

These instructions in bold italics should be deleted before posting the emergency procedures document:

This is a generic version of an emergency procedures document provided as a guide only. Principal investigators must develop Emergency Procedures specific to their laboratory by removing and adding material as appropriate.

The revised protocol is to be posted in the laboratory where it is clearly visible. Ensure that all personnel are familiar with the contents of the protocol and that they know where it is posted.

Ensure that the Emergency Protocol is amended when changes occur. A yearly review prior to lab inspections is recommended.

Insert P.I. name Lab Emergency Procedures

Date: _____

EMERGENCY CONTACT NUMBERS

EMERGENCY (Queen's Emergency Report Centre): 36111

Environmental Health and Safety: 32999

FIX-IT: 77301

Departmental Safety Officer: (insert name and contact number)

Principal Investigator: (insert name and contact numbers)

Alternate Laboratory Contact: (insert name and contact numbers)

Injury or Exposure

1. If the injury is severe (Emergency):

- **If the injury is severe** in that it involves significant loss of blood, loss of consciousness, a broken limb or is potentially life threatening then proceed immediately with appropriate emergency first aid and contact the **Emergency Response Center (36111)** who will call for an ambulance and direct paramedics to your location
- Note that the Emergency Response Centre will direct ambulance personnel to your location on campus. That is why it is better to call 36111 rather than 911 when you are on Queen's campus.

- **Alternatively**, perform appropriate first aid and proceed directly to the Emergency Department at Kingston General Hospital (map appended)
- Report incident as described in #4 below

2. If the injury is not severe and there has been a potential exposure to hazardous material:

- If exposed to a **potentially infectious material** (via cuts, needle sticks, punctures, scratches, spills on chapped or broken skin, animal bites, etc.), the affected area must be immediately disinfected, washed thoroughly but gently with multiple applications of soap and water for at least five minutes, and the cut then covered with a sterile bandage. Immediately after first aid and decontamination follow steps in #4 below.
- If there has been a chemical exposure, follow the appropriate procedure for the chemical involved. First aid treatment for **chemical exposures** will depend on the chemical involved. Ensure that you read the MSDS for each hazardous chemical before you begin to work with it and that you are familiar with the appropriate response to an exposure incident. Immediately after first aid and decontamination follow steps in #4 below.
- If exposed to a **radioactive material** follow the procedure for personal radioactive decontamination (below).

3. If splashed in the eye or mouth:

- Immediately wash the eyes at an eyewash station for 15 minutes (using clean hands to hold eyes open).
- or rinse mouth extensively if that was the mucosal area exposed.
- Immediately after first aid and decontamination follow steps in #4 below.

4. Immediately after first aid and decontamination:

Medical attention:

If urgent (but not emergency) medical attention is required:

- **If a specific SOP for the hazard has been developed** then follow that SOP for first aid and subsequent care. This will often involve contacting Walsh and Associates Occupational Health Service at their Kingston number 613-546-4646 (or at their Belleville number 613-966-4114).
- **If you do not have a specific SOP for this type of incident** and you are uncertain about the appropriate medical response then contact Walsh and Associates Occupational Health Service at their Kingston number 613-546-4646 (or at their Belleville number

613-966-4114) and ask to speak to a nurse. Tell them that you work at Queen's University and specify the type of incident.

- If you have sustained an injury, you might be asked to take a photograph of the wound and email it to admin@walshandassociates.ca so that a nurse or doctor can better evaluate the injury and recommend next steps.
- A member of the medical staff at Walsh and Associates might wish to see you at their clinic in downtown Kingston (20 Clarence St, Kingston) or they might recommend that you go to KGH Emergency.
- For more information about services provided by Walsh and Associates Occupational Health Services to Queen's personnel see
<http://www.safety.queensu.ca/walsh/>

Reporting requirements:

- All accidents must be **reported** to the Principal Investigator and the Department of Environmental Health and Safety. Incidents are to be reported to the Department of Environmental Health and Safety for follow-up so that we can attempt to prevent similar or more severe incidents in the future. These reports are treated as confidential documents. Incidents involving biohazardous material will be reported to the Biohazards Committee by the University Biosafety Officer.
- Blank incident report forms can be obtained from each Departmental Safety Officer.
- All incidents requiring medical assistance or resulting in time off of work must be reported by the Department of Environmental Health and Safety to the Workplace Safety Insurance Board (WSIB) within three day's of the occurrence. It is therefore extremely important that all incidents of this nature be reported to Department of Environmental Health and Safety within 24 hours.

Spills

Biological Material Spills

1. Spills of biohazard level 2 material in biological safety cabinets (BSC):

- Leave the BSC in operation.
- Remove contaminated protective clothing, place it in bags and autoclave prior to disposal or laundering.
- Wash hands with disinfectant soap.
- Assemble clean-up materials and don appropriate protective clothing (*insert list here*).

- Cover the spill with paper towel. Soak the paper towel with a suitable disinfectant, working from the outside in. Gentle flooding will avoid creating aerosols.
- Allow sufficient contact time for disinfection.
- Bleach or other disinfectants suitable for the infectious agents in use are acceptable as long as the manufacturer's recommended contact time is used. Ethanol is not recommended because it is difficult to achieve the required contact time due to evaporation.
- If spilled material has gone through the perforated grills then pour disinfectant through grills into the catch tray underneath. Let stand for the appropriate contact time for the disinfectant, drain the tray through drain cock and clean.
- Use forceps to pick up any broken glass or sharps and place in a puncture-resistant container.
- Wipe up spill and place all materials in a plastic bag inside the cabinet. After decontamination thoroughly rinse the surface to remove any remaining bleach (if used) because it can corrode stainless steel.
- Items in the BSC at the time of the spill must be thoroughly cleaned with a disinfectant prior to removal from the BSC and/or bagged for removal and autoclaved.
- Wipe the inside of the cabinet with disinfectant and allow BSC to run for 10 minutes prior to resuming work.
- Report the incident to your supervisor.

2. Spills of biohazard level 2 material in an open area within the laboratory (outside of the BSC):

- Vacate area; warn others to leave
- If the spill came in contact with you or your clothing:
 - Follow page 1 section entitled “Injury or Exposure”
 - Remove contaminated clothing and place in bag for decontamination by autoclaving or chemical disinfection; if footwear has been contaminated, take care not to track contamination into clean areas before removing; take a shower if necessary; wash hands thoroughly
- Advise laboratory supervisor and seek assistance from the Department of Environmental Health and Safety and/or the Biosafety Officer if needed
- Depending on the biohazard and the size and location of the spill (inside containment lab (note that all level 2 labs at Queen's should have air flowing into the lab and the

ventilation designed not to recirculate throughout the building) or in a common hallway), and building ventilation, consider whether further evacuation of employees may be necessary (***modify depending on the biohazard in use in your lab***)

- Mark off area using barricade tape or warning signs to prevent others from entering
- Wait at least 30 minutes to allow aerosols to settle before re-entering area
- Don appropriate protective clothing (respiratory protection, eye protection, long sleeved gown/coveralls with tight fitting wrists, gloves, shoe covers (***edit as appropriate for your laboratory***) and assemble spill response materials
- Cover the spill with paper towel
- Soak the paper towel with a suitable disinfectant, working from the outside in, Bleach is often suitable, but ensure that there are not any chemicals in the spill that would result in the release of chlorine gas, Gentle flooding will avoid creating aerosols
- Allow sufficient contact time for disinfection (usually 30 minutes depending on the disinfectant and microorganisms present)
- Use long forceps to pick up broken glass or sharps and place in a puncture-resistant container; remove the soaked paper towels with a double-gloved hand and dispose of them in a suitable receptacle
- Items in the vicinity of the spill must be thoroughly cleaned with a disinfectant and/or by autoclaving; disinfect protective clothing and equipment
- Report the spill to the University Biosafety Officer in the Department of Environmental Health and Safety

