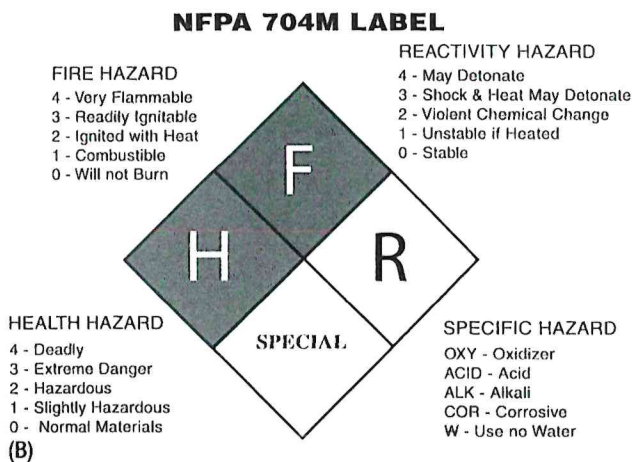
Revision Date: 04/11/XX

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(A)

FIGURE 14-3A Read the Material Safety Data Sheet (MSDS) before using any chemical product. Copyright © Cengage Learning®. All Rights Reserved.



(B)

FIGURE 14-3B The NFPA label identifies specific hazards of chemicals. Copyright © Cengage Learning®. All Rights Reserved.

mucus, and other similar fluids. Three diseases that can be contracted by exposure to body fluids include hepatitis B, caused by the hepatitis B virus; hepatitis C, caused by the hepatitis C virus; and acquired immune deficiency syndrome (AIDS), caused by the human immunodeficiency virus. The mandates of this standard are discussed in detail in Chapter 15:4.

Environmental Safety

Ergonomics is an applied science used to promote the safety and well-being of a person by adapting the environment and using techniques to prevent injuries. Ergonomics includes the correct placement of furniture and equipment, training in required muscle movements, efforts to avoid repetitive motions, and

an awareness of the environment to prevent injuries. The prevention of accidents and injury centers around people and the immediate environment. The health care worker must be conscious of personal and patient/resident safety at all times. In addition, every health care worker must be alert to unsafe situations and report them immediately. Examples include burned-out lightbulbs, frayed electrical cords, scalding water in a sink or bath area, missing floor tiles or torn carpet, and other similar hazards.

Environmental hazards in health care facilities can also endanger patients, health care personnel, other individuals, and the environment. Radiation exposure is a major concern in radiology departments and dental offices. In dental offices, a lead apron should be used to cover the patient before dental radiographs are taken. In addition, the dental worker taking the radiographs usually stands outside the room to activate the machine and expose the film. In radiology departments, all machines that emit radiation waves must be checked frequently to make sure they are operating correctly and not allowing leakage of radiation. Radiographers should stand behind a protective shield when activating the machines. To ensure that the level of exposure is safe, personnel in these departments wear badges that measure exposure to radiation. Another substance that can cause radiation exposure is radioactive iodine. This substance is used to diagnose thyroid problems and treat thyroid diseases. After it has been given to a patient, small amounts of radiation are present in the neck area for several days. This is a beneficial treatment for the patient, but precautions must be taken to protect the patient's family and friends. Contact must be limited, especially with children and pregnant women. No eating utensils or food should be shared. Other radioactive substances used to treat cancer present the same problems. An example is radioactive seeds that are used to treat prostate cancer in men. At times, patients are even kept in isolation for several days to prevent radiation exposure to others. Even antineoplastic drugs used to treat different cancers can be hazardous to health care personnel and pregnant individuals. In operating rooms and dental offices, nitrous oxide, a gas used as an anesthetic, may cause spontaneous abortions in pregnant women. Mercury used in dental offices and thermometers can present a danger to people and the environment if it is not disposed of correctly. In the same line, individuals and the environment can be injured by improper disposal of biohazard wastes such as needles and syringes. Contaminated wastes containing body fluids, such as blood, can spread disease if they are not destroyed properly. All health care workers are responsible for identifying the specific hazards that present a danger to themselves, others in society, and the environment, and for taking proper precautions to deal with those hazards.



