FLINDERS MEDICAL CENTRE

LABORATORY

SAFETY MANUAL

This manual applies to ALL laboratories within Flinders Medical Centre whether FUSA staffed or FMC staffed. Refer to the FUSA/FMC agreement for OH&S within the Flinders Medical Centre, signed by the Dean, SOM and the CEO, FMC March 1997, and revised in June, 1999.

THIS MANUAL HAS BEEN SUPPLIED AND IS TO BE READ IN CONJUNCTION WITH THE FMC POLICY AND PROCEDURE DIRECTORY (http://intra.fmc.sa.gov.au/fmc/docs/default.asp) AND THE FMC EMERGENCY PROCEDURES AND FLIP CHART

02/2004
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FOURTH REVIEW : FEBRUARY 2004

FIFTH REVIEW : JUNE 2006

DATE OF NEXT REVIEW : JUNE 2007

THE LABORATORY SAFETY SUB-COMMITTEE (INCORPORATING HAZARDOUS SUBSTANCES MANAGEMENT) OF THE FMC OH&S COMMITTEE HAS THE RESPONSIBILITY OF REVIEWING AND UPDATING THIS MANUAL.
THIS LABORATORY SAFETY MANUAL BELONGS TO

ROOM: ..................................................................................................................

The Laboratory Supervisor* is .........................................................................

* The Laboratory Supervisor is any person, Academic or non-Academic who provides guidance and/or instruction regarding the activities of another person at work or study. The Laboratory Supervisor is responsible for ensuring all personnel in his/her laboratory are informed about the hazards associated with the laboratory activities and providing instruction and training in safe working procedures within the laboratory.
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EMERGENCIES
1.1 EMERGENCY PHONE NUMBERS

ALL Immediate Emergencies* ................................................................. 33# (all hours)

Blood & Body Fluid Exposure ................................................................. pager 5566* (all hours)

Local Laboratory Manager .................................................................

FUSA Laboratory Manager 64062

Radiation Safety Officer 64642

Pager 2075*

After Hours Contact Number for this laboratory .................................

Laboratory Supervisor .................................................................

Other: ........................................................................................................

• Refer to FMC Emergency Procedures Flip Chart (located near telephone) for types of emergencies and procedures.
If a Blood/Body Fluid Exposure (BBFE) has occurred it is important that immediate steps are taken to
determine the significance of the injury and whether follow-up is necessary.

This appendix describes the recommended course of action to be taken by all persons who have been
exposed to blood or body fluids by sharp instrument/object (e.g. needles, scalpel blade, or glass slide) or
splash injury.

Occupational Health Nurses will maintain the BBFE Hotline from 8.00am – 5.00pm Monday to Friday and at
all other times the Nursing Co-ordinator will provide this service.

The Blood/Body Fluid Exposure Hotline Ensures:

- Early follow-up and counselling;
- Confidentiality;
- Accurate and easy reporting;
- Eliminates unnecessary follow-up.

Information for the Affected Person

- Wash the affected area immediately with soap and water.
- If cuts and abrasions are involved they should be included in the washing.
- For eye splashes rinse gently but thoroughly with water or normal saline, while the eyes are open.
- If blood gets in the mouth, spit it out and rinse the mouth with water several times.
- Alcohol based rinses or foams should be used if water is not available.
- Page BBFE Hotline on 5566*
- Give name of source (if known) and FMC UR number.
- Give details of the incident.

In the Management of the Affected Person the Hotline Co-ordinator will:

- Arrange immediate treatment and support;
- Record the accident details;
- Confirm the nature of the exposure.
- Categorise the exposure as follows:
### BLOOD/BODY FLUID EXPOSURE PROCEDURE

#### 24 HOUR SERVICE HOTLINE

**Non-Parenteral**  
**Possible Parenteral Exposure**

<table>
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<tr>
<th>Doubtful Parenteral Exposure</th>
<th>Definite Parenteral Exposure</th>
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</thead>
<tbody>
<tr>
<td><strong>Massive Exposure</strong></td>
<td></td>
</tr>
<tr>
<td>Counselling provided</td>
<td>Ensures affected person has blood taken and completes yellow staff serology form (these will be provided by the Hotline Co-ordinator).</td>
</tr>
</tbody>
</table>

| Safe work practice reinforced | Determine Hepatitis B antibody status of affected staff member |
| Provide counselling and results and arrange for follow-up assessment if required |

| Further follow-up not required | When the source individual is known to be positive for HIV, Hepatitis B or Hepatitis C an urgent consult with the on call Infectious Diseases Consultant will be arranged. Prophylactic treatment will be offered when necessary |

Refer to Section 2.5 for full policy, Incidental Reporting and Investigation
1.3 MERCURY SPILL PROCEDURE (for laboratory areas)

FMC MERCURY SPILL PROCEDURE (for laboratory areas)

- Responsibility of the mercury spill remains with the staff member and supervisor involved
- Prevent other persons from entering the near vicinity to avoid spreading the spill
- Do not use a vacuum cleaner to collect and clean up mercury

Contents of Mercury spill kit
- 1 hand held plastic pasteur pipette
- 1 empty plastic jar (250ml) labelled ‘Mercury for Recycling’
- 1 piece of capped grey pipe
- 1 pair of disposable gloves (large)
- 1 container of DeMerc chemical decontaminating powder*
- 1 bottle of DeMerc thiosulphate wash solution*
- 1 sponge
- 1 dust pan and brush
- Hazard Report Form

*Material safety data sheets (MSDS) for the solution and powder are available from OHS & Injury Management Services, Transportable Office, Southern Carpark, extn 64026

NB. If the broken item is a sphygmomanometer, ensure that it remains upright and contact Biomedical Engineering (ext. 64061). If after hours, contact security (ext. 64569).

For a mercury spill on a non-carpeted surface, follow steps 1 - 4

**STEP ONE:**
- Put on the gloves supplied in the kit and wear a pair of safety glasses from your work area
- Using the plastic pipette provided, collect all visible droplets of mercury & squirt into the plastic jar labelled ‘Mercury for Recycling.’ Place any glass fragments into the jar also and screw the lid on
- If the broken item is a large thermometer that will not fit into the jar, uncap one end of the grey pipe and slide the broken thermometer into the pipe. Recap the pipe.
- Place the jar, pipe and the pipette into the self sealed bag labelled ‘FMC Mercury Spill Kit’

**STEP TWO:**
- Sprinkle a fine dusting of the DeMerc powder over the area where the spill occurred
- Wait 5 minutes then sweep up the powder with the dust pan and brush
- Place the powder and the dust pan and brush into the self sealed bag
- **Do not dispose of the DeMerc powder container**

**STEP THREE:**
- Squirt the DeMerc wash solution onto the sponge and onto the spill area. Wipe over the entire area, especially where there are joins or cracks in the floor surface or grout between tiles
- Place the sponge into the self sealed bag
- **Do not dispose of the DeMerc wash solution bottle.**

**STEP FOUR:**
- Remove gloves, place into self sealed bag and seal the bag. Wash hands thoroughly with soap and water.
- Complete Hazard report form indicating room number where spill occurred, and forward to Manager/Supervisor

06/2002
DISPOSE OF:
Self sealed bag – take to ‘Mercury Spill Disposal Bin’ located in the Cold Room near the Porters Station on the level 4 landing, room 4E203.

RETURN TO STORES:
DeMerc Wash solution bottle
DeMerc powder container
Instructions

For a mercury spill on a carpeted surface, follow steps 1 and 4 as above, isolate area using existing ‘caution signs’ available in all ward areas, and contact Environmental Services (ext. 64540) for immediate treatment.

Replacement Mercury spill Kits can be collected from Stores, level 4, Item No: 010002 Spill Kit: Mercury (laboratory)
1.4 CHEMICAL SPILL PROCEDURE

CODE YELLOW - INTERNAL EMERGENCY
(INCLUDING DISCOVERY OF CHEMICAL SPILLAGE)

An INTERNAL EMERGENCY can be any of the following:
Failure of vital internal services, Hazardous substance incidents, Structural damage and illegal occupancy.