3. Large spills of biohazard level 1 material in an open area within the laboratory (outside of the BSC):

- Some biohazard level 1 infectious material is hazardous to those with compromised immune systems. You should know whether or not the level 1 material that you are working with falls into this category. (***edit as appropriate***)
- Work to minimize spread of the biohazard level 1 material to areas outside your laboratory where individuals with compromised immune systems might be present unbeknownst to you. Ensure that the laboratory door remains closed and follow the clean-up procedures for level 2 material above, reducing the precautions where appropriate. (***edit as appropriate***)

Chemical Material Spills

1. General Chemical Spill Procedures:

- Notify occupants in the immediate area of the spill.
- Attend to any persons that may have been contaminated. Contaminated clothing must be removed immediately and appropriate first aid applied.
- If a volatile flammable material is spilled, control any possible sources of ignition and ventilate the area.
- Wear appropriate personal protective equipment for the material spilled and avoid breathing any vapour from the spill. **Be aware that the use of a respirator requires specialized training.** Never enter a contaminated atmosphere without respiratory protection or use a respirator without training. If respirator protection is required and no trained personnel are available, call the Department of Environmental Health and Safety (Ext. 32999).
- Use appropriate spill control material to first contain, neutralize and absorb the spill according to procedures previously obtained from the MSDS. Generally, loose spill control material should be distributed over the entire spill area, working from the outside, circling to the centre. This reduces the chance of splashing or spreading of the spill.
- Attention should be given to preventing the spilled material from entering drains (floor and sink).
- When the spilled materials have been absorbed, use a brush and scoop (spark-resistant if flammable material is involved) to place materials in an appropriate container. Store the container in a secure ventilated area.
- Contact the Department of Environmental Health and Safety (Ext. 32999) for disposal instructions.
- Decontaminate the surface where the spill occurred before allowing normal work activities to resume in the area.
- Notify your immediate Supervisor or Principal Investigator.
- Complete a Spills Report Form (<http://www.safety.queensu.ca/safety/policy/eh&s/spillform.htm>) and submit it to your Departmental Safety Officer and the Department of Environmental Health and Safety within 3 Days.

2. Spills that Pose an Immediate Threat to Health

Work Site Employees:

- Evacuate the immediate area, leaving everything in place and closing doors to isolate the spill area.
- Activate the Fire Alarm.

- Call Queen's Emergency Report Centre (ERC) at Ext. 36111. ERC will contact the Department of Environmental Health and Safety to obtain assistance.
- Notify the Principal Investigator and/or the Departmental Safety Officer and report with them to the HazMat Team near the main or designated entrance to the building.
- The Department of Environmental Health and Safety will notify the Chair of the appropriate Joint Health and Safety Committee to request their involvement in an investigation of the incident.
- A brief outline of the response that will be initiated by the Department of Environmental Health and Safety (EH&S), in conjunction with the ERC, in a spill situation can be found in SOP-HAZMAT-01 Queen's University <http://www.safety.queensu.ca/safety/policy/eh&s/spill.pdf>
- If the HazMat Team Leader requests assistance from any off campus authority, this authority may take primary control over the situation and the HazMat Team may play a supportive role.
- Media liaison will be handled by the Director, Environmental Health and Safety with the assistance of Queen's Marketing and Communications. The Queen's HazMat Team or any other Queen's employee or student shall not communicate with the media directly.

