



AL Mustaqbal Universty
Department of anesthesia techniques
Title of the lecture :- Safety
and security in chemical
laboratories



جامعة المستقبيل
AL MUSTAQBAL UNIVERSITY



Asst. Lec. Lilyan Qassim Alwan

lilyan.qassim@uomus.edu.iq

Asst. Lec. Hadeer Mohammed

hadeer.mohammed@uomus.edu.iq

1-Basic Safety

Science lab is a place of doing experiments and learning, but it must be stay safe and alert at all times because there are many hazards in lab.

So the basic safety rules include:

- 1-**Never run in the lab or engage practical jokes.
- 2-**Never eat, drink, or smoke while working in the lab
- 3-**Never work or touch anything in the lab without the supervision of an instructor.
- 4-**Listen to or read instructions carefully before attempting to do anything.
- 5-**Keep your work area uncluttered (Take to the lab station only what is necessary) and clean it at the end of experiment.
- 6-**Keep bags away from burners.

2-Personal Safety

When you working in a science lab, you must always:

- Wear a lab coat, gloves and goggles

1. **Goggles:** to protect your eyes from chemicals, heated materials and things that might be able to shatter.
2. **Lab coat:** to protect you from chemical spills. Must be worn properly.
3. **Gloves:** to protect your hands when handling chemicals (using any hazardous or toxic agents)

3-Glassware Safety

1. Do not use chipped or cracked glassware and show it to the teacher.
2. If a piece of glassware gets broken, do not try to clean it up by yourself. Notify the teacher.
3. Do not place hot glassware in water. Rapid cooling may make it shatter.
4. When pouring liquids into glassware, make sure the container is not at the edge of the table.
5. Broken glassware should be disposed in a special glass disposal container.

4-Chemical Safety

1. Always it must be know the chemicals that you are working with and the hazards may be causing.

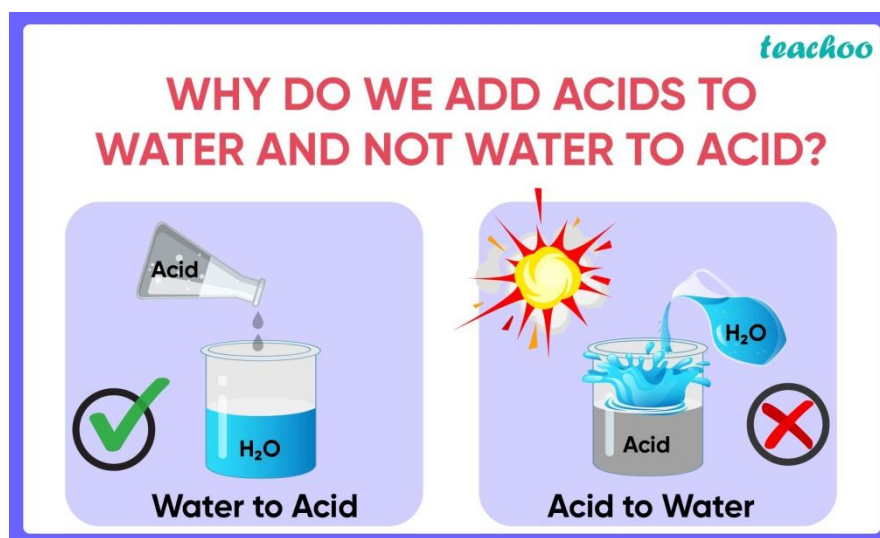
Material Safety Data Sheets (MSDS) must be on file and available for each chemical in the lab.

MSDS lists:

- **Product Identit**
- **Hazardous Ingredients**
- **Physical Data**
- **Fire & Explosion Hazard Data**
- **Reactivity Data**
- **Health Hazard Data**
- **Precautions for Safe Handling & Use**
- **Control Measures**

2. Follow your teacher directions when using chemicals.
3. During lab work, keep your hands away from your face.
4. Never mix chemicals without your teacher telling to do.

5. Never put anything into your mouth during a lab experiment.
6. Never use mouth pipetting
7. If you need to smell the odor of chemical do not put your nose over the container and inhale the fumes.
8. When diluting acids **avoid** adding the water to the concentrated acid (causing an explosion, which can splash acid on you). **Therefore, you must add acid slowly to water**



9. Notify your teacher if any spills or accidents happen.
10. Store chemicals on shelves with labeling the chemicals and solutions.
11. Storage of flammable should not be open. They must be in the container labeled with warning.
12. Storage of corrosives like strong acids and bases should not be open.
13. After handling chemicals, always wash your hands with soap and water.
14. All chemical waste must be collected properly labeled and sent for appropriate disposal.

5-Heating Safety

1. When heated the solution in a test tube it is very important to tilt it away from you to avoid inhaling fumes that coming from the solution.
2. Use tongs or protective gloves to handle hot objects.
3. When heating a test tube, move it around slowly over the flame to distribute the heat evenly.
4. Only glassware that is thoroughly dry should be heated.
5. Make sure no flammable solvents in the surrounding area when lighting a flame.

6-First Aid

1. It is important to know the correct way to act if an emergency does occur.
2. It must be know the location of safety equipment, which available in the lab, including **the fire extinguisher, eyewash station and fire blanket.**



The Eyes: flush eyes immediately with plenty of water for several minutes.

If a foreign object entered into the eye, do not allow the eye to be rubbed.

7-Some of hazard signed



Animal hazard



Sharp instrument hazard



Heat hazard



Glassware hazard



Chemical hazard



Electrical hazard



Eye & face hazard



Fire hazard



Biohazard



Laser radiation hazard



Radioactive hazard



Explosive hazard

HEALTH HAZARD

- 4 - Deadly
- 3 - Extreme danger
- 2 - Hazardous
- 1 - Slightly hazardous
- 0 - Normal material

FIRE HAZARD

- Flash Point
- 4 - Below 73° F
 - 3 - Below 100° F
 - 2 - Below 200° F
 - 1 - Above 200° F
 - 0 - Will not burn

SPECIFIC HAZARD

- Oxidizer OXY
- Acid ACID
- Alkali ALK
- Corrosive COR
- Use NO WATER
- Radiation Hazard



REACTIVITY

- 4 - May detonate
- 3 - Shock and heat may detonate
- 2 - Violent Chemical change
- 1 - Unstable if heated
- 0 - Stable