

**Chapter 02: Safety in the Clinical Laboratory**  
**Turgeon: Linné & Ringsrud's Clinical Laboratory Science, 7th Edition**

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**MULTIPLE CHOICE**

1. The newest Patient Safety Goals with application to the laboratory includes:
  - a. improve accuracy of patient identification.
  - b. identify analytical errors by using quality control before releasing results.
  - c. decrease the laboratory turn-around time.
  - d. establish an exact protocol for testing outpatient specimens.

ANS: A

TJC National Patient Safety Goals:

Goals Related to the Laboratory (Effective January 1, 2014)

Goal 1 Improve the accuracy of patient identification.

Goal 2 Improve the effectiveness of communication among caregivers.

Goal 7 Reduce the risk of health care–associated infections.

Reference: The Joint Commission (TJC): National Patient Safety Goals effective January 1, 2013. Goals related to a laboratory accreditation program.

[www.jointcommission.org/Standards](http://www.jointcommission.org/Standards). Retrieved February 1, 2014.

PTS: 1

DIF: Cognitive Level: 2

REF: p. 19

2. Which of the following legislative documents ensures that workers have safe and healthful working conditions?
  - a. Occupational Safety and Health Act
  - b. Hazard Communication Standard
  - c. Clinical Laboratory Improvement Act (CLIA)
  - d. Both a and b

ANS: D

Both the Occupational Safety and Health Act and the Hazard Communication Standard are legislation that ensures that workers have safe and healthful working conditions. The U.S. government created a system of safeguards and regulations under the Occupational Safety and Health Act of 1970 and in 1988 expanded the Hazard Communication Standard to apply to hospital staff.

PTS: 1

DIF: Cognitive Level: 1

REF: p. 22

3. Safety in the clinical laboratory includes:
  - a. a formal safety program.
  - b. chemical hygiene plan.
  - c. bloodborne pathogen plan.
  - d. all of the above.

ANS: D

The Occupational and Safety Health Agency (OSHA) and the Centers for Disease Control and Prevention (CDC) have published numerous safety standards that are applicable to clinical laboratories. Safety in the clinical laboratory includes a formal safety program, specifically mandated plans (e.g., chemical hygiene and bloodborne pathogens), and identification of various hazards (e.g., fire, electrical, chemical, and biological hazards).

PTS: 1

DIF: Cognitive Level: 1

REF: p. 22

4. Information related to hazards associated with chemicals in the workplace must be provided in:
- Laboratory Policy Manual.
  - material safety data sheets (MSDSs).
  - Bloodborne Pathogen Standards information.
  - Standard Operating Procedures Manual.

ANS: B

Hazards associated with chemicals are provided in MSDSs, which describe hazards, safe handling, storage, and disposal of hazardous chemicals. The information is provided by chemical manufacturers and suppliers about each chemical and accompanies the shipment of each chemical.

PTS: 1

DIF: Cognitive Level: 1

REF: p. 23

5. Perhaps the simplest and most important step in the proper handling of any hazardous substance is proper:
- disposal of a chemical.
  - labeling of a substance.
  - storage of a substance.
  - wearing of heavy rubber gloves.

ANS: B

Labeling may be the simplest and the single most important step in the proper handling of any hazardous substance. A label for a container should include a date and the contents of the container. When the contents of one container are transferred to another container, this information should also be transferred to the new container. OSHA recommends that all chemically hazardous material be properly labeled with the hazardous contents and severity of the material, as well as bear a hazard symbol. The labels of chemicals in the original containers must not be removed or altered.

PTS: 1

DIF: Cognitive Level: 2

REF: p. 26

6. Standard Precautions is:
- a term that has replaced the term Universal Precautions.
  - the process of treating all blood and body fluids as potentially infectious.
  - a safety precaution concerned with the handling of all patient specimens.
  - all of the above.

ANS: D

The Centers for Disease Control and Prevention (CDC) recommends safety precautions concerning the handling of all patient specimens. These are known as Standard Precautions (formerly known as “universal precautions,” or “universal blood and body fluid precautions”).

PTS: 1

DIF: Cognitive Level: 2

REF: p. 28

7. The definition of a biohazard is:
- chemicals that can burn the skin severely.
  - flammable substances.
  - potentially infectious materials or agents.
  - explosive liquids.

ANS: C

Biohazard is a word that is posted throughout the laboratory to denote infectious materials or agents that present a risk or even a potential risk to the health of humans or animals in the laboratory. The potential risk can be either through direct infection or through the environment. Infection can occur during specimen collection, or from handling, transporting, or testing the specimen.

PTS: 1

DIF: Cognitive Level: 1

REF: p. 28

8. Infectious disease safety practices include:
- educating and training all health workers in standard precautions.
  - providing disposable gloves.
  - monitoring compliance with protective biosafety policies.
  - all of the above.

ANS: D

The purpose of the Bloodborne Pathogens Standard and the Occupational Exposure Standard is to provide a safe work environment. OSHA mandates that an employer do the following:

- Educate and train all healthcare workers in standard precautions and in prevention of bloodborne infections.
- Provide proper equipment and supplies (e.g., gloves).
- Monitor compliance with the protective biosafety policies.

PTS: 1

DIF: Cognitive Level: 2

REF: p. 30

9. An important change in the newly revised OSHA Hazard Communication Standard (HCS) is:
- labels on chemicals must be in different colors.
  - new safety data sheets can be abbreviated documents.
  - a single set of harmonized criteria for classifying chemicals is used.
  - the chemical mixtures must be stated on the container label.

