SPILL MANAGEMENT

2020

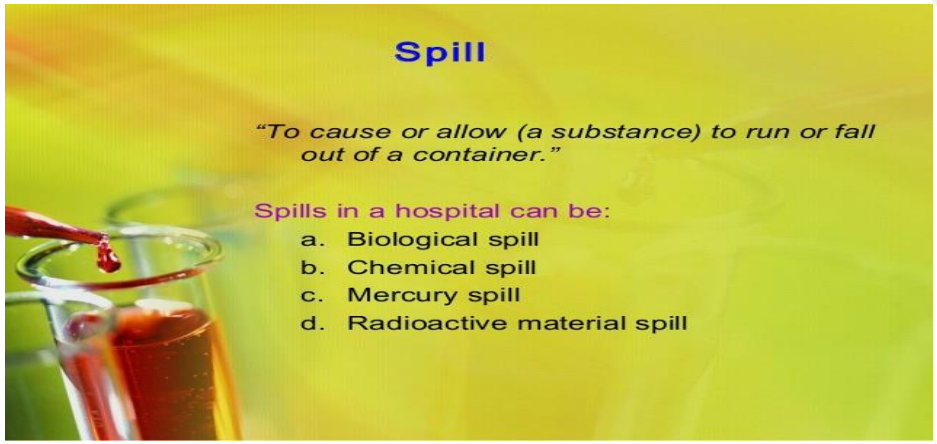
Objectives

At the end of this session participants will understand;

- Spills
- Spill control and prevention
- Steps to spill management
- Spill kits (Biological & Chemical)

What is a Spill?

- A quantity of liquid that has spilled or been spilt



Spill Control & Spill Prevention

- Comply with Occupational Safety Health Administration, OSHA 29CFR 1910.120 Hazardous Waste Operations and Emergency Response

Spill Control …

- Different spills require different remedial measures.
- Individuals should be familiar with the properties and hazards of the materials which they work with.
- Improper clean-up of a spill may result in injury, illness, and release to the environment
- Chemical spill may result in fire, or property damage

Chemical Spill Control …

- Planning for chemical spills is essential
- Before beginning work with chemicals ensure:
  - Receive adequate training for cleaning up small spills
  - Stock pile appropriate types and amounts of spill clean-up materials / spill kits
  - Availability of appropriate PPE.

Chemical Spill Control …

- Each chemical user should consult the Material Safety Data Sheet (MSDS) for the specific chemical that he/she plans to work with and consider response options in case of a spill or release beforehand

Pre-planning is essential to safely and properly handling a spill.

7 Steps to Spill Management

❶ Never Assume

- Report spill to the supervisor
- Co-ordinate spill team
- Evacuate non-spill team person (s)

❷ Assess Area

- Consider other potential risks near the spill
- Eliminate all ignition, heat or power sources
- Remove portable items without coming in contact with spill
- Determine Hot Zone Area

❸Identify Spill

- Do not approach spill if it is unidentified
- Look at labels, containers, markings, colour of container, signs, etc., to help determine what product is
- Use MSDS (Materials Safety Data Sheet) to help identify.

❹ Respond

- Wear appropriate PPE – chemical resistant clothing, gloves, goggles, respirators
- If needed, cover all drains, doorways and areas where spill can escape
- Contain spill from spreading using granular or absorbent socks
- Absorb spilled material working from outside of spill inwards, circular motion is recommended.

Dealing with Minor Spills

- A spill of 5 litres or less provided it is not concentrated, hasn't spread outside the laboratory and did not result in personnel requiring medical attention.
- Concentrated products of any quantity must be treated as a major spill.
- <u>Steps:</u>

1. Assess safety
2. Stop the source
3. Contain and clean up the spill
4. Record the spill

Dealing with Large(Major) Spills

A spill of over 5 liters or concentrated chemicals of any volume, results in a fire/explosion or present a risk for a fire/explosion. Result in personnel requiring medical attention and is not contained within the lab.

- <u>Steps:</u>

1. Assess safety
2. Consult the MSDS
3. Put on PPE
4. Stop the source
5. Contain and control the flow
6. Clean up the spill
7. Notify the appropriate authority
8. Record the incident.

❺Clean Up/Disposal

- Use spark-proof and chemically compatible equipment to clean up (shovels, brooms, dustpans, etc.)
- Pick up absorbed materials with shovel and place in disposable bag or container
- All pads, granular powders, socks, non-reusable gloves, clothing, etc. should be placed in disposable container.

Contents

- Universal spill boom (5’X 17’)
- Universal spill pads (17’ x 19’)
- Universal pillow (17’X17’)
- Red Z solidifier
- Green Z solidifier
- Acid Lock solidifier
- Alky solidifier
- Petro Lock absorbent
- Nitrile gloves
- Scoop/scraper
- 9"x12" zip lock bag
- Hazardous waste label
- Non-Hazardous waste label

Example of Spill Kit

Solidify potentially infectious blood and body fluid spills

quickly and easily absorbs spills such as gasoline, crude oil, solvents, paint sludge, or any other oil based product

Neutralizes high pH spills

Neutralizes and solidifies low pH fluid spills

❻ Decontaminate

- Remove the most soiled or contaminated clothing first
- Rinse off heavily contaminated materials in a contained area
- Never touch clean clothing or materials with contaminated gloves
- Turn clothing inward to avoid re-contaminating
- Decontaminate all non-disposable items (brooms, shovels, thongs, protective clothing)

❼ Reporting

- Report spills to supervisor as per your spill procedures
- All “Reportable Quantity” spills must be reported to the proper authority

Biological Spill control…

- When a spill occurs laboratory staff must decide how to react
- The actions required depend on:
  - Where the spill occurred
    - Inside the BSC
    - Outside the BSC
  - Severity of the spill
    - Type of culture (solid or liquid)
    - Amount of live organisms involved