1. CHEMICAL SPILLAGE
   1. Establish what has been spilt and note location
   2. Advise Switchboard on 33# of location and chemical name (spell out)
   3. Switch on fume hood if applicable
   4. Evacuate immediate vicinity and close doors
   5. Wait for Response Team outside fire doors and advise of all details

2. GAS LEAK/TOXIC SMELL
   1. Evacuate area and close fire doors to compartment
   2. Advise Switchboard on 33# on location of smell/leak
   3. Wait for Response Team outside fire doors and advise of all details

3. EMERGENCY CODING
   Chemical spill is a code YELLOW, Internal Emergency (refer to Emergency Procedures flip chart).

4. EMERGENCY INFORMATION
   Emergency information is available from ChemWatch database. Refer to Section 1.6

5. CONTACT PERSONS
   A list of contact persons in case of chemical spillage within FMC is on page 1.4.1 (next page).
## CONTACT PERSONS
### IN CASE OF CHEMICAL SPILLAGE WITHIN FMC

Start at top of list; stop when first person is contacted.

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Location Room No.</th>
<th>FMC Ext.</th>
<th>Pager No.</th>
<th>A/H Number</th>
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<tr>
<td>John Edwards</td>
<td>Environmental Health</td>
<td>4E 431.1</td>
<td>65016</td>
<td>2711</td>
<td>H 8379 9566 or 0421140970</td>
</tr>
<tr>
<td>Malcolm Whiting</td>
<td>Special Chemistry &amp; Pharmacology</td>
<td>6D 223</td>
<td>65511</td>
<td>20073</td>
<td>H 82045511 or M 0401124642</td>
</tr>
<tr>
<td>Angela Binns</td>
<td>Support Services / Medical Biotechnology</td>
<td>5D 117</td>
<td>68995</td>
<td>2199</td>
<td>H 85561303 or 0409098165</td>
</tr>
<tr>
<td>Tadija Petronijevic</td>
<td>Laboratory Manager</td>
<td>6E 111.3</td>
<td>64062</td>
<td>20020</td>
<td>H 8271 1610 or 0421140985</td>
</tr>
</tbody>
</table>

This list should be reviewed by the Laboratory Safety Sub-Committee (Incorporating Hazardous Substances Management) of the FMC OH&S Committee every 12 months.

If any changes need to be made prior to the review contact the Fire/Emergency Officer or the Chairperson of the Laboratory Safety Sub-Committee.

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**Revised October, 2008**

**DISTRIBUTION:**
All Persons Listed +
Emergency Response Team Leader
Bob Crossman, Director, Environmental Service
Robert Wellman, Fire/Emergency Officer
Shelley Short, Manager, OHS Unit
Supervisor, Security
Switchboard Supervisor

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FMC Laboratory Safety Manual
1. Notify all other persons not involved in the accident to vacate the area at once. Permit only the minimum number of persons necessary to deal with the contamination into the area.

2. If the contamination is due to a spill of liquid from a container and the hands are protected, right the container.

3. Confine the area of contamination and drop absorbent paper onto it. If the radio-active material is in powder or some other dry form, use wet absorbent paper.

4. If the spill is on the skin, flush thoroughly with water, taking care not to spread contamination into the eyes or mouth.

5. Discard any clothing which is contaminated.

6. Contact Control Centre (ext. 64582) and request emergency shutdown of air conditioning to your area until an assessment of the situation can be made by the Radiation Safety Officer or senior local staff. Switch on local fume cupboards (which vent directly to the outside of buildings) to assist ventilation in the interim.

7. Notify the Radiation Safety Officer as soon as possible,
   a) Weekdays : 8.30am - 5.00pm; ext. 64642, 64291 or via FMC Switchboard
   b) Evenings and weekends : via FMC Switchboard.

8. Proceed with the decontamination of all personnel involved in the incident, followed by decontamination of the area, do not allow resumption of work in the area without approval of the Radiation Safety Officer.

*Note*
The exact procedure to be followed depends very much on the activity and chemical form of the substance which is spilled. Consult the FMC Radiation Safety Manual for more detailed instructions on radioactive spill procedures.
1.6 EMERGENCY INFORMATION FROM CHEMWATCH DATA BASE

1. Access the ChemWatch program.
2. Select “Database”.
3. Select “Level 1 (simplified)”.
4. Enter name of chemical or CAS number for chemical.
5. Click on “Start Search”.
6. If a list of chemicals is displayed, click on name of chemical of interest to highlight.
7. Select “Emergency” button.
8. Hazard information will be displayed.
9. Further information can be obtained by selecting:
   “First aid” - advice on first aid
   “Spills” - recommended procedure for spills
   “Fire” - advice for fire fighting
   “Doctor” - advice to doctor for treatment.
10. Select “Return” to exit chemicals screen.
11. Select “Quit” to exit to main menu.
GENERAL INFORMATION
2.1 OVERVIEW OF LEGISLATIVE RESPONSIBILITIES

1.1 OVERVIEW OF THE LEGISLATION


The Occupational Health, Safety and Welfare Act places a "general duty of care" on every person at Flinders Medical Centre. The general duty of care establishes the responsibilities of Employers, Managers/Supervisors, employees and all other persons who are involved in the provision of a safe working environment while at work. The general duty of care clearly establishes the preservation of health and safety at work as a continuous responsibility for anyone who contributes to working conditions or the circumstances in which work is performed. A general duty of care is dependent on what is considered to be "reasonably practicable". This takes into account the severity of the hazard or risk, the knowledge of the hazard and ways to control it, the availability and suitability of measures to remove or minimise it and the cost of such measures.

1.2 RESPONSIBILITIES OF THE EMPLOYER, SECTION 19, O H, S & W ACT, 1986

The legislation outlines a number of specific responsibilities for the Employer. Directions are then delegated through Managers/Supervisors at Flinders Medical Centre to the employees.

The Employer's responsibilities include the following:

- To provide and maintain a safe working environment, safe systems of work, plant and substances in a safe condition. This duty refers to all aspects of work and the working environment. It covers work premises, machinery, methods of work and ergonomics as well as factors in the physical environment eg. lighting, ventilation, heat or noise.
- To provide adequate facilities for the welfare of employees.
- To provide information (in appropriate languages), instruction, training and supervision to ensure that all employees are safe from injury and risks to health.
- To monitor working conditions at any workplace that is under the management and control of the Employer. This places the onus on the Employer and Manager/Supervisor to identify health and safety problems present in the workplace.
- To monitor the health and welfare of the Employer's employees so that the Employer and Manager/Supervisor is aware of any adverse health effects or injuries arising from the work environment. Such monitoring must be relevant to the prevention of work-related injuries.
- To keep information and records about work-related injuries suffered by employees in their employment with the Employer and retain those records for such period as may be prescribed.
- Managers/Supervisors have an important practical role to play in making sure that health and safety procedures are followed in the work areas. The Manager/Supervisor must have a good working knowledge of the rules and regulations that apply to the work groups. In directing employees to carry out specific tasks the Manager/Supervisor must be satisfied that the employees have received proper information, instruction and training before the employee commences that work and can do those tasks without the likelihood of injuring themselves or others.
- To ensure that any Manager/Supervisor is provided with such information, instruction and training as are necessary to ensure that each employee under their supervision is, while at work, so far as is reasonably practicable, safe from injury and risks to health.
1.3 RESPONSIBILITIES OF EMPLOYEES, SECTION 21, O H, S & W ACT, 1986

Employees have an obligation to take reasonable care to protect their own health and safety at work. They are also required to avoid doing anything that would affect the health and safety of any other person.

Taking reasonable care to protect their own health and safety includes:

- Utilisation of any equipment provided for health and safety purposes, including personal protective equipment and clothing provided by the Employer.
- Following any reasonable instruction that the Employer may give in relation to health and safety at work.
- Ensuring they are not affected by the consumption of alcohol or another drug to the extent that they may endanger their own health and safety at work or the safety of any other person at work.