Legal

In addition, every health care worker must accept the responsibility to use good judgment in all situations, ask questions when in doubt, and follow approved policies and procedures to create a safe environment. Always remember that a health care worker has a legal responsibility to protect the patient from harm and injury.

EQUIPMENT AND SOLUTIONS SAFETY

Basic rules that must be followed when working with equipment and solutions include:

- Do *not* operate or use any equipment until you have been instructed on how to use it.
- Read and follow the operating instructions for all major pieces of equipment. If you do not understand the instructions, ask for assistance.
- Do *not* operate any equipment if your instructor/immediate supervisor is not in the room.
- Report any damaged or malfunctioning equipment immediately. Make no attempt to use it. Some facilities use a lockout tag system for damaged electrical or mechanical equipment. A locking device is placed on the equipment to prevent the equipment from being used (Figure 14-4).
- Do not use frayed or damaged electrical cords. Do not use a plug if the third prong for grounding has been broken off. Never use excessive force to insert a plug into an outlet.
- Never handle any electrical equipment with wet hands or around water.



FIGURE 14-4 Some facilities use a lockout tag system for damaged equipment to prevent anyone from using the equipment.

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- Store all equipment in its proper place. Unused equipment should not be left in a patient's room, a hallway, or a doorway.
- When handling any equipment, observe all safety precautions that have been taught.
- Read MSDSs before using any hazardous chemical solutions.
- Check the NFPA code on a chemical to determine the specific hazards associated with the chemical.
- Never use solutions from bottles that are not labeled.
- Read the labels of solution bottles at least three times during use to be sure you have the correct solution (Figure 14-5).
- Do *not* mix any solutions together unless instructed to do so by your instructor/immediate supervisor or you can verify that they are compatible.
- Some solutions can be injurious or poisonous. Avoid contact with your eyes and skin. Avoid inhaling any fumes displaced by a solution. Use only as directed.
- Store all chemical solutions in a locked cabinet or closet following the manufacturer's recommendations. For example, some solutions must be kept at room temperature, while others must be stored in a cool area.

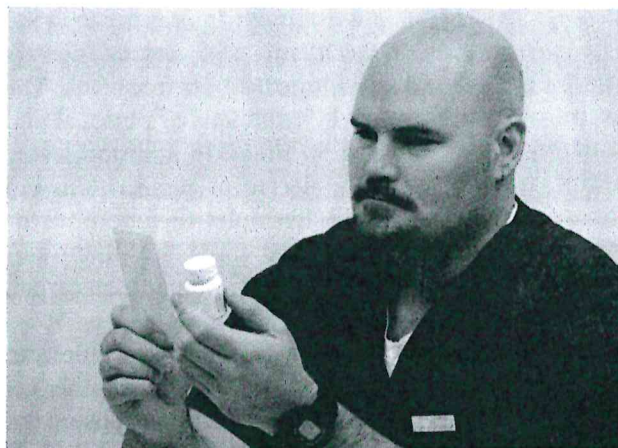


FIGURE 14-5 Read the label on a solution bottle at least three times to be sure you have the correct solution. Copyright © Cengage Learning®. All Rights Reserved.

- Dispose of chemical solutions according to the instructions provided on the MSDS for the solution.
- If you break any equipment or spill any solutions, immediately report the incident to your instructor/immediate supervisor. You will be told how to dispose of the equipment or how to remove the spilled solution (Figure 14-6).

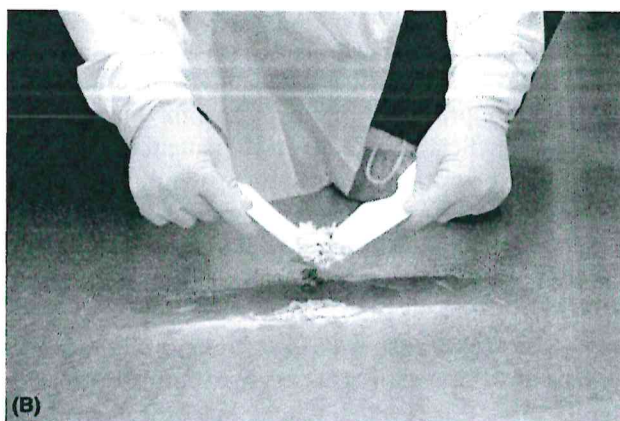


FIGURE 14-6 To clean a spill: (A) pour coagulating powder on the spill. (B) When the material has been absorbed, pick up the residue and (C) place it in a biohazard container. (D) Clean the area thoroughly with a disinfecting solution. Copyright © Cengage Learning®. All Rights Reserved.

