Health and Safety Guidance

SPILLAGE MANAGEMENT

ARRANGEMENTS

AND

GUIDANCE

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ROYAL FREE HOSPITAL NHS TRUST

AND

ROYAL FREE AND UNIVERSITY COLLEGE MEDICAL SCHOOL
OF UNIVERSITY COLLEGE LONDON
(ROYAL FREE CAMPUS)

1 November 2003
SCOPE

This policy is to inform and instruct staff of what actions to take on the discovery or involvement with a spillage of biologically hazardous material (blood, body fluids or micro-organisms) or a chemical substance. All areas within the Trust and Medical School are covered by this policy. The policy does not cover radioactive material* or leaking gases which are dealt with in different guidelines. It is the responsibility of each Head of Department (or service manager) to ensure compliance with this policy.

* Advice on dealing with a radioactive spill can be obtained from the Radiation Protection Supervisors in individual departments or from the Radiation Protection Advisers listed in the appendix.

EMERGENCY PLANS AND PROCEDURES

Each department which stores or handles hazardous micro-organisms or hazardous chemicals or toxic chemicals must have in place emergency plans and procedures for dealing with the spillage of these organisms and chemicals. Risk assessments (which should follow the guidelines for COSHH risk assessments) should be carried out for the micro-organisms and chemicals that are stored, used and transported in each department and emergency plans prepared as required. The Head of Department is responsible for ensuring that this documentation is up to date and that it is readily available to staff and emergency services. It is also a legal requirement to assess the need for and to provide appropriate Personal Protective Equipment (PPE), along with training in its use. Guidance is available from the Health and Safety Adviser for the Trust and Medical School, the Biological Safety Officer, or Infection Control Team on how to carry out these assessments (see also; Dealing with a suspicious substance p9).

PROCEDURES IN THE EVENT OF A SPILLAGE:

1. BLOOD AND BODY FLUID SPILLAGE

(From: Protection against Blood-Borne Infections in the Workplace & RFH Infection Control Manual- see appendix)

Small spots of blood or small spills
- Gloves and eye protection should be worn
- Contamination should be wiped up with paper towels soaked in freshly prepared hypochlorite solution (Milton or chlorine releasing tablets) containing 10,000 ppm (1%) available chlorine.
- If broken glass is present, first treat the spillage with hypochlorite, then carefully remove the pieces of glass with disposable forceps or scoop to a sharps bin, before wiping up as above.
- Towels and gloves should be disposed of in a yellow clinical waste bag for incineration (or an autoclave bag if in a laboratory).
- Hands must be washed following clearing up.
**Larger spills other than urine (unless bloodstained)**

Staff, patients and visitors must be kept away from the spillage and if possible a warning sign shown, while preparation is made to handle the spill as outlined below.

- Gloves, eye protection and a disposable apron should be worn. If the spillage is extensive, disposable plastic overshoes or rubber boots may be necessary.
- Liquid spills should be covered with dichloroisocyanurate (chlorine releasing) granules and left for at least two minutes before clearing up with paper towels, absorbent mats or incontinence pads. A specialised spillage mop with detachable absorbent pads (see under Chemical Spillage - Dealing with the spillage) is a convenient way of absorbing the spillage after disinfection.
- Alternatively, the spill may be covered with paper towels, absorbent mats or incontinence pads and gently flooded with hypochlorite solution (Milton or chlorine releasing tablets) containing 10,000 ppm (1%) available chlorine* (again this should be left for at least two minutes before attempting to clear up).
- If broken glass is present, first decontaminate the spillage as above, then carefully remove the pieces of glass with disposable forceps or scoop to a sharps bin, before wiping up.
- Paper towels, gloves, disposable overshoes and any contaminated clothing should be placed in a yellow clinical waste bag for incineration (or an autoclave bag if a laboratory) and hands washed (reusable PPE may need to be decontaminated with dilute disinfectant).
- Finally, the area should be washed with water and detergent and allowed to dry.