1.4 ORGANISATIONAL RESPONSIBILITIES

For detailed organisational responsibilities within FMC refer to Section 3.1, Roles and Responsibilities for Occupational Health, Safety and Injury Management.
2.2 COMMITTEE STRUCTURE FOR OCCUPATIONAL HEALTH & SAFETY

- **FU Council**
- **Vice Chancellor**
- **Biosafety Committee**
- **FU OHS COMMITTEE**
- **FACULTY OF HEALTH SCIENCES AREA OHS COMMITTEE**
- **# FMC OHS COMMITTEE**
- **# FMC RADIATION SAFETY COMMITTEE**
- **# LABORATORY SAFETY SUB-COMMITTEE INCORPORATING HAZARDOUS SUBSTANCES MANAGEMENT**

* SMHS : Southern Mental Health Service
* ISCHS : Inner Southern Community Health Service

# For details of Membership and Terms of Reference refer to FMC Policy and Procedures Directory, Section 5: FMC Committee Structure and Terms of Reference

02/2004
2.3 LABORATORY OH&S ORGANISATION

OH&S Structure Relating to Laboratories

FLINDERS MEDICAL CENTRE

CHIEF EXECUTIVE OFFICER

Research and Development Labs

→ OH&S Workgroups

Diagnostic Labs (SouthPath)

→ OH&S Workgroups

- Nursing & Patient Services
  - WG 4 – Laboratories (Ophthalmology)

- Medicine, Cardiac & Critical Care Services
  - WG 5 – Laboratories (Endocrinology, Neuro-Endocrinology, Nephrology, Respiratory Function)

- Surgical & Speciality Services
  - WG 3 – Laboratories (Breast Cancer, General & Digestive Surgery, Molecular Biology, Gastro Molecular Biology, Gastrointestinal Services, Gastro Epithelial Biology, Gastro & Hepatology, Urology)

- Women & Children at Flinders
  - WG 4 – Laboratories (Obstetrics & Gynaecology, Child Nutrition Research Lab)

- Emergency & Perioperative Medicine
  - WG 3 – Laboratories (Anaesthesia & Intensive Care Lab, Pain Unit Lab)

- Pharmacy WG 2 – Laboratories
  - (Quality Control Lab, Production Service)

FLINDERS UNIVERSITY

SCHOOL OF MEDICINE

DEAN

Laboratory Manager

→ Research Labs

→ OH&S Workgroups

- Faculty of Health Science
  - WG 2 - SOM Laboratories

- Faculty of Health Science
  - WG 3 – SOM Administration & External Units

- Faculty of Health Science
  - WG 4 – Rural Clinical School (Renmark & Mount Gambier)

10/2005
This Laboratory is in Workgroup:

............................................................................................................................... ...............

Your Management Representative is:

............................................................................................................................... ........................................

Your Health and Safety Representative is:

............................................................................................................................... ........................................

Your Deputy Health and Safety Representative (if applicable) is:

............................................................................................................................... ........................................
2.4 RESOLUTION OF OH&S ISSUES

When situations arise or are identified which may pose a risk to health and safety, the process outlined below should be followed with a view to resolving the issue at the earliest possible level.

No Immediate Threat to Safety

- Employee identifies safety problem
  - Employee consults with immediate Supervisor
    - Problem not solved
      - Employee consults with Health & Safety Representative
        - Problem not solved
          - HSR* consults with immediate Supervisor
            - Problem not solved
              - HSR* consults with Divisional Director or Senior Manager
                - Problem not solved
                  - HSR* presents problem to OHS Committee for resolution
                    - Problem not solved
                      - Chief Executive Officer directs Senior Manager to conform to Committee’s resolution
                        - Problem not solved
                          - HSR* issues a default notice
                            - Problem not solved

Immediate Threat to Safety

- Employee identifies safety problem
  - Employee consults with immediate Supervisor
    - Problem solved
      - HSR* directs that unsafe work cease immediately
        - Problem solved
          - HSR* consults immediately with immediate Supervisor
            - Problem solved
              - HSR* consults immediately with Divisional Director or Senior Manager
                - Problem not solved
                  - Employer implements Inspector’s direction - problem solved
                    - Problem solved
                      - HSR* or Employer calls in DIA Inspector - stop work order remains
                        - Problem not solved
                          - HSR* or Employer appeals against Inspector’s direction
                            - Problem not solved
                              - Industrial Court determines the matter by a review committee
                                - Problem solved
                      - HSR* consults immediately with Divisional Director or Senior Manager
                        - Problem not solved
                          - HSR* consults immediately with Divisional Director or Senior Manager
                            - Problem solved
                              - Employer implements Inspector’s direction - problem solved
                                - Problem solved
                                  - HSR* or Employer calls in DIA Inspector - stop work order remains
                                    - Problem not solved
                                      - HSR* or Employer appeals against Inspector’s direction
                                        - Problem not solved
                                          - Industrial Court determines the matter by a review committee
                                            - Problem solved

*HSR : Health & Safety Representative
2.5 INCIDENT REPORTING & INVESTIGATION

POLICIES RELATING TO LABORATORY SAFETY
3.1 ROLES & RESPONSIBILITIES FOR OCCUPATIONAL HEALTH, SAFETY & INJURY MANAGEMENT

This section comprises Procedure Number: SP1.7 of the FMC Policy and Procedure Directory and can be located at http://intra.fmc.sa.gov.au/lido/Policies/ProceduresPdf/roles%20&%20responsibilities%20for%20ohsim.pdf
<table>
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<th>3.2 RISK MANAGEMENT OCCUPATIONAL HEALTH &amp; SAFETY</th>
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3.3 TRAINING IN OHS&W

This section comprises Procedure Number: SP1.11 of the FMC Policy and Procedure Directory and can be located at http://intra.fmc.sa.gov.au/fido/Policies/ProceduresPdf/training%20in%20ohs&w.pdf
3.4 FIRST AID IN THE WORKPLACE

This section comprises Procedure Number: SP1.3 of the FMC Policy and Procedure Directory and can be located at http://intra.fmc.sa.gov.au/fido/Policies/ProceduresPdf/first%20aid%20in%20the%20workplace.pdf
3.5 VACCINATIONS FOR STAFF

This Section Comprises Procedure Number: SP8.9 of the FMC Policy and Procedure Directory and can be located at http://intra.fmc.sa.gov.au/fido/Policies/ProceduresPdf/vaccinations%20for%20staff.pdf
3.6 PERSONAL PROTECTIVE EQUIPMENT

This Section comprises Policy Number: OHS 3.16 of the FMC Policy and Procedure Directory and can be located at http://intra.fmc.sa.gov.au/fmc/Docs/OH&S/P%20to%20R/personal%20protective%20equip.asp
3.7 WORKSTATION SAFETY

3.8 SAFER MATERIAL HANDLING

This section comprises Procedure Number: SP2.2 of the FMC Policy and Procedure Directory and can be located at
3.9 WASTE MANAGEMENT Including Sharps Disposal

LABORATORY SAFETY
4.1 GUIDELINES FOR LABORATORY SAFETY

- Always be conscious of the potential hazards.
- Keep evacuation routes clear at all times.
- Be aware of emergency evacuation procedures.
- Use personal protective equipment supplied as per Section 3.6.
  
  Note: Nitrile gloves should be used for handling organic solvents (eg xylene, chloroform). Nitrile gloves are available from FMC stores.
- Exercise care entering and leaving the laboratory.
- Handling, storing or consumption of food or drink in laboratories is not allowed.
- Read the label on all substances used in the laboratory and follow the warnings. If in doubt, ask your Supervisor.
- Follow safe working procedures at all times.
- Store the minimum quantities of substances in the laboratory.
- Always use a fume cupboard for handling hazardous or volatile substances.
- Wear appropriate attire.
- Appropriate closed footwear shall be worn in laboratory areas at all times, by all persons.
- Clean up spills immediately:
  
  (a) for chemicals, follow instructions on label or Material Safety Data Sheet (MSDS) or engage emergency procedure in Section 1.4.
  (b) for infectious materials, follow procedure set out in Section 6.1.
  (c) for blood & body fluids, follow the procedure for infectious materials set out in Section 6.1. If splashed on the body, engage emergency procedure set out in Section 1.2.
- Dispose of surplus or used chemicals as per Section 5.7, Guidelines for Disposal of Laboratory Chemicals.
- Avoid working alone in the laboratory especially if:
  
  (1) the procedure is particularly hazardous and/or
  (2) the procedure is performed after normal working hours.
- Washing of hands when leaving the laboratory is recommended.
- Mechanical pipetting devices should be used for all pipetting procedures.
- Gas cylinders must be secured in an upright position.
- Keep the laboratory in a clean and tidy state. It is good practice to clear the bench at the end of each day.
- Avoid using glassware that is chipped, broken, cracked or badly scratched.
- Take care in using cryogenic fluids or dry ice for cooling.

4.2 LABORATORY SAFETY TRAINING

The development of a systematic training and education program is an important strategy in managing and implementing good laboratory work practices and is a vital component of overall occupational health and safety policy and procedures. All staff, including senior management, should participate in appropriate health and safety training and there should be a commitment for resources and support from this group for an ongoing program.