PATIENT/RESIDENT SAFETY

Basic rules that must be followed to protect a patient or resident include:

- Do *not* perform any procedure on patients unless you have been instructed to do so. Make sure you have the proper authorization. Follow instructions carefully. Ask questions if you do not understand. Use correct or approved methods while performing any procedure. Avoid shortcuts or incorrect techniques.
- Provide privacy for all patients. Knock on the door before entering any room (Figure 14-7A). Speak to the patient and identify yourself. Ask for permission to enter before going behind closed privacy curtains. Close the door and/or draw curtains for privacy before beginning a procedure on the patient (Figure 14-7B).
- Always identify your patient. Be absolutely positive that you have the correct patient. Check the identification wristband, if present. Ask the patient to state his or her name. Repeat the patient's name at least twice. Check the name on the patient's bed and on the patient's record.
- Always explain the procedure so the patient knows what you are going to do (Figure 14-7C). Answer any questions and make sure you have the patient's consent

before performing any procedure. Never perform a procedure if a patient refuses to allow you to do so.

- Observe the patient closely during any procedure. If you notice any change, immediately report this. Be alert to the patient's condition at all times.
- Frequently check the patient area, waiting room, office rooms, bed areas, or home environment for safety hazards. Report all unsafe situations immediately to the proper person or correct the safety hazard.



FIGURE 14-7B Close the door and draw curtains for privacy before beginning a procedure. Copyright © Cengage Learning®. All Rights Reserved.



FIGURE 14-7A Always knock on the door or speak before entering a patient's room. Copyright © Cengage Learning®. All Rights Reserved.



FIGURE 14-7C Explain the procedure and answer any questions to make sure you have the patient's consent. Copyright © Cengage Learning®. All Rights Reserved.



FIGURE 14-8A Lower the bed and place the call signal and other supplies within easy reach of the patient before leaving a patient.

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FIGURE 14-8B Wash your hands before and after any procedure, and any time they become contaminated during a procedure.

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- Before leaving a patient/resident in a bed, observe all safety checkpoints. Make sure the patient is in a comfortable position. Check the bed to be sure that the side rails are elevated, if indicated; that the bed is at the lowest level to the floor; and that the wheels on the bed are locked to prevent movement of the bed. Place

the call signal (a bell can be used in a home situation) and other supplies such as the telephone, television remote control, fresh water, and tissues within easy reach of the patient/resident (Figure 14-8A). Open the privacy curtains if they were closed. Leave the area neat and clean, and make sure no safety hazards are present. Wash your hands thoroughly (Figure 14-8B). If your hands are not visibly dirty or contaminated with blood or body fluids, they can be cleaned with a waterless hand cleaner (Figure 14-8C).

PERSONAL SAFETY

Basic rules that must be followed to protect yourself and others include:

- Remember, it is your responsibility to protect yourself and others from injury.
- Use correct body mechanics while performing any procedure.
- Wear the required personal protective equipment (PPE) as discussed in Chapter 15:4. This may include a gown, mask, gloves, and/or protective eyewear.



FIGURE 14-8C If your hands are not visibly dirty or contaminated with blood or body fluids, they can be cleaned with a waterless hand cleaner. © Cengage Learning®. All Rights Reserved.

- Walk—do *not* run—in the laboratory area or clinical area, in hallways, and especially on stairs. Keep to the right and watch carefully at intersections to avoid collisions. Use handrails on stairways.
- Promptly report any personal injury or accident, no matter how minor, to your instructor/immediate supervisor.
- If you see an unsafe situation or a violation of a safety practice, report it to your instructor/immediate supervisor promptly.
- Keep all areas clean and neat with all equipment and supplies in their proper locations at all times.
- Wash your hands frequently. Hands should always be washed before and after any procedure, and any time they become contaminated during a procedure (refer to Figure 14-8B).
- Keep your hands away from your face, eyes, mouth, and hair.
- Dry your hands thoroughly before handling any electrical equipment.