3. Large Chemical Spills or Spills of Unknown Material

Work Site Employees:

- Alert people in the immediate area
- Leave the container in place to aid identification by the HazMat Team.
- Control sources of ignition (if it is safe to do so)
- Evacuate the immediate area, closing doors to the affected area on the way out.
- Activate the Fire Alarm
- Call Queen's Emergency Report Centre (ERC) at Ext. 36111. ERC will contact the Department of Environmental Health and Safety to obtain assistance.
- Notify the Principal Investigator and/or the Departmental Safety Officer and report with them to the HazMat Team near the main or designated entrance of the building.
- The Department of Environmental Health and Safety will notify the Chair of the appropriate Joint Health and Safety Committee to request their involvement in an investigation of the incident.

- If the HazMat Team Leader requests assistance from any off campus authority, this authority may take primary control over the situation and the HazMat Team may play a supportive role.
- Media liaison will be handled by the Director, Environmental Health and Safety with the assistance of Queen's Marketing and Communications. The Queen's HazMat Team or any other Queen's employee or student shall not communicate with the media directly.

Radioactive Material Spills

General Precautions:

- Inform persons in the area that a radioactive spill has occurred. Keep them away from the contaminated area.
- Cover the spill with absorbent material to prevent the spread of contamination.
- Any area that is found to have non-fixed contamination exceeding the regulatory criteria must be cleaned (as detailed below) and re-monitored. If the area cannot be cleaned to meet the criteria, the contaminated area must be sealed, removed, or shielded until the criteria are met.

1. Minor Spills of less than 100 exemption quantities of a nuclear substance:

- Wearing protective clothing (lab coat, or disposable coveralls) and appropriate disposable gloves, clean up the spill using absorbent paper and place it in a plastic bag for transfer to a labelled waste container.
- Avoid spreading contamination. Work from the outside of the spill towards the centre.
- Wipe test or survey for residual contamination as appropriate. Repeat decontamination, if necessary, until contamination monitoring results meet the Nuclear Substance and Radiation Devices licence criteria.
- Check hands, clothing and shoes for contamination.
- Report the spill and cleanup to the Supervisor.
- Report the spill and cleanup to the permit holder and the University Radiation Safety Officer (URSO) in the Department of Environmental Health and Safety.
- Record spill and cleanup and decontamination monitoring details. Adjust inventory and waste records appropriately.

2. Major Spills of more than 100 exemption quantities, or contamination of personnel, or release of volatile material:

- Clear the area. Persons not involved in the spill should leave the immediate area.
- Limit the movement of all personnel who may be contaminated until they are monitored.
- If the spill occurs in a laboratory, leave the fumehood running to minimize the release of volatile radioactive materials to adjacent rooms and hallways.
- Close off and secure the spill area to prevent entry. Post warning sign(s).
- Notify the University Radiation Safety Officer (URSO) and permit holder immediately.
- The URSO will direct personnel decontamination and will decide about decay or cleanup operations.
- If personnel are contaminated follow procedure detailed below.
- Record the names of all personnel involved in the spill. Note the details of any personal contamination.
- The URSO will arrange for any necessary bioassay measurements.
- Submit a full report along with a copy of the contamination monitoring results to the URSO
- The URSO must submit a report to the CNSC.

3. Personal Radioactive Decontamination:

- The University Radiation Safety Officer (URSO) must be informed of all cases of personal contamination immediately.
- If a person is suspected of being contaminated, locate the contaminated area with a survey meter, if possible.
- If external contamination is present and the skin is not broken, flush copiously with water and then wash the area with a mild nonabrasive detergent or soap such as Ivory. Work the lather into the contaminated area by rubbing gently for about 3 minutes and then rinse thoroughly with lukewarm water. Repeat the procedure twice if necessary.
- If the skin is broken in the contaminated area, swab the area with wet swabs taking care not to spread the activity over the body or into the wound.
- The URSO will arrange for any necessary bioassay measurements.

Animal Escape

If animals are used in the laboratory, it is mandatory that emergency procedures for animal escape be written (PHAC Containment Level 2 Checklist Question 78).