* Hypochlorite solutions (eg household bleach) may be replaced by solutions of dichloroisocyanurate prepared from tablets according to the manufacturer’s instructions. Note: metals can be damaged by hypochlorite, and they should not be exposed to it for lengthy periods.

**NB:** Spilt blood should not be allowed to dry as potential aerosol production is greater from dried blood.

A normal mop and bucket should not be used for blood spillages.

Note that urine may promote the release of free chlorine from the treated area when hypochlorite or other chlorine-containing compounds are applied. Ventilation of the area may be necessary.

**Leakage in the Vacuum transport system for specimens**

In the event of a blood or body fluid leakage in the specimen transport system, immediately inform the Assistant General Manager in Pathology Services (see appendix), as well as the laboratory managers in the Haematology and Clinical Biochemistry Departments, and the Biological Safety Officer or his Assistant. The system must be closed down and a specialised decontamination procedure carried out.
2. MICRO-ORGANISM SPILLAGE

A spillage of micro-organisms would normally occur only in laboratories equipped to handle this situation (Containment Level 2 or 3 laboratories), unless the organisms are being used in a clinic or on the ward for therapeutic reasons. Examples would be; BCG (Bacille Calmette-Guerin) for inoculation or bladder instillation, or the inoculation of genetically modified live micro-organisms (see below). The disinfection of micro-organisms is based on information contained in the Trust and Medical School Laboratory Disinfection Policy (see appendix).

Any spillage of micro-organisms outside of the specific Containment Level areas must be reported immediately to the Biological Safety Officer or his Assistant and the Infection Control Team (for contact numbers- see appendix).

Spillage in laboratories
Departments with laboratories which handle infectious micro-organisms (Hazard Group 2 or 3) or fluids which might contain such organisms, must have a risk assessment standard operating procedure for dealing with relevant spillages. Further, a spillage control kit for biological hazards, or the appropriate disinfectants, must always be readily available in these laboratories. Biological spillages in Containment Level 3 laboratories require specialised fumigation and disinfection procedures. These must be documented and available in the department.

Spillage of genetically modified micro-organisms in clinics or on wards
Before live GM (genetically modified) organisms are used in a clinic or on the ward, the GM Committee must give permission to its use. The Committee will receive a full risk assessment of its intended use which will include details of specific handling and disinfection procedures in the event of a spillage. Guidelines will then be made available to staff handling such organisms.

Spillage of BCG:
(In bladder instillation the spillage may be larger than expected and include urine)

- Proceed as for handling a blood and body fluid spill, but use 2% Hycolin (not hypochlorite) as the disinfectant.

- A final clean should be carried out using 70% alcohol or IMS (Industrial methylated spirits). Note: These disinfectants above are safe to use on metal surfaces such as trolleys etc.

Inform the Infection Control Team. An incident form should be filled out and passed to the local area co-ordinator (via the manager) who will forward it to the Clinical Governance Support Centre for distribution to the relevant persons.
3. CHEMICAL SPILLAGE

A spillage kit suitable for the types of chemicals being handled, as well as suitable personal protective equipment (PPE) must be on hand in the laboratory suite. The Department Safety Officer is responsible for ensuring the kit is maintained and that all staff members are familiar with its use and location. Information on handling spillages of specific hazardous chemicals should be included in the department COSHH risk assessments (for detailed information sources on handling spillage of specific chemicals see appendix).

Immediate action when spillage occurs:
The member of staff first on the scene must immediately alert other staff, and tell patients or visitors to keep a safe distance away.

