

Handling and Disposing of Sharps



Standard Operating Procedure

June 2018

Definition

The term “sharp” is often used as a catch-all expression for any and all sharp or pointed items such as broken glassware, scalpel and razor blades, lancets, hypodermic syringes with needles, etc., which can cause cuts or puncture injuries.

Risks

The use of sharp devices exposes healthcare workers to the risk of injury and potential exposure to bloodborne infectious agents, including hepatitis B virus, hepatitis C virus and human immunodeficiency virus (HIV) (CDC 2001; Do et al 2003).

Sharps injuries can occur in any healthcare setting, including non-hospital settings such as in office-based practices, home health care and long-term care facilities. Injuries most often occur (CDC 2008):

- during use of a sharp device on a patient (41%);
- after use and before disposal of a sharp device (40%); and
- during or after appropriate or inappropriate disposal of sharp devices (15%).

There are many possible mechanisms of injury during each of these periods.

Hollow bore needles are of particular concern, especially those used for blood collection or intravascular catheter insertion, as they are likely to contain residual blood and are associated with an increased risk for bloodborne virus transmission. Non-hollow bore sharps such as glass vials and butterfly needles have also been involved in sharps incidents (ASCC 2008).

Examples of sharps associated with sharps injuries in healthcare settings

Hollow bore sharps	Non-hollow bore sharps
Disposable needles/ syringes	Glass vials
Steel-winged (butterfly) needles	Dental probes
Intravenous catheter stylets	Scalpel blades
Multi-sample blood collection needles	Suture needles
Arterial blood collection syringe needles	Retractors
Aspiration needles	Skin or bone hooks
Injector pen needles	Sharp electrosurgical tips

To limit the risk of sharps injuries, the hierarchy of controls method is a well-recognized approach to prevent sharps injuries (CDC 2008; NOHSC (2010 [2003])). The first priority is to eliminate and reduce the use of needles and other sharps where possible. Next is to isolate the hazard, thereby protecting an otherwise exposed sharp, through the use of an engineering control. When these strategies are not available or will not provide total protection, the focus shifts to work-practice controls and PPE.

Handling of sharps

All healthcare workers should take precautions to prevent injuries caused by needles, scalpels and other sharp instruments or devices: during procedures; when cleaning used instruments; during disposal of used needles; and when handling sharp instruments after procedures. Standard measures to avoid sharps injuries include handling sharp devices in a way that prevents injury to the user and to others who may encounter the device during or after a procedure. Examples include (CDC 2008):

- using caution when handling sharps to avoid auto-inoculation and the generation of aerosols during use and disposal.
- using instruments, rather than fingers, to grasp needles, retract tissue, and load/unload needles and scalpels;
- giving verbal announcements when passing sharps;
- avoiding hand-to-hand passage of sharp instruments by using a basin or neutral zone; and
- using round-tipped scalpel blades instead of pointed sharp-tipped blades.

The extent to which gloves protect healthcare workers from transmission of bloodborne infectious agents following a needlestick or other puncture that penetrates the glove has not been determined (Siegel et al 2007). Although gloves may reduce the volume of blood on the external surface of a sharp (Mast et al 1993), the residual blood in the lumen of a hollow bore needle would not be affected; therefore, the effect on reduction of transmission risk is not quantifiable (Siegel et al 2007).

When working with biological agents the use of needles, syringes, and other sharp objects is suggested to be strictly limited. Every attempt should be made to use safety-engineered or disposable sharps and the use of regular sharps should be restricted to situations or procedures where there is no alternative. If regular needles/syringes, scalpel and razor blades, and pointy scissors are the only option use with caution. Examples of safety-engineered sharps include: needles and scalpel blades which re-sheath the needle/blade or automatically retract once used, needleless systems, and disposable scalpels.



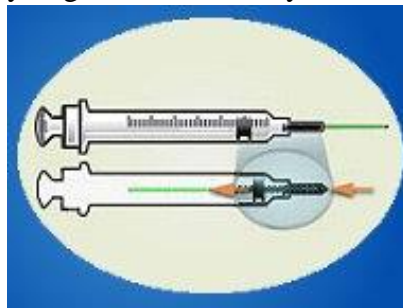
Sharps without (left) and with (right) safety features.(CDC 2018)

General Best Practices for all Sharps Use

- Sharps **must not** be passed directly from hand to hand and handling should be kept to a minimum. To hand a sharp object to someone else put it on a tray for another person to pick up.
- Always **wear safety glasses/goggles** or consider wearing a face shield when using sharps or work behind a shield.
- The object must be **pointed away** from yourself and other people at all times.
- **Keep your fingers away** from the tip of the object.
- If the object is reusable, put it in a secure, closed container after you use it.
- Tell the people you are working with when you plan to set the object down or pick it up.

