

# **Introduction to Surgical Technology**

## **SECTION B: Safety**

### **Module 1-B: Environmental Safety**



**Introduction to Surgical Technology**  
**Section B: Safety**  
**Module 1-B: Environmental Safety**

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# Introduction to Surgical Technology

## Section B: Safety

### Module 1-B: Environmental Safety

**PREREQUISITES:**  
None

## Learning Activities Sheet

Student name \_\_\_\_\_

**DIRECTIONS**

Place a checkmark in the appropriate box as you complete each of the steps below.

- 1. **Take** Pretest provided by your instructor.
- 2. **Stop** Have your instructor evaluate your performance. Follow your instructor's recommendations concerning the following learning activities.
- 3. **Read** Module Objective Sheet.
- 4. **Study** Information Sheet, Objective 1.
- 5. **Research** Online resources to learn more about environmental safety. Your instructor will list several Web sites on the blanks below. Visit at least three of the following Internet sites.



- \_\_\_\_\_
- \_\_\_\_\_
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- 6. **Do** Assignment Sheet 1, "Subscribe to a Safety Pledge."
- 7. **Stop** Have your instructor evaluate your performance. If the evaluation is satisfactory, continue to step 8. If the evaluation is not satisfactory, repeat steps 4 and 6.

**Optional**



- 8. **View** Videotape entitled *Safety Orientation—Nursing*.
- 9. **Study** Information Sheet, Objective 2.
- 10. **Do** Assignment Sheet 2, "Complete an Accident Report Form."
- 11. **Stop** Have your instructor evaluate your performance. If the evaluation is satisfactory, continue to step 12. If the evaluation is not satisfactory, repeat steps 9 and 10.

**Optional**



- 13. **View** Videotape entitled *Hazardous Energy Source (Lockout-Tagout)*.

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- 14. **Study** Information Sheet, Objective 4 through Objective 9.
- 15. **Read** Student Supplement 1, "Guidelines for Interpreting Material Safety Data Sheets."
- 16. **Do** Assignment Sheet 3, "Interpret Material Safety Data Sheets."
- 17. **Stop** Have your instructor evaluate your performance. If the evaluation is satisfactory, continue to step 18. If the evaluation is not satisfactory, repeat steps 14 through 16.

**Optional**



- 18. **View** Videotape entitled *Back Safety for Health Care Providers*.
- 19. **Study** Information Sheet, Objective 10.
- 20. **Observe** Demonstration of procedures to be used in completing Job Sheet 1.
- 21. **Do** Job Sheet 1, "Use Proper Body Mechanics in Standing, Sitting, Moving, and Lifting."
- 22. **Stop** Have your instructor evaluate your performance. If the evaluation is satisfactory, continue to step 23. If the evaluation is not satisfactory, study the procedure outlined in Job Sheet 1 and repeat steps 19 and 21.
- 23. **Study** Information Sheet, Objective 11 and Objective 12.
- 24. **Read** Student Supplement 2, "Tornado Tips."
- 25. **Do** Assignment Sheet 4, "Analyze Severe Weather Scenarios."
- 26. **Stop** Have your instructor evaluate your performance. If the evaluation is satisfactory, continue to step 27. If the evaluation is not satisfactory, repeat steps 23 through 25.
- 27. **Study** Information Sheet, Objective 13 through Objective 15.
- 28. **Do** Assignment Sheet 5, "Analyze Fire Emergency Scenarios."
- 29. **Stop** Have your instructor evaluate your performance. If the evaluation is satisfactory, continue to step 30. If the evaluation is not satisfactory, repeat steps 27 and 28.

**Optional**



- 30. **View** Videotape entitled *Fire Extinguisher Training and Use 2000*.
- 31. **Study** Information Sheet, Objective 16 through Objective 22.
- 32. **Observe** Demonstration of procedures to be used in completing Job Sheet 2.
- 33. **Do** Job Sheet 2, "Operate a Portable Fire Extinguisher."
- 34. **Stop** Have your instructor evaluate your performance. If the evaluation is satisfactory, continue to step 35. If the evaluation is not satisfactory, study the procedure outlined in Job Sheet 2 and repeat steps 31 and 33.

**Optional**



- 35. **View** Videotape entitled *Fire Protection/Electrical Safety*.
- 36. **Study** Information Sheet, Objective 23 and Objective 24.
- 37. **Do** Assignment Sheet 6, "Apply Safety Principles to the School and Workplace."
- 38. **Stop** Have your instructor evaluate your performance. If the evaluation is satisfactory, continue to step 39. If the evaluation is not satisfactory, repeat steps 36 and 37.
- 39. **Take** Written Test provided by your instructor.
- 40. **Stop** Have your instructor evaluate your performance. If the evaluation is satisfactory, continue to step 41. If the evaluation is not satisfactory, repeat steps 4, 9, 12, 14, 19, 23, 27, 31, and 36.
- 41. **Check** With your instructor for any additional assignments to be completed.
- 42. **Do** Additional assignments your instructor lists below.  


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- 43. **Take** Module Review provided by your instructor.
- 44. **Stop** Have your instructor evaluate your performance. Follow your instructor's recommendations concerning a review of the above learning activities.
- 45. **Stop** Have your instructor evaluate your performance on this module by compiling your scores on the Written Test, assignment sheets, job sheets, and Module Review. If the evaluation is satisfactory, proceed to the next module. If the evaluation is not satisfactory, ask your instructor for further instructions.



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**Section B: Safety**  
**Module 1-B: Environmental Safety**

**Module Objective Sheet**

**MODULE  
OBJECTIVE**

After completing this module, you should be able to follow evacuation and personal safety guidelines for conducting yourself safely at school and at work. You should demonstrate these competencies by completing the assignment sheets and job sheets and by scoring 100 percent on the Written Test and on the Module Review.

**SPECIFIC  
OBJECTIVES**

After completing this module, you should be able to

1. Discuss ways of developing a good safety attitude.
2. Complete statements concerning personal safety guidelines.
3. List general steps/guidelines for reporting defective equipment.
4. List expectations for a safe environment at school or work.
5. State the purposes of a material safety data sheet (MSDS).
6. Match MSDS sections to the information each section contains.
7. Match hazard placard and label symbols to their hazards.
8. Identify hazards using the NFPA 704 hazard triangle.
9. Match methods by which a hazardous material can enter the body to their correct descriptions.
10. Complete statements concerning the principles of body mechanics.
11. List basic types of emergencies.
12. Discuss severe weather safety guidelines.
13. Arrange in order the steps to follow on receiving a bomb threat.
14. Complete guidelines for general evacuation procedures in a fire emergency.
15. Describe the disabled person's fire evacuation responsibilities.
16. Identify the components of fire by labeling the sides of a fire tetrahedron.
17. Match fire classifications to their fuel sources.
18. Match fire extinguisher symbol shapes to fire classification letters.
19. Match extinguisher pictographs to the extinguisher's intended applications.
20. List the characteristics of fires appropriate for handling with a portable fire extinguisher.

## Module 1-B: Environmental Safety

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21. Arrange in order the basic steps in using a fire extinguisher.
22. List fire prevention guidelines.
23. Complete statements concerning electrical safety.
24. Select true statements concerning basic equipment safety.
25. Subscribe to a safety pledge. (Assignment Sheet 1)
26. Complete an accident report form. (Assignment Sheet 2)
27. Interpret material safety data sheets. (Assignment Sheet 3)
28. Analyze severe weather scenarios. (Assignment Sheet 4)
29. Analyze fire emergency scenarios. (Assignment Sheet 5)
30. Apply safety principles to the school and workplace. (Assignment Sheet 6)
31. Use proper body mechanics in standing, sitting, moving, and lifting. (Job Sheet 1)
32. Operate a portable fire extinguisher. (Job Sheet 2)

**Introduction to Surgical Technology**  
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**Information Sheet**

**OBJECTIVE 1**

**Discuss ways of developing a good safety attitude.**

✓ **NOTE:** Developing a positive attitude toward safety can save you money, your job, and even your life. Don't think "It can't happen to me." It does every day.

1. **Focus on the task at hand.**
2. **Stay alert; accidents happen easily when you are tired or bored.**
3. **Take time to do the job right; do not take shortcuts.**

✓ **NOTE:** Staying safe may take a little extra time, but it results in fewer mistakes.

4. **Determine your priorities—what needs to be done first, second, and so on—so that you do not run out of time to complete high-priority tasks.**
5. **Use your head; think before you act.**
6. **Do not fool around or let emotions such as anger or frustration get in the way of your doing a job safely.**
7. **Take responsibility for your actions and for those of your team.**

✓ **NOTE:** Others trust and depend on you to do your job correctly. If you or your team does not act responsibly, others may suffer. Understand that safety is everyone's responsibility.

8. **Avoid unnecessary risks.**

✓ **NOTE:** Think of what could happen if you take a chance on performing a task unsafely.

**OBJECTIVE 2**

**Complete statements concerning personal safety guidelines.**

1. **Know the correct emergency telephone numbers in your area; be sure that they are posted near the telephone.**

Examples: Fire and police departments, ambulance service, poison-control center

2. **Comply with all safety rules and posted signs.**
3. **Be alert to dangers and hazards.**
4. **Be familiar with the location of fire-fighting and first-aid equipment.**
5. **Use the right tool or equipment for the job, and use it properly.**

6. Follow instructions when performing a task.
7. Wear personal protective equipment (safety glasses, gloves, etc.) as required.
8. Use and store potentially hazardous materials and products strictly according to the label instructions and cautions.
9. Never transfer the contents of a container from the original container to another unauthorized container.

Example: Removing sanitizer from its original, labeled container and placing it in a spray bottle or other container.

10. Never operate, adjust, modify, or repair equipment without permission and proper training.
11. Tag and report defective equipment immediately.
12. Follow all safety guidelines set by the management.
13. Correct or report all unsafe conditions immediately.

Examples: Spills, boxes piled in the hallway and blocking a fire exit

14. Report all accidents and get first aid immediately.

✓ **NOTE:** All accidents must be reported, no matter how minor the accident appears.

15. Use proper body mechanics.
16. Keep your work area clean and neat.
17. Always conduct yourself in a safe manner.
18. Do not participate in horseplay or play jokes on others.

**OBJECTIVE 3**

**List general steps/ guidelines for reporting defective equipment.**

✓ **NOTE:** If you find any equipment that is defective or needs repair, follow your organization's specific **lockout/tag-out** procedures.

KEY TERMS

**Lockout**—Procedure ensuring that all hazardous energy sources (gas, electricity, hydraulic systems) to a defective tool or machine are locked in the OFF position before maintenance is performed

**Tag-out**—Procedure in which special tags are used to warn others not to operate the equipment; the tag contains a printed warning of what will happen if the power is turned on

1. Visually inspect all electrical equipment before and after each use for any signs of defects or malfunctions.
2. Immediately notify your instructor if you discover a defective piece of equipment.
3. Lockout the equipment per the organization’s SOPs (see Figure 1 below).

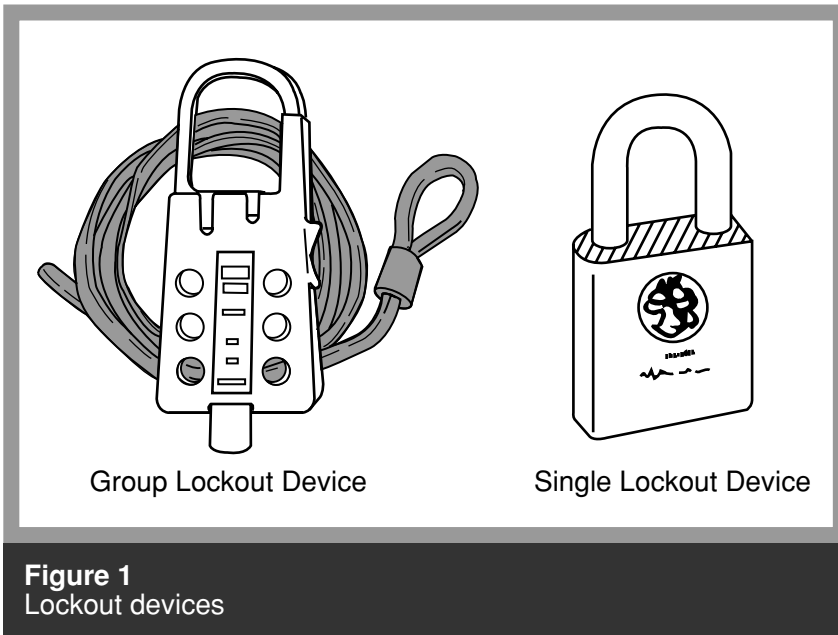
KEY TERM

**SOP**—Standard operating procedure

4. Tag-out the equipment per the organization’s SOPs (see Figure 2 below).

✓ **NOTE:** Use the lockout procedure whenever possible. Use the tag-out procedure to back up the lockout system or when the lockout system is unavailable. Remember: Tags do not prevent the equipment from being started up, so if the tag system is used alone, exercise extra caution.

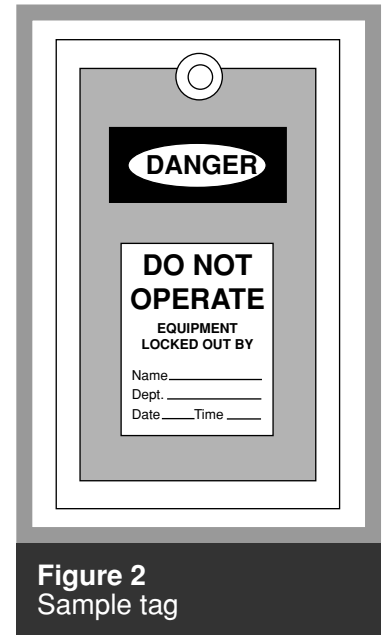
5. Remove the piece of equipment from the operations area if possible.
6. Do not use the lockout lock and key for any other purpose.



Group Lockout Device

Single Lockout Device

**Figure 1**  
Lockout devices



**Figure 2**  
Sample tag

**OBJECTIVE 4**

List expectations for a safe environment at school or work.

1. Adequate lighting to prevent eyestrain and to allow performance of required duties
2. Clean air

3. Comfortable, *ergonomic* seating and equipment that encourages good *body mechanics*.

KEY TERMS

**Ergonomic**—The science of designing and arranging equipment so that the equipment and the people who use it interact most efficiently and safely

Examples: A mouse pad with an integral wrist rest; curved computer keyboards; desk chairs with adjustable heights and backs

**Body mechanics**—The use of the body to maintain balance and to achieve motion

Examples: Good posture, safe lifting techniques

4. Working emergency alarm and lighting systems
5. Clearly marked, unlocked, and accessible emergency exits
6. Clear, barrier-free, walkways accessible to all
7. Posted safety rules
8. Posted evacuation routes and rules
9. Mandatory safety training available to all
10. Available personal protective equipment
11. Designated smoking and nonsmoking areas
12. Clearly identified hazardous materials
13. Available *material safety data sheets* (MSDS) on all hazardous materials in the organization

KEY TERM

**Material safety data sheet (MSDS)**—Form that explains each hazardous material used by an organization

14. Lighted, open parking and entrance areas
15. Up-to-date, operable fire extinguishers

OBJECTIVE 5

State the purposes of a material safety data sheet (MSDS).

1. To inform the user of the material's physical properties or fast-acting health effects that make it dangerous to handle

2. To tell the user the level of protective gear needed
3. To tell the user the first-aid treatment necessary if exposed to the product or its hazards
4. To tell management and the user the preplanning needed for safely handling spills, fires, and day-to-day operations
5. To tell the user how to respond to accidents

## OBJECTIVE 6

**Match MSDS sections to the information each contains.**

✓ **NOTE:** Each organization can design its own MSDS form, and the sections may be in a different order than on the following list. However, each section must include all of the following information.

1. **Chemical name**—Identifies the substance and lists the date the MSDS was prepared, the name and address of the manufacturer, and usually a phone number for emergencies
2. **Hazardous ingredients/chemical identity**—Names the substances in the chemical that may be dangerous, provides safe exposure limits and common names for the chemical
3. **Physical characteristics**—Describes usual or safe physical qualities such as how it looks or smells, boiling and melting temperatures, evaporation rates, how easily it dissolves, and how heavy it is compared to water
4. **Fire and explosion data**—Identifies **flashpoint**, **flammability**, **combustibility**, and the best way to put out fire involving that chemical

KEY TERMS

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**Flashpoint**—The lowest temperature at which a substance when heated will ignite

**Flammable**—Capable of igniting easily and burning or spreading rapidly

**Combustible**—Capable of bursting into flames at temperatures above 100°F

5. **Reactivity**—Describes what happens if this chemical comes in contact with certain conditions (e.g., heat) or chemicals (e.g., air, water, other chemicals)
6. **Health hazards**—Lists ways the chemical may enter your body, symptoms of overexposure, and emergency first aid procedures
7. **Usage, handling, and storage**—Describes how to clean up an accidental spill, leak, or release, including special precautions; tells how to handle, store, and dispose of the chemical safely
8. **Special protection and precautions**—Explains special personal protective equipment (PPE) to use when working with the chemical, and provides extra health and safety information not covered in other sections

## Module 1-B: Environmental Safety

### OBJECTIVE 7

Match hazard placard and label symbols to their hazards. (See Figure 3 through Figure 10 below and on the next page.)

