

Department of Molecular Medicine

and

Haematology, 7th Floor

LABORATORY SAFETY

MANUAL

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INTRODUCTION

This booklet has been compiled to maintain a standardized code of safety practice in the research laboratories in the Department of Molecular Medicine and Haematology, 7th Floor, University of the Witwatersrand Medical School.

People who work in scientific laboratories are exposed to many kinds of hazards. This can be said of most workplaces; in some, the hazards are well recognized (those of ordinary fire, for example) and the precautions to be taken are obvious. Laboratories, however, involve a greater variety of possible hazards than do most workplaces, and some of those hazards call for precautions not ordinarily encountered elsewhere. Therefore, this manual has been provided to inform and guide the laboratory worker in safe practices which should help to avoid injury.

All laboratory students are required to read the booklet and sign the declaration on the last page. This declaration should be countersigned by your course coordinator and kept by her. It is the responsibility of each student working in specific laboratories, e.g. the HIV Pathogenesis Research Laboratories to familiarize themselves with the specific safety requirements of that laboratory.

SAFETY CONTACT INFORMATION

Safety officer: Dr M. Papathanasopoulos 717-2618 or 082 2580817

Campus Health and Wellness centre: 717-9110/9111

GENERAL SAFETY

A. General Rules of Safety

1. Entry to laboratories is restricted to staff/student members. Visitors must be approved by the section head or a senior laboratory staff member.
2. All staff /students should know where fire extinguishers, alarms and emergency exits are situated.
3. No running, jumping, or horseplay in laboratory areas shall be permitted.
4. No staff/students shall work alone in a laboratory or chemical storage area when performing a task that is considered unusually hazardous by the laboratory supervisor or safety officer.
5. Spills shall be cleaned immediately. Water spills can create a hazard because of the slip potential and flooding of instruments (particularly on the floor below.) Chemical spills of liquids and solids shall be cleaned immediately to prevent contact with skin or clothing. Flood the area with the recommended disinfectant, start from around the area and work inwards. Paper towels can then be dropped on top, allowed to soak through and disposed of in the appropriate manner.
6. It is the responsibility of everyone working in the laboratory to make certain that it is left clean after work is performed.
7. Check with your section head if specific vaccinations are required.
8. A dosimeter will be issued to staff working with specific radioactive material.
9. Eye protection is mandatory in all areas where there is potential for injury.
10. Be considerate of others that you are sharing the space with.

B. Personal Hygiene

1. Wash promptly whenever a chemical has contacted the skin. Know what you are working with and have the necessary cleaning/neutralization material on hand and readily available.
2. Laboratory coats are to be worn when working in the laboratory and may **not** be worn in the tea room, rest rooms or the canteen. Clothing worn in the lab should offer protection from splashes and spills. No sandals or open toed shoes when working in laboratories.
3. Inhalation is one of the four modes of entry for chemical exposure. "Sniff-testing" should not be done.
4. **Never** pipette by mouth. **Always** use a automated pipette-boy or bulb to pipette.
5. Do not drink, eat, smoke, or apply cosmetics in the laboratory or chemical storage areas.
6. Do not use ice from laboratory ice machines for beverages.
7. Hands should be washed after working with infectious material and should always be washed before leaving the laboratory.

C. Specimens

1. All specimens should be regarded as potentially hazardous.
2. Gloves must be worn when handling specimens and cell cultures. Do not touch door handles with used gloves. In general, used gloves should not be worn in the corridors or transferred from room to room. If necessary, e.g. to photograph an agarose gel, put on a new pair.
3. All contaminated glassware should be placed in a metal box for autoclaving.

D. Waste Disposal

1. All contaminated waste should be placed into biohazard bags and boxes.
2. Plastic and paper towels should be discarded into a biohazard bag for incineration.
3. Disposable needles and razor/scalpel blades must be placed in a "sharps disposal" box for incineration.
4. Broken or cracked glassware should not be used. These should be placed in a "broken glassware" bin, and sent for autoclaving and disposal.
5. If working with radioactivity, consult the radioactive officer, obtain a badge if necessary, and follow procedures.

E. First Aid

Find out where the first aid boxes and eye bath stations are situated. A designated party should be responsible for monitoring and maintaining the first aid kit(s). There should be a log attached to the kit indicating the last inspection date and by whom the kit was inspected.

1. Eyes: Should any chemical or infected solution get into the eyes, use the eye bath to rinse them thoroughly with distilled water.
2. Cuts: Any minor cuts should be rinsed under running water and allowed to bleed for a short while. If no foreign objects are in the cut, pressure should be applied to stop bleeding.
3. Burns: These should immediately be held under cold water.

