IMPROVE LIFE. **SAFE SHARPS FOR BIOHAZARD ACTIVITIES**

1.0 Scope

These guidelines outline the expectations around the safe use of sharps and proper handling practices when working with infectious materials or toxins at University of Guelph facilities, to reduce workplace injuries. This guidance also applies to activities involving biohazard inoculations into animals and subsequent necropsies.

Sharps injuries can happen before, during or after sharps use, during clean up, or disposal of sharps, and after disposal. It is crucial to follow safe sharps practices when:

- ✓ using sharp instruments and devices,
- ✓ after completing procedures using sharps
- ✓ when cleaning used instruments.

A sharp is identified as any object that can cut skin and includes needles, as well as scalpels, lancets, razor blades, scissors, damaged glassware etc. A needlestick or other sharps injury can cause a significant wound and potentially result in a secondary infection from exposure to infectious agents or toxins. Adopting best practices such as the use of safety engineered sharps, and general sharps handling practices combined with the use of appropriate personal protective equipment can be highly effective in substantially reducing injuries and preventing exposures not only to the user but anyone that may encounter the sharp downstream.

2.0 Responsibility of Principal Investigators (PIs)

PIs engaged in in-vivo biohazard activities must consider using engineered specific controls to reduce personal sharps injury and/or subsequent exposure. PIs must confirm that all research team members are properly trained on the use of sharps before engaging their team members in a procedure involving biohazards. A Sharps Exposure Control plan should be developed and submitted with every BSC-7 form where sharps will be used with regulated animals. This should be reviewed regularly by PIs incorporating continuous improvements such as needleless systems and related protective devices for using sharps.

3.0 General safety practices to prevent biohazard exposure and reduce the hazard and risks due to sharps:

A) Use Personal protective equipment (PPE)

PPE and/or barriers as listed in the Biosafety Manual. While handling sharps, wear slip-, cut- or puncture-resistant gloves such as Kevlar gloves. Cut-resistant gloves must be considered at least for the non-dominant hand if wearing gloves on both hands impacts dexterity.

B) Needle injury prevention practices

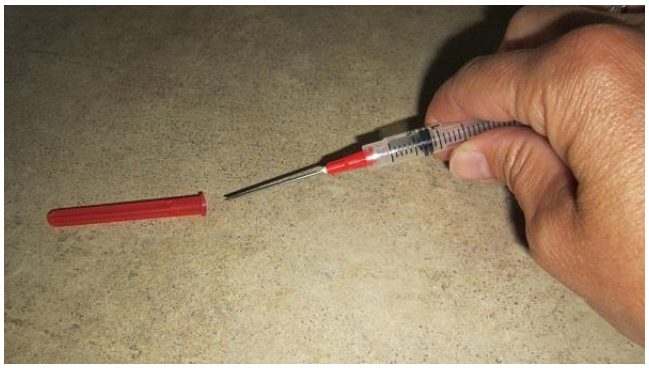
- Confirm the needle is not bent or broken before use.
- Never remove needle caps by mouth.
- Always keep your hand behind the needle tip.
- Do not bend or manipulate needles in any way.
- Never force sharps into a disposal container
- Restraint animals appropriately to reduce inadvertent needlestick injuries from animal movement.
- Never attempt to remove a used needle from the syringe before disposal.

i) Minimize "two-handed techniques".

Recapping needles, or passing sharp devices (i.e., scalpels) from one person to another are common examples of "two-handed" techniques that can lead to hand injuries by contaminated sharps.

- If a sharp device must be passed between personnel, adopt a procedure to prevent both personnel from grasping the device at the same time. E.g., when collecting infectious tissue, only one person should be in control of the sharp device. When personnel are assisting other personnel, they should have their hands as far away from the cutting area as feasible and should pay attention to the person handling the sharp device.
- Do not recap needles. However, if recapping is absolutely required, strictly adhere to the “one-hand scoop” technique, or a needle cap holder for recapping. See image below:

One-hand scoop technique
(Video can be viewed at https://www.youtube.com/watch?v=AYUbpBLceTg&t=41s)



- ✓ Leave the needle cap on the flat surface.
- ✓ Guide the tip of the used needle into the cap using only one hand.
- ✓ Recap the bulk of the length of the needle by moving the syringe forward. This allows the needle to enter the cap in a scooping movement.
- ✓ Lift the needle and syringe vertically and, once the tip is covered, use the other hand to fix the cap into place.

ii) Discarding sharps

- ➢ Use Puncture-resistant, leakproof, sharp disposable containers, available in animal facilities, as applicable.
- ➢ Prior to conducting in-vivo experiments, confirm that sharps disposal container is within easy horizontal reach and below eye level.
- ➢ Always dispose of sharps immediately in the Sharps Disposal Container
- ➢ Never fill sharps container over ¾ full or beyond the fill line
- ➢ Never remove discarded sharps from sharps container
- ➢ Never dispose of needles or other sharps into anything other than the dedicated sharps container, even if they are capped or otherwise contained. This reduces the risk of accidental injury to researchers and custodial staff.