Equipment Associated Emergencies

Centrifuge

- In case of a centrifuge malfunction, rotor failure or test tube failure, a risk exists of infectious material being released due to the release of aerosols.
- If a centrifuge malfunctions while in operation it must be turned off immediately and unplugged.
- If infectious material is involved, the machine shall not be opened for 30 minutes to allow the aerosols to disperse and settle.
- **PLACE A NOTE ON THE CENTRIFUGE WARNING OTHERS NOT TO OPEN IT.**
- If using infectious material, leave the room for at least 30 minutes and place a note on the door warning people not to enter.
- The operator, wearing gloves and a fit-tested N95 respirator if required for the material involved, and other appropriate PPE, should remove all debris and disinfect the interior of the centrifuge and the head (or cups).
- It is important to remember that some disinfectants will corrode the interior of centrifuges and rotors so extreme care must be taken to thoroughly rinse following disinfection.
- All debris must be collected, bagged, treated and disposed of appropriately.

Biological Safety Cabinet

- DO NOT use the Biological Safety Cabinet if the ALARM sounds or if there are other indications of cabinet malfunction such as no airflow, reduced pressure on magnehelic gauge (drop > 0.2), or unusual noises.
- If working with infectious material, immediately stop work and cover the material; remove gloves and wash hands; don a fit tested a fit-tested disposable N95 respirator, or half face respirator with HEPA filters, and fresh gloves before proceeding.
- Seal, surface decontaminate and remove any biohazardous material.
- Decontaminate the interior of the BSC.
- Switch off the alarm or the power if the motor is making noise.

- Place a sign on the cabinet to indicate that it is broken and must not be used.
- Contact the Department of Environmental Health and Safety for advice and servicing (ext. 32999).
- If personnel have potentially been exposed to infectious material due to cabinet failure, take appropriate precautions as outlined above. This type of incident must be reported to the senior investigator and the Department of Environmental Health and Safety. These reports are treated as confidential documents. Incidents involving biohazardous material will be reported to the Biohazards Committee by the University Biosafety Officer.

Autoclave

- When an accident arises out of an autoclave's operation resulting in injury or death to a person, property damage, or when an explosion or rupture occurs, no person shall alter or move any item at the scene of the incident, until they have been given permission to do so in writing from a Technical Standards and Safety Authority qualified inspector, unless for the purpose of saving a life or relieving human suffering.
- Incidents of this type must be reported immediately to the Department of Environmental Health and Safety.
- The Department of Environmental Health and Safety will notify the Technical Standards and Safety Authority of the incident if appropriate.

Power Failure

- An alternate light source (an emergency light system or large flashlight) must be available.
- If working in a Biological Safety Cabinet (BSC) when a power failure occurs, proceed in a manner similar to that for failure of a BSC (above).
- A fit-tested disposable N95 respirator, or half face respirator with HEPA filters, should be available in Level 2 areas for use in emergencies.
- Stop work with chemical hazards and contain them since the ventilation systems will not be working.

Fire

- In case of fire in the laboratory: Shout "FIRE" to alert anyone nearby

- If you cannot put the fire out within 30 seconds, leave the lab, closing the door behind you, set off the fire alarm, alert staff and call Queen's Emergency Report Centre (36111) and then follow the posted FIRE ALARM PROCEDURE.
- Even if you can put out the fire, the University Fire Safety Officer in the Department of Environmental Health and Safety must be informed of its occurrence so that he can follow-up.

In case of a fire alarm:

- If working with biohazardous materials when the fire alarm rings, cap all flask or bottles of bacteria, virus, cells, etc., so that any infectious material will be contained if the power goes out. Alternatively, if possible to do so quickly and safely, infectious level 2 biohazardous material may be dumped into disinfectant solution before evacuating.
- If working with hazardous chemicals or radioactive materials quickly cover or otherwise contain the material before leaving if it is safe to do so.
- Leave the laboratory closing the door behind you and follow the posted FIRE ALARM PROCEDURE.

Map to KGH Emergency