- Wear safety glasses when instructed to do so and in any situations that might result in possible eye injury.
- While working with your partner in patient simulations, observe all safety precautions taught in caring for a patient. Review the role each of you will have before you begin practicing a procedure so each person knows his or her responsibilities. Avoid horseplay and practical jokes; they cause accidents.
- If any solutions come in contact with your skin or eyes, immediately flush the area with cool water. Inform your instructor/immediate supervisor.
- If a particle gets in your eye, inform your instructor/immediate supervisor. Do *not* try to remove the particle or rub your eye.

STUDENT: Go to the workbook and complete the assignment sheet for 14:2, Preventing Accidents and Injuries. Then return and continue with the procedure.

PROCEDURE 14:2

Preventing Accidents and Injuries

Equipment and Supplies

Information section on Preventing Accidents and Injuries, several bottles of solutions, laboratory area with equipment

Procedure

1. Assemble equipment.
2. Review the safety standards in the information section for Preventing Accidents and Injuries. Note standards that are not clear and ask your instructor for an explanation.
3. Examine several bottles of solutions. Read the labels carefully. Read the safety or danger warnings on the bottles. Read MSDSs provided with hazardous chemicals. Check the NFPA label and note specific hazards.
4. Practice reading the label three times to be sure you have the correct solution. Read the label before taking the bottle off the shelf, before pouring from the bottle, and after you have poured from the bottle.
5. Look at major pieces of equipment in the laboratory. Read the operating instructions for the equipment. Do *not* operate the equipment until you are taught how to do it correctly.
6. Role-play the following situations by using another student as a patient.
 - Show ways to provide privacy for the patient.
 - Identify the patient.
 - Explain a procedure to the patient.
 - Observe the patient during a procedure. List points you should observe to note a change in the patient's condition.
7. Check various patient areas in the laboratory. Note any safety hazards that may be present. Discuss how you can correct the problems. Report your findings to your instructor.
8. Discuss the following situations with another student and decide how you would handle them:
 - You see an unsafe situation or a violation of a safety practice
 - You see a wet area on the laboratory counter
 - You get a small cut on your hand while using a glass slide
 - A solution splashes on your arm
 - A particle gets in your eye
 - A piece of equipment is not working correctly
 - A bottle of solution does not have a label
 - You break a glass beaker
9. Observe and practice all of the safety regulations as you work in the laboratory.
10. Study the regulations in preparation for the safety examination. You must pass the safety examination.
11. Replace all equipment used.

(continues)

PROCEDURE 14:2 (CONT.)

PRACTICE: Use the evaluation sheet for 14:2, Preventing Accidents and Injuries, to practice this procedure. When you believe you have mastered this skill, sign the sheet and give it to your instructor for further action.



Check

FINAL CHECKPOINT: Using the criteria listed on the evaluation sheet, your instructor will grade your performance.

14:3 Observing Fire Safety

Health care providers must know three basic facts about fires: how they start, how to prevent them, and how to respond when they occur.

Fires need three things in order to start (Figure 14-9):

- **Oxygen:** present in the air
- **Fuel:** any material that will burn
- **Heat:** sparks, matches, flames

The major cause of fires is carelessness with smoking and with matches. Other causes include misuse of electricity (overloaded circuits, frayed electrical wires, and/or improperly grounded plugs), defects in heating systems, spontaneous ignition, improper rubbish disposal, and arson.

