

Using Biohazardous Sharps Safely in Laboratory Research Applications

With the evolution of lab instrumentation and development of kits to support life science-related procedures, the need to use sharp devices such as needles, glass pipettes and scalpel blades has diminished over time. However, sometimes the use of a sharp instrument is unavoidable. Penetration of the skin with a biologically contaminated sharp device is one of the most efficient means of transmitting infection. It is essential for persons who perform tasks involving biological materials and sharps devices to do so in a manner that minimizes the potential for occupational injuries sustained from sharp devices.

The best practices policy below was developed by the VU Biosafety Program and endorsed by the VU Institutional Biosafety Committee (IBC) to provide researchers with guidelines for protecting themselves and others from sustaining a sharps-related injury.

Please observe the following safety practices when using sharp devices such as needles, scalpels, Pasteur pipettes, slides, and capillary tubes while performing lab procedures.

1. Eliminate the use of devices sharp enough to puncture the skin (including glass) whenever possible.

Identify all sharps that you are using as part of your procedures and determine whether an alternative is available to carry out the procedure without using a device sharp enough to injure your skin. (Example, if you must lyse cells, there are methods to accomplish this without pulling the cells through a needle and syringe. Replace the needle flexible tubing or use some other cell disruption technique. If an option exists, please adopt it if at all possible.

Glass septum vials, beakers, flasks, reagent bottles, capillary tubes, Pasteur pipettes and slides/coverlips will create a sharp hazard if broken. Review your current procedures and consider non-glass alternatives that eliminate the need to use these breakable devices. If you can't eliminate their use, consider options that have shatter-proof features (i.e., Teflon coating).



Do not use glass receptacles for biohazard collection!

2. Use a sharp with an engineered safety feature when such a device is available and feasible for your procedure.

The availability of “safety engineered sharps” devices (as defined in the OSHA Bloodborne Pathogens standard) has increased substantially in recent years due to their required use in human healthcare.

Regulatory considerations:

- Bloodborne pathogens: If your procedures employ the use of sharps in conjunction with human blood or body fluids meeting the definition of other potentially infectious materials (OPIM) under the OSHA Bloodborne Pathogens standard, a safety engineered sharp must be used or a written rationale must be documented and available for regulatory review.
- Recombinant DNA molecules: If your procedures employ the use of hypodermic needles in conjunction with RDNA materials or agents that require BSL-2 containment, a needle-locking or fixed/integrated needle must be used, or a written rationale must be documented and available for regulatory review.



Note: The use of needles and blades in conjunction with pathogens or macaque-derived materials warrants the use of safety engineered sharp when feasible and must be addressed in the activity-specific risk assessment. Contact the VU Biosafety for assistance at VUBiosafety@vanderbilt.edu.

3. Get trained in proper techniques before using sharps devices in conjunction with biohazardous materials.

Improper use of sharps devices and poor technique can increase your risk of sustaining a sharps exposure or other injuries. Assure that you are properly trained and qualified by an experienced lab member on new techniques and equipment in a controlled setting before employing these in a procedure involving biological (or other hazardous) materials.

4. Use scalpels/blades in the appropriate and safe manner.

- Before using a disposable blade, stage a sharps container within arm's reach so that it can be immediately disposed of after use.
- Use disposable safety scalpels with fixed blades whenever possible. These devices eliminate the need to remove or install a blade, which requires significant skill to perform safely.
- If you must use a reusable scalpel, consider using blades with engineered safety features that allow for enclosure of the blade before blade removal.
- Do not use blades without a handle. The handle serves to control the blade and puts a barrier (and distance) between your hand and the sharp edge.
- Do not "saw" with a scalpel/blade or put excessive force on it. These actions can cause the blade to snap creating an aerosol and flying debris hazard as well as a sharps exposure hazard. Use knives for tasks that require greater cutting action.
- Do not leave blades out in the lab environment after use (i.e., left on the lab counter), regardless of what they have been used for.



Be proactive to protect yourself and others from blades left out in the lab!

5. Do not leave sharps devices out in the environment any longer than necessary.

- Do not leave sharps unattended when preparing them for use.
- For disposable sharps, have a sharps container readily available, preferably within arm's reach for disposal of sharps immediately after use. Dispose of sharps directly into the container and immediately after use if your procedures permit you to do so.
- For reusable sharp devices (i.e., knives, scissors), have a storage container that will enclose the sharp end (i.e., bucket or enclosed tray) readily available at the point of use.
- Do not use syringes with needles attached as "specimen containers" if other alternatives are available. If other alternatives are not available, the needle and syringe should be placed in a puncture-resistant, leak proof secondary container with a secure lid for transport of the specimen to the lab. If you must recap, use a one-handed scoop technique whenever possible.
- Do not leave sharp devices in your pockets! Do not stick your hands into previously used lab coat pockets without patting them down first for contents.

