

Safety in the Clinical Laboratory

I. Safety

A. Agencies and Practices

OSHA - US Dept. of Labor's **O**ccupational **S**afety and **H**ealth **A**dministration
To ensure safe and healthful working conditions for every American worker

CLSI - **C**linical and **L**aboratory **S**tandards **I**nstitute (formerly NCCLS, National Committee for Clinical Laboratory Standards)

CDC - **C**enter for **D**isease **C**ontrol (part of DHHS, Dept. of Health and Human Services)

CAP - **C**ollege of **A**merican **P**athologists

TJC - **T**he **J**oint **C**ommission (formerly JCAHO, Joint Commission on Accreditations of Healthcare Organizations)

OSHA-mandated plans:

Chemical hygiene plan - MSDS, Right to Know, Labeling, Threshold limits, employee information, and training

Exposure control plan - Occupational exposure to blood borne pathogens, Standard precautions (formerly universal precautions); biohazards, avoiding transmission of infectious diseases

Infection Control Programs -

Standard Precautions -

include plans, practice controls, protective clothing/equipment, education/training, labels, Hep B virus (HBV) vaccine, and medical follow-up

Such as -

Washing hands

Food/drink restrictions

Personal protective equipment

Barrier precautions (gloves, gowns, mask/eye protectors)

Protection from aerosols (cabinets, shields, handling specimens cautiously) transporting specimens in biohazard/sealed bag

B. Biohazards and Prevention of Disease Transmission – exposure control plan

Biohazard: common color is a bright or orange-red.

This biological warning symbol is used to signify the actual or potential presence of a biohazard and to identify equipment, containers, rooms, or materials that contain or are contaminated with viable hazardous agents, including infectious agents.



C. Other Hazards – Chemical, Electrical, Fire, Misc.

Radiation Hazard: usually set in a bright yellow background.

This visual warning indicates that radioactive materials are present. Time, shielding, and distance are key for protection. If pregnant, avoid this area/room.



Chemical or Poison Hazard: skull and bones symbol.

Denotes the presence of a toxic or poisonous agent, chemical, or gas.



Corrosive Hazard: liquid poured onto hands/other liquid.

This symbol indicates agents that are damaging to the skin, eyes, or tissue.



Flammable Hazard: usually set in a red background, with a number.

This symbol indicates the presence of a flammable substance.

Flammables are agents that react by igniting at lower temperatures.

The degree of hazard may be identified by:

1. Flash point (or ignition temperature: lowest temperature at which liquid will ignite).
2. Flammability limits: concentration range in which mixture with air will ignite.



Electrical Hazard:

This sign indicates the possibility of electrical current passing through a person.



Sharps Hazard/Container:

Any time there is a possibility of skin puncture with contaminated sharp objects, these objects must be placed in a container like this.



NFPA Chemical Hazard Sign

This special emergency guide warns emergency, rescue, and fire personnel of potential hazards within a specified area and allows them to take necessary precautions. The numerals used (0-4) are from the **National Fire Protection Association (NFPA)** hazard rating system.

The manufacturer, using this rating system, assigns the numbers, which indicate levels of risk for each product. The NFPA hazard sign is most often seen on commercial

product labels. It can also be found, however, displayed within a laboratory; a supervisor may transcribe the numbers from the products found within the laboratory. The numbers may also be entered on the Material Safety Data Sheet.

NFPA Label:

<p><u>Left, blue = health hazard</u> 4 = Danger: May be fatal on short exposure. Specialized protective Equipment required. 3 = Warning: Corrosive or toxic. Avoid skin contact or inhalation. 2 = Warning: May be harmful if inhaled or absorbed. 1 = Caution: May cause irritation. 0 = No unusual hazard.</p>	<p><u>Top, red = fire hazard</u> 4 = Danger: Flammable gas or extremely flammable liquid. 3 = Warning: Flammable liquid. Flash point below 100 °F. 2 = Caution: Combustible liquid. Flash point of 100 - 200 °F. 1 = Combustible when heated. 0 = Not combustible.</p>	<p><u>Right, yellow = instability hazard</u> 4 = Danger: Explosive material at room temperature. 3 = Danger: May be explosive if spark occurs, if heated under confinement, or mixed with water. 2 = Warning: Unstable, or may react if mixed with water. 1 = Caution: May react if heated, or mixed with water. 0 = Stable: Not reactive when mixed with water.</p>
<p><u>Bottom, white = specific hazards</u> OXY = Oxidizer ACID = Acid ALK = alkali W = use no water = radiation hazard</p>		

D. Waste – Handling, Disposal

Regular -

Hard cardboard container with lid - for broken glass (non-biohazard)
 Waste basket - for paper, paper towel

Glass –

Broken glass container to prevent puncture of handlers

Infectious waste – packaged in color-coded containers, labeled, incinerated/autoclaved

Sharps container - puncture resistant (hard plastic) without recapping needle for needles with blood

Biohazard - double-bagged, placed in designated area for disposal (containers must be washed, decontaminated/disposed)

For items that come in contact with blood, body fluids - tubes, slides, etc.

Bucket - for syringes, gloves, etc. (soft things)

Safekeeper/Sharpskeeper (cardboard container in bucket) - for pipet tips, slides, etc. (items that can break or have sharp corners)

Disposal - of medical waste by a licensed organization or autoclave appropriately

E. Fire Extinguishers

Class A - paper, wood, clothing, trash

Identified by green triangle containing with "A"

Uses water or soda and acid to cool fire

Class B - oils, gasoline, paint, lacquers, flammable gases, etc.

Identified by red square containing "B"

Uses foam (a dry chemical) or carbon dioxide to block air flow

Class C - electrical, or near electrical

Identified by blue circle containing "C"

Uses non-conducting extinguishing equipment, such as carbon dioxide, or a dry chemical, or Halon

Shut down circuit, pull plug

Never use water - electrocution from standing in water can occur

Class ABC extinguisher - multi-purpose

Uses graphite

Found in most labs

RACE =
Rescue
Alarm
Contain
Extinguish/Evacuate

Transmission-Based Precautions -

1. Airborne - standard precautions, mask/respirator, gloves
2. Droplet - standard precautions, mask, gloves
3. Contact - standard precautions, mask, gloves, gown

Procedure -

The following is the correct order for putting on and removing isolation gown:

Putting On

1. Gown
2. Mask
3. Gloves

Removing (opposite order)

1. Gloves
2. Mask
3. Gown

H. Accidental Needle Sticks

- Report immediately to a supervisor
- Immediate and follow-up testing must be performed for blood borne pathogens
- Counseling is usually provided