Fire Extinguishers

Fire extinguishers are classified and labeled according to the kind of fire they extinguish. The main classes are:

- **Class A:** used on fires involving combustibles such as paper, cloth, plastic, and wood

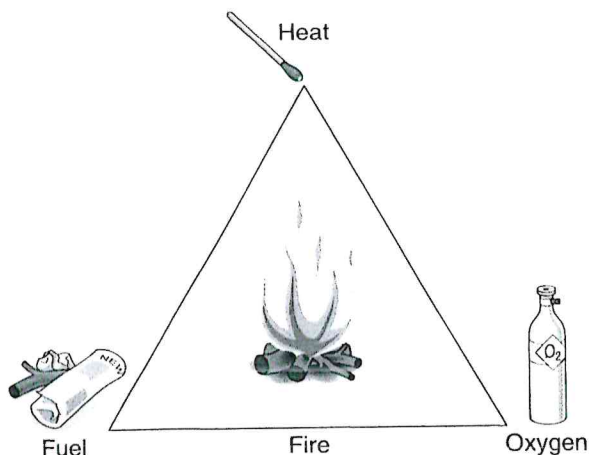


FIGURE 14-9 The fire triangle shows the three things needed to start a fire. Copyright © Cengage Learning®. All Rights Reserved.

- **Class B:** used on fires involving flammable or combustible liquids such as gasoline, oil, paint, grease, and cooking fat
- **Class C:** used on electrical fires such as fuse boxes, appliances, wiring, and electrical outlets; the C stands for nonconductive; if possible, the electricity should be turned off before using an extinguisher on an electrical fire
- **Class D:** used on burning or combustible metals; often specific for the type of metal being used and are not used on any other types of fires

Many different types of fire extinguishers are available. The main types include:

- **Water:** contains pressurized water and should only be used on Class A fires
- **Carbon dioxide:** contains carbon dioxide gas that provides a smothering action on the fire by forming a cloud of cool ice or snow that displaces the air and oxygen; does leave a powdery, snowlike residue that irritates the skin and eyes and can be dangerous if inhaled; most effective on Class B or C fires
- **Dry chemical:** contains a chemical that acts to smother a fire; type BC extinguishers contain potassium bicarbonate or sodium bicarbonate, which leaves a mildly corrosive residue that must be cleaned up as soon as possible; type ABC extinguishers contain monoammonium phosphate, a yellow powder that leaves a sticky residue that can damage electrical appliances such as computers; both residues can irritate the skin and eyes; used on Class A, B, or C fires
- **Halon:** contains a gas that interferes with the chemical reaction that occurs when fuels burn; used on electrical equipment because it does not leave a residue and will not damage appliances such as computers; most effective on Class C fires

Most fire extinguishers are labeled with a diagram and/or a letter showing the type of fire for which they are effective (Figure 14-10). Many extinguishers are used on different types of fires and will be labeled with more than

CLASSES OF FIRE EXTINGUISHERS

Ordinary
Combustibles



CLASS A

Used for fires of ordinary combustibles such as wood, paper, cloth, and plastics

Flammable
Liquids



CLASS B

Used for fires of flammable liquids and gases such as paint, gasoline, oil, grease, and cooking fats

Electrical
Equipment



CLASS C

Used for electrical fires such as fuse boxes, wiring, electrical outlets, and appliances; if possible, turn off the electricity before using an extinguisher on this type of fire

Combustible
Metals



CLASS D

Used on burning or combustible metals such as magnesium, titanium, and sodium; specific for the type of metal; not used on other types of fires

FIGURE 14-10 Fire extinguishers contain diagrams and/or letters to show the type of fire on which they should be used.

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one diagram and/or letter. In addition, some extinguishers put all of the diagrams on the label; however, a diagonal red line is drawn through any diagram that depicts a fire for which the extinguisher should not be used. For example, if a diagonal red line is drawn through the diagram for electrical fires, it means the extinguisher should *not* be used on any electrical fire. Health care workers must become familiar with the types and locations of fire extinguishers in their place of employment before a fire occurs so they are prepared to act when faced with this type of situation.

In case of fire, the main rule is to remain calm. If your personal safety is endangered, evacuate the area according to the stated method and sound the alarm. If the fire is small, confined to one area, and your safety is not endangered, determine what type of fire it is and use the proper extinguisher.