#### 1. Corrosive

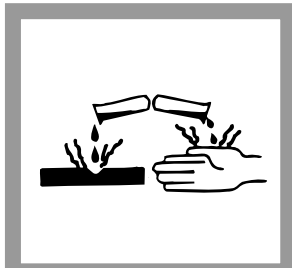


Figure 3  
Corrosive

#### 2. Explosive

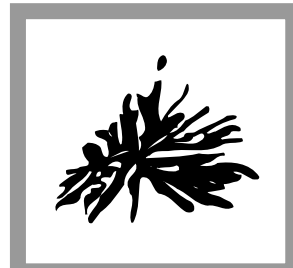


Figure 4  
Explosive

#### 3. Flammable

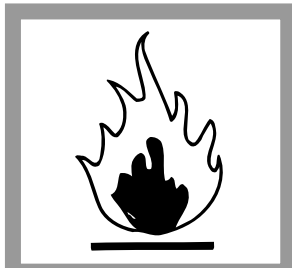


Figure 5  
Flammable

#### 4. Harmful to foodstuffs

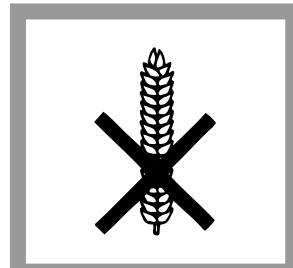


Figure 6  
Harmful to foodstuffs

#### 5. Infectious

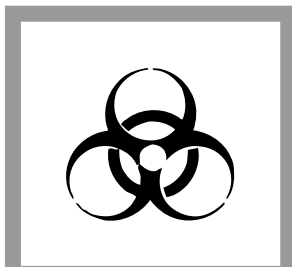


Figure 7  
Infectious

#### 6. Oxidizing

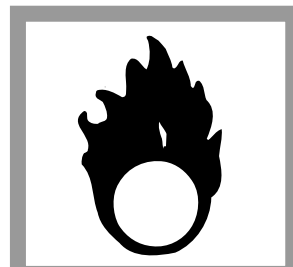
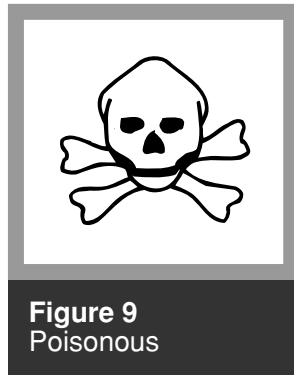
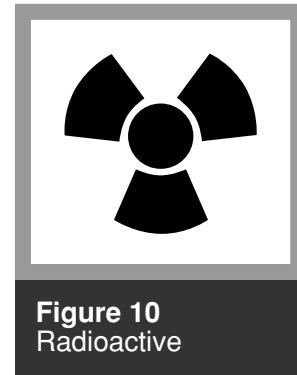


Figure 8  
Oxidizing

7. Poisonous



8. Radioactive

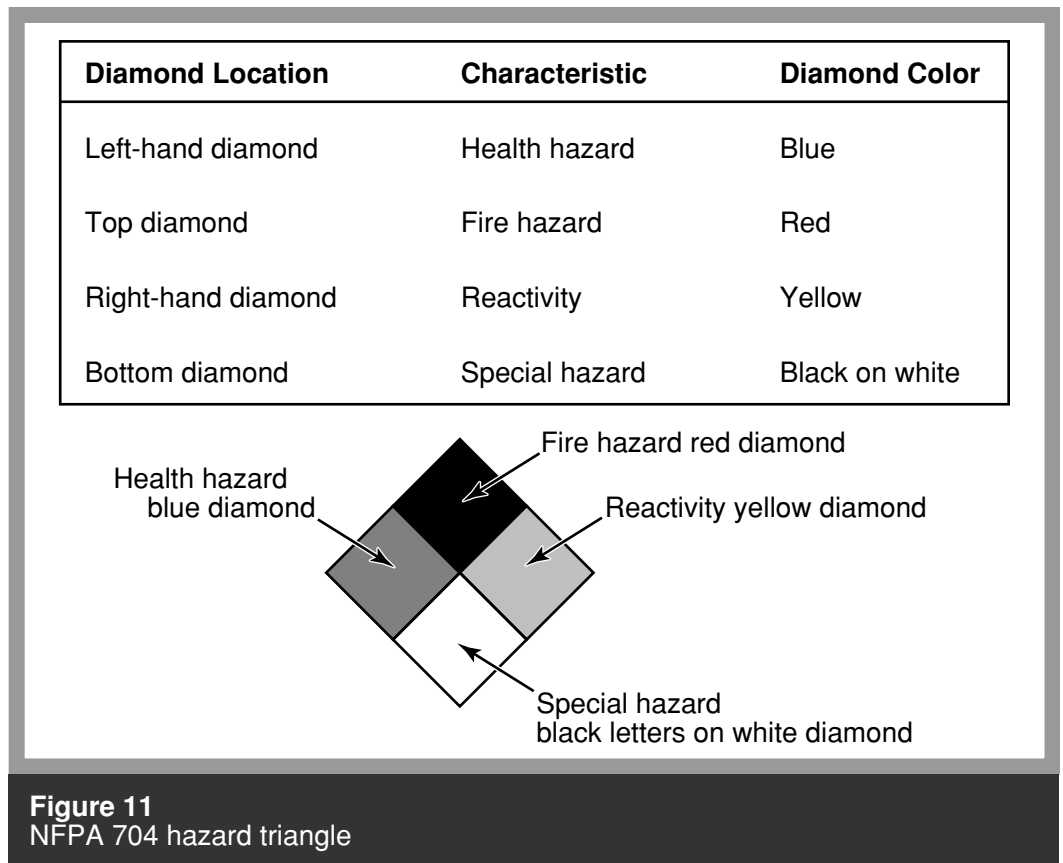


OBJECTIVE 8

Identify hazards using the NFPA 704 hazard triangle.

✓ **NOTE:** This system is commonly used on chemical storage containers, as well as vehicles transporting hazardous materials. The diamonds are a quick way to identify how hazardous a chemical is. They are based on the coding system of the National Fire Protection Association (NFPA).

1. The classification system consists of a large diamond made up of four smaller diamonds. Each diamond represents a different characteristic and is represented by a different color (see Figure 11).





2. Health, fire, and reactivity hazards are rated according to their severity on a scale of 0-4 with 0 meaning “no hazard” and 4 meaning “severe hazard” (see Figure 12).

Rating #	Health Hazard Meaning	Fire Hazard Meaning (Flash Points)	Reactivity Hazard Meaning
4	Deadly	Below 73°F	May detonate
3	Extreme danger	Below 100°F	Shock and heat may detonate
2	Hazardous	Below 200°F	Violent chemical change
1	Slightly hazardous	Above 200°F	Unstable if heated
0	Normal material	Will not burn	Stable

**Figure 12**  
Health, fire, and reactivity hazards and ratings

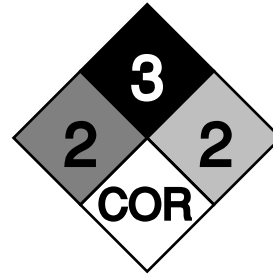
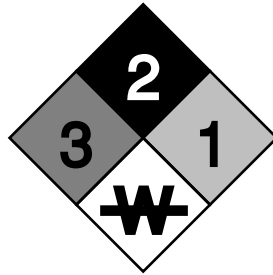
3. Other specific hazards are identified with abbreviations or symbols (see Figure 13).

Specific Hazard	Abbreviation or Symbol
Oxidizer	OXY
Acid	ACID
Alkali	ALK
Corrosive	COR
Use NO WATER	
Radiation hazard	

**Figure 13**  
Other specific hazards and their abbreviations and symbols

Examples: Chemical #1

Chemical #2



Chemical #1 presents an extreme danger to your health, it will burn below 200°F, and it is unstable if heated. Do not use water on this chemical.

Chemical #2 is a corrosive that is hazardous to your health. It is very flammable with flash point below 100°F, and is capable of violent chemical change.

✓ **NOTE:** Remember—The greater the number, the greater the hazard.

**OBJECTIVE 9**

**Match methods by which hazardous materials can enter the body to their correct description.**

1. **Ingestion**—By mouth

Example: Swallowing rubbing alcohol

2. **Absorption**—Through the skin

Example: Getting some cleaning agents on your hands or skin

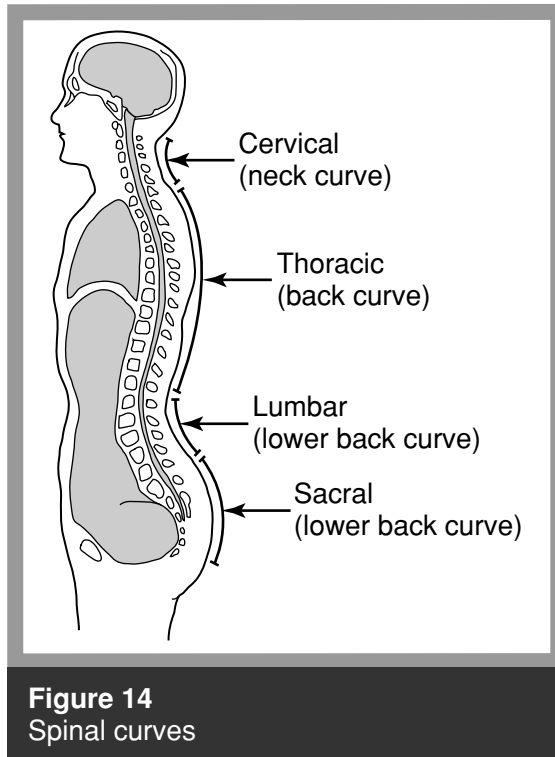
3. **Inhalation**—By breathing in gases, vapors, fumes, and other forms of a material

Examples: Inhaling an anesthetic or smoke

**OBJECTIVE 10**

**Complete statements concerning the principles of body mechanics.**

1. **Using the body correctly results in coordination and endurance.**
2. **Good body mechanics prevent fatigue and injury, especially to the back.**
3. **Techniques for good body mechanics include maintaining good posture, lifting correctly, and moving correctly.**
4. **Maintaining good posture requires keeping the three natural curves of the back (see Figure 14 on the next page) in balance while standing, sitting, or lying down.**



**Figure 14**  
Spinal curves

- Correct standing posture
  - Align ears, shoulders, hips, knees, and ankles.
  - Keep shoulders relaxed and knees slightly bent.
  - Place feet slightly apart to improve balance.
  - Rest one foot on a footstool or rail to ease strain on your back when standing for an extended period.
  - Stand as close to the work area as possible to prevent reaching.
- Correct sitting posture
  - Align ears over shoulders and shoulders over hips.
  - Place **lumbar** roll or rolled up towel between your lower back and the back of nonadjustable chairs.

KEY TERM

**Lumbar**—Relating to the vertebrae (region) between the thoracic vertebrae and the sacrum

- Adjust chair height and seat back firmness and angle as necessary.
- Rest your buttocks against the chair back and keep your feet on the floor or footstool.

- Place your computer screen at eye height and at a comfortable distance from your eyes.
- Adjust the height of the work area as necessary.
- Correct lying (or sleeping) posture
  - Rest on your side with your knees slightly bent toward your chest (modified **fetal position**).

### KEY TERM

**Fetal position**—Position in which the body lies on one side curled up with the arms and legs drawn up toward the chest and the head bowed forward

- Rest on your back with a pillow placed under your knees.
- Sleep with only one pillow under your head.
- ✓ **NOTE:** Sleeping with more than one pillow or too thick a pillow under your head exaggerates your neck curve and places undue stress on your back.
- Choose a firm mattress.
- Moving correctly
  - Walk with your head up and your shoulders back.
  - Cushion and support your wrist and arm when using a computer keyboard and mouse.
  - ✓ **NOTE:** There are all sorts of ergonomic mouse pads available today. One that many people find comfortable incorporates a gel wrist pad so that the user's hand is level with or above the mouse, thus relieving pressure on the carpal nerve and helping to prevent **carpal tunnel syndrome**. There are also many keyboard wrist rests.

### KEY TERM

**Carpal tunnel syndrome**—Condition caused by compression of the nerve where it passes through the wrist into the hand; characterized by weakness, pain, and disturbances of sensation in the hand

- Occasionally move and stretch your joints freely through entire range of motion.
- Use carts, wheelchairs, bed sheets, or other devices to lift and carry objects whenever possible.

- **Pivot**, roll, or slide the object when a lifting or carrying device is not available.

KEY TERM

**Pivot**—To turn as if on a pin or shaft; to revolve

- Ask for help when you must carry a large object, and then ensure that you and your helper coordinate movements and carry the object on the same side of the body and at the same level.
- Use ladders rather than chairs or boxes to reach high objects.
- Avoid over-reaching or stretching to reach high objects.

■ **Lifting correctly**

- Determine whether or not you can lift the object alone or need help.
- Bend at your knees and hug the object close to you to maintain your back's correct alignment and your center of balance.
- Use your leg muscles, not your back muscles, for the actual lifting.
- Never turn or twist the body while lifting.

✓ **NOTE:** Make sure that your feet, knees, and torso are pointing in the same direction when lifting. Turn your feet *after* you have lifted the object.

OBJECTIVE 11

**List basic types of emergencies.**

✓ **NOTE:** Most emergencies should be handled by trained personnel. Know the extent of your responsibilities (your role) for each of the basic types of emergencies. Your job may be as simple as calling for help or as complex as aiding in evacuation and roll call.

1. **Fires**

2. **Mechanical failures**

Examples: Loss of electricity, loss of heating or refrigeration system

3. **Bombs and bomb threats**

4. **Severe weather**

Examples: Tornadoes, hurricanes, thunderstorms (lightning and wind)

5. **Natural disasters**

Examples: Floods, earthquakes

**6. Accidents**

Examples: Falls, cuts, burns, electrical shocks, poisoning, drowning, machinery entrapment

**7. Health problems**

Examples: Heart attacks, strokes, seizures, heat exhaustion

**OBJECTIVE 12****During severe weather safety guidelines.*****Before severe weather occurs***

- 1. Know your organization's severe weather plan and your role in it.**
- 2. Make sure that you know where to go in the event of severe weather.**
- 3. Take part in the organization's periodic severe weather drills.**
- 4. Know the location of the organization's emergency disaster supply kit, which should include a first-aid kit, battery powered radio and flashlight with extra batteries, canned food and can opener, and bottled water.**
- 5. Learn where to get weather information, and the meaning of "watch" and "warning."**

**KEY TERMS**

**Watch**—Possibility of but no immediate danger; prepare to take shelter

**Warning**—Immediate danger; take shelter immediately

***During severe weather***

- 1. When alarms, sirens, or warnings are issued by the local civil defense or national weather center, follow your severe weather plan.**
- 2. Move quickly and quietly to your planned shelter:**
  - In nursing homes, hospitals, schools: Seek shelter on the lowest level and in the interior of the building, away from glass and outside openings.
  - In high-rise buildings: You may not have time to go to the lowest floor, so seek shelter in a hallway or small room in the interior of the building away from windows; do not use or seek shelter in an elevator.
- 3. Do not seek shelter in dining halls, gyms, or other large rooms with wide-span roofs.**
- 4. Make yourself as small as possible by crouching down.**
- 5. Put your head down and cover it and your face with your arms.**

6. Answer to roll call if at school.
7. Remain in designated area until the signal is given to return.

OBJECTIVE 13

Arrange in order the steps to follow on receiving a bomb threat.

1. When you answer the call, obtain as much information as you can about the caller, recording the call if possible.

Examples: Male, female, background noises, accent, voice characteristics

2. Alert your instructor, supervisor, or building administrator.
3. Follow your building evacuation plan.
4. Do not return to the building until the “all clear” signal is given.

OBJECTIVE 14

Complete guidelines for general evacuation procedures in a fire emergency.

✓ **NOTE:** Schools and hospitals hold routine fire evacuation drills. These drills must be taken with the utmost seriousness. Were a real fire to occur, students'/employees' knowledge of their responsibilities and proper evacuation routes could save their lives and that of others.

*Upon discovery of fire or smoke or upon activation of a smoke detector—*

1. Close the doors around the fire to contain it, if doing so does not compromise your safety.
2. Do not attempt to extinguish or fight the fire unless you have been trained to do so.
3. Pull the nearest fire alarm.

✓ **NOTE:** Fire alarms may be activated by smoke detectors, heat detectors, or pull stations (the “pull-to-activate-fire-alarm” boxes in the corridors). In buildings so equipped, activation of the fire suppression sprinklers may also activate the alarm system.

