Diseases, Disorders and Injuries

Needlestick and Sharps Injuries

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What are needlestick injuries?

Needlestick injuries are wounds caused by needles that unintentionally puncture the skin.

These injuries can occur at any time when people use, disassemble, or dispose of needles. When not disposed of properly, needles can hide in linen or garbage and injure other workers who encounter them unexpectedly.

What are sharps?

"Sharps" include needles, as well as items such as scalpels, lancets, razor blades, scissors, wires, retractors, clamps, pins, staples, cutters, and glass items. Essentially, any object that is able to cut the skin can be considered a "sharp."

What are the hazards from needlestick and sharps injuries?

Infected needlesticks and sharps may transmit infectious diseases, especially blood-borne pathogens (germs like viruses that cause disease). Concerns include the Human Immunodeficiency Virus (HIV), which leads to AIDS (Acquired Immune Deficiency Syndrome), hepatitis B, and hepatitis C.

Incidental punctures by contaminated needles can inject hazardous fluids and pathogens into the body through the skin. There is potential for injection of hazardous drugs, but contact with infectious fluids, especially blood, is by far the greatest concern. Even small amounts of infectious fluid can spread certain diseases effectively.

Sharps can create a cut in the skin which allows contact between blood or fluids.

The risk of infection after exposure to infected blood varies by bloodborne pathogen. It is estimated that the hepatitis B virus has a 6% to 30% chance of causing an infection from a needlestick injury if the person is not vaccinated. In comparison, the risk of HIV transmission is about 0.3% and the risk for hepatitis C is about 1.8%. These are estimates. Regardless of the probability, it is always good practice to eliminate or reduce the risk of infection.

Sharps have transmitted many other diseases involving viruses, bacteria, fungi, and other microorganisms to healthcare workers, laboratory researchers, and veterinarian staff. The diseases include:

- Blastomycosis
- Brucellosis
- Cryptococcosis
- Diphtheria
- Herpes
- Malaria
- Mycobacteriosis
- Mycoplasma caviae
- Rocky Mountain spotted fever
- Sporotrichosis
- *Staphylococcus aureus*
- *Streptococcus pyogenes*
- Syphilis
- Toxoplasmosis
- Tuberculosis

Many of these diseases were transmitted in rare, isolated events. However, they demonstrate that needlestick and sharps injuries can have serious consequences.

How do needlestick injuries occur?

Injuries can occur at every stage of their use, disassembly, or disposal.

Injuries involving hollow-bore needles (such as syringe needles) can occur:

- During use:
  - Accessing IV line.
  - Collision with sharp or worker.
  - Insertion or removal of the needle.
- During or after disposal:
  - Improper handling during disposal (for example, holding needles with hands)
  - Dropping unintentionally
  - During disposal.
- After use, before disposal:
  - Not using safety-engineered sharps or not using them correctly
  - Recapping needle.
  - During clean-up.

Injuries involving solid sharps (such as scalpel blades) can occur:

- During use of the item:
  - Collision with sharp or worker.
  - Handling or passing the sharp.
  - Having another hand or body part close to the sharp while using it.
- or after disposal:
  - Improper handling during disposal (for example, holding a scalpel blade with hands).
  - Dropping unintentionally.
- After use, before disposal:
  - Sharp left in an unusual location.
  - During clean-up.

Equipment design, nature of the procedure, condition of work, and staff experience are all factors that influence these occurrences.

How can needlestick and sharps injuries be prevented?

Preventing injuries is the most effective way to protect workers. A comprehensive sharps injury prevention program would include:

- Recommended guidelines.
- Improved equipment design.
- Effective disposal systems.
- Employee training.
- Safe recapping procedures, where necessary.
- Surveillance programs.

The Centre for Communicable Diseases and Infection Control at the Public Health Agency of Canada (PHAC) reviews, publishes, and updates guidelines to protect staff from exposure to all infection-causing agents in healthcare settings. The current guideline is titled "Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings".

Preventing injuries from sharps and needlesticks is considered a part of the routine practices used by healthcare workers.

Workers who use sharps require education and training as part of a sharps injury prevention program. Workers should be educated in how to protect themselves during use, and to protect others who may encounter the sharps during or after procedures.

The use of safety-engineered devices such as protected needle devices, or needle-free systems with self-sealing ports and syringes is encouraged. PHAC states that use of such safety devices is required by some jurisdictions. Using these devices must take into consideration both the safety of the health care worker and the patient.