Make decision to:
   a) Evacuate the area affected - using fire alarm to call fire brigade or

   b) Control the spillage -

a) If the Chemical is unknown or the staff are unable to deal safely with it -
   Set the fire alarm off immediately

   If the nature of the spillage or uncontrolled release is unknown, or if the staff present are not trained in the use of PPE and suitable spillage kits, the fire alarm must be set off immediately. The person who raises the alarm should await the arrival of the Trust Fire Team and the Fire Brigade and provide details of the spillage. Staff working on the floor directly below should also be informed where possible.

b) If the Chemical is known and the staff trained and equipped -
   Deal with the spillage locally only if it is safe to do so

   A spillage may only be dealt with locally if the nature of the spillage is known and by staff who are trained in the use of the required PPE and chemical spillage kits. If there is any doubt about the hazard involved or ability to deal with the size of the spillage, the fire alarm should be raised and details given of the location and nature of the spillage to the fire team on their arrival.

   If the spillage has occurred in a biological or radiation hazard area the Biological Safety Officer or Radiation Protection Supervisor (or adviser) and Fire Brigade must be informed and any further risks assessed.
If the decision is to control the spillage - carefully assess the situation.

First steps should be:

- **Inform others** that you intend to deal with the spill. Two trained members of staff should act as a response team. Someone should watch from a safe distance, preferably through an observation window.

- If a **flammable** liquid is spilt:
  - Eliminate **ignition sources**, such as naked flames.
  - If a large spill, contact Works Department, arrange to **isolate electrical supply** – Do not use switches in the immediate area as spark from the switch may ignite spill.

- **Ventilate area and close doors**. Open windows (where possible). Do not cross the spill or move further into the room to close doors. If safe, ask others to close doors from adjacent rooms.

- **Isolate spill**. Consider sealing off the area and displaying warning signs on the doors. If there is a possibility the chemical could seep to the floor below, the occupants must be warned and evacuated.

- **Assemble equipment** required and make preparations to deal with the spill in an adjacent but safe room.

- **Personal Protective Equipment (PPE)** to be used, listed below:
  - **Respirator** (use half mask, suitable for the fumes*)
  - **Gloves** (*Do not use latex gloves*), gloves with wide chemical resistance such as nitrile should be used. However, neoprene, PVC or butyl gloves give greater protection than nitrile against certain chemicals; for example some concentrated acids.
  - **Eye protection**
  - **Chemical resistant apron or gown**

* NB If vapours penetrate the respirator and the chemical smell becomes apparent, the wearer should leave the area and call the fire brigade.

Note special attention to the following chemicals:

- **Formaldehyde**. Never attempt to deal with large spillages of formaldehyde – evacuate the room and sound fire alarm to call fire brigade.

- **Glutaraldehyde**. For details on safe handling- see ‘Arrangements for the Use of Glutaraldehyde’ (Cidex) available on Freenet or from the Safety Office.

Dealing with the spillage - Types of spillage kits

Departments are advised that they need to have their own appropriate chemical spillage kits on hand for emergencies (these should include suitable PPE, or PPE needs to be prepared and readily available in the near vicinity). In an emergency if no spill kit is available locally, the Supplies Dispatch Department chemical spill kit can be used as a back-up (ext 3069).
There are a number of different types of commercial spillage kits available, these are listed below.

- **Absorbable spill pillows, mats and socks**, these come in different shapes (oblong or square), which can be placed in or over the spill, or sausage shaped, to surround the spill and contain it. Note: unless specifically indicated these pads are not always suitable for concentrated corrosive acids such as hydrochloric and sulphuric acids. Acid neutralisers or absorbent granules should be used - see below.

- **A collapsible mop** is now commercially available on which **absorbent spillage pads are Velcro fastened** for ease of removal and replacement. These pads draw liquid into an absorbent core where they are turned into a non-drip gel. This system has the advantage of the user not having to bend over the vapours of potentially dangerous chemicals while applying or retrieving spill pads and are easily to dispose of (these pads are not suitable for corrosive acids).

- **Commercial neutralisers for concentrated acids and alkalis** are available (this creates heat, 2-3 minutes should be allowed between treatments). An **inactivator for formaldehyde** and **chemical absorbents for solvents** are also available.

- A number of different types of general **spillage absorbent granules and chemical binders** are also available. As with neutralisers (above), these have the disadvantage of having to be scooped or swept up after application.

