

# Using Sharps Safely in Laboratory Research Applications

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With the advancement 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 somewhat 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 all personnel who perform tasks involving biological materials and sharp devices to do so in a manner that minimizes the potential for occupational injuries sustained from sharp devices.

The best practices policy below has been developed by the Biological Safety Section of the Vanderbilt Environmental Health & Safety (VEHS) Office with endorsement by the Institutional Biosafety Committees (IBC) to provide researchers with guidelines for protecting themselves and other staff from sustaining a sharps-related injury.

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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 your skin (including glass) whenever possible.**

Identify all sharps that you are using as part of your procedures and determine whether or not 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 ways to accomplish this without pulling the cells through a needle and syringe. Replace the needle with a feeding tube or use some other cell disruption technique.) If an option exists, please adopt it if at all feasible.

Glass septum vials, reagent bottles, capillary tubes, Pasteur pipettes and slides/coverslips 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).

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

The availability of "safer sharps" devices (as defined under the OSHA Bloodborne Pathogens standard) has increased substantially in recent years due to their required use in human healthcare settings.

***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 material (OPIM) under the OSHA Bloodborne Pathogens standard, a "safer 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/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.

**3. Get trained in proper techniques before using sharp 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 by senior personnel 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 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. If safety-engineered blades are not an option, forceps must be used to remove the blade.
- Do not use blades without a handle. The handle serves as a means to control the blade and puts a barrier 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.

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

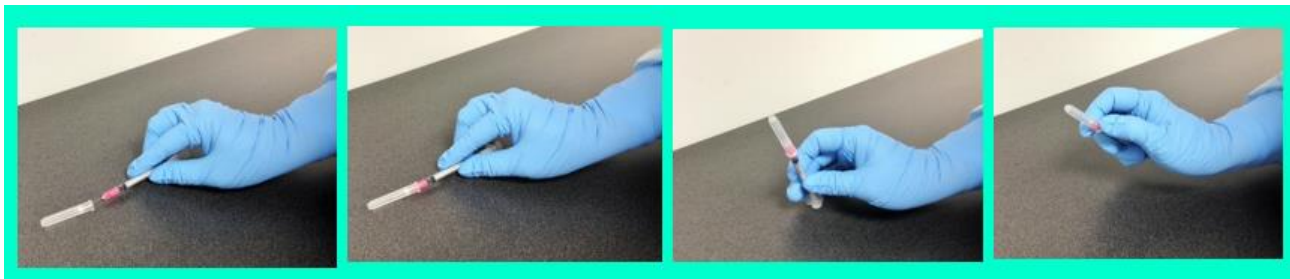
- Do not leave sharps unattended when preparing them for use.
- For disposable sharps, have a sharps container readily available, preferably within arm's reach for disposal of sharps immediately after use. Dispose of sharps directly into the container and immediately after use if your procedures permit you to do so.
- For reusable sharps devices (i.e., knives, scissors), have a storage container that will enclose the sharp end (i.e., a 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 feasible.
- Do not leave sharp devices in your pockets! Do not stick your hands into lab coat pockets without patting them down first for contents.

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

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 with contaminated sharps. Eliminate these techniques whenever possible, or modify the technique to eliminate the risk to the non-dominant hand.

- If a sharp device must be passed between personnel, adopt a system to prohibit both personnel from grasping the device at the same time.
- When conducting tissue collection, have one person in control of the sharp device. Assisting personnel should have their hands as far away from the cutting area as feasible and pay attention to the person handling the sharp device. Additionally, the use of cut-resistant gloves (especially on 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 scoop technique to do so as shown below.



*First, place cap on a level horizontal surface; gently slide needle half-way into cap...*

*Then, slowly tip up needle end of the device and allow cap to slide over needle...*

*Finally, use your thumb of the hand holding the device to secure the cap on the syringe.*

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

#### 7. Do not put excessive force on a sharps device.

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

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

Proper sharps containers must be used for sharps disposal. An appropriate container is leak-proof on the sides and bottom, has a means of permanent closure, bears the biohazard symbol, and is designed for sharps collection.

- Make sure the lid is properly installed before putting the container into use.
- Close the lid for transport or storage purposes. Permanently close the lid for disposal purposes.

**Please Note:** "Makeshift" containers such as beakers, coffee cans, milk jugs, fluids bottles, bleach bottles, etc. are not appropriate 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, your container is too full or you are using a container that is not the right size for the items you need to dispose of.
- Do not place non sharp items such as gloves, and 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 more room in them. This creates aerosols and can cause items to come out of the containers.
- Do not force a sharp into a sharps container and NEVER retrieve an item from the container with your hand!

#### 10. If you sustain an injury with a sharp, 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 (6-0955) 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, non-human primate body fluids, or body fluids from animals that were exposed to pathogens or viral vectors. **NOTE: The VEHS Biosafety Officer must be notified by the supervisor or Occupational Health if the injury involved exposure to infectious agents or materials containing recombinant DNA molecules.**