4. Exit the building immediately according to evacuation plans.
5. Proceed to your designated meeting area and answer to roll call.
6. Dial 911 or local fire emergency number if in a rural area to notify the fire department of the fire and its exact location.
7. Notify the building administrator of the location of the fire.

*At the sound of a fire alarm—*

1. Shut down any machinery or processes in your area of responsibility.

2. Carefully feel several areas of any closed doors; if the door is hot, *do not open it*.

✓ **NOTE:** Opening the door provides oxygen that may immediately and dramatically increase the size and intensity of the fire.

3. Check the exit path for smoke or fire; *do not enter smoke*.

✓ **NOTE:** Smoke inhalation, not burns, is the number one cause of fire deaths. A person can become confused and disoriented by the carbon monoxide in smoke in a matter of seconds and die from smoke inhalation quickly thereafter.

4. If the exit path is clear of smoke and fire, remain calm and immediately walk—do not run—to the nearest exit, and leave the building.

5. If you can smell but not see smoke, place a wet towel over your head and hold a wet cloth to your nose and mouth when exiting if possible.

6. To limit fire or smoke damage, close all doors and windows when leaving the room, if doing so does not compromise your own safety.

7. Close all hallway doors as you leave, if doing so does not compromise your own safety.

8. Assist disabled persons to a secure area—such as a stairwell—and inform responding fire department personnel of their location.

9. Assist visitors who are not familiar with evacuation routes.

10. Use the stairs, not the elevators.

✓ **NOTE:** Heat or smoke can activate the elevator call system and stop the elevator on a fire floor. Additionally, fire personnel may need to use the elevators for fire or rescue operations.

11. Leave the building in an orderly manner, and proceed to the designated meeting area.

12. Answer to roll call.

13. Report any hazardous conditions left in your work area to responding fire department personnel.

Examples: X-ray photographs, chemicals, oxygen equipment and storage tanks

14. Keep walkways clear for emergency personnel/vehicles.

**OBJECTIVE 15**

**Describe the disabled person's fire evacuation responsibilities.**

*Pre-emergency responsibilities*

1. Be familiar with your workplace buildings and their exits.

2. Know and share the safest method to use to assist you.

3. Know how many people you need to provide you with assistance.
4. Whenever possible, try to have a designated person or persons assist you during the evacuation.
5. Be prepared to explain how and where you need to be supported.
6. Practice instructions beforehand.

***Evacuation responsibilities***

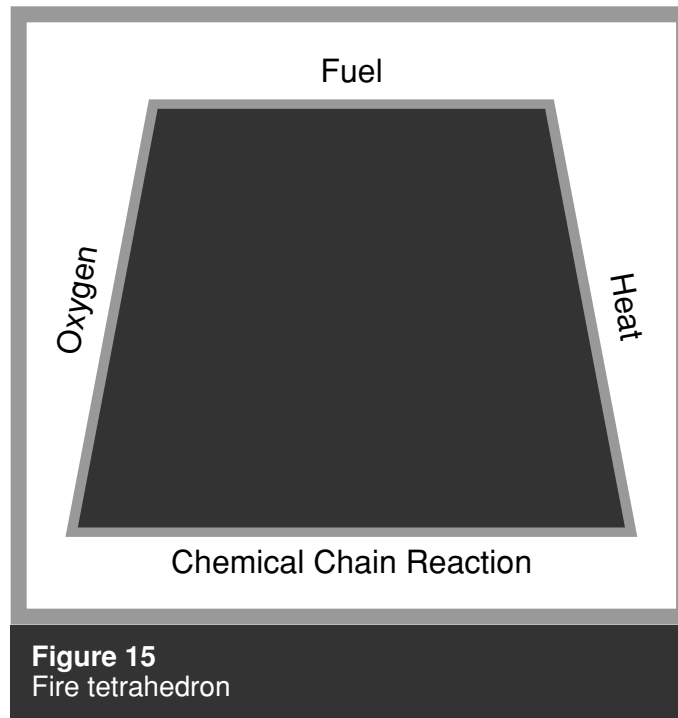
1. Check the hallway for smoke and fire.
2. If the hallway is clear of smoke and fire—
  - Go to the nearest stairwell.
  - Remain as close to the stairs as possible, without hindering the exit of others.
  - Do not use the elevators.
  - Have a previously designated person contact fire personnel for assistance.
3. If there is smoke or flames in the hallway—
  - Stay in the room with the doors closed.
  - Place wet clothing or towels at the bottom of the door if possible.
    - ✓ **NOTE:** This helps prevent the spread of smoke into the room.
  - Call 911 and give the operator your exact location.
  - Place a wet cloth over your mouth and nose, if possible, and wait until someone arrives to assist you.

**OBJECTIVE 16**

**Identify the components of fire by labeling the sides of a fire tetrahedron.**

✓ **NOTE:** For many years the fire triangle (oxygen, fuel, and heat) was used to teach the components of fire. While this example is useful, it is not technically correct. Each of four components of the fire tetrahedron (see Figure 15 on the next page) must be in place for combustion to occur. If any one of the components is removed, the fire will be extinguished.

1. Oxygen
2. Fuel
3. Heat
4. Chemical chain reaction



**Figure 15**  
Fire tetrahedron

**OBJECTIVE 17** Match fire classifications to their fuel sources.

Fire Class	Fuel Source	Fuel Classification
Class A	Wood, paper, rubber, plastic, trash, cotton bedding	Ordinary combustibles
Class B	Gasoline, oil, grease, gases (oxygen), paints, anesthetic agents	Flammable liquids
Class C	Live electrical equipment, wiring, appliances, motors	Electrical equipment
Class D	Combustible metals  Examples: Aluminum, magnesium, titanium, zirconium, sodium, potassium, lithium, calcium, zinc	Combustible metals  <b>✓ NOTE:</b> These fires are more common in industrial than in hospital settings. They require a special dry powder, Class D extinguisher.

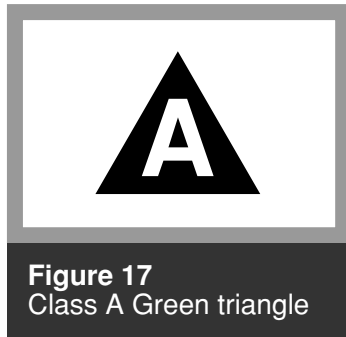
**Figure 16**  
Fire classifications and fuel sources

OBJECTIVE 18

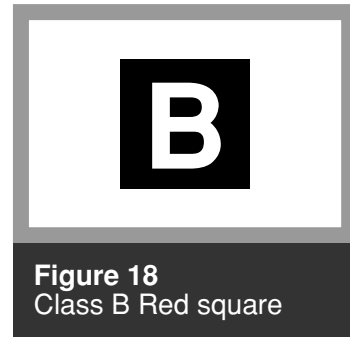
Match fire extinguisher symbol shapes to fire classification letters.

✓ **NOTE:** All portable fire extinguishers are labeled with picture and shape symbols. Each of the shape symbols contains the letter of the fire class for which the extinguisher is effective. Because speed is important when a fire is discovered, you should be able to glance at the symbols and know immediately whether the extinguisher is appropriate for the fire on hand.

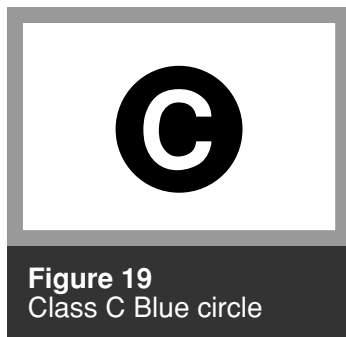
1. **Class A**—Green triangle



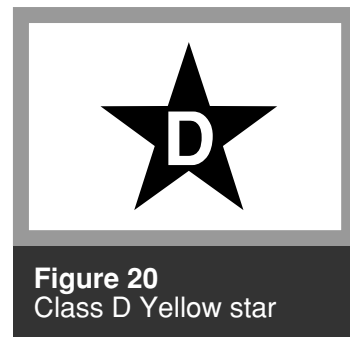
2. **Class B**—Red square



3. **Class C**—Blue circle



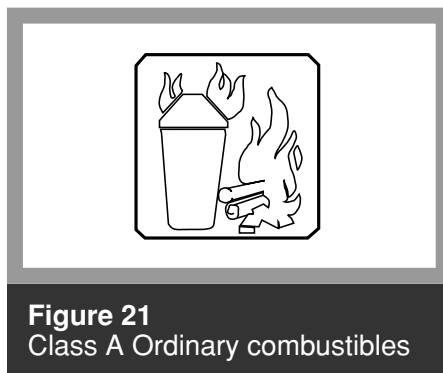
4. **Class D**—Yellow star



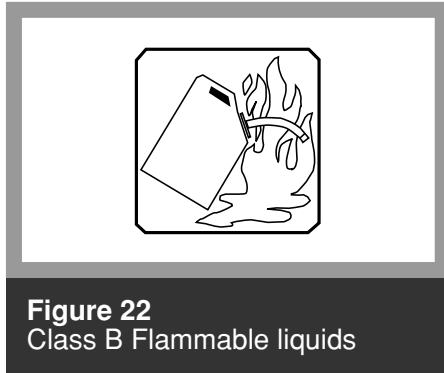
OBJECTIVE 19

Match extinguisher pictographs to the extinguisher's intended purposes (see Figures 21 through Figure 26).

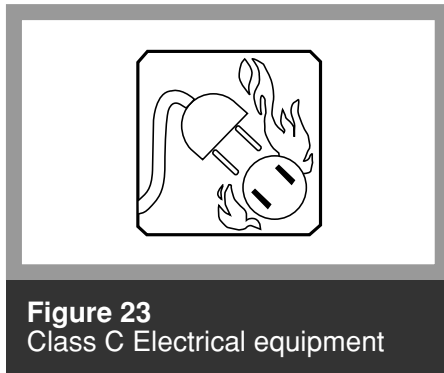
1. **Class A**—Ordinary combustibles



2. **Class B**—Flammable liquids



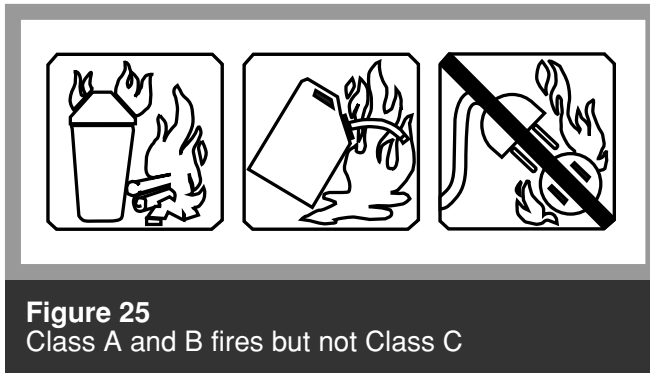
3. **Class C**—Electrical equipment



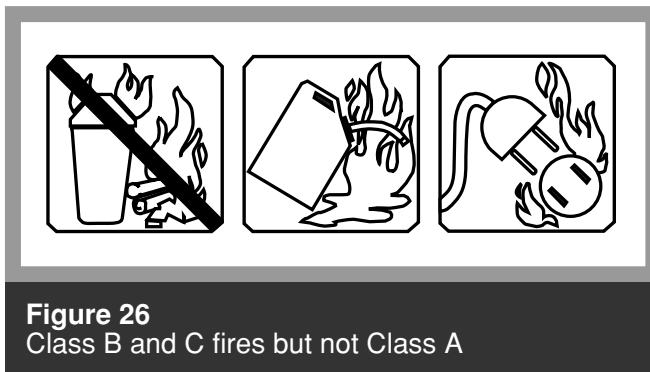
4. **Class A fires but not Class B or C**



5. Class A and B fires but not Class C



6. Class B and C fires but not Class A



OBJECTIVE 20

List the characteristics of fires appropriate for handling with a portable fire extinguisher.

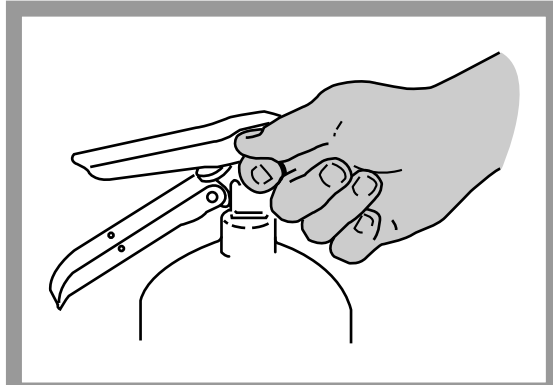
1. The fire is contained, as in a trash can, and is not spreading beyond the spot where it started.
2. The flames are not higher than the employee's head.
3. The heat from the fire does not prevent the employee from getting close enough to discharge the extinguisher within its effective range.
4. The size of the fire allows the employee to stand upright without experiencing radiated heat while discharging the extinguisher.
5. The fire cannot block the employee's only means of escape.
6. The employee can fight the fire with his or her back to an escape exit.
7. The fire is not producing a lot of smoke.
8. The fire is not near other fuels or hazardous materials that would cause it to grow suddenly or create an explosion.

## OBJECTIVE 21

Arrange in order the general steps in using a fire extinguisher.

✓ **NOTE:** Fighting even small fires presents risks. If you have not been trained to use a fire extinguisher or if the fire is not appropriate for handling with an extinguisher, *do not attempt to extinguish the fire*. Instead, pull the nearest fire alarm, evacuate the building, and get help immediately.

1. **Identify the fire class and then check the extinguisher label to make sure that the extinguisher is coded to put out that type of fire.**
2. **Pull the pin to break the inspection band (see Figure 27).**



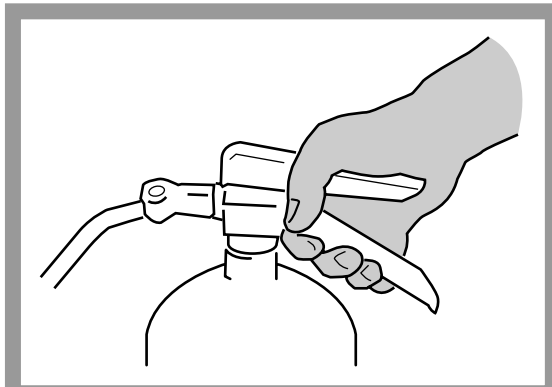
**Figure 27**  
Step 2 Pull the pin

3. **Aim the extinguisher nozzle or horn at the base of the fire (see Figure 28).**



**Figure 28**  
Step 3 Aim the extinguisher nozzle or horn

4. Squeeze the handle to release the *extinguishing agent* (see Figure 29).



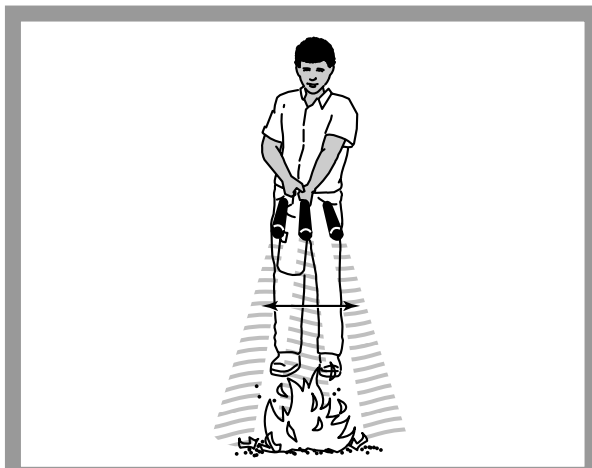
**Figure 29**  
Step 4 Squeeze the handle

KEY TERM

**Extinguishing agent**—Substance used to put out a fire

Examples: Water, carbon dioxide, dry chemicals, halon, foam

5. Sweep the nozzle from side to side until the fire appears to be out, repeating the process if fire breaks out again (see Figure 30).



**Figure 30**  
Step 5 Sweep the nozzle from side to side

✓ **NOTE:** One way to remember this sequence is to remember that the first letters of the steps spell “I PASS.” Most portable extinguishers work according to these general directions. Always follow the directions printed on the model you are using.

**OBJECTIVE 22****List fire prevention guidelines.**

1. **Keep equipment clean and in good operating condition.**
2. **Never overload electrical outlets.**
3. **Store flammables/combustibles in appropriate containers away from heat sources.**
4. **Keep heat sources away from flammables/combustibles.**  
Example: Do not smoke near oxygen equipment.
5. **Keep work and trash areas clean and free of debris.**
6. **Dispose of flammables according to established safety guidelines.**
7. **Never leave open flames unattended.**
8. **Use caution when using spark-producing equipment.**
9. **Report suspicious persons (possible arsonists) to security or supervisory personnel.**
10. **Keep fire exits unlocked.**
11. **Keep escape routes clear and well marked.**
12. **Know where fire alarm boxes are located.**
13. **Know where fire extinguishers are located and how to use them.**
14. **Always be on the lookout for fires or conditions that could cause fires or hinder escape and report them immediately.**
15. **Properly dispose of cigarettes and matches.**
16. **Smoke only on designated breaks and in designated areas.**

**OBJECTIVE 23****Complete statements concerning electrical safety.**

✓ **NOTE:** Handle electrical equipment with care. All electrical equipment is potentially hazardous and can cause fires, explosions, shocks, burns, and even death.