Precautions for the Use of Needles and Syringes

- Needles **must not be recapped, bent, removed or broken after use.**
- If there is **absolutely no alternative** to removing or re-capping a needle:
 - a) 1st choice would be to use a safety-engineered needle system.



Syringe with a Retractable Needle

- b) 2nd choice would be to use a holder for the cap while removing or re-capping the needle.



Holder for the cap while removing or re-capping the needle

- Aerosol and spray/droplet producing procedures with Risk Group 2 biological agents must be done in a BSC.
- Sprays or aerosols may be generated while using needles when:
 - a. a needle disengages from a syringe while using infectious or chemically hazardous material
 - b. forcing material through a needle, especially small-bore needles
 - c. removing a needle from a serum vial pressurized by injecting more air than the volume withdrawn.

- Use a needle-locking type of syringe to prevent separation of needle and syringe or use a disposable type where the needle is an integral part of the syringe unit. This includes using these for injections, filtration, liquid transfer, and column loading. This will also prevent the loss of valuable sample.

Precautions for the Use of Scalpels

- Regular scalpels require you to place your fingers next to the blade and apply force to snap off the blade. Disposable scalpels with fixed blades or re-usable scalpels with a re-tractable shield are the safest and best option.
- Scalpel blades **should not be used** (or razor blades) without the handle/holder.
- A scalpel **should not** be used as a saw or excessive force used 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.

Disposal of sharps

All laboratories that generate sharp or pointed waste are responsible for the separation, packaging and treatment of their laboratory waste prior to its removal and disposal. Questions should be directed to the Environmental Protection Services at 416.946.3473 or e-mail hazwaste.ehs@utoronto.ca

Disposal of single-use sharps

Any person who has used a disposable sharp instrument or equipment must be responsible for its safe management and immediate disposal after use.

After they are used, single-use syringes and needles, scalpel blades and other sharp items should be placed in an appropriate container. These containers should be clearly labelled, puncture and leak proof. The containers should be located at the point of use or, if this is not possible, as close as practical to the use area. Reusable sharps requiring transport to a reprocessing area must be placed in a puncture-resistant lidded container. Sharps containers must be placed in a secure position or mounted on the wall to prevent tipping. There are numerous safety devices available that assist with safe removal and disposal of sharps (eg scalpel blade removers).

Needles and Syringes

Needle and blade waste includes hypodermic, surgical, suture or IV needles, syringes with needles, lancets, scalpels, blades and similar metallic sharp or pointed items for disposal that are capable of causing punctures, cuts, or tears in skin or membranes.

Per the universal precautions for exposure to blood and bodily fluids, all needles and blades used in medical care, diagnosis and research, including the manipulation and care of laboratory animals, should be considered potentially infectious. Needles and blades pose a risk to those who use them and needle and blade waste pose a health risk to those involved in its handling, transportation and disposal.

Needle and blade waste contaminated with or containing viable biological materials and trace amounts of hazardous chemical, singly or in any combination, can be collected together in the same yellow container for needle and blade waste. In most cases, the quantity of potentially hazardous material adhering to used needles and blades will be minimal and present in trace amounts only. All liquids containing hazardous chemical or radioactive materials must be drained from disposable syringes and collected for appropriate disposal.

All needle and blade waste for disposal must be carefully collected in an approved needle and blade waste container. Autoclavable plastic sharps containers must comply with CSA Standard Z316.6-14 for the collection and disposal of needle and blade waste generated at the University of Toronto. Their capacities range from 1.4 to 7.6 litres. These containers are available at the University of Toronto Medstore: <http://www.uoftmedstore.com/>.

These 3 yellow containers are available from Stores in the Medical Sciences Building.

