



**COSHH: Control of
Substances Hazardous to Health**

Module 3



Health & Safety
Essentials

Registered charity number 207890

Exposure to hazards

Objective:

In this module, you will learn how to get started on your assessment by thinking through your activities and how chemicals enter the body.

Exposure assessment

Having classified the hazards, it is necessary to consider the **likely** means of exposure arising from tasks in the laboratory.

Specific task information will also need to be taken into account, such as the potential for generating aerosols or dusts, the duration and frequency, the number of people exposed and the workplace or process conditions (e.g., temperature or pressure).

The potential for exposure depends on:

- quantity – how much is being used/produced, i.e., the dose (exposure over time – Small/Medium/Large)
- physical properties – its physical form as a solid, liquid, gas (volatility/dust – Low/Medium/High)
- method – open bench, fume cupboard, totally enclosed, etc. (affects routes of entry into the body)
- frequency of exposure – Hourly, Daily, Weekly, Monthly, Occasionally
- cumulative or sequential effects (its absorption, distribution, metabolism and excretion in the body)

The exposure of **susceptible persons** should also be considered within the assessment such as young persons or new and expectant mothers.

In many cases, decisions about exposure require only information readily available from suppliers' data sheets.

Caution – Remember that a suppliers' Safety Data Sheet is not a risk assessment!

Think about the task: If the substance is harmful, how might workers be exposed?

- Breathing in fumes, mist or dust?
- Contact with the skin?
- Swallowing?
- Contact with the eyes?
- Skin puncture?

Exposure routes

Exposure by inhalation - Once inhaled, some substances can attack the nose, throat or lungs, whereas others enter the body through the lungs and pass into the blood stream, thereafter harming the organs of the body, such as the liver, kidneys and brain.

Exposure by skin contact - Some substances damage the skin, whereas others pass through it and damage other parts of the body. Skin could become contaminated by:

- direct contact with the substance, e.g., touching it or dipping your hands into it
- splashing
- substances landing on the skin, e.g., airborne dust
- contact with contaminated surfaces–this includes contact with contamination inside protective gloves, or the use of inappropriately selected gloves made from a material that allows penetration through to the skin.



Exposure by swallowing - People transfer chemicals from their hands to their mouths by eating, smoking, etc. without washing first.

Exposure to the eyes - Some vapours, gases and dusts are irritating to eyes. Caustic fluid splashes can damage eyesight permanently.

Exposure by skin puncture - Risks from skin puncture such as cuts or needle stick injuries are rare, but can involve infections or dangers from very harmful substances, e.g., drugs.

Potential effects:

Short term (acute) effects have an immediate impact such as skin/eye irritation, headaches, dizziness, nausea, unconsciousness, respiratory problems or burns.

Long term (chronic) effects may also have acute effects, but here there are also symptoms of disease or ill effects that develop over a long period of time, such as cancer, lung disease, liver/kidney disease or skin problems.

Intermediate effects do not appear immediately, and could take many months; however, once developed, the effects stay with the individual for the rest of their life. These affect people differently; examples include asthma, dermatitis and sensitisers. Symptoms usually stop when contact stops.

Remember that accidents are also a potential source of exposure by:

- Chemical splash to face, eyes, hands, etc.
- Chemical injected beneath skin by needle
- Numerous reports of "solvent" smells, suggesting inhalation
- Allergic reaction attributed to chemical contact
- Acute asthma attack
- Penetration of gloves leading to skin rashes

Learning assessment 2

What's the main hazard to your health?

See if you can identify the main hazard of each option presented below. Then, rank the hazards in terms of (short-term or long-term) potential potency A-J [where A is the most potentially harmful and J is the least harmful to health].

1. Sodium chloride 10% solution
2. Solid sodium cyanide
3. Mouldy hay
4. Dichloromethane
5. Wood dust
6. Cadmium sulphate
7. Nickel
8. Pigeon feathers
9. Sucrose
10. Shower head of the emergency shower in the lab

For example, sodium cyanide is an acute (i.e., short-term) deadly poison, wood dust poses a chronic hazard, and those hazards that cause sensitisation will cause a reaction that stays with you for life.

Check your answers on the separate answer sheet.