**Safe waste disposal after spillage**
All chemical waste must be disposed of in accordance with the Medical School and Trust guidelines in: *Arrangements for disposal of hazardous chemical waste*.

When the spillage has been contained and it is considered safe to return to the area, proceed with the clean-up procedure below:

Wearing PPE, place the waste in a suitable container with a tight fitting lid or a suitable sealable plastic bag (which can be later placed in a container with a lid). Clearly label and identify the chemical waste. If the waste is volatile or fuming, the waste container must be placed open in a fume cupboard (not a recirculating model) to allow complete evaporation to take place before sealing. The floor and contaminated surfaces should then be washed with fresh soapy water. On leaving the area all PPE must be removed carefully and either disposed of or washed. Care must be taken not to take off the respirator and eye protection until the contaminated gloves are first removed.

The Head of Department or Service Manager is responsible for ensuring that the correct procedures for the disposal of chemical waste are followed in accordance with the Medical School and Trust guidelines. Specialist advice can be sought from the Chemical Waste Officer (see appendix).
4. OTHER SPILLAGES

Mercury

A 24 hour service for the safe removal of spilt mercury is provided by the Royal Free Hospital porters. Contact the Head Porter (ext 3368, Bleep 1104) with details of the location and volume of the spill. The kit can be obtained from the Porters Lodge (also at Queen Mary’s Hospital and the RNTNE) and the waste later collected from the department. Printed instructions for the mercury spillage kit is given to the department or ward each time the request is made. Instructions are also attached to the Spillage Box. (For mercury spillage in the Medical School, the Chemical Waste Officer should be contacted- see appendix)

Cytotoxic drugs

Departments, wards and clinics where cytotoxic drugs are used must have a Chemotherapy Drug Spill Kit available. A commercial kit can be obtained from the Pharmacy. Full instructions for its use are printed on the outside of the kit. Disposal must be in a special cytotoxic waste bin and arrangements made for collection via the head porter.

Cryogenic Gas Spillages

Liquid nitrogen is almost exclusively used for preservation of samples. It has a boiling point of -196°C, 1ml of liquid will evaporate to form 682mls of gas. The density of gaseous nitrogen is slightly less than air, however cold gas will tend to be heavier. The two hazards associated with handling liquid nitrogen are cold burns or asphyxiation due to displacement of air.

Any spillage should be allowed to evaporate. The area should be well ventilated wherever this is possible. If the enclosure is small then the immediate area needs to be evacuated. Where liquid nitrogen is routinely handled in a small or confined space then an oxygen detector alarming at or below 16% oxygen needs to be fitted. [Because of air displacement, liquid nitrogen containers must be sent in lift cars unaccompanied].

Containment of spilt liquid nitrogen needs to be approached with care. The liquid should be allowed to evaporate, recovery is not a practical option. Liquid nitrogen may make materials brittle and cause floor covering to crack. Suitable gloves and some form of eye protection need to be worn when handling liquid nitrogen. Cryogenic burns should only be treated with lukewarm water, never hot.

Spillages onto or into equipment

Mechanical or electrical medical equipment which has become accidentally contaminated with biological material such as blood, body fluids or micro-organisms could need specialist attention and disinfection other than general decontamination of the outside of the equipment (as outlined in part 1 and 2 of this policy). For example, this could require that the equipment is checked and dismantled by an electronics expert. In which case the Department of Medical Electronics should be contacted. For advice on dealing with other
contaminated equipment contact the Biological Safety Officer, his Assistant or the Safety Adviser (see appendix). Further information can be obtained in the Medical Devices Agency publication Sterilisation, Disinfection and Cleaning of Medical Equipment (see appendix).

**Dealing with a suspicious substance**

- On discovery of any suspicious material*, individuals in the room should shut windows (unless the substance is fuming) and doors and evacuate to an adjacent unoccupied room away from any potential hazard until an initial assessment has been made. Leave a warning sign not to enter on the door (see also Policy Document- In the event of a deliberate release of an infectious disease. Appendix 1).