Spills in the BSC

- **Small spill:**
  - clean up the spill with absorbent paper towel saturated with disinfectant
  - Place contaminated absorbent paper into a disposable bag while in the BSC, seal the bag and place it in the solid waste container to be autoclaved
  - Immediately wipe the interior surface and walls of the BSC and any items or equipment with paper towel saturated with disinfectant

Spills in the BSC

- Large Spill:
  - More extensive decontamination is required
  - Leave the BSC on
  - Surface decontaminate all items inside the BSC
  - Pour disinfectant onto the work surface
  - ALLOW AT LEAST 30 MINUTES FOR DECONTAMINATION
  - Clean up the BSC

Spills outside the BSC

- All spills outside the BSC are large (major) spills
- Notify all staff in the laboratory to evacuate immediately …… YELL "SPILL"
- Make sure BSCs are left on
- Leave the room immediately

Spills outside the BSC

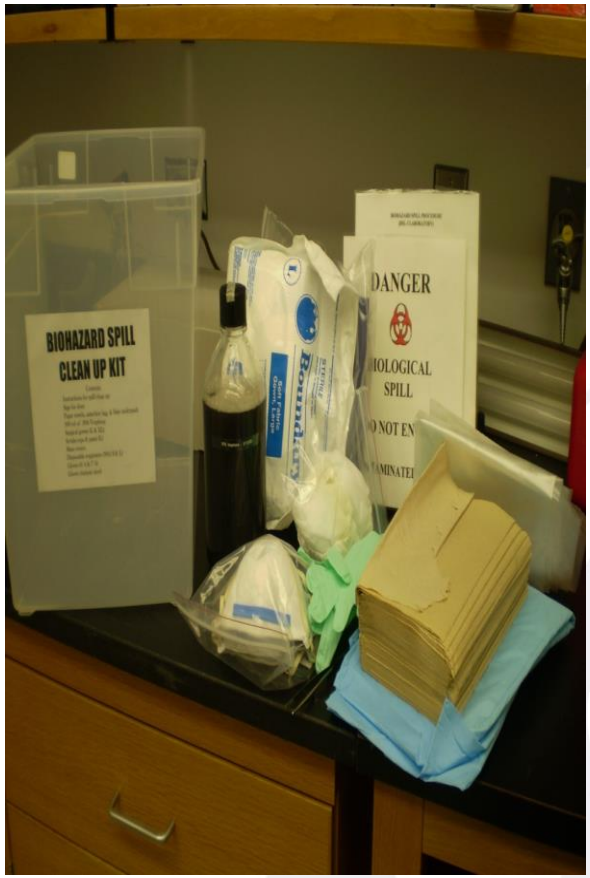
- Stay outside with the doors closed for at least 4 hours to allow aerosols to settle
- Know air exchange rates to determine the time
- Use appropriate respiratory protection, gown, and gloves from the spill kit

Spills outside the BSC

- Enter the laboratory accident scene
- Clean up the spill as per SOP in the spill kit
- ALWAYS HAVE A WELL-STOCKED SPILL KIT LOCATED OUTSIDE THE LABORATORY

Contents of a Spill Kit

- Laminated SOP for spill clean-up
- Concentrated disinfectant
- Spray bottle for disinfectant
- Biohazard signs for laboratory doors
- Autoclave bags / waste box / container
- Absorbent materials / paper towels
- Sharps container
- Small disposable dustpan &broom
- PPE - N-95 respirators, Gown, Shoe covers, Gloves (S, M, L), Eyewear, Head cover
- Signage for the door
- Adhesive tape (masking, package)
- Pencil / pen
- Forceps



Spills in the Centrifuge

- Tubes containing patient specimens or culture isolates may break or leak with the stress of centrifugation

- No safety cups in use, follow the procedure for a spill outside the BSC

- Containment of leakage is the main advantage of using safety cups

Spills in the Centrifuge

- Containment of tube leakage prevents or reduces:

  - aerosol dispersion to the environment during centrifugation
  - release of contaminated liquids inside the centrifuge
  - risk of aerosol escape or surface contamination during the spill clean up

Contaminated Centrifuge Safety Cups

- First step in the spill clean-up:

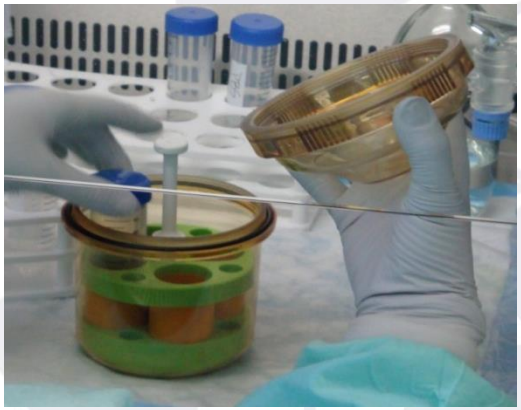
  - remove unopened safety cup

  - Place in BSC and leave undisturbed for 30 minutes

  - disinfect the inside surfaces of the centrifuge

Contaminated Safety Cups

- Second step in the spill clean up:
  - Open the safety cup and place lid in disinfectant
  - Disinfect uncompromised tubes by wiping down with disinfectant soaked cotton wool / paper towel
  - Pour disinfectant in cup, stand for 30 minutes, pour off contents into discard container to be autoclaved, wash cup



Key Messages

- Individuals should be familiar with the properties and hazards of the materials which they work with.
- Improper clean-up of a spill may result in injury, illness, and release to the environment
- Pre-planning is essential to safely and properly handling a spill.
- Always have a well stocked spill kit located outside the laboratory