PHAC recommends that:

- Needles should not be recapped (unless there is a legal requirement). Used items should be placed immediately in a designated puncture-resistant container that is easily accessible at the point of care.
- Eyes, nose, and mouth should be protected if splashes with blood or body fluids are anticipated.
- Immediately perform first aid if someone has been exposed to blood or body fluids. First aid should include:
    - Thoroughly rinsing the injury site with running water, and gently cleaning with soap and water if possible.
    - Flushing the eyes, nose, or mouth with running water if they have been exposed.
    - Broken skin should be rinsed thoroughly.

- Report the incident and exposure immediately to your employer.
- Follow instructions for further treatment and follow-up from medical professionals, where necessary.

The "Workbook for Designing, Implementing & Evaluating a Sharps Injury Prevention Program" resource from the Centres for Disease Control and Prevention (CDC) can be used in program design.. A sharps injury prevention program should use a hierarchy of control approach, including:

Elimination - find ways to eliminate or reduce needle use during procedures, medication delivery, and specimen collection.

Engineering controls - isolate the hazard by using sharps disposal containers or other devices that have an integrated injury prevention feature. Instruments can be used to grasp needles and scalpels to avoid direct contact. Safety devices must be chosen with care as no one device or strategy will work in every situation.

Administrative controls - promote safe work practices (through education, training, procedures, and signs) such as avoiding hand-to-hand passage of sharps, separating sharps from other waste, and not carrying garbage or linen bags close to the body.

Personal Protective Equipment (PPE) - PPE should be used as the last control approach, where appropriate. Puncture- and cut-resistant gloves could be used (such as during waste disposal).

In situations where recapping is considered necessary, develop safe approaches that workers can follow. Workers should never move an exposed needle tip toward an unprotected hand. Recap by laying the cap on a flat surface and scoop it onto the tip of a syringe held in one hand. Keep the free hand away from the sheath and well behind the exposed needle.

In addition, all eligible workers should be vaccinated against any disease they may be exposed to, such as Hepatitis B.

How should sharps be disposed of?

An effective system for disposing of used needles and sharps is crucial to preventing injuries. Have disposal containers readily available.

Workers should place needles in wide-mouth, puncture-resistant containers. The containers should ideally allow disposal while using only one hand to reduce the risk of injury to the user. Locate disposal containers specifically where needles and sharps are used to make safe disposal possible. Replace the containers before they are completely filled - sharps containers should be removed and replaced when they are threequarters full. Make sure they are sealed, collected, and disposed of according to local regulations for biomedical waste.

All staff should report every incident in which they find needles or sharps left at the bedside or thrown into the regular garbage.

In general, sharps disposal containers should:

- Be rigid and puncture-resistant. Containers do not need to be made of a specific material but should be able to resist punctures and function as designed throughout their lifespan (plastic and metal are common).
- Be tamper-resistant and do not have removable lids. Non-manual mechanisms should unlock closed containers.
- Be stable (that is, not likely to fall or fall over).
- Have an opening large enough to insert sharps but not large enough to insert a hand.
- Have a handle capable of holding the weight when it is full.
- Be resistant to leaking and breaking even after being dropped.
- Only be reused if designed to do so.
- Not stored near food or anywhere it could reasonably pose a hazard.
- Accessible to people who use them and take them for disposal.
- Be easy to use.
- Be clearly labelled:
    - Sharps that pose a biohazard threat should display the biohazard symbol.
    - Indicate the maximum fill level (usually about three-quarters full or as recommended by the manufacturer).
    - "DANGER."
    - Manufacturer information.

The CSA Group standard CSA Z316.6 Sharps injury protection—Requirements and test methods—Sharps containers have more detailed requirements for sharps containers.

Follow any legislated requirements for sharp disposal that apply to your workplace.

What steps are involved with a surveillance program?

Surveillance programs that provide in-depth analysis of incidents are an important tool for obtaining information. The goals of these programs should include:

- Determining the rate of injuries.

- Investigating the factors that cause the injuries or near misses (such as sharps being left in unusual locations).
- Ensuring that injured workers receive proper treatment.
- Identifying areas in which the prevention program needs improvement.
- Develop practical strategies for dealing with the issue.

Fact sheet last revised: 2024-11-08

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