1. **Do not use any electrical appliance or equipment while you are touching metal or water.**
2. **Unplug electrical equipment before cleaning, inspecting, repairing, or removing anything from it.**
3. **Keep electrical equipment and work areas clean to prevent electrical fires.**
4. **Know that electrical sparks can ignite any nearby flammable materials.**

5. Keep access to **electrical panels** (see Figure 31 below) and **junction boxes** clear (see Figure 32 below).

KEY TERMS

**Electrical panel**—Panel designed to display electrical wiring connections; usually placed inside the house

**Junction box**—Weatherproof enclosure designed to protect exterior electrical wiring connections

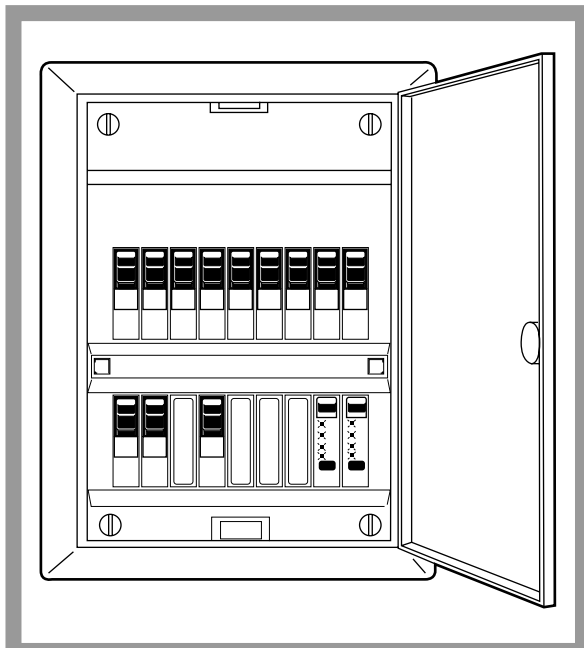


Figure 31  
Electrical panel

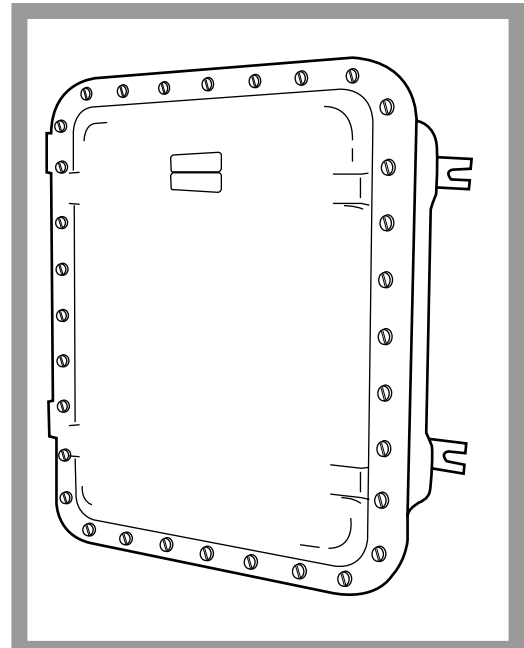


Figure 32  
Junction box

6. Keep flammable materials away from electrical heat sources, including lights.
7. Know the location of fuses and circuit breakers.

KEY TERMS

**Fuse**—An electrical safety device consisting of a wire or strip of metal that melts and interrupts the circuit when the current exceeds a particular level

**Circuit breaker**—A device that shuts off a circuit when it becomes overloaded (too much current is flowing)

8. Make sure all electrical equipment is properly *grounded*.

## KEY TERM

**Grounded**—Connected to earth or to an object that conducts electrical current to the earth

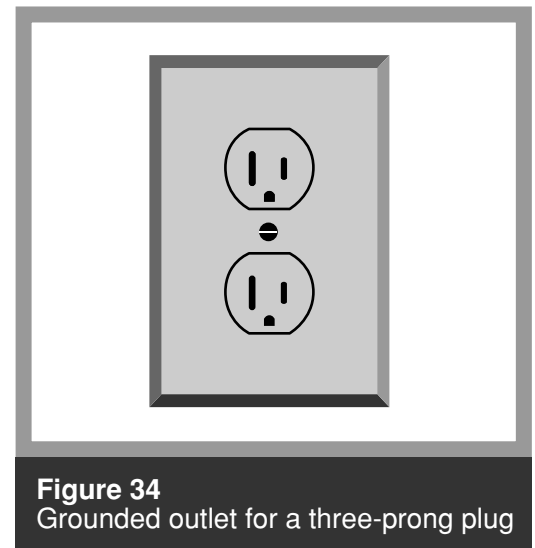
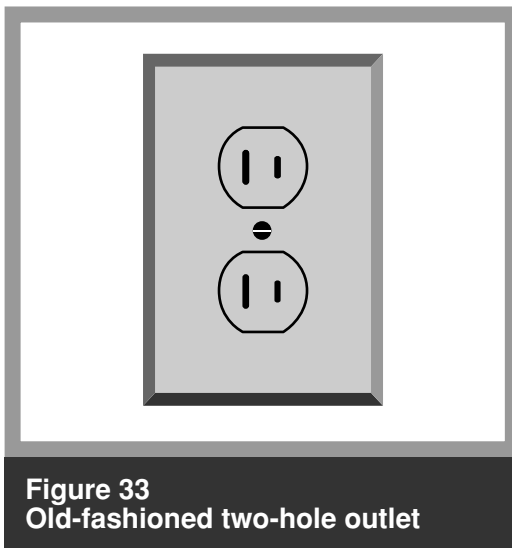
9. Plug power tools into *grounded outlets* equipped with *ground fault circuit interrupters* (GFCI).

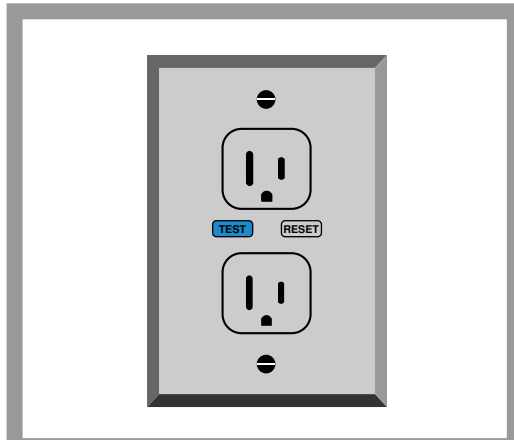
✓ **NOTE:** Figure 33 below shows an old-fashioned two-hole outlet without a receptacle for a ground prong. Figure 34 below shows a typical grounded outlet for a three-prong plug; and Figure 35 on the next page shows a GFCI outlet. The GFCI looks the same as the three-hole grounded outlet but contains test/reset buttons. These are most common in bathrooms and in kitchens and other areas where water and electricity are used side by side and present a shock hazard.

## KEY TERMS

**Grounded outlet**—Outlet that has a round receptacle for the ground prong on a plug; equipment is automatically grounded when plugged into such an outlet (see Figure 34 below)

**Ground fault circuit interrupter**—Device designed to protect against electric shock; should someone come in contact with “hot” wire or path to the ground the GFCI shuts the circuit in a fraction of a second, well before currents that are dangerous (see Figure 35)





**Figure 35**  
GFCI outlet

10. **Never use water on electrical fires.**
11. **Report any of the following unsafe conditions to your instructor or supervisor immediately and do not use:**
  - Defective, frayed, or damaged electrical cords
  - Shocking, sparking, overheating, or smoking equipment
  - Corroded or broken switches or outlets
  - Extension cords impermanent use

**OBJECTIVE 24**

**Select true statements concerning basic equipment safety.**

1. **Remove rings and other jewelry when operating power equipment.**
2. **Secure long hair and loose clothing (e.g., ties, scarves, wide sleeves) when working with or near power equipment.**
3. **Wear personal protective equipment (safety goggles, gloves, etc.) as required.**
4. **Use equipment and tools only for their intended purposes.**
5. **Never use any equipment unless you are trained to do so.**
6. **Inspect equipment before each use; replace it or have it repaired by a qualified individual if parts are worn or damaged.**
7. **Disconnect the power from equipment before performing any maintenance tasks.**
8. **Make sure that power switches are turned to OFF before plugging or unplugging equipment.**

9. Never disconnect the power by pulling on the cord; instead, remove the plug from the outlet.
10. Make sure that your hands are dry before disconnecting equipment from its power source.
11. Keep electrical cords out of traffic areas.
12. Do not leave or store equipment in aisles or traffic lanes that could present a tripping hazard.



# Introduction to Surgical Technology

## Section B: Safety

### Module 1-B: Environmental Safety

## Student Supplement 1—Guidelines for Interpreting Material Safety Data Sheets

Living in the modern world, you probably are aware that the use of chemicals offers convenience and progress at home and work. Naturally, you want to avoid dangerous overexposure to chemicals, especially on the job. Such overexposure is possible no matter where you work, even in an office or light industry.

Your company's hazard communications, or HazCom, program was created to protect your health and safety. Three important elements are at the heart of your HazCom program: warning labels on containers, training on the safe use and handling of chemicals, and material safety data sheets (MSDSs).

### What is on a MSDS

MSDSs are printed pages that give you all the critical information you need about how to use, transport, and store chemicals in order to protect yourself, as well as what to do in case of emergencies and overexposure. Information on MSDSs includes:

- The chemical's name or names
- Name, address, and phone number of the manufacturer
- List of the chemical's ingredients
- Permissible exposure limits (PEL) or threshold limit value (TLV)
- What conditions or other substances will cause the chemical to catch fire, explode, melt, or turn into dangerous gases
- How the chemical usually looks and smells
- How to put out a fire involving the chemical
- What to do if the chemical spills or leaks
- How to prevent dangerous exposure
- Health hazards such as skin irritant or cancer-causing agent
- Symptoms of overexposure
- What to do if you are overexposed
- When the MSDS was prepared

The information for each chemical's MSDS is put together by the manufacturer or distributor for that chemical. The sheets often look different from each other, but they still provide the same information. The law requires your employer to keep MSDSs up to date and to send the MSDS to your doctor or designated representative if you request it.

### Where the MSDS is kept

MSDSs must be readily accessible to employees—a posted sign may tell you where, and you can also find out by reading your company's written HazCom program. If you are not sure where to find MSDSs, your supervisor or your company's HazCom contact will make them available to you. It is the law.

### When to read a MSDS

You should always read the MSDS *before* you begin a job using a chemical. Even if you have used the chemical before, the manufacturer may have changed its formula, which may change the steps you should take to protect yourself. Taking proper precautions listed on the MSDS, such as wearing a respirator, can prevent serious long-term illnesses.

If you do not understand something on the MSDS, or have questions about your company's HazCom program, ask your supervisor or company contact. Your company knows that HazCom works best if you are fully informed and involved.

### How to read a MSDS

The material safety data sheet, or MSDS, is written information that can help protect you from overexposure to chemicals you find on the job. The MSDS is part of your company's hazard communications program. Each company can design its own MSDS form, and the sections may be in a different order. But, the basic kinds of information on any MSDS will be the same.

**Chemical name** (see Figure 1 on the next page). Lists the identity of the substance (the name on the label), date the MSDS was prepared, the name and address of the manufacturer, and usually a phone number for emergencies and more information.

**Hazardous ingredients/chemical identity** (see Figure 1 on the next page). Includes names of substances in the chemical that might be dangerous, and lists safety exposure limits such as permissible exposure limit or PEL (set by OSHA) or the threshold value limit or TVL. Also lists common names for the chemical.

**Physical characteristics** (see Figure 1 on the next page). Describes many physical qualities of the chemical, and lets you know what is usual or safe. For example, how the chemical looks and smells; boiling and melting temperatures (important in case a chemical might become a gas you could breathe); evaporation rate (known as *percent volatile*); how easily the chemical dissolves; and how heavy it is (this tells you if it will sink, float, or dissolve in water).

**Fire and explosion data** (see Figure 1 on the next page). Tells you the lowest temperature at which the chemical could catch fire (flash point). Lets you know if it is flammable (catches fire below 100°F) or combustible (catches fire above 100°F). Lists the best way to put out a fire involving that chemical.

The diagram shows a Material Safety Data Sheet (MSDS) with the following sections and labels:

- Chemical name**: Points to Section 1.
- Hazardous ingredients/chemical identity**: Points to Section 2: HAZARDOUS INGREDIENTS IDENTITY INFORMATION.
- Physical characteristics**: Points to Section 3: PHYSICAL CHEMICAL CHARACTERISTICS.
- Fire and explosion data**: Points to Section 4: FIRE AND EXPLOSION HAZARD DATA.

The sheet is titled "MATERIAL SAFETY DATA SHEET" and is labeled "FRONT" in a black oval at the bottom right.

Figure 1

**Reactivity** (see Figure 2 on the next page). Describes what happens if this chemical comes in contact with air, water, or other chemicals. Describes conditions (like heat) or materials (like water) that can cause the chemical to react by burning, exploding, or releasing dangerous vapors. The chemical is called “incompatible” or “unstable” with these conditions or substances.

**Health hazards** (see Figure 2 on the next page). Lists ways the chemical might enter your body, like splashing on your skin or being breathed in as vapor, as well as possible symptoms of overexposure. Lets you know if overexposure might make existing medical conditions worse, and describes emergency first-aid procedures.

**Usage, handling, and storage** (see Figure 2 on the next page). Describes how to clean up an accidental spill, leak, or release, including special procedures. Tells you how to handle, store, and dispose of chemicals safely. Remember, if there is an accident, notify your supervisor immediately. Take care of it yourself only if you are trained to do so and are wearing the proper equipment.

**Special protection and precautions** (see Figure 2 on the next page). Explains special personal protective equipment (PPE) and other equipment to use when working with the chemical, special procedures, extra health or safety information, signs that should be posted, and other information not covered in other sections.

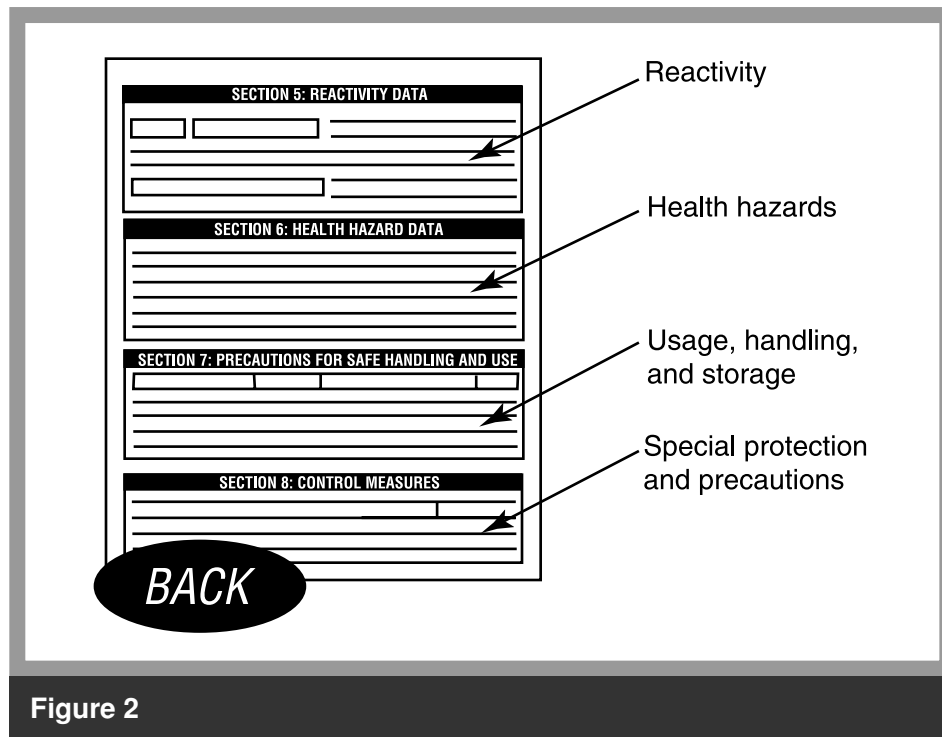


Figure 2

### Terms and abbreviations used on MSDSs

The following terms and abbreviations will help you interpret material safety data sheets.