Avoid injury while discarding sharps

- Do not force sharps into container
- Do not bend or break needle
- Do not put fingers inside container
- Do not recap needle
- Do not remove needle

C) Scalpel injury prevention practices

- Do not use blades without a handle. The handle serves to control the blade and puts a barrier between your hand and the sharp edge.
- Do not "saw" with a scalpel or put excessive force on it. These actions can cause the blade to snap creating an aerosol and flying debris as well as a sharps exposure. Use knives for tasks that require greater cutting action.
- Place used blades immediately and directly into a Sharp Disposal container.
- Do not leave blades out in the lab or animal environment after use (i.e., left on the countertop), regardless of what they have been used for.
- Use single use, disposable safety scalpel with fixed blades (if possible)

D) Glassware injury prevention practices

Broken glass can penetrate the skin and cause lacerations just like needles, and razors. Specialized glassware, including vials, desiccators, autoclavable tubing/glassware, micro-fabrication, and thin film deposition devices etc., are prone to breakage from hairline cracks and from dropping the item.

- Avoid glassware, if possible.
- Check for damage before use; never use damaged glassware.
- Never store glassware above shoulder height.
- Store tall vessels at the back of shelves with smaller ones in front.
- Store heavy glassware at bench height.
- Carry large glass bottles in specially designed carriers; do not hold bottles by the neck.
- Sweep up broken glass or pick it up with forceps. Never use fingers directly to pick up broken glass.
- Use an ampoule breaker or opener for breaking ampoules.

4.0 Emergency response and incident reporting procedures

- If an injury is sustained with a sharp, take appropriate action to minimize the risk of lab-acquired infection.
- Follow Emergency Procedure for Exposure
- All injuries, exposures and near misses must be reported through completion of University of Guelph's Incident and Injury reporting process

5.0 Equipment options and recommendations

To prevent, sharp injuries, the following can be used:

A) Blunt tip needles: These needles can be used to draw up or reconstitute biohazardous materials. They replace standard hypodermic needles there by reducing the risk.

B) Safety-engineered needles: It's a needle device with a built-in safety feature or mechanism such as retraction, covered by a sheath, shield that effectively reduces the risk of exposure. Examples of safe sharps or related equipment that reduce the risk of injury are provided below:

1) Retractable needle

The syringe has spring-based retracting needle where safety can be activated immediately after injection. The needle gets completely retracted into the syringe barrel.

* An example of a retractable needle can be found in the embedded link Retractable needle

2) Needle with safety guard or shield

i. **Eclipse safety needle, Luer lock or Flip lock:** These needles have a protective shield which allows for shielding of the needle tip immediately after injection, with a single finger stroke. The needle remains locked inside the activated cover.

* An example of needle with safety guard or shield can be found in the embedded link Eclipse safety needle, Luer lock or Flip lock

ii. **Monoject Insulin & Tuberculin**: This syringe utilizes barrel-based safety technology and offers increased flexibility. It has a safety shield which provides

360-degree protection after activation, during use and after disposal to downstream workers. This could be used for small volumes and its entry is not restricted to small mouth tubes as there are no gliders or luer lock on it.
*An example of this barrel based safety technology can be found in the embedded link Monoject Insulin & Tuberculin

iii. **Raumedic Rau Safe**: This safety system uses a telescopic sheath that is manually extended and locked out over the needle after the injection. This avoids covering the external surface of the barrel before and during the injection.
*An example of this system can be found in the embedded link Raumedic RauSafe,

D) Disposable safety scalpel

The disposable, single-use scalpel minimizes risk, and its retractable blade offers further protection to the users.
*An example of this safe sharp can be found in the embedded link Disposable Safety scalpel

E) Safe blade removal system

Blade remover tool, unit, box or system allows for safe and easy removal of scalpel blade.
* An example of these systems can be found in the embedded link Surgical blade removal tool, Blade remover unit or Qlicksmart blade removal system

F) Ampoule opener

This is a simple, safe, reusable, autoclavable safety tool that can easily open ampoules.
*An example of this opener can be found in the embedded link Snapit ampoule glass opener