
LABORATORY HAZARDS AND ACCIDENTS

Laboratory Accidents:

Accidents occur in the lab mainly through ignorance, lack of foresight, and lack of care. A careless worker endangers not only himself / herself but also his / her colleagues as well.

TYPES OF LABORATORY HAZARDS

1- Chemical Hazards

It is wise to regard all chemicals as toxic unless you know otherwise. The main dangers to the person are associated with toxicity, chemical burns and dermatitis. Chemical's related risk of explosion and fire are also possible.

Toxic symptoms may follow ingestion, inhalation or skin absorption.

To lower the risk of toxicity, eating, drinking and smoking are prohibited in the laboratory. Benzene vapours are fire risk and inhalation may lead to chronic poisoning.

Swallowing of strong acid or alkali causes corrosive poisoning. Strong acids or alkalis can also cause acid burns or alkali burns.

Some chemicals are with biological hazards like carcinogenic and are regarded as the potential causes of tumours of the urinary tract, example, Ortotoludine and Ethidium bromide.

Oxidizing agents, when they come in contact with organic materials or other readily oxidizable compounds frequently causes explosions. The followings are examples for highly poisonous substances.

Solids	Liquids	Gases
Antimony	Nessler's reagent	Hydrogen cyanide
Beryllium	Benzene	Hydrogen sulphide
Iodine	Bromine	Carbon-mono oxide
Cyanides	Fluorine compound	
Phenol		
Oxalic acids		

2- Physical Hazards

Hazards of glass are the biggest cause of lab accidents. More than 30% of all laboratory accidents are cuts from broken glass. If one is not careful enough, profuse bleeding might result following a deep cut. The glass may also be contaminated with stool, pus, and bacteriological cultures resulting in severe infections.

Moreover, mechanical hazards are common in laboratories. Laboratory personnel should be aware of the mechanical hazards of equipment like centrifuges, shakers and autoclaves.

FACTORS CONTRIBUTING TO LABORATORY ACCIDENTS

A poorly designed laboratory and overcrowding can increase the risk of accident occurrence. Most lab accidents are the result of bad lab practices like:

- Poor training;
- Lack of concentration;
- Noisy environment;
- Untidy working and not using racks to hold sample containers;
- Carelessness and negligence;

- Over work and fatigue;
- Hot and humid climatic conditions;
- Hurrying to finish work.

How to avoid laboratory accidents??

- ➔ Always inspect glass apparatus from damages before use. Don't use damaged, cracked, badly scratched or chipped glass wares. Broken glass wares should be discarded in to a container reserved for these purposes.
- ➔ Always replace reagent bottles on the shelves and never leave bottles of acid or alkali where they may be over turned.
- ➔ Always label all bottles clearly to show their contents.

What are the main accidents associated with laboratory work?

The main hazards and accidents associated with laboratory work are as follows:

1. Infection
 2. Burns
 3. Cuts.
 4. Harmful effects of toxic chemicals.
 5. Injury from explosions.
 6. Electric shock.
 7. Fire.
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1. Infection

This can be caused by:

A. Pathogens being inhaled in aerosols when snap closing specimen containers, dispensing or pipetting infectious fluids.

B. Pathogens being ingested from contaminated fingers, or in food that has been contaminated, e.g. by being stored in a medical laboratory refrigerator.

C. Mouth- pipetting of specimens and cultures, which is one of the commonest ways of ingesting pathogens.

D. Pathogens entering the skin through needle punctures, cuts, scratches insect bites sores or other open skin lesions, Hence, always handle infected needles with great care.

2. Burns

Can be caused by:

A. Flammable chemicals and stains, or by reagents catching fire easily.

B. Fire from spirit lamps, Bunsen burners, lighted tapers or from faulty electrical equipment or over loaded circuits.

C. Corrosive chemicals being spilt on the skin or ingested when mouth pipette.

3. Harmful effects of toxic chemicals

Can be caused by:

A. Inhaling fumes from toxic chemicals.

B. Ingesting toxic chemicals by mouth - pipetting

C. Skin contact with toxic chemicals