Fire Emergency Plan

While working in a health care facility, know and follow the fire emergency plan established by the facility. The plan usually states that all patients and personnel in immediate danger should be moved from the area. The alarm should be activated as quickly as possible (Figure 14-11). All doors and windows should be closed, if possible, to prevent drafts,

which cause fire to spread more rapidly. Electrical equipment and oxygen should be shut off. Elevators should never be used during a fire. The acronym *RACE* is frequently used to remember the important steps. *RACE* stands for:

- *R* = Rescue anyone in immediate danger. Move patients to a safe area. If the patient can walk, escort him or her to a safe area. At times it may be necessary to move a patient in a bed or use the bed sheets as lift sheets to carry a patient to a safe area.
- *A* = Activate the alarm. Sound the alarm and give the location and type of fire.
- *C* = Contain the fire. Close windows and doors to prevent drafts. Shut off electrical equipment and oxygen if your safety is not endangered.
- *E* = Extinguish the fire or evacuate the area. If the fire is small and contained, and you are not in danger, locate the correct fire extinguisher to extinguish the fire. If the fire is large or spreading rapidly, or if you or a patient/resident are in danger, evacuate the area.

By following the fire emergency plan, knowing the location of fire extinguishers and exit doors, and remaining calm, the health care worker can help prevent loss of life or serious injury during a fire.



FIGURE 14-11 When a fire occurs, the fire alarm should be activated as quickly as possible. © Andre Blais/www.Shutterstock.com



Safety

Preventing fires is everyone's job. Constantly be alert to potential causes of fires, and correct all situations that can lead to fires. Some rules for preventing fires are:

- Obey all "No Smoking" signs. Most health care facilities are "smoke-free" environments and do not permit smoking anywhere on the premises.
- Extinguish matches, cigarettes, and any other flammable items completely. Do not empty ashtrays into

trash cans or plastic bags that can burn. Always empty ashtrays into separate metal cans or containers partially filled with sand or water.

- Dispose of all waste materials in proper containers.
- Before using electrical equipment, check for damaged cords or improper grounding. Avoid overloading electrical outlets.
- Store flammable materials such as kerosene or gasoline in proper containers and in a safe area. If you spill a flammable liquid, wipe it up immediately.
- Do not allow clutter to accumulate in rooms, closets, doorways, or traffic areas. Make sure no equipment or supplies block any fire exits.
- When oxygen is in use, observe special precautions. Post a "No Smoking—Oxygen in Use" sign. Remove all smoking materials, candles, lighters, and matches from the room. Avoid the use of electrically operated equipment whenever possible. Do not use flammable liquids such as alcohol, nail polish, and oils. Avoid static electricity by using cotton blankets, sheets, and gowns.

Disaster Plans



Legal

In addition to fires, other types of disasters may occur. Examples include tornadoes, hurricanes, earthquakes, floods, and bomb threats. In any type of disaster, stay calm, follow the policy of the health care facility, and provide for the safety of yourself and the patient. It is important to note that health care workers are legally responsible for familiarizing themselves with disaster policies so appropriate action can be taken when a disaster strikes.

STUDENT: Go to the workbook and complete the assignment sheet for 14:3, Observing Fire Safety. Then return and continue with the procedure.

PROCEDURE 14:3

Observing Fire Safety

Equipment and Supplies

Fire alarm box, fire extinguishers

Procedure

1. Read the information section on Observing Fire Safety.
2. Learn the four classes of fire extinguishers and know for which kind of fire each type is used.

3. Locate the nearest fire alarm box. Read the instructions on how to operate the alarm. Be sure you could set off the alarm in case of a fire.
4. Locate any fire extinguishers in the laboratory or clinical area. Look for extinguishers in both the room and surrounding building. Identify each extinguisher and the kind of fire for which it is meant to be used.
5. Learn how to operate a fire extinguisher. Read the manufacturer's operating instructions carefully. Work with a practice extinguisher or do a mock demonstration.

PROCEDURE 14:3 (CONT.)



CAUTION: Do *not* discharge a real extinguisher in the laboratory or clinical area.

Safety

- Check the extinguisher type to be sure it is the proper one to use for the mock fire (Figure 14-12A).
- Locate the lock or pin at the top handle. Release the lock following the manufacturer's instructions (Figure 14-12B).

NOTE: During a mock demonstration, only pretend to release the lock.