Training provides a means for:

- sharing of knowledge
- developing skills, abilities and competencies for the trainee
- influencing behaviour of trainee into more effective patterns
- improving workplace performance
- emphasising the best (safest) work methods and procedures in laboratories
- clarifying the role of people in the workplace
- ensuring legal obligations and performance standards are met
- reducing costs to FMC.

Training may be directed at various aspects of the work:

- induction training and workplace orientation for persons who are new to FMC or who have transferred from one laboratory to another;
- job training, targeting persons commencing a new job or task in the laboratory, including situations where the existing job has been altered or the person has taken on a new role within the laboratory;
- hands-on training as provided by the Supervisor and experienced co-workers on a day-to-day basis;
- training for specific functions, such as first aid or manual handling training, safety committee member or safety representative training;
- staff development training; and
- training that compliments a health and safety program, such as industrial relations, dispute resolutions, assertiveness training or time management.

All workers should be made aware of the potential hazards in their area and in the tasks being undertaken, in addition to the use of appropriate preventative measures in dealing with them. This information should be regularly reviewed and updated.

Relevant reference material, such as safety manuals, material safety data sheets, instructions for operating machinery and technical information should be readily available.

All training should be documented & the records retained by the Department.
Infection Control recommends that all staff adopt Standard Precautions (formerly known as Universal Precautions) as the primary strategy for prevention of hospital-acquired infection. Standard Precautions are designed to protect both patients and workers from blood (including dried blood), all other body fluids, secretions and excretions (excluding sweat), non-intact skin and mucous membranes through handwashing, use of personal protective equipment (PPE), aseptic practices, safe disposal and handling of potentially infectious material, the appropriate reprocessing of instruments and equipment following use and environmental controls.

**Handwashing:** Hands must be washed after contact with blood, body fluids and contaminated items, whether or not gloves are worn; immediately after gloves are removed; between patient contacts; and when otherwise indicated to avoid transfer of micro-organisms to other patients or environments.

**Gloves:** Non sterile, single-use examination gloves must be worn whenever there is a risk of direct contact with blood, body fluids, mucous membranes, non-intact skin or contaminated equipment or surfaces. Single use gloves must be discarded immediately after use and changed as soon as they are torn or punctured. Wearing gloves does not replace the need for handwashing. General-purpose utility gloves to be used for cleaning and during manual decontamination of used instruments and equipment. Utility gloves may be reused. Wash after use in detergent and water and store dry. Replace if glove integrity changes. All gloves are discarded into general waste.

**Gowns, masks, eye protection, face shields:** Wear gowns, masks, eye protection and/or a face shield during procedures and patient care activities that are likely to generate splashes or sprays of blood, body fluids, secretions and excretions.

**Adequate Footwear:** Footwear should be capable of protecting clinical health care workers from injury or contact with sharp objects.

**Safe disposal and handling of sharps:** Take care to prevent injuries when using needles, scalpels, and other sharp instruments or devices. Sharps are classified as medical waste.

**Patient care instruments/equipment:** Ensure that reusable equipment is not used for the care of another patient until it has been cleaned and reprocessed appropriately (see Infection Control manual).

**Environmental controls:** There should be regular cleaning schedules to maintain a safe patient and staff environment. A neutral detergent is the cleaning solution of choice for environmental surfaces.

Additional Precautions apply to those situations where Standard Precautions may be insufficient to prevent transmission of infection. They are implemented in conjunction with Standard Precautions when a patient is known, or suspected to be infected or colonised with epidemiologically important or highly transmissible microorganisms that can be transmitted by the airborne route (eg. *Mycobacterium tuberculosis*), droplet transmission (eg. Pertussis) or by contact spread (eg. colonisation with MRSA). Alongside other measures, a single room is often indicated and a “STOP” sign is used to alert staff of the need for Additional Precautions.


Related documents:

1) Section 1.2: Blood & body fluid exposure procedure
2) Section 3.5: Vaccination for staff
4.4 COMPRESSED GAS SAFETY

This Section comprises Procedure Number: SP5.3 of the FMC Policy and Procedure Directory and can be located at http://intra.fmc.sa.gov.au/fido/Policies/ProceduresPdf/compressed%20gas%20safety.pdf
4.5 OPERATING INSTRUCTIONS FOR GENERAL PURPOSE GAS REGULATORS

SETTING UP EQUIPMENT

1. Chain the cylinder.
2. Remove the protective dust seal from the cylinder valve.
3. Inspect the cylinder valve for traces of dirt, dust, oil or grease. NOTE: If oil or grease is detected, DO NOT use the cylinder. Inform TEMPO of this condition immediately.
4. Inspect the regulator for damaged threads, dirt, dust oil or grease. If oil or grease is detected or if threads are damaged, DO NOT use the regulator. Contact Biomedical Engineering to clean the regulator and/or repair the damage before using.

INSTALLING THE REGULATOR

1. Make sure the regulator has the proper inlet fitting to fit the cylinder valve. If the fitting is so equipped, make sure the flat sealing washer is in place between the regulator and the cylinder valve outlet. The threads may be either right-hand or left-hand depending on the cylinder and regulator connections. Regulator inlet connections with left-hand threads have a "V" notch machined into the hex to signify a left-hand thread.
2. Tighten the regulator inlet nut or yoke T-screw securely.
3. Make proper connection to outlet of regulator fitting or valve.
4. Before opening the cylinder valve, on adjustable regulators release the tension on the regulator adjusting spring by turning the adjusting knob in a counter clockwise direction. On preset pressure regulators ensure that equipment or a closed valve is fitted to the outlet connection to prevent the free flow of gas once the cylinder valve is opened.

TURNING ON THE CYLINDER

1. Be sure that the adjusting knob of the regulator (adjustable pressure model) is fully counter clockwise and equipment is fitted to the outlet connection if a preset pressure model. Stand so the cylinder valve is between you and the regulator. NOTE: For greater safety never stand in front of a regulator when opening the cylinder valve. Slowly turn the cylinder valve on in a counter clockwise direction until you hear the gas begin to flow into the regulator. Wait about 10 seconds, then turn the cylinder valve fully on.
2. To check for leaks, close the cylinder valve and observe the high pressure gauge for 5 minutes. If the high pressure gauge reading drops, there is a gas leak in the cylinder valve, inlet fitting, high pressure gauge or regulator seat. Retighten the regulator to cylinder connection and repeat step 1. Should the high pressure gauge continue to drop after retightening, the regulator must be removed and returned for service.

ADJUSTING REGULATOR DELIVERY PRESSURE AND FLOW

1. After the regulator has been securely attached to the cylinder, adjust the delivery pressure to the desired pressure setting by turning the adjusting knob in a clockwise (increase) direction until the desired pressure is reached.
2. If the regulator is equipped with an outlet valve, flow can be controlled by proper adjustment of the valve.

TURNING OFF CYLINDER VALVE

When you have finished using the regulator, close the cylinder valve off in a clockwise direction and allow all pressure to drain from the regulator. Gas will cease to flow and the pointers on both pressure gauges will indicate zero when all pressure has been released from the regulator. After all pressure has been drained, release all tension on the regulator-adjusting knob by turning it fully counter clockwise.

REMOVING REGULATOR

1. It is not necessary to remove the regulator unless the cylinder is being moved or an empty cylinder is being replaced. NEVER attempt to remove the regulator if any pressure is showing on either pressure gauge. If pressure is showing follow 'Turn Off Cylinder Valve' procedure described above.
2. Remove the regulator from the cylinder and replace the protective cap on the cylinder.

02/2002
WARNING

Oxygen is not flammable; however, the presence of pure oxygen will drastically increase the speed and force with which burning takes place. Oxygen must never be allowed to contact oil, grease or other petroleum-based substances; therefore, use no oil or grease on regulator, cylinder, valves or equipment. Do not use or store near excessive heat 125 degrees F (52 degrees C) or open flame.
Gas regulator checks
If you have a regulator that looks different to these please ask Biomedical Engineering to check if it is OK for your application.
Figure 13 - OK (but flow meter should be vertical)

Figure 14 - OK

Figure 15 - OK

Figure 16 - OK

Figure 17 - OK only for CO₂

Figure 18 - OK
## 4.6 GUIDE TO LABORATORY WASTE DISPOSAL

Refer also to FMC Waste Management Policy, Section 3.7.