- **TLV**—Threshold limit value; a time-weighted average concentration *under which* most people can work consistently for 8 hours a day, day after day with no harmful effects
- **Ceiling**—Uppermost limit
- **ACGIH**—American Conference of Governmental Industrial Hygienists
- **OSHA**—Occupational Safety and Health Act
- **PEL**—Permissible exposure limit; the maximum time-weighted concentration *at which* 95 percent of exposed, healthy adults suffer no adverse effects over a 40-hour week
- **ppm**—Parts per million
- **STEL**—Short-time exposure limit; a 15-minute, time-weighted average that should not be exceeded at any time during a workday. Exposures at STEL should not be longer than 15 minutes and should not be repeated more than four times a day with at least 60 minutes between exposures
- **IDLH**—Immediately dangerous to life and health; material *at or above* this level poses an immediate hazard to life or produces immediate, irreversible, debilitating effects
- **LEL**—Lower explosive limit; below the flammability range (too lean to burn)
- **UEL**—Upper exposure limit; above the flammability range (too rich to burn)

## **Student Supplement 2—Tornado Tips**

### **Tornado Tips**

**Tornado**—Violent rotating column of air in contact with the ground. It has many faces: cone-shaped, rotating mass of debris at the surface with no visible connection to the cloud; dark seething cloud on the ground.

**Look and listen for the following signs.**

- Series of pouches projecting downward from the storm's base
- Large hail, heavy rain, strong winds
- Intense, frequent lightning
- Loud roar like the sound of a jet or train
- Rotating cloud of debris or dust near the ground
- Bulge or pendent with organized rotary motion at the base of a thunderstorm
- Characteristics of the "typical" tornado

Time: 7:39 p.m. DST

Path: 5½ miles

Width: 500 feet

Area: 1 square mile

**Perform the following safety procedures.**

- Seek inside shelter—leave vehicles.
- Avoid windows, doors, and outside walls.
- Protect head and chest; crouch with your face to floor and hands clasped behind your head.
- Home—go to shelter, basement, or first-floor, interior small room, bathroom, closet, or hall and get under sturdy furniture, a mattress, or in a tub.
- Schools, offices—go to designated shelter (interior rooms or hallways or lowest floor); avoid places with wide-span roofs such as auditoriums, gymnasiums, and cafeterias; avoid halls that open to the south or west; avoid south or west walls.
- Mobile homes or vehicles—evacuate to substantial structure, ditch, culvert, or ravine.

- Be sure everyone is familiar with your safety plan; have a portable TV/radio and flashlight in your shelter area.

**Learn the meanings of terms used to describe tornadic conditions.**

*Tornado warning—*

- Tornado has been reported or indicated by Doppler radar!
- Take cover immediately if in or near the warning area.

*Tornado watch—*

- Conditions favor tornado development.
- Make preliminary plans.
- Watch for threatening conditions.
- Listen to a TV/radio so that you will know if the watch turns to a warning.

**Introduction to Surgical Technology**  
**Section B: Safety**  
**Module 1-B: Environmental Safety**

**OBJECTIVE 25**

**Assignment Sheet 1—Subscribe to a Safety Pledge**

Name \_\_\_\_\_ Date \_\_\_\_\_

---

**Evaluation criteria**

**Rating**

- Form is signed and dated by student \_\_\_\_\_
- Form is signed and dated by parent or guardian \_\_\_\_\_

**Overall rating** \_\_\_\_\_

Evaluator's comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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**EXERCISE**

**DIRECTIONS**

Read the safety pledge on the next page and then sign and date it if you agree to follow it. Have your parent or guardian sign the safety pledge if you are under their supervision.

### SAFETY PLEDGE

\_\_\_\_\_, who is a student enrolled in surgical technology, will be in contact with surgical supplies and materials, power equipment, hazardous materials, and some physical dangers involving lifting and moving.

This student will receive instruction about safety and correct procedures to follow to protect him/her from danger. The student must assume responsibility for safe practices, and we therefore ask that he/she subscribe to the following safety pledge:

- I AGREE TO ABIDE BY ALL OF THE SAFETY RULES IN THE SURGICAL TECHNOLOGY CLASSROOM/CLINICAL TEACHING FACILITY AND WILL MAINTAIN PROFESSIONAL CONDUCT IN KEEPING WITH THIS PROFESSION.
- I PLEDGE THAT I WILL TAKE PROPER CARE OF ANY EQUIPMENT THAT IS ISSUED TO ME OR THAT I USE IN CLASS/CLINICAL WORK, AND I AGREE TO RETURN IT TO ITS PROPER STORAGE LOCATION.
- I WILL IMMEDIATELY REPORT TO MY INSTRUCTOR/SUPERVISOR ANY UNSAFE SITUATIONS, EQUIPMENT, OR ACCIDENTS.

**Student's Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

- I HEREBY GIVE CONSENT TO ALLOW MY DAUGHTER/SON/WARD TO OPERATE ALL EQUIPMENT NECESSARY IN CARRYING OUT THE REQUIREMENTS OF THE COURSE.

**Parent's or Guardian's Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Introduction to Surgical Technology**  
**Section B: Safety**  
**Module 1-B: Environmental Safety**

OBJECTIVE 26

**Assignment Sheet 2—Complete an Accident Report Form**

Name \_\_\_\_\_ Date \_\_\_\_\_

---

**Evaluation criteria**

**Rating**

- Form is complete and accurate \_\_\_\_\_
- Form is neat and legible \_\_\_\_\_
- Form is signed and dated by student \_\_\_\_\_

**Overall rating** \_\_\_\_\_

Evaluator's comments \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

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**EXERCISE**

**DIRECTIONS**

Read the following scenario. Answer the questions assuming that you are the surgical technologist in the scenario. Complete the accident report form given to you by your instructor using the current date and your own personal information for home address, telephone, etc.

**SCENARIO**

It is 3 PM and the end of your shift. You have just finished assisting with a long, complicated operation. You are tired, as you gather up the tissue and blood specimens that you have been asked to deliver to the medical center lab.

On the way to the lab, you round a corner incautiously and bump into June A. Verschoe, a 34-year-old hospital visitor. You both fall on impact, and the specimens fly out of your hands and break. Small bits of glass from a broken specimen container embed in your right forearm and elbow and also in June's left calf. June is more embarrassed than hurt. She brushes the accident off as minor and asks to be directed to the women's room so that she can clean up before visiting the patient she has come to see.

1. Is this a minor accident as June describes? Why or why not?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Module 1-B: Environmental Safety

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2. Do you let June continue to the women's room and then to her patient? Why or why not?

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3. List the immediate steps you would take in this accident.

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4. Complete the accident report form provided by your instructor.

**Introduction to Surgical Technology**  
**Section B: Safety**  
**Module 1-B: Environmental Safety**

OBJECTIVE 27

**Assignment Sheet 3—Interpret Material Safety Data Sheets**

Name \_\_\_\_\_ Date \_\_\_\_\_

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**Evaluation criteria**

**Rating**

- Directions have been followed \_\_\_\_\_
- All questions have been answered correctly \_\_\_\_\_

**Overall rating** \_\_\_\_\_

Evaluator's comments \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**EXERCISE**

**DIRECTIONS**

Read the MSDSs at the end of this assignment and use them to answer the following questions.

**MSDS 1—Hydrogen Peroxide (45%-59.5%)** (see pages 51 through 58)

1. What special hazard is posed by this product? \_\_\_\_\_
2. What is this product used for? \_\_\_\_\_
3. What company manufactures this product? \_\_\_\_\_
4. What general health effects can this product have? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. What first aid measures should you take if you spill some 45%—59.5% hydrogen peroxide on your skin?  
\_\_\_\_\_  
\_\_\_\_\_
6. How should this product be stored? \_\_\_\_\_  
\_\_\_\_\_

## Module 1-B: Environmental Safety

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7. Is this product combustible? Explosive? \_\_\_\_\_
8. Is this product considered a human carcinogen? \_\_\_\_\_
9. What DOT placard would be affixed to containers of this product? \_\_\_\_\_  
\_\_\_\_\_
10. Aside from sterilization procedures, what other applications could this product have?  
\_\_\_\_\_

### **MSDS 2—CIDEX®OPA Solution** (see pages 59 through 63)

1. What is this product used for? \_\_\_\_\_
2. Who manufactures this product? \_\_\_\_\_
3. Why is the Composition and Ingredients Section for this product not applicable?  
\_\_\_\_\_
4. How hazardous is this product? \_\_\_\_\_
5. How should you protect your hands when cleaning up a spill of this product?  
\_\_\_\_\_
6. What color is this product? \_\_\_\_\_
7. What medical conditions can be aggravated by exposure to this product?  
\_\_\_\_\_

### **MSDS 3—Institutional Formula Drano** (see pages 65 through 68)

1. What are the two main ingredients in this product? \_\_\_\_\_
2. What are the potential health effects of this product? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. What first aid measures should you take if you accidentally ingest some of this product?  
\_\_\_\_\_

4. What PPE should you don when using this product? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. What does this product smell like? \_\_\_\_\_





## MATERIAL SAFETY DATA SHEET

**HYDROGEN PEROXIDE (45% - 59.5%)****MSDS: 001**

EFFECTIVE: 12/18/98

REVISION: A

CR8432

FOR PRODUCT ASSISTANCE CONTACT ADVANCED STERILIZATION PRODUCTS - (800) 755-5900  
EMERGENCY TELEPHONE NUMBERS: CHEMTREC (800) 262-8200

**Advanced Sterilization Products  
a Johnson & Johnson Company  
33 Technology Drive  
Irvine, CA 92618-2346**

**1. CHEMICAL PRODUCT/COMPANY IDENTIFICATION**

PRODUCT NAME: HYDROGEN PEROXIDE  
SYNONYMS: HYDROGEN PEROXIDE SOLUTION (DOT), PERHYDROL, PEROSSIDO DI IDROGENO (ITALIAN), PEROXYDE D'HYDROGENE (FRENCH), WASSERT-OFFPEROXID (GERMAN) AND WATER-STOFFPEROXIDE (DUTCH)

HMIS HAZARD RATINGS: HEALTH (BLUE): 2  
REACTIVITY (YELLOW): 2  
FLAMMABILITY (RED): 0  
SPECIAL HAZARD (WHITE): OXIDIZER, CORROSIVE

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

CAS# AND COMPONENTS:	MATERIAL/COMPONENT:	HYDROGEN PEROXIDE
	PERCENT:	45 TO 59.5%
	CAS#	7722-84-1
	MATERIAL/COMPONENT:	WATER
	PERCENT:	55 TO 40.5%
	CAS#	7732-18-5

**3. HAZARD IDENTIFICATION****EMERGENCY OVERVIEW:**

OXIDIZER. CONTACT WITH COMBUSTIBLES MAY CAUSE FIRE. DECOMPOSES YIELDING OXYGEN THAT SUPPORTS COMBUSTION OF ORGANIC MATTERS AND CAN CAUSE OVERPRESSURE IF CONFINED.

**HEALTH EFFECTS:**

CORROSIVE TO EYES, SKIN, NOSE, THROAT, AND LUNGS. MAY CAUSE IRREVERSIBLE TISSUE DAMAGE TO THE EYES INCLUDING BLINDNESS.

**4. FIRST AID MEASURES**

EYES: IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES, LIFTING UPPER AND LOWER LIDS INTERMITTENTLY. SEE PHYSICIAN OR OPHTHALMOLOGIST.

SKIN: WASH WITH LARGE AMOUNTS OF WATER. IF IRRITATION OCCURS, SEE A PHYSICIAN.

INHALATION: REMOVE TO FRESH AIR. IF BREATHING IS DIFFICULT OR DISCOMFORT OCCURS, CALL A PHYSICIAN.

INGESTION: DO NOT INDUCE VOMITING. CALL PHYSICIAN OR YOUR LOCAL POISON CONTROL CENTER FOR MOST CURRENT INFORMATION.



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**NOTES TO PHYSICIAN:**

HYDROGEN PEROXIDE AT THESE CONCENTRATIONS IS A STRONG OXIDANT. DIRECT CONTACT WITH THE EYE IS LIKELY TO CAUSE CORNEAL DAMAGE ESPECIALLY IF NOT WASHED IMMEDIATELY. CAREFUL OPHTHALMOLOGIC EVALUATION IS RECOMMENDED AND THE POSSIBILITY OF LOCAL CORTICOSTEROID THERAPY SHOULD BE CONSIDERED. BECAUSE OF THE LIKELIHOOD OF SYSTEMIC EFFECTS, ATTEMPTS AT EVACUATING THE STOMACH VIA EMESIS INDUCTION OF GASTRIC LAVAGE SHOULD BE AVOIDED. THERE IS REMOTE POSSIBILITY, HOWEVER, THAT A NASOGASTRIC OR OROGASTRIC TUBE MAY BE REQUIRED FOR THE REDUCTION OF SEVERE DISTENSION DUE TO GAS FORMATION.

**5. FIRE FIGHTING MEASURES**

**EXTINGUISHING MEDIA:**

PREFERABLY WATER OR WATER FOG. CARBON DIOXIDE AND DRY CHEMICAL MAY ALSO BE USED.

**SPECIAL FIRE FIGHTING PROCEDURES:**

ANY TANK OR CONTAINER SURROUNDED BY FIRE SHOULD BE FLOODED WITH WATER FOR COOLING. WEAR FULL PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING APPARATUS.

**DEGREE OF FIRE AND EXPLOSION HAZARD:**

PRODUCT IS NONCOMBUSTIBLE. ON DECOMPOSITION H<sub>2</sub>O<sub>2</sub> RELEASES OXYGEN WHICH MAY INTENSIFY FIRE.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

OXYGEN WHICH SUPPORTS COMBUSTION.

**6. ACCIDENTAL RELEASE MEASURES**

**PROCEDURE FOR RELEASE OR SPILL:**

DILUTE WITH LARGE VOLUME OF WATER AND HOLD IN A POND OR DIKED AREA UNTIL H<sub>2</sub>O<sub>2</sub> DECOMPOSES. DISPOSE ACCORDING TO METHODS OUTLINED FOR WASTE DISPOSAL.

**7. HANDLING AND STORAGE**

WEAR CUP TYPE CHEMICAL SAFETY GOGGLES AND/OR FULL FACE SHIELD, POLYESTER OR ACRYLIC FULL COVER CLOTHING AND RUBBER OR NEOPRENE GLOVES AND SHOES. AVOID COTTON, WOOL, AND LEATHER. AVOID EXCESSIVE HEAT AND CONTAMINATION. CONTAMINATION MAY CAUSE DECOMPOSITION AND GENERATION OF OXYGEN GAS WHICH COULD RESULT IN HIGH PRESSURES AND POSSIBLE CONTAINER RUPTURE. HYDROGEN PEROXIDE SHOULD BE STORED ONLY IN VENTED CONTAINERS AND SHOULD BE TRANSFERRED ONLY IN A PRESCRIBED MANNER. NEVER RETURN UNUSED HYDROGEN PEROXIDE TO ORIGINAL CONTAINER. EMPTY DRUMS SHOULD BE TRIPLE RINSED WITH WATER BEFORE DISCARDING. UTENSILS USED FOR HANDLING HYDROGEN PEROXIDE SHOULD BE MADE ONLY OF GLASS, STAINLESS STEEL, ALUMINUM, OR PLASTIC.

**VENTILATION:**

PROVIDE MECHANICAL GENERAL AND/OR LOCAL EXHAUST VENTILATION TO PREVENT RELEASE OF VAPOR OR MIST INTO THE WORK ENVIRONMENT.

**STORAGE:**

STORE DRUMS IN COOL AREAS OUT OF DIRECT SUNLIGHT AND AWAY FROM COMBUSTIBLES.



## MATERIAL SAFETY DATA SHEET

## HYDROGEN PEROXIDE (45% - 59.5%)

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

VENTILATION SHOULD BE PROVIDED TO MINIMIZE THE RELEASE OF H<sub>2</sub>O<sub>2</sub> VAPORS AND MIST INTO THE WORK ENVIRONMENT. SPILLS SHOULD BE COLLECTED OR CONFINED IMMEDIATELY AND DILUTED FOR DISPOSAL TO PREVENT RELEASE INTO THE WORK AREA. REMOVE CONTAMINATED CLOTHING IMMEDIATELY AND WASH BEFORE REUSE.

**RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:****RESPIRATORY:**

IF CONCENTRATIONS IN EXCESS OF 10 PPM ARE EXPECTED USE APPROVED SELF-CONTAINED BREATHING APPARATUS. DO NOT USE OXIDIZABLE SORBANTS SUCH AS ACTIVATED CARBON.

**EYES:**

USE CUP TYPE CHEMICAL GOGGLES AND/OR FULL FACE SHIELD.

**GLOVES:**

LIQUID PROOF RUBBER OR NEOPRENE GLOVES.