B-D Guardian Number	300460	#300466	#300439
Capacity:	1.4 litre	3.1 litre	7.6 litre
Size:	small	medium	large
MDC Number	41121	41120	41119

- The use of other containers manufactured for the collection of needle and blade waste may be preferred or necessary in some work places having specialized requirements. In these situations, a specimen of the preferred container must be submitted to the Biosafety Office. All such containers must be CSA Standard compliant, yellow, and sized so that they can be placed into a 20 litre pail for disposal.
- Needle and blade waste contaminated with or containing viable biological agents and trace amounts of hazardous chemical or radioactive material, singly or in any combination, can be collected together in the same yellow container for needle and blade waste. In most cases, the quantity of potentially hazardous material adhering to used needles and blades will be minimal and present in trace amounts only. All liquids containing hazardous chemical or radioactive materials must be drained from disposable syringes and collected for appropriate disposal.
- The yellow containers for needle and blade waste must not be filled beyond capacity, to prevent injuries due to overfilling. Needles and blades must never be forcibly pushed into a container.
- Needles should not be recapped, purposely bent or broken by hand, removed from disposable syringes, or otherwise manipulated by hand.
- Loose needle and blade waste must not be placed directly into a 20 litre pail.
- Empty 4 litre sodium hypochlorite bleach jugs and similar plastic containers are not acceptable for the collection and disposal of needle and blade waste.
- Needle and blade waste for disposal must not be placed into office garbage containers or plastic bags of solid waste.

Needleless devices

Needleless devices do not use needles for procedures such as the collection or withdrawal of body substances after initial venous or arterial access is established or administering medication or fluids.

The CDC recommends that (O'Grady et al 2002):

- the needleless components are changed at least as frequently as the administration set;
- caps are changed no more frequently than every 3 days or according to manufacturer's recommendations;
- all components of the system are compatible to minimize leaks and breaks; and
- contamination risk is minimized by wiping the access port with an appropriate antiseptic and accessing the port only with sterile devices.

Disinfection of needleless connectors with chlorhexidine/alcohol or povidone-iodine has been shown to significantly reduce external contamination (Casey et al 2003).

Retractable devices

Retractable technology is only one example of the broad range of safety-engineered medical devices that have been designed and produced to assist in reducing the risk of occupational exposure to bloodborne pathogens in healthcare. Implementation of safety-engineered devices must be accompanied by appropriate training and education for healthcare workers in the use of the new technology to achieve successful reduction in percutaneous injury rates.

Biologically contaminated needle and blade waste

According to the principles of universal blood and body fluid precautions, all needles and blades used in medical care, diagnosis, and research, including the manipulation and care of laboratory animals, should be considered potentially infectious. Needles and blades pose a risk to those who use them and needle and blade waste may pose a health risk to those involved in its handling, transportation, and disposal.

If the needle and blade waste is contaminated with or contains viable biological agents, it must be treated to inactivate the biological agents, as outlined in Section 5.1. The designated yellow containers for needle and blade waste are autoclavable. The filled container may be steam sterilized along with other laboratory waste.

Caution: Although the yellow containers for needle and blade waste collection are puncture-resistant, care must be used when they are loaded into and removed from the autoclave chamber. After autoclaving, the plastic container will be very hot. To avoid the possibility of injury, never squeeze, push, or apply force to a container of needles and blades.

Steam sterilization is generally not recommended for laboratory waste contaminated with or containing a combination or mixture of viable biological agents and significant amounts of hazardous chemical or radioactive materials. These situations will be handled on a case-by-case basis. Contact the Environmental Protection Technicians at 416.946.3473.

Chemical disinfection of needle and blade waste is generally not recommended since it requires additional handling, increasing the potential risk of injury. Consult Section 5.1 for procedures.

Chemically contaminated needle and blade waste

Needle and blade waste containing trace amounts of a hazardous chemical must be collected in a yellow container. All liquids containing hazardous chemicals must be drained from disposable syringes and collected for appropriate disposal. Autoclaving may be required if the waste is contaminated with viable biological agents.

For needle and blade waste contaminated with significant amounts of a hazardous chemical, the chemical should be deactivated in accordance with the procedures outlined in the chemical's Material Safety Data Sheet, prior to disposal. Environmental Protection Services may be consulted for further chemical deactivation procedures.

Radioactively contaminated needle and blade waste

Needle and blade waste containing trace radioactive materials must be collected in a yellow sharps container. All liquids containing radioactive material must be drained from the disposable syringes and collected for appropriate disposal. Autoclaving of the sharps may be required if any of the needle and blade waste is contaminated with viable biological agents.

