

GENERAL ADVICE ON SAFE WORKING IN LABORATORIES

Introduction

It is essential that all laboratory personnel and in particular new entrants at all levels – should receive safety training on all general aspects of work in the laboratory and on specific aspects of safety such as emergency evacuation procedure, location of fire alarm points, fire extinguisher positions and use etc.

Your training should include important aspects of occupational hygiene, namely the protection of yourself and others from exposure to physical, chemical or biological agents.

All laboratory staff and students must recognise that they have a responsibility both for their own safety and for the safety and health protection of other people in the laboratory. This must be borne in mind in planning and carrying out all operations and experiments in the laboratory.

It is however the responsibility of laboratory management to ensure that all aspects of laboratory safety are Planned, Organised, Controlled, Maintained, Audited and Reviewed.

The following advice should therefore be supplemented with on-the-job training where required.

General Conduct and Basic Precautions

- Never run in the laboratory or along corridors.
- Never indulge in horseplay in the laboratory.
- Treat all chemicals with respect and handle them in accordance with good occupational hygiene practice.
- Always exercise care when opening and closing doors on entering and leaving the laboratory, and look where you are going!
- Ensure that your footwear is sensible for the laboratory. Open-toed shoes or sandals offer no protection against injury.
- Long hair can be a problem in the laboratory. It could become entangled in moving mechanical equipment or could trail on a contaminated bench surface when you bend over equipment. If you do have long hair ensure it is tied back out of harm's way. Similar considerations apply to ties and jewellery such as pendants and necklaces.
- Make sure you know the emergency procedures and emergency exit routes applicable to your laboratory.
- Ensure that doorways and emergency exits are not obstructed by trolleys, stools etc.
- Ensure that you understand all the safety signs at your place of work.
- Know or learn the position of any eye wash bottles, safety showers and fire extinguishers at your work area.

Know the location of the nearest trained first-aider or how to obtain medical attention in event of an emergency.

General Laboratory Housekeeping

- The work bench at all times should be kept clean and free from chemicals and equipment that is not required.
- Storage cupboards and shelves should be kept orderly and free from spillages. Old chemicals should be disposed off in accordance with approved procedures.
- It is very desirable to clean up after each stage of an experiment. Apparatus which has contained harmful chemicals should be decontaminated before being left for final cleaning.
- The laboratory floor should be free of obstruction. Reagent bottles and apparatus left on the floor can cause accidents. Wet floors can lead to slipping accidents.
- Any spillage of chemicals on the bench or floor should be cleaned up in accordance with laboratory procedures and disposed of safely.
- All equipment not in use should be returned to its proper storage place, in a clean and working condition.
- All containers of laboratory reagents and chemicals should be properly labelled showing their identity and hazards, and they should be placed upon the appropriate shelves immediately after use, with their labels to the front.
- Labels on reagent bottles should never be altered or tampered with: if the contents of a container do not appear to correspond with the printed label, the laboratory supervisor should be consulted.
- Reagent bottles should always be cleaned carefully if the contents have been spilled down the sides.

Chemical and Clinical Waste - Methods of disposal in many cases must comply with legislation: hence local rules will apply; if you have not been given this information ask your laboratory/project supervisor for details.

Equipment Repairs - Before laboratory apparatus and equipment is passed to non-laboratory maintenance staff for repair, it should be carefully decontaminated of any harmful agents.

Laboratory Hygiene

- Food and drink must never be stored, prepared or consumed in laboratories or chemical storerooms.
- Wash your hands regularly when working with chemical or biological agents, especially before meals or snacks, and before visits to the toilet.
- A smoking policy is in force and is not allowed in laboratories.
- Do not apply cosmetics in the laboratory.

- Avoid any contact between your fingers and mouth in the laboratory, such as biting finger-nails. Likewise, chewing pens or pencils should always be avoided

Protective Clothing

Protective clothing, safety spectacles, respirators are a last line of defence but nonetheless important means of personal protection. You should be trained in and familiar with their correct use and upkeep – ask your supervisor for information if you do not already have it.

Laboratory coats are for the protection of your person and your clothing from contamination from chemicals. Wear laboratory coats properly fastened. Laboratory coats should be regularly laundered and kept in good repair: torn or ragged laboratory coats are dangerous.

Eye Protection - It is essential to wear suitable eye protection in laboratories at all times. Safety spectacles provide only the minimum protection from unexpected hazards. They are not an adequate substitute for goggles or full face visors.

Full face visors provide additional protection to the eyes and face when carrying out potentially hazardous operations such as working with alkali metals, decanting large volumes of acids/caustics etc. A special full face visor is required when working with UV light.