**SPECIAL CLOTHING AND EQUIPMENT:**

POLYESTER OR ACRYLIC FULL CLOTHING. (AVOID COTTON, WOOL, AND LEATHER)

**FOOTWEAR:**

RUBBER OR NEOPRENE FOOTWEAR. (AVOID LEATHER)

## 9. PHYSICAL AND CHEMICAL PROPERTIES

MELTING/FREEZING POINT:	40%	60%
	—41.4°C (—42.5°F)	—52°C (—62°F)
BOILING POINT:	110°C (229°F)	114°C (237°F)
VAPOR PRESSURE:	22 MM HG @ 30°C	18.3 MM HG @ 30°C
VAPOR DENSITY (AIR=1):	NO DATA	NO DATA
APPEARANCE AND STATE (ROOM TEMP.)	<-----CLEAR TO COLORLESS----->	
ODOR:	<-----ODORLESS----->	
SPECIFIC GRAVITY (H <sub>2</sub> O=1):	1.15 @ 20C/4C	1.19 @ 20C/4C
SOLUBILITY IN H <sub>2</sub> O % BY WT:	<-----100%----->	
% VOLATILES:	<-----100%----->	
EVAPORATION RATE (BUTYL ACETATE=1)	<-----ABOVE 1----->	
pH (AS IS):	<-----1.0 - 3.0----->	
pH (1% SOLUTION):	<-----5.0 - 6.0----->	
ODOR THRESHOLD:	<-----NOT AVAILABLE----->	
PARTITION COEFFICIENT (N-OCTANO/WATER):	<-----NOT AVAILABLE----->	
FLASH POINT:	<-----NON COMBUSTIBLE----->	
AUTOIGNITION TEMPERATURE:	<-----NON COMBUSTIBLE----->	
FLAMMABLE LIMITS (AIR)	UPPER:	<-----NON COMBUSTIBLE----->
	LOWER:	<-----NON COMBUSTIBLE----->
EXPLOSIVE PROPERTIES:	<-----NOT APPLICABLE----->	
OXIDIZING PROPERTIES:	STRONG OXIDIZER	
SOLUBILITY FAT SOLUBILITY (SOLBENT OIL)	NO DATA AVAILABLE	

## 10. STABILITY AND REACTIVITY

STABILITY:

STABLE UNDER NORMAL CONDITIONS

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

CONDITIONS TO AVOID:

EXCESSIVE HEAT OR CONTAMINATION COULD CAUSE PRODUCT TO BECOME UNSTABLE AND DECOMPOSE.



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MATERIALS TO AVOID: DIRT, ORGANICS, CYANIDES, AND COMBUSTIBLES SUCH AS WOOD, PAPER, OILS, ETC.

MAJOR CONTAMINANTS THAT CONTRIBUTE TO INSTABILITY: IRON AND OTHER HEAVY METALS, COPPER ALLOYS AND CAUSTIC.

INCOMPATIBILITY: REDUCING AGENTS, WOOD, PAPER, AND OTHER COMBUSTIBLES (SEE ABOVE)

HAZARDOUS DECOMPOSITION PRODUCTS: OXYGEN THAT SUPPORTS COMBUSTION

SENSITIVITY TO MECHANICAL IMPACT: NO DATA AVAILABLE

SENSITIVITY TO STATIC DISCHARGE: NO DATA AVAILABLE

**11. TOXICOLOGICAL INFORMATION**

EYE CONTACT: SEVERE IRRITANT/CORROSIVE (RABBIT) (70% H<sub>2</sub>O<sub>2</sub>) REF. ICG/T-79.027

SKIN CONTACT: SEVERE IRRITANT/CORROSIVE (RABBIT) (50% H<sub>2</sub>O<sub>2</sub>) REF. I89-1079

SKIN ABSORPTION: LD<sub>50</sub>>6.5 G/KG (RABBIT) (70% H<sub>2</sub>O<sub>2</sub>) REF. ICG/T-79.027

INHALATION: LC<sub>50</sub>>0.17 MG/L (RAT) (50% H<sub>2</sub>O<sub>2</sub>) REF. I89-1080

INGESTION: LD<sub>50</sub>>225 MG/KG AND <1200 MG/KG (RAT) (50% H<sub>2</sub>O<sub>2</sub>) REF. I86-914

**ACUTE EFFECTS FROM OVEREXPOSURE:**

SEVERE IRRITANT/CORROSIVE TO EYES, SKIN, AND GASTROINTESTINAL TRACT. MAY CAUSE IRREVERSIBLE TISSUE DAMAGE TO THE EYES, INCLUDING BLINDNESS. INHALATION OF MIST OR VAPORS MAY BE SEVERELY IRRITATING TO NOSE, THROAT, AND LUNGS.

**CHRONIC EFFECTS FROM OVEREXPOSURE: (EFFECTS CONSIDERED INCLUDE: SENSITIVITIES, CARCINOGENICITY, TERATOGENICITY, MUTAGENICITY, SYNERGISTIC PRODUCTS, AND ANY MEDICAL CONDITIONS GENERALLY RECOGNIZED AS BEING AGGRAVATED BY EXPOSURE.)**

THERE ARE REPORTS OF LIMITED EVIDENCE OF CARCINOGENICITY OF HYDROGEN PEROXIDE TO MICE ADMINISTERED HIGH CONCENTRATIONS IN THEIR DRINKING WATER (IARC ONOGRAPH 36,1985). HOWEVER, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER CONCLUDED THAT HYDROGEN PEROXIDE COULD NOT BE CLASSIFIED AS TO ITS CARCINOGENICITY TO HUMANS (GROUP III CARCINOGEN).

**12. ECOLOGICAL INFORMATION**

**ENVIRONMENTAL FATE:**

H<sub>2</sub>O<sub>2</sub> IN THE AQUATIC ENVIRONMENT IS SUBJECT TO VARIOUS REDUCTION OR OXIDATION PROCESSES AND DECOMPOSES INTO WATER AND OXYGEN. H<sub>2</sub>O<sub>2</sub> HALF LIFE IN FRESHWATER RANGED FROM 8 HOURS TO 20 DAYS, IN AIR FROM 10-20 HOURS AND IN SOILS FROM MINUTES TO HOURS DEPENDING UPON MICROBIOLOGICAL ACTIVITY AND METAL CONTAMINANTS.

ENVIRONMENTAL EFFECTS: CHANNEL CATFISH 96 HR LC<sub>50</sub> = 37.4 MG/L

FATHEAD MINNOW 96 HR LC<sub>50</sub> = 16.4 MG/L

DAPHNIA MAGNA 24 HR LC<sub>50</sub> = 7.7 MG/L

DAPHNIA PULE 48 HR LC<sub>50</sub> = 2.4 MG/L

PHYSA SP. 96 HR LC<sub>50</sub> = 17.7 MG/L

(FRESHWATER SNAIL)

FOR MORE INFORMATION REFER TO ECETOC "JOINT ASSESSMENT OF COMMODITY CHEMICALS NO. 22, HYDROGEN PEROXIDE." ISSN-0773-6339, JANUARY 1993.



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## 13. DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:**

AN ACCEPTABLE METHOD OF DISPOSAL IS TO DILUTE WITH A LARGE AMOUNT OF WATER AND ALLOW THE HYDROGEN PEROXIDE TO DECOMPOSE FOLLOWED BY DISCHARGE INTO A SUITABLE TREATMENT SYSTEM IN ACCORDANCE WITH ALL REGULATORY AGENCIES. BECAUSE ACCEPTABLE METHODS OF DISPOSAL MAY VARY BY LOCATION AND BECAUSE REGULATORY REQUIREMENTS MAY CHANGE, THE APPROPRIATE REGULATORY AGENCIES SHOULD BE CONTACTED PRIOR TO DISPOSAL.

## 14. TRANSPORT INFORMATION

**DOT PROPER SHIPPING NAME:**

HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS WITH MORE THAN 40 PERCENT BUT NOT MORE THAN 60 PERCENT HYDROGEN PEROXIDE.

IATA:	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS WITH MORE THAN 40 BUT NOT MORE THAN 60 PERCENT HYDROGEN PEROXIDE.
IMDG:	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS WITH MORE THAN 40 BUT NOT MORE THAN 60 PERCENT HYDROGEN PEROXIDE.
DOT CLASSIFICATION:	5.1 (OXIDIZER)
DOT LABELS:	OXIDIZER, CORROSIVE
DOT MARKING:	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS WITH MORE THAN 40 BUT NOT MORE THAN 60 PERCENT HYDROGEN PEROXIDE. UN 2014
DOT PLACARD:	5.1 (OXIDIZER)
UN NUMBER:	UN 2014
HAZARDOUS SUBSTANCE/RQ:	NOT APPLICABLE
49 STCC NUMBER:	4918776
PRECAUTIONS:	PROTECT FROM PHYSICAL DAMAGE. KEEP DRUMS IN TRANSPORT IN UPRIGHT POSITION. DRUMS SHOULD NOT BE STACKED IN TRANSIT. DO NOT STORE DRUMS ON WOODEN PALLETS.
OTHER SHIPPING INFORMATION:	ALUMINUM TANKS, DRUM/DOT 420, PACKING GROUP II

## 15. REGULATORY INFORMATION

## OSHA EXPOSURE LIMITS

SUBSTANCE(S):	HYDROGEN PEROXIDE
OSHA PEL-TWA:	1 PPM
STEL:	NOT APPLICABLE
CEILING:	NOT APPLICABLE
SKIN DESIGNATION:	NOT APPLICABLE
ACGIH TLV-TWA:	1 PPM
STEL:	NOT APPLICABLE
CEILING:	NOT APPLICABLE
SKIN DESIGNATION:	NOT APPLICABLE

TARGET ORGAN EFFECTS: SENSORY IRRITATION, EYE, LUNGS, AND SKIN

CARCINOGENIC POTENTIAL:	HYDROGEN PEROXIDE
REGULATED BY OSHA:	NO
LISTED ON NTP REPORT:	NO
IARC GROUP 1, 2A, 2B:	NO



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**US EPA REQUIREMENTS**

RELEASE REPORTING	CERCLA (40 CFR 302)	NOT LISTED
LISTED SUBSTANCE(S):		NO
RQ:		NOT APPLICABLE
CATEGORY:		NOT APPLICABLE
RCRA WASTE NO:		NOT APPLICABLE
UNLISTED SUBSTANCE(S):		HYDROGEN PEROXIDE 45.0-59.5%
RQ:		100 LB.
CATEGORY:		IGNITABILITY, CORROSIVITY
RCRA WASTE NO:		D001, D002
SARA TITLE III SEC 313 (40 CFR 372):		NOT LISTED
LISTED TOXIC CHEMICAL:		NOT LISTED
REPORTING THRESHOLD:		NOT APPLICABLE

**INVENTORY REPORTING**

SARA TITLE III SEC 311/312 (40 CFR 370)	
SUBSTANCE(S):	HYDROGEN PEROXIDE 45.0-59.5%
HAZARD CATEGORY:	FIRE HAZARD, IMMEDIATE (ACUTE) HEALTH HAZARD

PLANNING THRESHOLD.....:	CONC. > 52%	CONC. < 52%
	500 LB.	10,000 LB.

**EMERGENCY PLANNING**

SARA TITLE III SEC 302/303 (40 CFR 355)	
LISTED SUBSTANCE(S):	HYDROGEN PEROXIDE > 52%
RQ:	1 LB.
PLANNING THRESHOLD:	1000 LB.
US TSCA STATUS:	LISTED

**CANADIAN INGREDIENT DISCLOSURE LIST**

SUBSTANCE(S):	HYDROGEN PEROXIDE > 52%
CONTROLLED PRODUCT:	YES
HAZARD SYMBOLS:	CORROSIVE, OXIDIZING, MATERIALS CAUSING OTHER TOXIC EFFECTS
CLASS & DIVISION:	CLASS C, CLASS D, DIV. 2 SUBDIV. B, CLASS E
PRODUCT IDENTIFICATION NO.	2014

**DOMESTIC SUBSTANCE LIST:**

CEPA PRIORITY LIST:	LISTED
CARCINOGENICITY:	NOT LISTED

**ACGIH APPENDIX A:**

A1 - CONFIRMED HUMAN:	NOT LISTED
A1 - SUSPECTED HUMAN:	NOT APPLICABLE
IARC GROUP 1 OR 2:	NOT APPLICABLE
	NO

**LABEL LANGUAGE (US/CANADA)**

HEALTH:	DANGER - CORROSIVE TO EYES AND SKIN. DIRECT EYE CONTACT MAY CAUSE IRREVERSIBLE TISSUE DAMAGE INCLUDING BLINDNESS. INHALATION OF MIST OR VAPOR COULD CAUSE IRRITATION OF LUNGS, NOSE, AND THROAT, USUALLY SUBSIDES AFTER EXPOSURE CEASES. DO NOT INGEST. CORROSIVE TO GASTROINTESTINAL TRACT. MAY BE FATAL IF SWALLOWED.
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**PHYSICAL:** OXIDIZER INITIATES COMBUSTION IN OTHER MATERIALS BY CAUSING FIRE THROUGH RELEASE OF OXYGEN.

**HANDLING AND STORAGE:**

KEEP CONTAINER IN COOL PLACE (AVOID EXCESSIVE HEAT), AWAY FROM COMBUSTIBLES SUCH AS WOOD, PAPER, OILS, ETC. STORE ONLY IN VENTED CONTAINERS. STORAGE SHOULD CONFORM TO STANDARDS IN NFPA BULLETIN 43A. AVOID CONTAMINATION CONTAMINATION COULD CAUSE DECOMPOSITION AND GENERATION OF OXYGEN WHICH MAY RESULT IN HIGH PRESSURES AND POSSIBLE CONTAINER RUPTURE. DO NOT RETURN UNUSED MATERIAL TO THE ORIGINAL CONTAINER.

WEAR CUP TYPE CHEMICAL SAFETY GOGGLES AND/OR FULL FACE MASK. USE ONLY SUITABLE PROTECTIVE CLOTHING, E.G., RUBBER, NEOPRENE OR SYNTHETIC FIBERS (AVOID COTTON, WOOL, AND LEATHER). USE GLASS, STAINLESS STEEL, ALUMINUM, OR PLASTIC MATERIALS WHEN HANDLING HYDROGEN PEROXIDE. EMPTY DRUMS SHOULD BE TRIPLE RINSED WITH WATER BEFORE DISCARDING.

**FIRST AID:**

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. SEE A PHYSICIAN. WASH CLOTHING BEFORE REUSE.

IF SWALLOWED, DRINK PLENTY OF WATER TO DILUTE. DO NOT INDUCE VOMITING. SEE A PHYSICIAN IMMEDIATELY. CALL THE POISON CONTROL CENTER AT (800) 764-7661 OR (800) 876-4766.

**STATE REGULATIONS:** CALIFORNIA PROPOSITION 65  
SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT OF 1986 REQUIRES THE GOVERNMENT OF CALIFORNIA TO DEVELOP A LIST OF CARCINOGENS (A) AND REPRODUCTIVE TOXINS (B). NO PERSONS DOING BUSINESS SHALL KNOWINGLY EXPOSE ANY INDIVIDUAL TO A CHEMICAL ON THIS LIST. 70% HYDROGEN PEROXIDE CONTAINS THE INDICATED CONCENTRATION(S) OF LISTED CHEMICALS: CADMIUM (A) LESS THAN 0.1 ppm, CHROMIUM (B) LESS THAN 0.2 ppm, AND LEAD (C) LESS THAN 0.5 ppm. PERCENTAGES LESS THAN 70% HYDROGEN PEROXIDE WOULD CONTAIN PROPORTIONATELY LESS.

**16. OTHER INFORMATION (PRODUCT USES):**

DUROX (TM) 50% REG & LR MEETS FOOD CHEMICAL CODEX REQUIREMENTS FOR ASEPTIC PACKAGING AND OTHER FOOD RELATED APPLICATIONS.

OXPURE<sup>®</sup> 50% CERTIFIED BY NSF TO MEET ANSI/NSF STD. 60 REQUIREMENTS FOR DRINKING WATER TREATMENT.

HY BRITE<sup>®</sup> 50% USED FOR METAL TREATING.

STANDARD 50% GRADE MOST SUITABLE FOR INDUSTRIAL BLEACHING, PROCESSING, POLLUTION ABATEMENT AND GENERAL OXIDATION REACTIONS.

SEMICONDUCTOR REG & SEG 50% GRADES, CONFORM TO ACS AND SEMI SPECS. FOR WAFER ETCHING AND CLEANING AND APPLICATIONS REQUIRING LOW RESIDUES.

SUPER D<sup>®</sup> 50% COMPLIES WITH PHARMACOPOEIA SPECIFICATIONS SUITABLE FOR PREPARING DILUTE SOLUTIONS FOR PHARMACEUTICAL AND/OR COSMETIC APPLICATIONS. TECHNICAL 50% ESSENTIALLY FREE OF INORGANIC METALS, SUITABLE FOR CHEMICAL SYNTHESIS.

CHLORATE GRADE 50% SPECIALLY FORMULATED FOR USE IN CHLORATE MANUFACTURE OR PROCESSING.