Needle and blade waste contaminated with significant quantities (any quantity greater than listed for select isotopes in Table 2 Column E) of radioactive materials must be disposed as radioactive waste.

Environmental Health and Safety will provide containers for sharps contaminated with significant quantities of radioactive materials. Contact EPS at 416.946.3473 prior to start of any work for container drop off. The liquids must still be drained from the syringes into the appropriate colour-coded radioactive liquid waste container.

Needles and sharps must be placed into this provided plastic container. Do not overfill or force waste into the container. The collected waste must not interfere with the installation of the lid.

The container must be clearly labelled to indicate that it contains radioactive needle and blade waste. The activity, isotope, solvent, date and permit number should be indicated on the waste tag.

Labelling

No specific additional labelling is required. The yellow container for the collection of needle and blade waste is supplied with an affixed standard label indicating either a maximum safe capacity / full level or a statement warning against overfilling and forcing objects into the yellow container. The universal biohazard warning symbol may also be displayed. In those situations where the biohazard warning symbol is inappropriate or unnecessary, this symbol should be covered or defaced with a black marking pen or equivalent.



Universal Biohazard Warning Symbol

Storage / Disposal

Sterilization, disinfection or decontamination of needle and blade waste may be required prior to disposal. The filled yellow plastic container of needle and blade waste must be closed by securing the attached cap over the top opening. The yellow container should be placed with the other biological waste pails for disposal. The Environmental Protection Technicians 416.946.3473 will collect them during their scheduled pickup. Containers with chemically contaminated needles and blades will need to call the Environmental Protection Technicians for a pickup as only permitted Biosafety laboratories are on a regular schedule. The only exception is for those containing radioactive waste, call 416.946.3473 but identify as Rad Waste for a pickup.

Glassware and Plasticware Waste

All laboratories that generate glass and plastic waste are responsible for the packaging of their laboratory waste prior to its removal and disposal. Glassware, plastic pipettes and micropipette tips should not be disposed of as regular garbage as they can puncture plastic garbage bags and may present a risk of injury.

The University provides a Non-hazardous Laboratory Glass and Plastics Recycling Program. Clean, non-hazardous material is to be separated into glass and plastic and placed in the appropriate toter. Gloves and all other garbage are to be kept out of the recycling toters. Amber glass is to be recycled separately. Bottles must be clean and empty. They may be placed in the brown toters (if available) or set aside for pick up by caretaking. Toters for disposal are provided by the Recycling Department and are serviced by the caretakers/building service workers. Please note that the orange bucket program has been phased out.

Definition

Glassware and plasticware waste is any disposable

- intact or broken laboratory containers such as flasks, beakers, bottles, etc.
- small glass containers, ampoules and tubes
- glass and plastic pipettes and micropipette tips.

Packaging

- Broken glassware, intact small glass containers and tubes, and glass and plastic pipettes must be regarded as potentially sharp and pointed objects and placed into the appropriate colored toter as outlined in the Non-hazardous Laboratory Glass and Plastics Recycling Program. Glassware must not protrude such that the lid cannot be closed.
- Glassware waste must not be placed into regular office garbage containers or plastic bags of solid waste.

Caution: Service workers have been instructed to not remove loose, broken glass on bench tops or floors and to not remove bags of solid waste containing glassware.

- Do not put laboratory glassware into the general recycling bins. Its composition may differ from that of recyclable glass containers.
- Very long or large glassware for disposal which does not completely fit into a toter may be placed into a cardboard container after any necessary disinfection or decontamination. The glassware must be fully enclosed by the cardboard container.
- The cardboard container must be closed, taped shut and labelled “GLASS for DISPOSAL-CAUTION”.
- The sealed labelled cardboard container may be placed beside other waste awaiting removal by building service workers.
- The glassware must be free of biological, chemical or radioactive contaminants and liquids.

Biologically contaminated glassware

- All containers must be empty and placed into the 20 litre Bio Waste pails supplied by Environmental Protection Services 416.946.3473.
- Autoclaving of the 20 litre Bio Waste pail is NOT to be done at any time as it ruins the integrity of the pail.
- The pail must be placed with the other biological waste awaiting removal by the Environmental Protection Technicians 416.946.3473.
- Laboratories using large amounts of bottled cell culturing media and animal serum should contact the Environmental Protection Technicians to review other methods of packing the waste.