<table>
<thead>
<tr>
<th>TYPE OF WASTE</th>
<th>PROCEDURE FOR DISPOSAL</th>
<th>DESTINATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass</td>
<td>Yellow sharps container</td>
<td>Yellow MGB</td>
</tr>
<tr>
<td>- Broken</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Intact chemical bottles</td>
<td>General Waste</td>
<td>Green MGB</td>
</tr>
<tr>
<td>Syringe needles &amp; other sharp objects</td>
<td>Yellow sharps container</td>
<td>Yellow MGB</td>
</tr>
<tr>
<td>Laboratory plastic containers</td>
<td>General waste</td>
<td>Green MGB</td>
</tr>
<tr>
<td>- Chemical bottles</td>
<td>General waste</td>
<td>Green MGB</td>
</tr>
<tr>
<td>- Other plastic items</td>
<td>General waste</td>
<td>Green MGB</td>
</tr>
<tr>
<td>- Containing liquid body substances</td>
<td>Medical waste, Yellow bags</td>
<td>Yellow MGB</td>
</tr>
<tr>
<td>Paper</td>
<td>Recyclable</td>
<td>Recycle boxes</td>
</tr>
<tr>
<td>- Office (all colours)</td>
<td>Recyclable</td>
<td>Blue MGB</td>
</tr>
<tr>
<td>- Confidential documents</td>
<td>Recyclable</td>
<td>Recycle bin*</td>
</tr>
<tr>
<td>- Cardboard (including card, newspapers &amp; magazines)</td>
<td>Recyclable</td>
<td>Recycle bin*</td>
</tr>
<tr>
<td>Gloves</td>
<td>General waste</td>
<td>Green MGB</td>
</tr>
<tr>
<td>- Non-contaminated</td>
<td>Medical waste, Yellow bags</td>
<td>Yellow MGB</td>
</tr>
<tr>
<td>- Contaminated with blood/body fluids or infectious material</td>
<td>Recyclable</td>
<td>Recycle bin*</td>
</tr>
<tr>
<td>Milk cartons</td>
<td>Recyclable (washed &amp; squashed)</td>
<td>Recycle bin*</td>
</tr>
<tr>
<td>Plastic &amp; glass drink bottles</td>
<td>Recyclable (lids off &amp; straws removed)</td>
<td>Recycle bin*</td>
</tr>
<tr>
<td>Chemicals</td>
<td>Incineration</td>
<td>Store Room, 4P 109</td>
</tr>
<tr>
<td>- Flammable liquids</td>
<td>Incineration</td>
<td>Store Room, 4P 114</td>
</tr>
<tr>
<td>- Insoluble substances</td>
<td>Incineration</td>
<td>Store Room, 4P 114</td>
</tr>
<tr>
<td>- Substances containing heavy metals</td>
<td>To laboratory sink +</td>
<td></td>
</tr>
<tr>
<td>- Others +</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scintillation vials (with contents – if less than 2100dpm/ml)</td>
<td>Yellow bags</td>
<td>Yellow MGB</td>
</tr>
<tr>
<td>Other radioactive waste</td>
<td>Refer to FMC Radiation Safety Training and Reference Manual – Acquisition, Disposal and Transport of Radioactive Substances</td>
<td></td>
</tr>
<tr>
<td>Tissue culture ware</td>
<td>General waste</td>
<td>Green MGB</td>
</tr>
<tr>
<td>- Emptied of contents</td>
<td>Medical waste, Yellow bags</td>
<td>Yellow MGB</td>
</tr>
<tr>
<td>- Containing organisms infectious to humans or animals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genetically manipulated organisms</td>
<td>Autoclaved prior to disposal as general waste</td>
<td>Yellow MGB</td>
</tr>
<tr>
<td>Plastic ware or other items contacted with carcinogenic &amp; highly toxic material</td>
<td>Cytotoxic waste, Purple bags</td>
<td>Purple bin (from Stores)</td>
</tr>
<tr>
<td>Animal carcasses</td>
<td>Medical waste, Yellow bags</td>
<td>Freezer in Animal House</td>
</tr>
</tbody>
</table>

* Recycle bins now located in lift foyer areas and disposal rooms
+ Some chemicals may be disposed to sewer in accordance with SA Water Trade Wastes Policy

Prepared by M Froscio and B Hyland for FMC OHS Unit, June 1997, Updated November 2000
CHEMICAL SAFETY
5.1 DANGEROUS GOODS AND HAZARDOUS SUBSTANCES

There are currently two classification systems in use throughout Australia for classification of substances (chemicals).

The Dangerous Goods (Substances) System has evolved over many years and is co-ordinated by the United Nations Expert Committee on Dangerous Goods. The focus of this classification is on hazards in transport and predominantly takes into consideration the physico-chemical properties of the substance. There are 9 classifications (as set out in the table below) and most classifications have further sub-classifications. The Dangerous Goods classification symbol is the coloured diamond incorporating the class number and pictorial symbol of the danger posed by the substance.

The hazardous substances system of classification focuses entirely on the health effects of the substance on the human body when the substance is inhaled, ingested or absorbed through the skin. A substance is classified as hazardous if the substance has a defined biological effect (poison, very toxic, toxic, harmful, corrosive, or irritant) above set concentrations. In addition a substance is classified as hazardous if there is evidence of the substance as a carcinogen, irritant or teratogen. There is no universal symbol for a hazardous substance.

All dangerous goods categories can also be subjected to the hazardous substances classification with the exception of class 1 (explosives), class 6.2 (infectious) and class 7 (radio-active). This results in a situation where any one substance may be classified as:

1) Non-dangerous and non-hazardous, eg. Sodium Chloride.
2) Dangerous but non-hazardous, eg. Ethanol.
3) Non-dangerous but hazardous, eg. Sodium Carbonate.
4) Dangerous and hazardous, eg. Methanol.

### CLASSIFICATION OF SUBSTANCES

<table>
<thead>
<tr>
<th>DANGEROUS SUBSTANCES</th>
<th>HAZARDOUS SUBSTANCES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CLASS</strong></td>
<td><strong>CATEGORY</strong></td>
</tr>
<tr>
<td>1</td>
<td>Explosive</td>
</tr>
<tr>
<td>2</td>
<td>Gases</td>
</tr>
<tr>
<td>3</td>
<td>Flammable liquids</td>
</tr>
<tr>
<td>4</td>
<td>Flammable solids</td>
</tr>
<tr>
<td>5</td>
<td>Oxidising substances</td>
</tr>
<tr>
<td>6</td>
<td>Poisonous</td>
</tr>
<tr>
<td>6.2</td>
<td>Infectious</td>
</tr>
<tr>
<td>7</td>
<td>Radioactive</td>
</tr>
<tr>
<td>8</td>
<td>Corrosive</td>
</tr>
<tr>
<td>9</td>
<td>Miscellaneous</td>
</tr>
<tr>
<td>?</td>
<td>Non-dangerous</td>
</tr>
</tbody>
</table>

- “List of Designated Hazardous Substances” and “Approved Criteria for Classifying Hazardous Substances” are Worksafe Australia Publications.
5.2 PROCEDURE FOR HANDLING CHEMICALS

Many of the chemicals we use in the laboratory are dangerous/hazardous if not handled appropriately. This statement sets out overall guidelines for Laboratory workers and Supervisors to ensure that chemicals are handled safely.

In handling chemicals, the risks range from minimal for something like sodium chloride to very great for chemicals which are explosive, very toxic, or highly flammable. Because the chemicals in use in different laboratories vary widely and change with time, any system or set of rules for safe handling will ultimately depend on those actually handling chemicals following some basic rules:

- **READ THE LABEL.** Hazards are usually identified on the label.
- **DETERMINE THE RISKS.** For every chemical you handle, know the risks in handling. This information will be found on the label, in reference books and computer data bases on hazardous chemicals (eg. ChemWatch) or in safety notes in laboratory method books.
- **IF IN DOUBT, ASK.** Laboratory Supervisors have a special responsibility to keep information about the hazards associated with chemicals in use.
- **TAKE PRECAUTIONS APPROPRIATE FOR THE RISKS INVOLVED.**

**SUMMARY OF PRECAUTIONS FOR SAFE HANDLING OF CHEMICALS**

For ALL chemicals:
- double-check the label
- avoid contact with skin and inhalation of fumes or dust
- clean up spills so that fellow workers are never exposed unknowingly to chemicals
- label containers or solutions clearly - refer to Section 5.3 Hazardous Substances, including Mercury Spill Procedure
- there should never be food or drink in areas where chemicals are in use

In general, **Supervisors have the following responsibilities:**

1. To ensure hazardous chemicals are appropriately label led and stored and to provide information to staff on precautions appropriate to different hazards. Refer to Section 5.3, Hazardous Substances including Mercury Spill Procedure.
2. To ensure their laboratory has adequate safety equipment.
3. To ensure their laboratory meets legislative requirements for occupational health & safety.
4. To ensure all operating procedures contain adequate warnings on hazardous reagents. The hazards should be identified wherever the chemical is mentioned.
5. To remain vigilant for safety hazards, and rectify any problem.
6. To maintain a register of chemicals used in their laboratory. Refer to Section 5.3, Hazardous Substances including Mercury Spill Procedure.