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THE CONTENTS AND FORMAT OF THIS MSDS ARE IN ACCORDANCE WITH OSHA HAZARD COMMUNICATION STANDARD AND CANADA'S WORKPLACE HAZARDOUS INFORMATION SYSTEM (WHMIS). ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, ASP MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND ADVANCED STERILIZATION PRODUCT'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT OR FROM THE PUBLICATION OF USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

Reference: HYDROGEN PEROXIDE 40-60% MATERIAL SAFETY DATA SHEET FROM VAN WATERS & ROGERS INC., VERSION 003, MSDS# FZ000041



## MATERIAL SAFETY DATA SHEET

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## CIDEX® OPA SOLUTION

FOR PRODUCT ASSISTANCE CONTACT ADVANCED STERILIZATION PRODUCTS - (800) 755-5900

EMERGENCY TELEPHONE NUMBERS: CHEMTREC (800) 262-8200

Prepared to U.S. OSHA, CMA, ANSI, and Canadian WHMIS

**Advanced Sterilization Products  
a Johnson & Johnson Company  
33 Technology Drive  
Irvine, CA 92618-2346**

**PART I** *What is the material and what do I need to know in an emergency?*

**1. PRODUCT IDENTIFICATION**

TRADE NAME (AS LABELED):

**CIDEX® OPA SOLUTION**

CHEMICAL NAME/CLASS:

Ortho-phthalaldehyde and Inorganic Salt Solution,  
CAS # 643-79-8

PRODUCT USE:

High Level Disinfectant

SUPPLIER/MANUFACTURER'S NAME:

**ADVANCED STERILIZATION PRODUCTS**

U.S. ADDRESS:

33 Technology Drive  
Irvine, CA 92618

U.S. EMERGENCY PHONE:

CHEMTREC: 1-800-424-9300  
CHEMTREC INTERNATIONAL: 1-703-527-3887

U.S. BUSINESS PHONE:

1-800-595-0200

DATE OF PREPARATION:

Release date.

**2. COMPOSITION and INFORMATION ON INGREDIENTS**

Ingredients that are 1% or greater need to be reported on an MSDS unless the component is carcinogenic. Since CIDEX OPA Solution has the active ingredient at 0.55% (99.45% inactive ingredients), and none of the components are carcinogenic, this section is not applicable.

**3. HAZARD IDENTIFICATION**

**EMERGENCY OVERVIEW:** This is a clear, light blue solution that is practically odorless. **Health Hazards:** This product is predominantly water and presents minimal hazards. The health hazards associated with contact with this product include the potential for irritation of the eyes, skin, nose, and other tissues. **Flammability Hazards:** Non flammable. **Reactivity Hazards:** Negligible.



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**LIKELY ROUTE OF EXPOSURE:** Inhalation, skin/eye contact.

**INHALATION:** Breathing vapors may be irritating to the nose, throat, or respiratory system. May cause coughing, chest discomfort and tightness, difficulty when breathing, or headache. Symptoms subside when exposure ends. Preexisting bronchitis or asthma conditions can be aggravated by exposure to this product. Heating of the solution will increase its potential for irritation.

**CONTACT WITH SKIN or EYES:** Persons with potential exposure should not wear contact lenses. Direct eye contact with the product may cause stinging, excess tearing, and redness. Skin contact may cause staining, especially after prolonged exposure. Repeated skin contact may cause dermatitis.

**INGESTION:** Ingestion may cause irritation or chemical burns of the mouth, throat, esophagus, and stomach. Symptoms may include vomiting, diarrhea, and nausea.

**INJECTION:** Injection of this material would lead to pain, mild irritation, and swelling at the site of injection.



**HAZARDOUS MATERIAL INFORMATION SYSTEM**

**HEALTH** (BLUE) 1

**FLAMMABILITY** (RED) 0

**REACTIVITY** (YELLOW) 0

**PROTECTIVE EQUIPMENT** B

EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		SEE SECTION 8
1. For routine applications.			

**PART II** *What should I do if a hazardous situation occurs?*

**4. FIRST-AID MEASURES**

**SKIN EXPOSURE:** Wash affected area immediately with plenty of soap and water for at least 15 minutes. If a skin reaction should occur, seek medical advice.

**EYE EXPOSURE:** Go to the nearest eyewash station and rinse immediately with plenty of water for at least 15 minutes. Seek medical advice.

**INHALATION:** If inhaled, remove person exposed to fresh air, and seek medical advice.

**INGESTION:** If swallowed, do not induce vomiting. Seek medical advice immediately. **CALL PHYSICIAN OR YOUR LOCAL POISON CONTROL CENTER FOR MOST CURRENT INFORMATION.**

**5. FIRE-FIGHTING MEASURES**

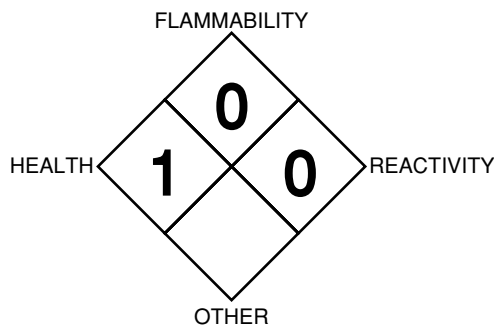
**FLASH POINT:** Not applicable.

**FLAMMABLE LIMITS (in air by volume, %):** Not applicable.

**FIRE EXTINGUISHING MATERIALS:** Select fire extinguishing media appropriate for the surrounding area.

**SPECIAL FIRE-FIGHTING PROCEDURES:** Wear self contained breathing apparatus, eye protection and protective clothing to prevent contact with skin and eyes.

**NFPA RATING**





## MATERIAL SAFETY DATA SHEET

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## CIDEX® OPA SOLUTION

**6. ACCIDENTAL RELEASE MEASURES**

**RELEASE RESPONSE:** Responders should wear appropriate personal protective equipment (for example, chemical goggles, gloves, apron, or lab coat) during the clean up of spills. See Section 13 for disposal.

For spill neutralization, sprinkle approximately 25 grams of glycine (free base) powder per gallon of estimated CIDEX® OPA Solution spill. With a mop or other tool, thoroughly blend the glycine into the spill. Allow 5 minutes for deactivation of *o*-phthalaldehyde. Close storm-water drains and take other measures to protect human health and the environment, as necessary. Place all neutralized spill residue and disposable clean-up materials in an appropriate container and seal. Rinse area and tools with soap and water solution and follow with a water rinse. Dispose of in accordance with applicable U.S. Federal, state, or local regulations, or appropriate standards of Canada (see Section 13, Disposal Considerations).

**PART III** *How can I prevent hazardous situations from occurring?***7. HANDLING and STORAGE**

**WORK AND HYGIENE PRACTICES:** All employees working with this product must be properly trained. Avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Avoid breathing mists and sprays of this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

**STORAGE AND HANDLING PRACTICES:** Store containers in a cool, dry location (15-30°C, 59-86°F), away from direct sunlight, or sources of intense heat. Store away from incompatible materials (see Section 10, Stability and Reactivity). Keep container tightly closed when not in use. Empty containers may contain residual amounts of this product; and must be triple rinsed prior to disposal.

**8. EXPOSURE CONTROLS - PERSONAL PROTECTION**

**VENTILATION AND ENGINEERING CONTROLS:** Use adequate ventilation. If existing ventilation is not adequate, product should be used with a local exhaust hood, or in ductless fume hoods/portable ventilation system.

**RESPIRATORY PROTECTION:** None normally required for routine use.

**EYE PROTECTION:** Safety glasses/goggles as authorized in 29 CFR 1910.133, applicable U.S. State regulations, or the appropriate standards of Canada.

**HAND PROTECTION:** Latex, PVC, or nitrile rubber gloves for routine use. Latex gloves should be changed frequently (every 10-15 minutes) during use of product. Use double gloves for spill response (latex covered by nitrile rubber) and follow Accidental Release Measures provided in Section 6 of this MSDS.

**BODY PROTECTION:** Use safety glasses/chemical goggles, gloves, apron, or lab coat.

**9. PHYSICAL and CHEMICAL PROPERTIES**

**EVAPORATION RATE** (n-BuAc = 1): Similar to water.

**COLOR:** Clear, light blue.

**SPECIFIC GRAVITY** (water = 1): 1.0003 g/cc

**MELTING/FREEZING POINT:** 0°C (32°F)

**SOLUBILITY IN WATER:** Soluble.

**BOILING POINT:** 100°C (212°F)

**pH** (0.1 M Solution): 7.2-7.8.

**ODOR:** Practically odorless.

**FLASH POINT:** Not applicable.

**FORM:** Liquid.

**HOW TO DETECT THIS SUBSTANCE** (warning properties): The color may be a distinguishing characteristic for this product, if spilled. The product stains proteins on surfaces to grey/black.



**CIDEX® OPA SOLUTION**

**10. STABILITY and REACTIVITY**

STABILITY: Stable.

INCOMPATIBILITY: Strong acids, strong bases, and strong oxidizers.

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**PART IV** *Is there any other useful information about this material?*

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**11. TOXICOLOGICAL INFORMATION**

TOXICITY DATA:

Eye exposure (rabbit) = slightly irritating, but reversible in seven days

LD<sub>50</sub> (oral, rat) > 5000 mg/kg

LD<sub>50</sub> (skin, rabbit) > 2000 mg/kg

SUSPECTED CANCER AGENT: This product's components are not found on the following lists: U.S. FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA.

SENSITIZATION TO THE PRODUCT: Non sensitizer

REPRODUCTIVE TOXICITY INFORMATION

Mutagenicity: Rat (acute in vivo cytogenetics assay with OPA >99%) — Negative  
(Gene mutation in mammalian cells in vitro with OPA >99%) — Negative  
Ames Assay (gene mutation in bacteria with OPA >99%) — Negative  
(Sister chromatid exchange assay in vitro with Chinese hamster ovary cells OPA >99%) — weakly positive.

Teratology: Rat NOEL: 20 mg/kg/day

No controlled clinical study data is available.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Preexisting asthma, bronchitis, or dermatitis and other skin disorders can be aggravated by exposure to this product.

RECOMMENDATIONS TO PHYSICIANS: Probable mucosal damage from oral exposure may contraindicate the use of gastric lavage.

**12. ECOLOGICAL INFORMATION**

ENVIRONMENTAL STABILITY: The components of this product will slowly decompose into inorganic and organic compounds.

**13. DISPOSAL CONSIDERATIONS**

Waste disposal must be in accordance with appropriate U.S. Federal, state, and local regulations or with regulations of Canada. Spent CIDEX® OPA Solution may be disposed down the drain, where authorized.

**14. TRANSPORTATION INFORMATION**

THIS MATERIAL IS NOT HAZARDOUS, PER THE U.S. DEPARTMENT OF TRANSPORTATION (49 CFR 172.101).

MARINE POLLUTANT: No component of this product is designated as a Marine Pollutant, per Appendix B to 49 CFR 172.101.

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS NOT CONSIDERED AS DANGEROUS GOODS.



## MATERIAL SAFETY DATA SHEET

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## CIDEX® OPA SOLUTION

## 15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: The components of this product are not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the California Proposition 65 lists.

**ADDITIONAL CANADIAN REGULATIONS:**

CANADIAN DSL/NDL INVENTORY STATUS: The components of this product are listed on the DSL inventory.

CANADIAN WHMIS SYMBOLS: **Class D2B: Other Toxic Effects**

## 16. OTHER INFORMATION


**PREPARED BY:** Advanced Sterilization Products  
33 Technology Drive  
Irvine, CA 92618

**DATE OF PRINTING:** October 25, 1999

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. Advanced Sterilization Products assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, Advanced Sterilization Products assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in her use of the material.



## INSTITUTIONAL FORMULA DRANO

<b>National Fire Protection Association (NFPA)</b>	<b>Fire Hazard</b>  <b>Specific Hazard</b>	<b>Hazardous Material Information System (HMIS)</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #cccccc;">Health</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="background-color: #333333; color: white;">Fire Hazard</td> <td style="text-align: center; color: white;">0</td> </tr> <tr> <td style="background-color: #cccccc;">Reactivity</td> <td style="text-align: center;">1</td> </tr> </table>	Health	3	Fire Hazard	0	Reactivity	1
Health	3								
Fire Hazard	0								
Reactivity	1								
<b>Protective Clothing</b>	Hand, feet, and eye protection required	<b>Emergency Overview</b>	Clear Straw color. Liquid. See Section 9. <b>DANGER. CORROSIVE. CAUSES EYE AND SKIN BURNS. HARMFUL OR FATAL IF SWALLOWED.</b>						

### Section 1. Chemical Product and Company Identification

<b>Product Name</b>	INSTITUTIONAL FORMULA DRANO	<b>Code</b>	90485
<b>Product Use</b>	Industrial/Institutional: Cleaning product.	<b>PMS#</b>	433205
<b>MSDS#</b>	126061002	<b>Validation Date</b>	04/19/2000
<b>U.S. Headquarters</b> Drackett Professional A Division of S.C. Johnson Commercial Markets, Inc. 8310 16th Street Sturtevant, Wisconsin 53177-0902 Phone: (888) 352-2249		<b>Print Date</b>	04/20/2000
		<b>Supersedes</b>	04/13/2000
		<b>In Case of Emergency</b>	(800) 851-7145

### Section 2. Composition and Information on Ingredients

Ingredients	CAS #	% by Weight	Exposure Limits	LC50/LD50
Sodium Hydroxide	1310-73-2	30-60	CEIL: 2 (mg/m <sup>3</sup> ) from OSHA (PEL) [United States] STEL: 2 (mg/m <sup>3</sup> ) from ACGIH (TLV) [United States]	Not available.
Water	7732-18-5	60-100	Not available.	Not applicable.

### Section 3. Hazards Identification

<b>Routes of Entry</b>	Inhalation. Skin contact. Eye contact.
<b>Potential Acute Health Effects</b>	
<i>Eyes</i>	Corrosive. May cause permanent damage including blindness.
<i>Skin</i>	Corrosive. May cause permanent damage.
<i>Inhalation</i>	May cause irritation and corrosive effects to nose, throat, and respiratory tract.
<i>Ingestion</i>	Corrosive. May cause burns to mouth, throat, and stomach.
<b>Medical Conditions Aggravated by Overexposure:</b>	None known.
<b>See Toxicological Information (section 11)</b>	

Continued on Next Page

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**INSTITUTIONAL FORMULA DRANO**

<b>Section 4. First Aid Measures</b>	
<b>Eye Contact</b>	Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Get medical attention immediately.
<b>Skin Contact</b>	Flush immediately with plenty of water for at least 15 minutes. Get medical attention immediately.
<b>Inhalation</b>	If breathing is difficult: Remove to fresh air. Get medical attention immediately.
<b>Ingestion</b>	Do not induce vomiting! Immediately drink plenty of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
<b>Section 5. Fire Fighting Measures</b>	
<b>Flammability of the Product</b>	None known.
<b>Flash Points</b>	Not available.
<b>Products of Combustion</b>	None known.
<b>Fire Fighting Media and Instructions</b>	Extinguish with water spray or carbon dioxide, dry chemical powder or appropriate foam. Normal fire fighting procedure may be used.
<b>Protective Clothing (Fire)</b>	Put on appropriate personal protective equipment (see Section 8).
<b>Special Remarks on Fire and Explosion Hazards</b>	Corrosive material (see Sections 8 and 10).
<b>Section 6. Accidental Release Measures</b>	
<b>Personal Precautions</b>	Put on appropriate personal protective equipment (see Section 8).
<b>Environmental Precautions and Clean-up Methods</b>	In the event of major spillage: Use appropriate containment to avoid environmental contamination. Sweep or scrape up material. Place in suitable clean, dry containers for disposal by approved methods. Use a water rinse for final clean-up.
<b>Section 7. Handling and Storage</b>	
<b>Handling</b>	Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Avoid breathing vapors or spray mists. Wash thoroughly after handling. Remove and wash contaminated clothing and footwear before re-use. Product residues may remain on/in empty containers. All precautions for handling the product must be used in handling the empty container and residue. <b>FOR INDUSTRIAL USE ONLY.</b>
<b>Storage</b>	Store in a dry, cool, and well-ventilated area. Protect from freezing. Keep container tightly closed. <b>KEEP OUT OF REACH OF CHILDREN.</b>
<b>Section 8. Exposure Controls/Personal Protection</b>	
<b>Engineering Controls</b>	Good general ventilation should be sufficient to control airborne levels. Respiratory protection is not required if good ventilation is maintained.
<b>Personal Protection</b>	
<i>Eyes</i>	Chemical splash goggles.
<i>Hands</i>	Chemical resistant gloves. Includes: Rubber gloves. Neoprene gloves.
<i>Respiratory</i>	If mists/vapors are not adequately controlled by ventilation, use appropriate respiratory protection to avoid over exposure. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.
<i>Feet</i>	No special protective clothing is required.
<i>Body</i>	If major exposure is possible, wear suitable protective clothing and footwear.