(A)

FIGURE 14-12A Check the extinguisher type to make sure it is the correct one to use. © Rob Byron/www.Shutterstock.com

- Grasp the handle to hold the extinguisher firmly in an upright position.
- Stand approximately 6–10 feet from the near edge of the fire.
- Aim the nozzle at the fire (Figure 14-12C).
- Discharge the extinguisher. Use a side-to-side motion. Spray toward the near edge of the fire at the bottom of the fire.



Safety

CAUTION: Do not spray into the center or top of the fire, because this will cause the fire to spread in an outward direction.

- Continue with the same side-to-side motion until the fire is extinguished.

NOTE: The word *PASS* can help you remember the correct steps:

P = Pull the pin.

A = Aim the extinguisher at the near edge and bottom of the fire.

S = Squeeze the handle to discharge the extinguisher.

S = Sweep the extinguisher from side to side at the base of the fire.



FIGURE 14-12B Release the pin on the fire extinguisher.

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(C)

FIGURE 14-12C Aim the nozzle at the near edge of the fire, and push the handle to discharge the extinguisher.

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(continues)

PROCEDURE 14:3 (CONT.)

- h. At all times, stay a safe distance from the fire to avoid personal injury.



Safety

CAUTION: Avoid contact with residues from chemical extinguishers.

- i. After an extinguisher has been used, it must be recharged or replaced. Another usable extinguisher must be put in position when the extinguisher is removed.
6. Check the policy in your area for evacuating the laboratory or clinical area during a fire. Practice the method and know the locations of all exits.

NOTE: Remember to remain calm and avoid panic.

7. Replace all equipment used.

PRACTICE: Use the evaluation sheet for 14:3, **Observing Fire Safety**, to practice this procedure. When you believe you have mastered this skill, sign the sheet and give it to your instructor for further action.

PRACTICE: Study the safety regulations throughout Chapter 14 in preparation for the safety examination.



Check

FINAL CHECKPOINT: Using the criteria listed on the evaluation sheet, your instructor will grade your performance.



Check

FINAL CHECKPOINT: Take the safety examination and obtain a passing grade to demonstrate your knowledge of safety.

TODAY'S RESEARCH TOMORROW'S HEALTH CARE

Draino for Blood Vessels?

Cardiovascular (heart and blood vessel) disease is the leading cause of death in the United States. Fatty plaques, caused mainly by an accumulation of LDL (low-density lipoprotein, or "bad" cholesterol), block the flow of blood in arterial walls, triggering a heart attack or stroke. HDL (high-density lipoprotein, or "good" cholesterol) helps protect the body from cardiovascular disease. HDL carries fats to the liver for disposal, helps prevent clots, and decreases inflammation in the blood vessels. For years, researchers have tried to find ways to increase the level of HDL while decreasing the level of LDL in the blood.

Scientists may have found the key to solve this problem in a small village in Italy. They discovered that residents of this village seemed to be immune to heart disease. Research showed that these individuals have a mutant gene that produces a powerful version of HDL. Scientists have produced a synthetic version of this HDL called *apo A-1 Milano*. When it was injected

into a small group of volunteer heart patients, plaque in blood vessels was reduced by 4 percent and no new plaque buildup occurred. Scientists called it a miracle "blood vessel Draino." However, apo A-1 Milano is expensive to produce because it is a protein. It also must be injected into the body by an intravenous infusion, making it even more costly and inconvenient. Recently the rights to apo A-1 Milano were acquired by The Medicines Company, which named the compound MDCO-215. The company is conducting extensive research to create a medicine from this compound and begin clinical studies.

Scientists are also evaluating other methods to increase levels of HDL. They have discovered an enzyme called *cholesterol ester transfer protein* that appears to reduce HDL levels and increase the levels of harmful LDL. Research is being conducted on new drugs that will block this enzyme. Who knows which approach will be most successful, but scientists will find the answer.

CHAPTER 14 SAFETY EXAMINATION

Grade _____ Name _____

Read all directions carefully. Put your name on all pages of the examination.

MULTIPLE CHOICE: In the space provided, place the letter of the answer that best completes the statement or answers the question.