ANS: C

The OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200(g)) requires that the chemical manufacturer, distributor, or importer provide safety data sheets (SDSs), formerly material safety data sheets (MSDSs), for each hazardous chemical to downstream users to communicate information on these hazards.

As with the current standard, the new HCS requires chemical manufacturers and importers to evaluate the chemicals they produce or import and provide hazard information to employers and workers by putting labels on containers and preparing SDSs. The modified standard provides a single set of harmonized criteria for classifying chemicals according to their health and physical hazards and specifies hazard communication elements for labeling and SDSs. Employers must ensure that SDSs are readily accessible to employees.

The major changes to the HCS include the following:

1. Hazard classification: Chemical manufacturers and importers are required to determine the hazards of the chemicals they produce or import. Hazard classification under the new, updated standard provides specific criteria to address health and physical hazards as well as classification of chemical mixtures.
2. Labels: Chemical manufacturers and importers must provide a label that includes a signal word, pictogram, hazard statement, and precautionary statement for each hazard class and category.
3. Safety data sheets: The new SDS format requires 16 specific sections, ensuring consistency in presentation of important protection information.
4. Information and training: To facilitate understanding of the new system, the new standard requires that workers be trained by December 1, 2013, and beyond for specified requirements.

The Hazard Communication Standard in 1983 gave the workers the “right to know,” but the new Globally Harmonized System gives workers the “right to understand.”

PTS: 1

DIF: Cognitive Level: 2

REF: p. 26

10. Preemployment health profiles of students and laboratory staff should include immune status evaluation for \_\_\_\_ at a minimum.
  - a. hepatitis B
  - b. rubella
  - c. measles
  - d. all of the above

ANS: D

Preemployment health profiles of students and laboratory staff should include immune status evaluation for hepatitis B, rubella, and measles at a minimum.

PTS: 1

DIF: Cognitive Level: 1

REF: p. 37

11. A carcinogen:
  - a. is any substance that can cause the development of cancerous growth in living tissue.
  - b. is related to the spread of viral diseases.
  - c. cannot be used in the laboratory.
  - d. is both a and b.

ANS: A

Carcinogens are any substances that cause the development of cancerous growths in living tissue; these substances are considered hazardous to people working with them in laboratories. When possible, substances that are potentially carcinogenic have been replaced by ones that are less hazardous. If necessary, with the proper safeguards in place, potentially carcinogenic substances can be used in the laboratory. Lists of potential carcinogens used in a particular laboratory must be available to all who work there.

PTS: 1

DIF: Cognitive Level: 1

REF: p. 41

12. A Class A fire is:
  - a. ordinary combustibles.
  - b. flammable liquids and gases.

- c. electrical equipment.
- d. powdered metal.

ANS: A

Fires are classified into five different basic types:

Class A—Ordinary combustibles

Class B—Flammable liquids and gases

Class C—Electrical equipment

Class D—Powdered metal (combustible) material

Class E—Cannot be extinguished

PTS: 1

DIF: Cognitive Level: 1

REF: p. 42

13. Infectious waste includes:
- a. blood and blood products.
  - b. contaminated sharps.
  - c. microbiological waste.
  - d. all of the above.

ANS: D

OSHA has defined infectious waste as blood and blood products, contaminated sharps, pathological wastes, and microbiological wastes.

PTS: 1

DIF: Cognitive Level: 1

REF: pp. 42-43

14. Treatment for alkali or acid burns of the skin is to:
- a. rinse thoroughly with large amounts of running tap water.
  - b. apply ice.
  - c. wash thoroughly with soap and water.
  - d. apply direct pressure.

ANS: A

For the treatment of alkali or acid burns on the skin or in the mouth: Rinse thoroughly with large amounts of running tap water. If the burns are serious, consult a physician.

PTS: 1

DIF: Cognitive Level: 1

REF: p. 44

## TRUE/FALSE

1. Food and drinks should not be stored or consumed in work areas.

ANS: T

All laboratories need programs to minimize risks to the health and safety of employees, volunteers, and patients. Suitable physical arrangements, an acceptable work environment, and appropriate equipment need to be available to maintain safe operations. In addition to Standard Precautions, a variety of other safety practices should be adhered to in order to reduce the risk of inadvertent contamination with blood or certain body fluids. These practices include the following:

1. All devices in contact with blood that are capable of transmitting infection to the donor or recipient must be sterile and nonreusable.

2. Food and drinks should not be consumed in work areas or stored in the same area as specimens. Containers, refrigerators, or freezers used for specimens should be marked as containing a biohazard.
3. Specimens needing centrifugation should be capped and placed into a centrifuge with a sealed dome.
4. Slowly place a gauze square over and carefully open rubber-stoppered test tubes with the gauze over the stopper to minimize aerosol production (the introduction of substances into the air).
5. Use autodilutors or safety bulbs for pipetting. Pipetting by mouth of any clinical material must be strictly forbidden.

PTS: 1

DIF: Cognitive Level: 2

REF: p. 35

2. Rubber-stoppered test tubes should be opened slowly with a gauze square over the stopper.

ANS: T

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PTS: 1

DIF: Cognitive Level: 2

REF: p. 35

3. Contact lenses can be manipulated with gloved hands.

ANS: F

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PTS: 1

DIF: Cognitive Level: 2

REF: p. 35

4. Lipstick or makeup should not be applied in the clinical work area.

ANS: T

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PTS: 1

DIF: Cognitive Level: 2

REF: p. 35