**Laboratory workers have the following responsibilities:**

To remain alert to the potential hazards in handling chemicals, to follow appropriate safety procedures where a hazard is known, and to seek advice when the extent of hazard or appropriate precautions are not clear.

02/2002
5.3 HAZARDOUS SUBSTANCES including mercury spill procedure

5.4 CHEMWATCH

The ChemWatch software program has been purchased by FMC to assist compliance with the Hazardous Substances Regulations and the FMC Policy for Hazardous Substances as set out in Section 5.3. ChemWatch has been designed to manage the entire chemicals portfolio of an organisation, whether large or small.

Features of the ChemWatch program include:

- Database of Material Safety Data Sheets (MSDS) for over 40,000 chemicals
- MSDS in Worksafe Australia approved format.
- Full MSDS or short version available.
- Chemical search by using name of chemical, trade name, United Nations (UN) Number or Chemical Abstracts Service (CAS) Number.
- Hazardous substances labels for compliance with Approved Code of Practice for labelling of hazardous substances.
- Emergency information, ie. first-aid treatment, procedure in case of spillage, advice for doctor and fire fighting procedure.
- Store manifest facility with three levels of storage:
  - Area - Laboratories
  - Section - Department
  - Specific Locations - Room number.
- Hazchem coding and Australian Dangerous Goods (ADG) coding.
- Networked throughout FMC via a file server located in Biomedical Engineering Department.
- Perform a risk assessment for the use of substances that are listed in the data base.

All areas of FMC, including laboratories, are required to enter all substances held and the quantities into the ChemWatch program. The program can then:

- Identify all substances which are classified as hazardous.
- Print a listing of:
  (a) all substances in a particular store
  (b) hazardous substances in a particular store
  (c) dangerous substances in a particular store.
- Perform a risk assessment of all hazardous and/or dangerous substances held in a particular store. (Refer to Section 5.5)
- Print a full MSDS or a short version (mini) MSDS (Refer Section 5.6) for any substance (hazardous or non-hazardous) listed in the data base.
- Print labels for hazardous substances.

Section 5.5 outlines the procedure for data entry into the ChemWatch.
5.5 CHEMWATCH DATA ENTRY


Instructions can also be found on the Chemwatch program

- Go to the Chemwatch homepage
- Select “Documentation”
- Select “Technical Manual”
- Chemwatch Technical Manual will show.
5.6 HOW TO OBTAIN AN MSDS FROM CHEMWATCH

1) Access the ChemWatch program.

2) Select “Data base” from the start Menu.

3) Select “Level 1 (simplified)”. 

4) Enter name of chemical or CAS number for chemical.

5) Click on name of chemical and click on “start search”.

6) Select “Print”. 

7) Select “List MSDS” for a full MSDS, or “List Mini MSDS” for a short version of MSDS.

8) MSDS will print.

9) For printing a number of MSDS’s at the same time:
   (a) select “send to” and then select “in tray” followed by “List MSDS” or “List mini MSDS”
   (b) to print the contents of the “in-tray”, select “print” and “reports” and the contents will be printed
   (c) to delete the contents of the “in-tray”, select “clear”.

10) For further assistance refer to the on-line technical manual available under “Documentation” on the Start Menu.
5.7 GUIDELINES FOR DISPOSAL OF LABORATORY CHEMICALS

FMC laboratories use a wide range of chemical substances in research, diagnostic and clinical activities. Waste chemical substances and solutions are often generated. To dispose of waste chemical substances, follow the appropriate procedure below.

1. DISPOSAL OF LIQUID WASTE CHEMICALS.

a) Aqueous solutions – can be disposed to sewer providing:
   1) pH range is between 6 and 10,
   2) Does not contain dangerous substances (eg. Flammable liquids, Oxidising substances, Toxic substances, Corrosive substances),
   3) Does not contain heavy metal ions (eg. Osmium, Cadmium, Barium, Lead).

b) Liquid substances that are NOT classified as dangerous – can be disposed to sewer providing;
   1) They are miscible with water.

c) Liquid substances that are classified as dangerous – CANNOT be disposed to sewer;
   The classes of liquid dangerous substances most commonly encountered in laboratories are classes 3, 5, 6.1, and 8.
   The procedure for disposal of these liquids is;

   **Class 3 Waste**, Flammable liquids (eg. Acetone, Alcohols, Xylene, HPLC waste)

   **Collection point is Room 4P-109** (Former Dangerous and Waste Chemical Store Room)

   To access the room, contact:
   - Anatomical Pathology Reception, Build ‘D’ level 4, room 4D-113 (0845 – 1700)
   - Tempo Health Support Services on either 64151 or 65536 and they will provide an escort and open the store for you.
   - Security Desk, Emergency Department, Build ‘B’ level 3 (Available for after hours emergency access only).
   - OHS&IMS Office, Transportable Building Southern car park, FMC (spare keys only).

   **Class 5 Waste**, Oxidizing substances (eg. Organic peroxides) and,

   **Class 6.1 Waste**, Toxic substances (eg. Chloroform, Dichloromethane, DMSO) and,

   **Class 8 Waste**, Corrosive substances (eg. Acids, Ammonia solution, Formaldehyde)

   **Collection point is 4P-114** (Tempo Chemical Store Room)

   d) For other classes of liquid dangerous substances, seek advice from one of the persons listed under Contacts (below).
2) DISPOSAL OF SOLID WASTE CHEMICALS.

a) Solid substances that are NOT classified as dangerous.

These can be disposed via the general waste stream. Place items into the general waste bin (take care not to break glass containers).

b) Solid substances that are classified as dangerous – CANNOT be disposed as general waste.

The classes of solid dangerous substances most commonly encountered in laboratories are;

- **Class 5 Waste**, Oxidizing substances (eg. Nitrates, Chromates) and,
- **Class 6.1 Waste**, Toxic substances (eg. Phenol, Mercury and Osmium salts) and,
- **Class 8 Waste**, Corrosive substances (eg. Hydroxides)

**Collection point is 4P-114** (Tempo Chemical Store Room)

To access the room contact Tempo Health Support Services on either 64151 or 65536 and they will provide an escort and open the store for you.

c) For other classes of solid dangerous substances, seek advice from one of the persons listed under Contacts (below).

3) LABELLING

All materials to be disposed must be clearly labeled with the:

- Name of substance
- Dangerous Goods Class
- Risk phrases applicable
- Safety phrases applicable
- Laboratory or area from which item originated (Name of person and Room number)

The most effective method of providing all this information is to use the original manufacturers bottle/container and to add name and room number.

4) CONTACTS

- OH&S Risk Management Coordinator, John Roberts
  Ext 65758

- Assistant Manager, Support Services, Angela Binns
  Ext 68995, Pager 20251
5.8 GUIDELINES FOR COMMON STORAGE OF CHEMICAL SUBSTANCES

As of July 2006, there are three separate areas for storage of chemical substances which are in excess to laboratory requirements:

- **Room 4P-109** (Former Dangerous and Waste Chemical Store)
  This room is to be used for **Class 3 Substances, Flammable liquids only** (eg. Alcohols, Acetone, Xylene, Toluene, Acetonitrile).

- Storage Cabinets located in Room 4D-301.
  a) **Class 6.1 Substances, Toxic Substances** (eg. Chloroform, DMSO, Dichloromethane) are to be stored in the **Class 6 cabinet (white)**
  b) **Class 8 Substances, Corrosive Substances** (eg. Acids and Hydroxides) are to be stored in the **Class 8 Cabinet (purple)**

- **Room 4P114**
  This room is to be used for **class 5, 6.1 & 8 chemicals**.