- _____ 1. Operate a piece of equipment only when
 - a. you have been instructed how to use it
 - b. you see other students using it
 - c. you think you know how to handle it
 - d. you have similar equipment in other classes
- _____ 2. If you find a damaged piece of equipment
 - a. dispose of it immediately
 - b. report it to the instructor
 - c. use it but be very careful
 - d. repair it yourself before you use it
- _____ 3. Solutions that will be used in the laboratory
 - a. can be injurious, so avoid eye and skin contact
 - b. can be mixed together in most cases
 - c. do not always need a label
 - d. are all safe for your use
- _____ 4. When the instructor is out of the room
 - a. equipment should not be operated
 - b. it is all right to operate equipment
 - c. it is a good time to experiment with equipment
 - d. be extra careful when using equipment
- _____ 5. All injuries occurring in the laboratory
 - a. should be treated by a fellow student
 - b. can be ignored if minor
 - c. should be washed with soap and water
 - d. should be reported to the instructor
- _____ 6. If a particle gets in your eye, you should
 - a. rub your eye
 - b. use cotton to remove it
 - c. call the instructor
 - d. flush your eye with water to remove it

- _____ 7. When handling any electrical equipment, be sure to
- a. wash your hands immediately before handling it
 - b. check first for damaged cords or improper grounds
 - c. plug equipment carefully into any socket
 - d. ask for written instructions on how to use it
- _____ 8. Horseplay or practical jokes
- a. are permitted if no one is insulted
 - b. may be done during breaks or study time
 - c. cause accidents and have no place in the lab
 - d. usually do not result in accidents
- _____ 9. The major cause of fires is
- a. smoking and matches
 - b. defects in heating systems
 - c. improper rubbish disposal
 - d. misuse of electricity
- _____ 10. The three things needed to start a fire are
- a. air, oxygen, and fuel
 - b. fuel, heat, and oxygen
 - c. fuel, carbon dioxide, and heat
 - d. air, carbon dioxide, and fuel
- _____ 11. Injuries are more likely to happen to persons who
- a. take chances
 - b. use equipment properly
 - c. practice safety
 - d. respect the dangers in using equipment
- _____ 12. If your personal safety is in danger because of fire,
- a. get the fire extinguisher and put it out
 - b. run out of the area as fast as you can
 - c. leave the area quietly and in an orderly fashion
 - d. open all windows and doors
- _____ 13. Wearing safety glasses in a laboratory
- a. is never necessary
 - b. should be done if you think it is necessary
 - c. is a requirement at all times
 - d. is required for certain procedures

True-False: Circle the "T" if the statement is true. Circle the "F" if the statement is false.

- T F 14. Carbon dioxide fire extinguishers leave a residue or snow that can cause burns or eye irritations.

- T F 15. Spilled solutions, such as bleach, should be wiped up immediately.
- T F 16. Personal protective equipment is worn for protection and as a safety measure.
- T F 17. If any solution comes in contact with your skin or eyes, flush the area with water and call the instructor.
- T F 18. The third prong on an electric plug is important for grounding electrical equipment.
- T F 19. In case of a fire alarm, avoid panic.
- T F 20. Correct body mechanics should be used while performing procedures.
- T F 21. Class A fire extinguishers can be used on electrical fires.
- T F 22. While using a fire extinguisher, hold the extinguisher firmly and direct it to the middle or main part of the fire.
- T F 23. Smoke and panic kill more people in fires than the fire itself.
- T F 24. For your own safety and the safety of a patient, it is important that you wash your hands frequently.
- T F 25. All waste material should be disposed of in the nearest available container.
- T F 26. All solutions used in the laboratory are poisonous.
- T F 27. The bottle label of any solution you use should be read by you at least three (3) times.
- T F 28. All manufacturers must provide a Material Safety Data Sheet (MSDS) with any hazardous product they sell.
- T F 29. When lifting a patient in bed, a narrow base of support should be maintained.
- T F 30. Keep the feet apart and the knees flexed when picking up an item from the floor.

31. Fill in the following chart with the indicated information.

Type Fire Extinguisher	Used on what type of fire?
a.	_____
b.	_____
c.	_____
d.	_____

32. List three (3) rules for preventing fires.

33. What is OSHA? What is its purpose?

34. How can you determine precautions that should be followed while using a hazardous chemical?

35. Identify the three (3) main diseases that can be contracted by exposure to body fluids.