Gloves - Disposable gloves are better for many purposes; they can be discarded immediately after use and thus reduce the risk of contamination.

Remember a policy of '*gloves for everything*' should be avoided. It is preferable to develop high standards of laboratory hygiene through awareness and training in procedures which establish good techniques in handling chemicals. The use of gloves then becomes an adjunct to safety.

Respiratory Protection – Inhalation of any chemical or biological dust should be avoided either by handling technique or the use of air extraction (eg working in a fume cupboard or under a ventilated hood) . Dust masks or respirators may be used as back-up protection or in those instances when no other means of avoiding inhalation is practicable. Pay particular attention to dust hazards if working with large quantities of light powders and when carrying out weighing, grinding or sieving operations.

Hearing Protection – Prolonged exposure to excessive noise can cause permanent damage to your hearing. Efforts should be made to reduce noise to a safe level. If this is not reasonably practicable, then appropriate ear protection must be worn.

Good Laboratory Practice

All laboratory work must be carried out in accordance with appropriate procedures and local rules, details of which should be available within each laboratory.

The following guidelines serve to highlight some key aspects of good laboratory technique.

- Never start an experiment on a bench already crowded with apparatus.
- Never leave a laboratory experiment unattended without first consulting your supervisor.
- Before starting an experiment, make sure you are familiar with all the known hazards of the starting materials and expected products and the necessary exposure controls.

- Appropriate safeguards should be planned in advance. These measures are required by law.
- If anything unexpected occurs during your experiment, or if you are in any doubt consult your supervisor immediately.

Machinery

- Never set machinery in motion without first making sure that no-one is likely to be injured.
- Observe all safety precautions which will be shown to you when you first use the machine.
- Never remove the guards or take action to defeat safety devices on a machine.

Broken Glass & Sharps - Great care should be taken in removal and disposal of broken glass, Pasteur pipettes, capillaries, syringe needles, scalpel blades and other sharps especially where these articles may be contaminated with chemical or biological agents. Use tweezers, never fingers to pick up broken fragments of glass etc. All such hazardous waste should be segregated, preferably in a designated 'sharps bin', until it is collected for disposal in the approved manner. Refer to the Safety Service leaflet GL02 '*Preventing injuries from Glass and Sharps*' for further information.

Handling Glass – Examine all glassware before use. Reject any glass apparatus that is damaged. Do not store damaged glassware in cupboards ensure it is disposed of properly.

Substances Hazardous to Health - are subject to stringent requirements under the COSHH regulations. A COSHH risk assessment should be in place for the handling of all substances hazardous to health. In particular ensure that specified exposure control measures are applied and that personal protective equipment and clothing is worn where specified.

Cryogenic Liquids – (eg liquid nitrogen) present special hazards; before using them you should have received training in the recommended handling precautions.

Electricity – Remember that electricity is dangerous: death could occur at 60 volts AC. See that all wires are properly insulated, check equipment before use. Worn or damaged flex, and damaged sockets and plugs, are all dangerous. Report all electrical faults to your laboratory supervisor. All electrical repairs, including the replacement of fuses, should always be carried out by an electrician. **Do not attempt repairs yourself.**

Manual Handling – Any operation where awkward or heavy loads are moved should be assessed. Contact your laboratory supervisor if in doubt about any lift

Passenger Lifts – Flammable liquids and hazardous chemicals, in particular solid carbon dioxide and cryogenic liquids, should only be transported in passenger lifts in accordance with local procedures. Check with your supervisor before using lifts to transport chemicals.

Storerooms and Refrigerators – Samples placed in refrigerators should be properly labelled, dated and logged to aid control. Hazardous materials should not be stored indefinitely, but should be safely disposed of after a project is completed. Flammable liquids should only be placed in refrigerators which are internally spark-proof. On no account must food or drink be kept in laboratory storerooms or refrigerators.

Special Hazards – Staff and students who work in laboratories where there are biological hazards, for example pathogenic micro-organisms, or where there is ionising radiation, for


example, X-rays or radioactive isotopes, must recognise that these are special categories of risk. In all such cases it is essential that any statutory safety regulations or codes of practice are observed and that adequate information is available relating to the hazards. Specialist advice and training must be provided where necessary.


Fire Emergency Action – It is imperative that you have a clear understanding of the fire drill. Fire alarm procedures should form an essential part of early training for all laboratory personnel.


Make sure you know what to do in event of a fire.

Reporting Injuries and Near-Miss Incidents – Remember to report all injury and any near-miss incidents to your supervisor.

Emergency telephone numbers

 **112**

 **2340 2993, 2340 3450** - Mr Louis Coleiro Health & Safety Officer

 **2340 2236, 2340 2997** - Precincts Office