N.B. Details of any accident on duty must be reported to laboratory management and entered in the accident book (see safety officer), and if necessary referred to the day clinic or doctor. Minor injuries many times are not reported because they are perceived to be embarrassing or that "careless actions" lead to the accident. However, minor injuries can sometimes lead to more serious complications that only become evident at a later time. The purpose of reporting and documenting accidents is not to affix blame, but instead to determine the cause of the accident so that similar incidents may be prevented in the future.

F. General housekeeping

1. THE AREA MUST BE KEPT AS CLEAN AS THE WORK ALLOWS. Each person is responsible for maintaining the cleanliness of his/her area.

2. Reagents and equipment items should be returned to their proper place after use. This also applies to samples in progress. Contaminated or dirty glassware should be placed in specific cleaning areas and not allowed to accumulate.
3. Chemicals, especially liquids, should never be stored on the floor, except in closed door cabinets suitable for the material to be stored. Nor should large bottles (2.5l or larger) be stored above the bench top.
4. Reagents, solutions, glassware, or other apparatus shall **not** be stored in hoods. Besides reducing the available work space, they may interfere with the proper air flow pattern and reduce the effectiveness of the hood as a safety device.
5. Stored items, equipment, and glass tubing shall not project beyond the front of shelf or counter limits.
6. Stored items or equipment shall not block access to the fire extinguisher(s), safety equipment, or other emergency items.
7. Materials stored near aisles shall be restrained to prevent their falling.
8. All containers must be labeled with the identity of hazardous contents.
9. Work surfaces must be decontaminated after use.

G. Notes on Equipment and electricals

Do not use any equipment unless you have been instructed on how to use it, or you have read the instruction booklet.

Centrifuges

Virtually all lab staff use centrifuges on a regular basis, ranging from the small benchtop variety to heavy duty floor-standing centrifuges. Spinning any preparation in any machine is potentially dangerous. Accidents are unlikely to happen if the following rules are applied:

1. Ensure that the carrier buckets are correctly balanced. Switch off the centrifuge immediately if it shakes violently or makes an unusual noise.
2. In the event of tube breakage during a run, the contents of the carrier must be decontaminated immediately by filling with disinfectant. If liquid has splashed out into the rotor chamber, leave the centrifuge for at least 2 hours with the lid closed, then disinfect the buckets and rotor chamber. This will minimize the danger of breathing infected aerosols.

Ventilation Hoods

Work that involves hazards and noxious materials which are toxic, odoriferous, volatile or harmful shall be conducted within a laboratory hood. The primary purpose of a laboratory hood is to keep toxic or irritating vapors and fumes out of the general laboratory working area.

Biological Safety Cabinets

Biological Safety cabinets are among the most effective, as well as the most commonly used, primary containment devices in laboratories working with infectious agents.

Class I and II biological safety cabinets, when used in conjunction with good microbiological techniques, provide an effective partial containment system for safe manipulation of moderate and some high-risk microorganisms. Personnel must be trained in the proper use of

the biological safety cabinets. Of particular note are those activities which may disrupt the inward directional airflow through the work opening of Class I and II cabinets. Aerosol particles can escape the cabinet in various ways. Among these are repeated insertion and withdrawal of workers' arms in and from the work chamber, opening and closing doors to the laboratory or isolation cubicle, improper placement or operation of materials or equipment within the work chamber, or brisk walking past the cabinet while it is in use. Strict adherence to recommended practices for the use of biological safety cabinets is as important in attaining the maximum containment capability of the equipment as is the mechanical performance of the equipment itself. Always decontaminate the hood using procedures adopted by the laboratory after each use or at the end of the work day.

Electricals

1. Equipment, appliance and extension cords shall be in good condition.
2. Extension cords shall not be used as a substitute for permanent wiring.
3. Electrical cords or other lines shall not be suspended unsupported across rooms or passageways. Do not place cords on pathways or other areas where repeated abuse can cause deterioration of insulation.
4. Multi-outlet plugs shall not be used unless they have a built-in circuit breaker. This causes overloading on electrical wiring, which will cause damage and possible overheating.

H. Handling Glassware

1. Glass breakage is a common cause of injuries in laboratories. Only glass in good condition should be used.
2. Discard or send for repair all broken, chipped, starred or badly scratched glassware. Hand protection should be used when picking up broken glass.
3. Do not store glassware near the edge of shelves. Store large or heavier glassware on lower shelves.

DECLARATION

I, _____ have read and fully understand the contents of the safety manual of the Department of Molecular Medicine and Haematology (7th Floor) at the University of the Witwatersrand Medical School.

I agree to abide by the laboratory rules outlined here, and ensure a safe working environment for everyone.

Signed at: _____ on _____, 2010

WITNESS

Signed at: _____ on _____, 2010