**ACCESS**

To access Rooms 4P-109, 4P114 and the cabinets in Room 4D-301;

- Contact Tempo Health Support Services on either 64151 or 65536 and they will provide an escort and open the store for you.
- Security Desk, Emergency Department, Build 'B' level 3 (1700 – 0845)
- **Available for after hours emergency access only**
- OHS&IMS office, Transportable Building Southern car park FMC (spare keys only).

Keys must be returned immediately after use.

**LABELLING**

All materials to be stored must be clearly labeled with the:
- Name of substance
- Dangerous Goods Class
- Risk phrases applicable
- Safety phrases applicable
- Laboratory or area from which item originated (Name of person and Room number)

The most effective method of providing all this information is to use the original manufacturers bottle/container and to add name and room number.

It is recommended that chemicals stored for re-use are dated.

**CONTACTS**

OH&S Risk Management Coordinator, John Roberts
Ext 65758

Assistant Manager, Support Services, Angela Binns
Ext 68995, Pager 20251
SPECIALISED LABORATORIES
6.1 BIOLOGICAL CONTAINMENT LABORATORIES

All Microorganisms are Potential Pathogens

Safe working practices, risk groupings and physical containment levels for laboratory work involving microorganisms are set out in AS/NZS 2243.3:2002 Safety in Laboratories – Microbiological aspects and Containment Facilities.

The standard classifies microorganisms into risk groups and sets out physical containment levels corresponding to each risk group. Requirements are provided for laboratory facilities, personal protective equipment and work practices relating to each physical containment level.

The safest procedure to adopt while working with microorganisms or infectious samples is to regard all as potentially pathogenic, and treat them accordingly. Thorough knowledge and use of good laboratory practice are of the utmost importance in the safe handling of infectious material.

Certain microorganisms present a risk of infection if they are handled on the open bench, usually because they are readily transmitted by aerosols, or their infectious dose is small. Others present hazards from risk of accidental self-inoculation. Special containment equipment and laboratory designs have been developed for the safe handling of infectious organisms.

The risk group classification is based on the pathogenicity of the agent, the availability and mode of transmission, and host range of the agent, the availability of effective preventive measures and the availability of effective treatment:

- **Risk Group 1 (low individual and community risk)**
  This is a microorganism which is unlikely to cause human, plant or animal disease.

- **Risk Group 2 (moderate individual risk, limited community risk)**
  This is a pathogen that can cause human, plant or animal disease, but is unlikely to be a serious hazard to laboratory workers, the community, livestock or the environment. Laboratory exposures may cause infection, but effective treatment and preventive measures are readily available and the risk of spread of the infection is limited.

- **Risk Group 3 (high individual risk, limited community risk)**
  This is a pathogen that usually causes serious human or animal disease and may present a serious hazard to laboratory workers. It could present a risk if spread in the community, but there are usually effective preventive measures or treatment available.

- **Risk Group 4 (high individual and community risk)**
  This is a pathogen that usually produces life-threatening human or animal disease. It represents a serious hazard to laboratory workers and is readily transmittable from one individual to another. Effective treatments and preventive measures are not usually available.

Biological laboratories are classified according to the risk group (1-4 above) of organisms used. The terminology “Physical Containment level 2” or “PC2” is used for laboratories handling risk group 2 organisms. Each containment level has specific recommendations for laboratory facility, equipment, practices techniques and monitoring procedures. The classifications PC1 and PC2 are common throughout FMC.

**Physical Containment Level 1 (PC1)**

No specific requirements for containment or equipment as the organisms handled do not pose a significant risk. Good laboratory practice should be engaged and protective equipment (gowns) should be worn. Refer to AS 2243.3:2002 Safety in Laboratories – Microbiological aspects and containment facilities for further details.
Physical Containment Level 2 (PC2)

Suitable for work with organisms in risk group 2 and requires additional conditions to the practices and facilities for level 1. Some of the conditions are listed here, but AS 2243.3:2002 should be consulted for the full list of requirements.

1) Restricted access to the laboratory area.
2) Biological symbol prominently displayed at the entrance.
3) Ready access to a steam steriliser.
4) Foot or elbow operated taps should be provided for hand washing.
5) Laboratory gowns (coats) to be removed when leaving the laboratory. Coat hooks should be provided near the access door.
6) Decontamination solutions (at working strength) should be readily available.
7) Gloves must be worn when handling cultures of organisms or biological samples suspected of containing organisms.
8) Where significant quantities of aerosols are produced, a Biological Safety Cabinet (Class I or II) should be provided.
9) All laboratory personnel are to be instructed in good microbiological techniques and advised of the risks of infection with pathogenic microorganisms.
10) All clinical specimens are to be regarded as potentially infectious.
11) Microbiological waste shall be autoclaved and disposed by the infectious waste stream in accordance with Waste Management Policy Section 3.9.

Physical Containment Level 3 (PC3)

More stringent requirements including, negative air pressure in laboratory, sealed laboratory for decontamination and all work to be carried out in Biological Safety Cabinet. Refer to AS 2243.3:2002 for full details.

Physical Containment Level 4 (PC4)

Further requirements include location of laboratory in separate building and double interlocking self closing doors and shower compartment. Refer to AS 2243.3:2002 for details.

Research Projects with microorganisms

All research projects involving microorganisms in risk group 2 or higher must be approved by the Institutional Biosafety Committee (IBC). Approval procedures can be found in the FU/FMC Biosafety Manual which can be viewed/downloaded from http://www.flinders.edu.au/research/Office/ethics/restricted/Biosafety_Manual.pdf

Further information can be obtained from

- The IBC Executive Officer, Angela Binns
  Ext 68995, Pager 20251

- The IBC Secretary, Vanessa Eig
  Ext 64062
6.2 PHYSICAL CONTAINMENT LABORATORIES FOR GENETIC MANIPULATION WORK

The Office of the Gene Technology Regulator, OGTR (formerly GMAC), a Federal Government agency, oversees research and development programmes involving Genetically Modified Organisms (GMOs). OGTR requires an Institutional Biosafety Committee (IBC) to be established by an Institution which undertakes such research and development activities. The IBC assumes internal monitoring and surveillance of resources and facilities for safe work practice involving GMOs and the administration of OGTR Guidelines set out in the “Handbook on the Regulation of Gene Technology in Australia”.

Laboratories where genetic manipulation experiments are performed and/or GMOs are used, may require special physical containment and work practice equivalent to the Physical Containment Laboratory standards set for microbiological work (Section 6.1).

Hence an OGTR PC2 laboratory is authorised to handle GMOs (plants, animals and microorganisms) of moderate risk. The requirements and standards are similar to a microbiological Physical Containment Level 2 laboratory, and in order to comply with OGTR Guidelines they must also:

1) Display a OGTR PC2 sign at the entrance.
2) Display OGTR PC2 procedures inside the laboratory.
3) Undergo annual inspection by the IBC.

Research projects with GMOs

In addition to the laboratory and containment requirements, all projects involving any GMOs (animal, plant or microorganism) must be approved by the IBC. Approval procedures can be found in the FU/FMC Biosafety manual which can be viewed/downloaded from http://www.flinders.edu.au/research/Office/ethics/restricted/Biosafety_Manual.pdf

Further information can be obtained from

- The IBC Executive Officer, Angela Binns
  Ext 68995, Pager 20251

- The IBC Secretary, Vanessa Eig
  Ext 64062
The basic principle of protection for laboratory workers using radioactive materials is to avoid all unnecessary exposure to radiation. Where exposure is unavoidable, any exposure should be kept as low as reasonably achievable (ALARA principle). The three essential strategies to achieve the ALARA principle are:

1) Minimise time spent in a radiation environment. The less time spent exposed to radiation will result in a smaller dose of radiation.

2) Distance is a very effective protective measure against radiation. The inverse square law applies where the dose rate decreases in proportion to the inverse of the square of the distance from the source of the radiation. Wherever possible, maintain a maximum distance from a radiation source to minimise the radiation dose.

3) Wherever possible, shielding materials should be used to protect laboratory workers using radioactive substances. Beta radiation is effectively shielded by low density materials (eg. perspex) while gamma radiation requires dense material (eg. lead) for shielding.

All laboratories which use radioactive substances should have a copy of:


Some requirements for laboratories are summarised here:

1) All laboratory personnel who use radio-isotopes must be registered with the FMC Radiation Safety Officer. Registration forms are available from Radiology Department. The Radiation Safety Officer will assess the need for radiation monitoring by TLD badges based upon usage of radioactive substances.