Continued on Next Page

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**INSTITUTIONAL FORMULA DRANO****Section 9. Physical and Chemical Properties**

Physical State and Appearance	Liquid.
Odor	Ammoniacal.
Color	Clear. Straw color.
pH	>13 [Basic.]
Specific Gravity	1.35
Boiling/Condensation Point	120°C (248°F)
Melting/Freezing Point	0°C (32°F)
Solubility in Water	Complete.

**Section 10. Stability and Reactivity**

Stability and Reactivity	The product is stable.
Conditions of Instability	None known.
Incompatibility with Various Substances	Reactive with oxidizing agents, acids. Do not mix with any other chemicals or products unless specified by label.
Hazardous Decomposition Products	When exposed to fire: Produces normal products of combustion.
Hazardous Polymerization	Will not occur.

**Section 11. Toxicological Information**

Acute Toxicity	ORAL (LD50). Estimated to be less than 500 mg/kg (rat).
Effects of Chronic Exposure	None known.
Other Toxic Effects	Not available.

**Section 12. Ecological Information**

Not available.

**Section 13. Disposal Considerations**

Waste Information	Undiluted product is regulated under environmental and transportation laws as a corrosive waste. Dispose of according to all federal, state, and local regulations.
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**Section 14. Transport Information**

<b>DOT Classification</b>	
DOT Proper Shipping Name	Corrosive liquids, n.o.s. (Sodium hydroxide)
DOT Class	Class 8: Corrosive material
UN/NA	UN1760
Packing Group	II
DOT Special Considerations	Limited Quantity
<b>TDG Classification</b>	
TDG Class	Not applicable
PIN/NIP	
TDG Special Considerations	

*Continued on Next Page*

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**INSTITUTIONAL FORMULA DRANO**

**Section 15. Regulatory Information**

Reporting in this section is based on ingredients disclosed in Section 2

**US Regulations**

<b>Federal</b>	Clean Water Act (CWA) 311: Sodium Hydroxide CERCLA: Hazardous substances.: Sodium Hydroxide
<b>State</b>	New Jersey spill list: Sodium Hydroxide New Jersey: Sodium Hydroxide Massachusetts spill list: Sodium Hydroxide Massachusetts RTK: Sodium Hydroxide Pennsylvania RTK: Sodium Hydroxide

This product is not subject to the reporting requirements under California's Proposition 65.

**Registered Product Information** Not applicable.

**Canadian Regulations**

**WHMIS Classifications** Not applicable.

**WHMIS Icon**

**Registered Product Information** Not applicable.

**Chemical Inventory Status** All ingredients of this product are listed or are excluded from listing on the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

**Section 16. Other Information**

**Other Special Considerations** Not available.

**Version** 1

**Notice to Reader**

*This document has been prepared using data from sources considered technically reliable. It does not constitute a warranty, express or implied, as to the accuracy of the information contained within. Actual conditions of use and handling are beyond seller's control. User is responsible to evaluate all available information when using product for any particular use and to comply with all Federal, State, Provincial, and Local laws and regulations.*

**Introduction to Surgical Technology**  
**Section B: Safety**  
**Module 1-B: Environmental Safety**

**OBJECTIVE 28**

**Assignment Sheet 4—Analyze Severe Weather Scenarios**

Name \_\_\_\_\_ Date \_\_\_\_\_

---

**Evaluation criteria**

**Rating**

- Scenario 1 responses appropriate per information in Objective 12 \_\_\_\_\_
- Scenario 2 responses appropriate per information in Objective 12 \_\_\_\_\_

**Overall rating** \_\_\_\_\_

Evaluator's comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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**INTRODUCTION**

You should know how to take shelter should severe weather threaten your place of employment or school building. To take shelter quickly and effectively, you must know your role in your organization's severe weather plan and the location of the building's shelter area.

Most schools and medical facilities hold routine severe weather drills. You must take these drills with the utmost seriousness. Were severe weather to occur, your knowledge of your responsibilities and the organization's shelter locations could save your life and that of others.

The following scenarios were designed to habituate you to the general sequence of actions to take in a severe weather emergency and should not take the place of actual drills at your place of employment or school.

**EXERCISE**

**DIRECTIONS**

Read the scenarios on the following page. Write, in order, the exact steps you would take in response to the weather emergency described. Use additional space as needed.

**Module 1-B: Environmental Safety**

**SCENARIO 1**

You and several of your co-workers are standing before the window on the fifth floor of the hospital, checking out the “weird” weather. It is hailing, and though it is only mid-afternoon, it has become very dark. The air has a greenish tinge to it. Just as you are about to return to work, the radio at the nurse’s station announces that a tornado watch is in effect for your county. What do you do?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

**SCENARIO 2**

Earlier, you heard on the radio that your county is under a tornado watch. You and several of your co-workers are standing before the window on the fifth floor of the hospital, checking out the “weird” weather. It is hailing, and though it is only mid-afternoon, it has become very dark. The air has a greenish tinge to it. Just as you are about to return to work, the local civil defense severe weather alarm sounds, and the radio at the nurse’s station announces that a tornado warning is in effect. What do you do?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

**Introduction to Surgical Technology**  
**Section B: Safety**  
**Module 1-B: Environmental Safety**

**OBJECTIVE 29**

**Assignment Sheet 5—Analyze Fire Emergency Scenarios**

Name \_\_\_\_\_ Date \_\_\_\_\_

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**Evaluation criteria**

**Rating**

- Scenario 1 responses appropriate per information in Objectives 14 and 15 \_\_\_\_\_
- Scenario 2 responses appropriate per information in Objectives 14 and 15 \_\_\_\_\_

**Overall rating** \_\_\_\_\_

Evaluator's comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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**INTRODUCTION**

You should know how to immediately evacuate your place of employment or school building in case of fire. To evacuate a building quickly and effectively, you must know your organization's fire evacuation plan, your designated role(s) in that plan, and all building evacuation routes.

Schools and medical facilities hold routine fire evacuation drills. These drills must be taken with the utmost seriousness. Were a real fire to occur, your knowledge of your responsibilities and proper evacuation routes could save your life and that of others.

The following scenarios were designed to habituate you to the sequence of actions to take in a fire emergency. They, of course, should not take the place of actual fire drills at your place of employment or school.

**EXERCISE**

**DIRECTIONS**

Read the scenarios on the following page. Write, in order, the exact steps you would take in response to the fire emergency described. Use additional space as needed.

## Module 1-B: Environmental Safety

### SCENARIO 1

It is 4 PM, on a cold, rainy December afternoon. You and Almed, a new employee, are in the basement of a hospital in the lab. This is the first day of work for Almed. English is his second language and he has yet to master it with facility. He has not participated in a fire drill and does not know the hospital's evacuation routes and procedures.

When you open the door to an adjoining storage room, you discover, a fast-moving fire climbing chemical storage shelves. What do you do?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_
11. \_\_\_\_\_
12. \_\_\_\_\_

### SCENARIO 2

You are on the fifth floor of the hospital waiting for the elevator. With you is Jean Watson, a nonambulatory surgery patient who you are taking to x-ray on the first floor. Two visitors, a young boy and his mother, are also waiting for the elevator. Just as the four of you enter the elevator, the fire alarm goes off. What do you do?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_

10. \_\_\_\_\_

11. \_\_\_\_\_

12. \_\_\_\_\_



**Introduction to Surgical Technology**  
**Section B: Safety**  
**Module 1-B: Environmental Safety**

OBJECTIVE 30

**Assignment Sheet 6—Apply Safety Principles to the  
School and Workplace**

Name \_\_\_\_\_ Date \_\_\_\_\_

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<b>Evaluation criteria</b>	<b>Rating</b>
• Answers are appropriate per information in the Information Sheet and the student's workplace safety procedures	_____
• Answers are relevant and specific	_____
• Answers are legible and grammatical	_____
	<b>Overall rating</b> _____

Evaluator's comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**EXERCISE**

**DIRECTIONS**

Describe what you should do in each of the following situations concerning safety in your school and at your medical facility. Be as specific as possible. Refer to the Information Sheet, to your school handbook, and to the policies and procedures manual for your medical facility as necessary.

**PERSONAL PROTECTIVE EQUIPMENT AND ATTIRE**

1. Required personal protective equipment (PPE) and attire

School \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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**Module 1-B: Environmental Safety**

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Medical Facility \_\_\_\_\_  
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2. Situations under which PPE requirements will vary

School \_\_\_\_\_  
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\_\_\_\_\_  
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Medical Facility \_\_\_\_\_  
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**SAFETY PROCEDURES**

1. You have an accident or see one happen

School \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Medical Facility \_\_\_\_\_  
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2. The plug on a piece of electrical equipment you need to use is dangling from the cord, and the electrical wire is exposed

School \_\_\_\_\_  
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Medical Facility \_\_\_\_\_  
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3. You spill some commercial cleaning agent on your skin and need to find out if the agent can have harmful effects on skin contact

School \_\_\_\_\_  
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Medical Facility \_\_\_\_\_  
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4. You answer the telephone and it is a bomb threat

School \_\_\_\_\_  
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Medical Facility \_\_\_\_\_  
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**SEVERE WEATHER**

1. You hear a severe weather alert (civil defense sirens)

School \_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

High-rise Medical Facility \_\_\_\_\_  
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2. The radio announces a severe weather watch

School \_\_\_\_\_  
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Medical Facility \_\_\_\_\_  
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**FIRE SAFETY**

1. You discover a fire in the rest room wastebasket

School \_\_\_\_\_  
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\_\_\_\_\_

Medical Facility \_\_\_\_\_  
\_\_\_\_\_  
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2. When you open the door to the cleaning supplies closet, the smoke detector goes off and thick smoke billows out. You are facing a fire that has already advanced several storage shelves above your head

School \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

High-Rise Medical Facility \_\_\_\_\_  
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**Introduction to Surgical Technology**  
**Section B: Safety**  
**Module 1-B: Environmental Safety**

**OBJECTIVE 31**

**Job Sheet 1—Use Proper Body Mechanics in Standing, Sitting, Moving, and Lifting**

Name \_\_\_\_\_ Attempt number \_\_\_\_\_

Date \_\_\_\_\_ Overall rating \_\_\_\_\_

<b>Evaluation criteria</b>	<b>Rating</b>
• Demonstrated correct standing posture	_____
• Demonstrated correct sitting posture	_____
• Demonstrated correct moving posture	_____
• Demonstrated correct procedure for lifting a heavy object safely, with and without assistance from another person	_____
<b>Overall rating</b>	_____

Evaluator's comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**INSTRUCTIONS**

When you are ready to perform this task, ask your instructor to observe the procedure and rate your performance using the evaluation criteria.

**EQUIPMENT AND MATERIALS**

- Two students, one to perform the task and one to assist when necessary
- Office with desk, adjustable desk chair, computer, mouse pad, mouse
- Operating room with operating table and scrub sink
- Lumbar roll or towel
- High shelving with object on top shelf
- Stepladder or straight ladder
- Cart and/or wheelchair as appropriate to object being moved
- Heavy object(s) to be lifted and moved
- Watch with second hand

**PROCEDURE**

- 1. Demonstrate correct standing posture while completing the following actions:
  - a. Stand beside operating table for 30 seconds.
    - Align ears, shoulders, hips, knees, and ankles.
    - Relax shoulders, and slightly bend knees.
    - Position feet slightly apart.

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- b. Stand beside operating table for three minutes.
  - Align ears, shoulders, hips, knees, and ankles.
  - Relax shoulders, and slightly bend knees.
  - Position feet slightly apart with one foot elevated on a footstool or rail.
- c. Walk to scrub sink.
  - Align ears, shoulders, hips, knees, and ankles.
  - Hold head erect.
- d. Wash hands at scrub sink.
  - Align ears, shoulders, hips, knees, and ankles.
  - Relax shoulders, and slightly bend knees.
  - Place feet slightly apart.
  - Stand as close to work area as necessary to prevent reaching.
- 2. Demonstrate correct sitting posture while completing the following actions:
  - a. Sit at a desk before a computer.
    - Adjust seat back firmness and angle as necessary.
    - Place a towel or lumbar roll between lower back and back of chair.
    - Align ears over shoulders, and align shoulders over hips.
    - Rest buttocks against chair back.
    - Rest feet on floor or footstool.
  - b. Use a computer.
    - Adjust height of work area as necessary.
    - Place computer screen at eye level and at comfortable distance from eyes.
    - Cushion and support wrist and arm when using computer keyboard.
- 3. Demonstrate correct lifting techniques and moving posture while performing the following actions:
  - a. Retrieve an object from a high shelf.
    - Place a ladder securely and have assistant brace it.
    - Position the ladder so that you do not need to overreach, stretch, or lean from the ladder to retrieve the object.

- b. Move a large, heavy object 10 feet.
  - Ask for help in carrying object.
  - Use a cart, wheelchair, bed sheets, or other device.
  - Pivot, roll, or slide the object if a carrying device is unavailable.
- 4. Demonstrate correct lifting procedure (single-person lift and carry).
  - a. Approach the object and size up its weight.
  - b. Consider your physical ability and determine whether or not you need help in lifting the object.
  - c. Place your feet close to the object and 8 to 12 inches apart for good balance.
  - d. Bend your knees and get a good handhold.
  - e. Using your leg muscles and keeping your back straight, lift the object straight up, keeping it close to your body.
  - f. Lift the object into carrying position, making no turning or twisting movements until the lift is completed.
  - g. Turn your body with changes of foot position after looking over your path of travel, making sure it is clear.
  - h. Carry the object 10 feet.
  - i. Set the object down, bending your knees, keeping your back straight, and using your leg muscles.
- 5. Demonstrate the correct two-person lift and carry procedure:
  - a. Position yourselves on either side of the object.
    - Place your feet close to the object.
    - Keep your feet 8 to 12 inches apart for good balance.
  - b. Bend your knees and get a good handhold.
  - c. Lift object straight up.
    - Use your leg muscles.
    - Coordinate your movements.
    - Keep your back straight.
    - Keep object close to your body.

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- d. Lift the object between you into carrying position.
  - Make no turning or twisting movements until the lift is completed.
  - Carry object on same side of body.
  
- e. Turn in desired direction of travel.
  - First looking over your path of travel, making sure it is clear.
  - Announce the direction you intend to turn.
  - Coordinate your movements.
  - Do not twist; move your feet instead.
  
- f. Carry the object 10 feet.
  - Coordinate your movements.
  
- g. Set the object down.
  - Announce your intentions.
  - Coordinate your actions.
  - Bend your knees.
  - Keep your back straight.
  - Use your leg muscles.

Evaluator's Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Introduction to Surgical Technology**  
**Section B: Safety**  
**Module 1-B: Environmental Safety**

**OBJECTIVE 32**

**Job Sheet 2—Operate a Portable Fire Extinguisher**

Name \_\_\_\_\_ Attempt number \_\_\_\_\_

Date \_\_\_\_\_ Overall rating \_\_\_\_\_

<b>Evaluation criteria</b>	<b>Rating</b>
• Sized up the fire	_____
• Planned escape route	_____
• Identified appropriate extinguisher for fire class	_____
• Pulled pin and tested extinguisher briefly	_____
• Carried extinguisher to within stream reach of fire	_____
• Aimed agent at base of fire and applied agent in slow sweeps	_____
• Applied agent until fire was out	_____
• Backed away from fire area	_____
<b>Overall rating</b>	_____

Evaluator's comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**INSTRUCTIONS**

When you are ready to perform this task, ask your instructor to observe the procedure and rate your performance using the evaluation criteria.

**EQUIPMENT AND MATERIALS**

- Fire department representative to light fire and conduct exercise safely
- Selection of portable fire extinguishers
- Protected outdoor area, free of wind and combustibles (a parking lot or paved area to the lee side of a building works well)
- Small Class A fire in an office-sized trash basket
- Appropriate out-of-order tags

**PROCEDURE**

1. Size up the fire to make sure that it is appropriate to fight with an extinguisher.
2. Determine your escape route.
3. Identify and select an extinguisher appropriate for the type of fire.
4. Pull pin at top of extinguisher to break the inspection band.

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- 5. Test the extinguisher briefly to ensure proper operation.
  - a. Point nozzle in safe direction.
  - b. Discharge very short test burst.
- 6. Carry the extinguisher by its handle to within stream reach of the fire, keeping yourself upwind of the fire with your back to your planned escape route.
- 7. Release the discharge horn or nozzle and aim it at the base of the fire.
- 8. Squeeze the handle to discharge the extinguishing agent in a slow back and forth sweep at base of flames.



**CAUTION:** The frost residue from the carbon dioxide gas that forms on the nozzle horn of carbon dioxide extinguishers can cause frostbite when contacted.

- 9. Continue to apply the agent for several seconds after the flames are extinguished to make sure that fire is out.
- 10. Back away from fire area.
- 11. Tag extinguisher for refill and inspection, and remove from service.

Evaluator's Comments: \_\_\_\_\_

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\_\_\_\_\_