Chemically contaminated glassware and containers

- Chemically contaminated glassware should be triple rinsed and/or decontaminated and placed into appropriate colored Toter supplied by Facilities and Services Department and available from the caretakers/building service workers.
- Should the lab staff determine that the rinse from the glassware cleaning is hazardous, it should be collected, packaged and labeled as a chemical waste.
- For empty chemical containers that cannot be triple rinsed because of hazard or size, contact Environmental Protection Services 416.946.3473 for location of drums for contaminated glassware and plasticware.
- Small, empty chemical containers that did not contain hazardous materials must be thoroughly rinsed. The original label must be defaced or removed and the container must be placed into the Teal coloured Toter along with other glassware for disposal.
- Alternatively, use the empty container to package chemical wastes for disposal. This eliminates the problem of finding suitable containers to package chemical waste as well as the disposal of an empty container.
- Do not put empty chemical containers and laboratory glassware into the general recycling bins.

Radioactively contaminated glassware

No flasks, bottles, tubes, etc., containing any amount of free liquid are allowed in the solid waste containers.

Do not put laboratory glassware into the solid radioactive waste containers or into the general recycling bins.

All free liquid from glassware must be drained into the appropriate colour-coded radioactive liquid waste container as outlined in Table 1. No liquid scintillation counting vials containing counting fluid are allowed in the radioactive solid waste container.

Empty glassware, including glass pipettes must be decontaminated and free from contamination, prior to disposal as non-radioactive glassware. If glassware cannot be decontaminated, consult with EPS at 416.946.3473 prior to disposal.

Labelling

Biological contaminated glassware in pails requires the Bio Waste tag provided with the 20 litre Bio Waste pail to be filled in completely.

Chemically contaminated glassware, if not dropped off at the contaminated glass and plastic drum location, should be labeled with the supplied hazardous chemical waste label.

Radioactive contaminated glassware has no standard label BUT must be identified as a Radioactive Waste on the container.

20 litre orange pails labeled 'Decontaminated Broken Glass Only' have space for marking the Building Name and Room Number on them.

Storage / Disposal

Do not overfill the colored Toters (Non-hazardous Laboratory Glass and Plastics Recycling Program); allow a minimum 2" head space below the brim to allow installation of the lid. Building service workers have been instructed to not remove overfilled Toters and to not remove bags of solid waste containing glass.

Reducing risks if a sharps injury is sustained

- Seek care immediately if you sustain a sharps injury
- If skin is penetrated, wash the affected area immediately with soap and water. Alcohol-based hand rub can be used to clean the area if soap and water are not available.
- Do not squeeze the affected area.
- Report the incident immediately to your supervisor.
- Ask about follow-up care, including post-exposure prophylaxis, which is most effective if implemented soon after the incident.
- Complete an accident / incident report form, including the date and time of the exposure, how it happened, and name of the source individual (if known).
- If a sharps injury happens to you, you can be reassured that only a small proportion of accidental exposures result in infection. Taking immediate action will lower the risk even further.

Individual actions for reducing the risk

- Become familiar with facility protocols on handling and disposal of sharps.
- Use the appropriate product for the situation and use it as directed.
- Avoid using needles where safe and effective alternatives are available.
- Before using any sharp medical device such as needles or scalpels, always plan for their safe handling and immediate disposal at the point-of-use.
- Make sure every used sharp medical device such as needles, scalpels etc are disposed of properly in puncture-resistant sharps containers located at the point-of-use.
- Report any needlestick or sharps-related injuries promptly as relevant (e.g. to infection control or occupational health and safety.
- professional, management, insurer) and ensure that you receive appropriate follow-up care.
- Ensure that you are vaccinated against blood-borne viruses such as hepatitis B.
- Participate in education sessions and professional development sessions on handling sharps, as well as those on new safety devices and how to use them.

This SOP is based on the following documents:

<https://ehs.utoronto.ca/laboratory-hazardous-waste-management-and-disposal-manual/5-5-sharp-waste-management/>

http://umanitoba.ca/admin/vp_admin/risk_management/ehso/media/Sharps_Safety.pdf

<https://www.nhmrc.gov.au/printpdf/book/export/html/53345>