2) All radioactive substances acquired by a laboratory are to be recorded in a register. Usage and disposal of each radioactive substance must be documented in the register.

3) Laboratories using radioactive substances are classified according to the amount of radioactive substances used in the laboratory. For details on classification of laboratories, refer to the FMC Radiation Safety Manual, The Ionising Radiation Regulations, 1985 or the FMC Radiation Safety Officer.

The most common class of radiation laboratory at FMC is the Class C Radiation Laboratory (less than 40MBq of radiotoxicity group 2 isotopes allowed in this type of laboratory).

4) All type C Radiation laboratories must:
   (a) display an appropriate sign on the door, bearing the radiation symbol, and
   (b) the name of the license holder of the laboratory (at least one person in a Class C laboratory must hold a license to handle radio-active substances) and a contact telephone number.
   (c) display, in a prominent position, a one page summary of the WORKING RULES for handling radionuclides in the laboratory, and a contingency plan for ACCIDENTAL SPILLS or radioactive contamination.

5) All radioactive waste is to be kept separate and labelled appropriately. Red plastic liners are to be used for bins. All radioactive waste is to be disposed of in accordance with the FMC Waste Management Policy, Section 3.9, and the FMC Radiation Safety Training and Reference Manual – Acquisition, Disposal and Transport of Radioactive substances.
6.4 RADIATION SAFETY

PLANT AND EQUIPMENT SAFETY
7.1 PURCHASING OF PLANT AND EQUIPMENT

Prior to obtaining quotations for new plant or equipment, consideration needs to be given to the hazards associated with the item and the ongoing maintenance and support of the item.

Consult with the relevant testing authority (Biomedical Engineering for all clinical and laboratory items, Computing Services for desktop computing items or Environmental Services for building and domestic items) who will advise of any special requirements such as service information, service training, maintenance contracts, purchase of spare parts, etc. which may need to be included on the quote.

Use the Asset Purchase Requisition (APR) form for:

1. All purchases of electrical laboratory equipment regardless of cost.
2. All purchases of non-electrical laboratory equipment over $1000.

Refer to Section 7.4 for policy on Plant Management.

Any plant or equipment purchased or acquired within FMC must undergo an acceptance check (safety check and recording on Asset register) prior to use. The nominated Plant Manager for the area will have the responsibility to ensure all plant and equipment has undergone an acceptance check. Refer to Section 7.4, Plant Management, for details.
7.2 SAFE OPERATION OF LABORATORY EQUIPMENT

All laboratory personnel should be instructed in the hazards of each laboratory equipment item. Hazards are often identified in manufacturer’s operation manuals which should be readily available. A selection of laboratory equipment together with major hazards is listed here.

1) Heat Sterilisers (Autoclaves)

These units operate under steam pressure. All operators will need to be trained in the correct operating procedures. The hazards are associated with handling hot items (use of insulated gloves) and steam burns (if unit is depressurised while too hot). Autoclaves also need to be inspected annually by State authorities (refer to Biomedical Engineering for portable autoclaves, Environmental Service for fixed autoclaves).

2) Centrifuges

Centrifuges generate high gravitational forces in samples by centrifugal action. The major hazards are due to the high mechanical forces generated. Hence modern centrifuges have intricate lid locking mechanisms to prevent access to the centrifugal chamber until the rotor has decelerated to an almost stationary position. Care should be taken to ensure balanced loading of the centrifuge. Some modern centrifuges have vibration cut out switches to stop the centrifuge if the load is not balanced.

3) Microtomes

This equipment is used for cutting thin histological sections for microscopic examination. The knife is extremely sharp and extreme care should be taken when handling. The knife should be guarded while not in use.

4) Fridges

Laboratory fridges should not be used for storage of food or drink. In addition, flammable liquids should not be stored in a fridge unless the fridge has been modified and labelled as suitable for storage of flammable liquids.

5) Laminar Flow Cabinets

Laminar flow cabinets are used as clean areas for performing tasks requiring aseptic techniques. The cabinet is fitted with a U.V. light which is normally left on when the cabinet is not in use to maintain aseptic conditions. The U.V. light must always be off when the cabinet is in use to prevent U.V. damage to the eyes of the operator. All personnel using laminar flow cabinets should be instructed in the correct procedure.

6) Biological Safety Cabinets

Biological safety cabinets provide aseptic work areas, but differ from laminar flow cabinets in the direction of the airflow so as to afford protection to the user from biological samples within the cabinet. There are two types of Biological Safety Cabinets. Class I provides operator protection but not sample protection. Class II provides both operator and sample protection. U.V. lights are used to maintain aseptic conditions in the working chamber and these must be turned off while in use. All personnel should be instructed in the use of biological safety cabinets.

7) Electrophoresis Equipment

Such equipment often uses high voltages to achieve separations of samples on a support medium. The hazard to the user is electrical contact with the sample while electrical current is flowing. **Always** turn the power supply off before opening the chamber.
8) Vacuum Equipment

Vacuum equipment such as centrifugal evaporators and freeze dryers present a hazard of implosion. Any glass attachment to a vacuum system must not have flat surfaces. Glass attachments should be inspected for scratches and cracks, and, if present, the glassware should be discarded. Eye protection should be worn when using vacuum equipment.

9) Use of Compressed Gases

Refer to Section 4.4, Compressed Gas Safety and Section 4.5, Operating Instructions for General Purpose Gas Regulators
All laboratory personnel should report any faults/malfunction of laboratory equipment to their immediate Supervisors. The designated Plant Manager for the area should be also notified for initiating repairs. Repairs are actioned by advising the Biomedical Engineering Department by a completed Biomedical Engineering Work Request. Please use an Environmental Services Work Request form for Environmental Services jobs. Biomedical Engineering will perform repairs or call for an outside service provider for repairs and keep appropriate records of maintenance performed.

Surplus or unwanted laboratory equipment should be sent to Biomedical Engineering Department for disposal or re-use and not stored in laboratory areas. Items for disposal must be accompanied by a completed FMC “Asset Transfer/Disposal Form”. Flinders University items should also be accompanied by a completed FU “Asset Retirement Application Form”. Blank forms are available from the SOM Laboratory Manager’s Office (Room 6E 111.3).
7.4 PLANT MANAGEMENT & RESIDUAL CURRENT DEVICES

This Section comprises Procedure Number: SP5.5 of the FMC Policy and Procedure Directory and can be located at http://intra.fmc.sa.gov.au/fido/Policies/ProceduresPdf/plant%20management%20rcds.pdf
ELECTRICAL SAFETY IN LABORATORIES
8.1 BASIC ELECTRICAL SAFETY

Laboratory personnel should be alert for faulty electrical plugs, electrical cords or extension cords. Report any faults to immediate Supervisor and/or remove item/electrical cord from service. Double adaptors are not permitted throughout FMC. A powerboard with individual switches for each outlet and a circuit breaker is recommended for temporary use and must be provided by Environmental Service. Additional power outlets should be sought where the number of outlets is inadequate.

Some moveable equipment may be required to be connected to an electrical circuit which is protected by a Residual Current Device (RCD). Assessment will be carried out by Plant Managers and Biomedical Engineering Department. If an RCD is required to satisfy State Regulations, Biomedical Engineering and/or Environmental Service will fit an RCD. An RCD must be routinely tested as set out in Section 7.4, Plant Management and Residual Current Devices.
8.2 ELECTRICAL EQUIPMENT IN COLD ROOMS

The following procedure is recommended for removal of equipment items from cold rooms prior to use of the equipment at room temperature.

Prior to removing equipment from cold rooms, enclose it in a plastic bag, exclude as much air as possible and then seal the bag. After removing, allow the item to adjust to room temperature for at least three hours (or preferably overnight), before removing from the bag and connecting to power. The condensation which will develop inside the unit will be minimised.

If there is evidence of moisture, corrosion or faulty operation contact Biomedical Engineering.
PROCEDURES SPECIFIC TO THIS LABORATORY
APPENDICES
10.2 SELECTED MSDS
10.3 RECORDS OF OH&S TRAINING
The FMC Laboratory Safety Manual was revised in February 2002, and updates were distributed in hard copy to all holders of the manual.

In May 2002 the manual was made available in electronic form at:


This page records all updates to the FMC Laboratory Safety Manual since the availability of the electronic form of the manual. All updates will be marked with the date of update in the bottom right hand corner of the page.

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