

Module 3: Chemical Safety and Hazard Management

3.2

Case study on hazard management

Resource Person

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Case Study 1

Case Study: Chemical Spill in the Laboratory

Scenario:

A first-year pharmacy student is working in the college laboratory with **concentrated sulfuric acid (H_2SO_4)**. While transferring the acid from a stock bottle into a beaker, the student accidentally knocks the beaker over, spilling sulfuric acid onto the lab bench and floor. Some acid also splashes on the student's gloves and lab coat.



Hazards Identified:

- **Chemical hazard:** Corrosive nature of sulfuric acid
- **Physical hazard:** Risk of slip and fall due to liquid spill
- **Health hazard:** Potential chemical burns from skin exposure

Steps Taken (Hazard Management)

- Immediate Response
- Containment and Cleanup
- Post-Incident Actions

Immediate Response

- The student calls for help and moves away from the spill.
- The instructor ensures the student removes contaminated gloves and rinses affected skin with water.
- The lab is evacuated to avoid further exposure.

Containment and Cleanup

- The instructor dons proper PPE and uses a **spill kit** with acid-neutralizing agent (sodium bicarbonate).
- The spill is safely neutralized and cleaned with absorbent material.
- Waste is collected in a labeled hazardous waste container.



Post-Incident Actions

- The student is examined by the medical officer for minor skin irritation.
- An **incident report** is filed.
- A **refresher training** session on chemical handling and spill management is scheduled for all students.



Lessons Learned

- Importance of **using small volumes** of hazardous chemicals when possible.
- Need for **proper lab technique and awareness**.
- Availability and use of **PPE and spill response tools** can prevent injury and escalation.
- Regular **training and drills** are key to building a safety-first culture.



Case Study 2

Case Study: Chemical Spill in a College Laboratory

Background

In a college chemistry lab, a student was preparing a solution using concentrated sulfuric acid. While transferring the acid from the reagent bottle to a beaker, the student accidentally knocked over the bottle, spilling acid on the workbench and floor.



Incident

- The student was **not wearing gloves** or a **lab coat**.
- The **acid splashed on the student's hand and wrist**, causing immediate burning sensation.
- The lab had a **spill kit** and **eyewash station**, but the student was unsure how to use them.
- The **teacher acted quickly**, using the spill kit to neutralize the acid and guided the student to the **safety shower**.
- The student was taken to the medical room and later recovered fully.

Hazards Involved

- **Chemical hazard:** Concentrated sulfuric acid (corrosive)
- **Physical hazard:** Spill leading to potential slips
- **Human error:** Lack of PPE and poor chemical handling

What Went Wrong

- Inadequate PPE
- Poor chemical transfer technique
- Lack of student training on emergency response

Corrective Measures

- Mandatory **PPE** policy reinforcement
- Regular **training on chemical handling and spill response**
- Clear labeling and instructions near emergency equipment
- Implementing **pre-lab safety briefings**

Learning Points

- Always wear **appropriate PPE** when handling hazardous chemicals.
- Be trained in **using emergency equipment** like spill kits and eyewash stations.
- Conduct **risk assessments** and follow SOPs before starting lab work.