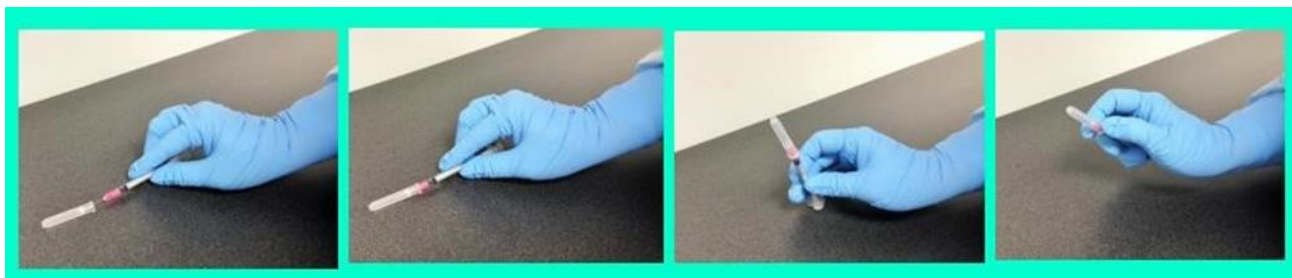
6. Minimize "two-handed techniques" with sharps.

Recapping needles or passing sharp devices (such as scalpels) from one person's hand to another person's hand are common examples of "two-handed" techniques that can lead to hand injuries involving contaminated sharps.

- If a sharp device must be passed between persons, adopt a system to prohibit both persons from reaching for the device at the same time.
- When conducting tissue collection, have only one person in control of the sharp device. Assisting persons should have their hands as far away from the cutting area as feasible and should be aware of the person handling the sharp device. Additionally, the use of cut-resistant gloves (especially the non-

dominant hand) is recommended for procedures that present a likelihood of exposure to a cutting device.

- Do not recap needles for disposal of the device. A sharps container can be placed within arm's reach and the device immediately deposited in the sharps container.
- If your procedure requires you to recap a needle, you should not use a slip-tip needle, and you must use a one-handed technique to do so as shown below.



- When cleaning and reprocessing reusable sharps, use cleaning tools (i.e., a brush or sponge on a handle) that limit the potential for contact between your hands and the sharp surfaces.

7. Do not apply excessive force to a sharp device.

Don't bend or break sharps. These actions increase your risk of sustaining a puncture wound and must not be practices.

8. Use an appropriate sharps container for disposal of biohazardous sharps waste.

Properly rated and marked sharps containers must be used for biohazardous sharps disposal. An appropriate container is leak-proof on the sides and bottom, has a properly installed lid with a means of permanent closure, bears the biohazard symbol, and is designed for sharps collection. See the Biohazardous Waste Guide for information on biohazardous sharps container selection and safe use.

- Make sure that the lid is securely installed at all points of contact between the body and lid before putting the container into use.
- If using a sliding lid style container, close (or restrict) the lid for transport or storage purposes. Permanently close the lid for disposal purposes.

Please note: "Makeshift" repurposed containers such as beakers, coffee cans, milk jugs, reagent bottles, bleach bottles, etc. are not appropriate biohazardous sharps containers for use on the job.

9. Do not overfill sharps containers.

- Sharp items should drop freely into a sharps container for the safest means of disposal. If items do not freely fall, the container is too full or the container in use is not the right size/configuration for the items that need to be disposed of.
- Do not place non-sharp items (i.e., gloves, wrappers, gauze) in sharps containers. These items take up space in the container and can hinder sharp items from falling into the container effectively.
- Do not shake sharps containers to try to make room for more items in them. Shaking a sharps container creates aerosols and can cause items to come out of the container.
- Do not force a sharp item into a sharps container and NEVER retrieve an item from the container with your hand!

10. If you sustain a sharps injury, take appropriate action to minimize lab-acquired infection risk.

- Thoroughly cleanse the wound with soap and water. Then, cover it with a bandage.
- Report the injury to your supervisor as soon as possible.
- Report to Occupational Health ((615) 936-0955) for follow-up immediately if the injury requires medical attention due to the severity of the skin damage OR if the injury involved exposure to human-derived materials, nonhuman primate-derived materials, or materials containing a pathogen or viral vector. The incident must also be reported to VU Risk Management via the [Origami portal](#).