- Inform the local manager to contact the hospital switchboard to initiate the appropriate procedure. This response is part of the **Trust’s Emergency Procedures**.

- The local manager or person finding the suspicious substance needs to remain available to answer questions and to give information or help.

* There is an extremely remote possibility that this could be a deliberate release of a harmful substance.

**Unidentified spillages**
(for example from a waste pipe leak)

Contact the Works Department and the Safety Adviser or his Assistant to identify the problem and establish a safe procedure for handling the spillage. If a spillage large enough to cause concern occurs outside of normal working hours, the site manager should be contacted (bleep 112).

**REPORTING OF SPILLAGE INCIDENTS AND FURTHER ACTION**

Following a biological or chemical spillage the Manager or Department Safety Officer should complete an incident form and append any additional relevant details. Certain high risk spillages need to be reported under RIDDOR regulations (see separate guidelines on RIDDOR). Check with the Safety Adviser and send a copy of the report if required.

**EXPOSURE TO MICRO-ORGANISMS, CHEMICALS OR CHEMICAL FUMES**

If exposure to potentially hazardous micro-organisms or a chemical has occurred, those involved should report to the Occupational Health and Safety Unit.
APPENDIX 1
Sources of information

Biological Safety:
- Protection Against Blood-Borne Infections in the Workplace- HIV & Hepatitis [1996]
  ACDP publication ISBN 0 11 3219539.
- Laboratory Disinfection Policy. Royal Free Hampstead NHS Trust and Royal Free and University
  College Medical School- Hampstead Site.
- Trust Policy Document- In the event of a deliberate release of an infectious disease
- General COSHH ACOP (Control of Substances Hazardous to Health) ISBN 0 7176 2534 6 (4th Edition)
- Safe working and the prevention of infection in clinical laboratories and similar facilities
  ISBN 0 7176 25133
- Infection Control Manual- see Freenet
- The management, design and operation of microbiological containment laboratories. ACDP publication
  ISBN 0 7176 20344
- Sterilisation Disinfection and Cleaning of Medical Equipment. Medical Devices Agency publication.
  Guidance on decontamination. ISBN 1 85839 518 6

Chemical Safety:
- General COSHH ACOP (Control of Substances Hazardous to Health) ISBN 0 7176 2534 6
- Trust and Medical School policy on the COSHH Regulations
- Guidance on: Arrangements for disposal of hazardous chemical waste. Royal Free &UC Medical School
  (Royal Free Campus) and Royal Free Trust.
- Hazards in the Chemical Laboratory, Ed SG Luxon, Royal Society of Chemistry, 1992 (Available from the
  Safety Office ext 8034/5 )
- Croner: Emergency Spillage Guide. Edited by PJ Warren (Available from the Safety Office ext 8034/5 )
- Sigma-Aldrich, Library of Chemical Safety Data (Available from Medical School Library)
- www.chm.bris.ac.uk/safety/msds.htm

Advice within Medical School and Trust
  Safety Adviser, Occupritional Health and Safety Unit, Ext 8034  Bleep 431
  Assistant Safety Adviser, Occupritional Health and Safety Unit, Ext 8035
  Dr T Harrison Biological Safety Officer, Hepatology, Department of Medicine, Ext 2881
  Dr Rob Gargan Assistant Biological Safety Officer, Occupotional Health and Safety Unit,
  Ext 8051
  Infection Control Team Medical Microbiology Department Ext 3277, 5216, 4707.
  Mr IAJ Fife Radiation Protection Adviser, Medical Physics Department, Ext 3759
  Dr JE Agnew Radiation Protection Adviser, Medical Physics Department, Ext 3208

Appendix 2
Documentation required at a local level
1) Lists of hazardous chemicals and their locations
2) Hazard data sheets for all hazardous chemicals
3) COSHH risk assessments for hazardous substances
4) Emergency plans for dealing with spillages of hazardous micro-organisms, large volumes of chemicals
   and highly toxic chemicals.