
**Introduction**

This position paper describes measures that dental healthcare workers (DHCW) can use to prevent percutaneous exposures in oral health settings. It is intended as an adjunct to, not a replacement for, related regulatory standards.

**Exclusions**

This position paper does not address the individual steps to manage a percutaneous exposure or individual situations in which an injury may occur. Rather, the emphasis is on skills, behavior, and technology (equipment/device design). Regardless, OSAP acknowledges the importance of prompt reporting and medical follow up for an injury. OSAP also encourages injury data to be used as a basis for education on unsafe devices and/or practices.

**Background**

Percutaneous injuries (PIs) pose the single greatest risk of transmission of a bloodborne infection to a dental healthcare worker in the oral health setting. Percutaneous exposures result from injuries by contaminated needles, burs, scalpels, broken glass, exposed ends of dental wires, or other sharps that penetrate or break skin. The prevention of PIs is multifactorial and influenced by equipment design and technology as well as worker knowledge, training, skill, and awareness of the potential consequences associated with occupational PIs.

Primary strategies to prevent injuries include appropriate administrative controls such as DHCW education and training as well as task-specific Standard Operating Procedures designed to minimize exposure. Additionally, engineering controls and safer work practice controls may significantly impact the possibility of an injury occurring. Finally, wearing the appropriate personal protective equipment can help prevent PIs.

Administrative controls are those safety rules implemented by the employer to help assure a safe work environment. Administrative controls may include written programs, such as elements of the exposure control plan, and systems, such as rewards for safe behavior and consequences for failure to observe safety rules.

Engineering controls are technology-based and remove or isolate hazards in the workplace. Examples of engineering controls include, but are not limited to, rubber dams (which minimize exposure to oral fluids by creating a dry field), needle recappers (which place contaminated ends of the needles away from DHCW hands), and sharps containers (which isolate and contain contaminated sharps in a puncture-resistant receptacle).

Work practice controls are behavior-based and involve changing or altering a task or procedure to reduce the likelihood of an exposure. This commitment to safety greatly influences the success of other control measures. Using the one-handed scoop technique to recap dental needles is a work practice control.

Data from observational and self-reported studies indicate comparable (about 0.3/month) frequencies of PIs among U.S. dentists, oral surgeons, hygienists, and assistants. PIs among dentists are less frequent than among general surgeons. In addition, as compliance with universal precautions has increased, studies suggest that the frequency of PIs among dentists has decreased from about 12 PIs per year in 1987 (one per month) to only three to four PIs per year in 1995.

Recently expanded regulations from the Occupational Safety and Health Administration (OSHA) clarify the agency’s definitions of engineering controls, stating that “sharps with engineered sharps safety protection” are considered an engineering control. As such, all healthcare facilities, including dental offices and clinics, must provide “appropriate” and “effective” safer medical devices. OSHA considers an “appropriate” safer device to be one that, “based on reasonable judgment in individual cases, will not jeopardize patient or employee safety or be medically contraindicated.” An “effective” safer medical device is one that, based on reasonable judgment, will make an exposure incident involving a contaminated sharp less likely to occur.

OSAP supports OSHA’s intent to prioritize the use of engineering controls and encourages dental employers to comply with the 2001 OSHA revisions by carefully assessing sharps safety devices to determine which, if any, may be “appropriate” and “effective” for their individual practices. OSAP also supports OSHA’s requirement for input from non-managerial frontline dental workers in evaluating the suitability of sharps safety devices for each dental care facility. As the end-users of these clinical devices, their perspectives are a crucial part of injury-prevention efforts.

To ensure that any sharps safety device brought into the dental practice is indeed appropriate and effective, OSAP strongly encourages
practices to use standardized device screening, evaluation tools and other resources available from government agencies and non-governmental organizations. Before bringing any safety device into clinical use, always “bench test” it first outside of the patient care arena to ensure that its use will not compromise patient or worker safety. Further, all employees using any sharps with engineered safety features must be trained in proper handling, use, and disposal of the device.

Recommendations:
The prevention of PIs remains key to minimizing the risk of bloodborne disease transmission. To that end, OSAP encourages that:

1. Dental Healthcare Workers
   • Communicate the importance of prevention and management of PIs to all DHCWs;
   • Train employees in the safe handling of instruments and devices;
   • Review procedures and consider devices (as they become commercially available) that may reduce the risk of PIs;
   • Seek input from non-managerial members of the clinical dental team in selecting appropriate and effective safety devices for the practice;
   • Manage all injuries as indicated by OSHA regulations and U.S. Public Health Service recommendations;
   • Comply with all OSHA requirements for documentation;
   • Convey the needs of the end users — the dental team — to the research, development, and manufacturing sectors.

2. Educators and Researchers
   • Teach the principles and practices of infection control, bringing theoretical information into the context of clinical settings;
   • Convey the seriousness of PIs and teach avoidance strategies;
   • Conduct research on PIs, innovative prevention practices and devices;
   • Evaluate newly developed, device and procedure-based percutaneous injury-reduction strategies to determine whether injuries among DHCWs are reduced and to identify any adverse effects on patient care and safety.

3. Manufacturers
   • Research and develop safer products, including sharps with engineered injury-prevention features;
   • Assist in dental worker education by sponsoring relevant courses and providing device-specific training materials;
   • Cooperate with other manufacturers to standardize products and device components (such as a cassette that holds all instruments and fits into both an ultrasonic cleaner and an autoclave);
   • Pursue collaborations with educational organizations like OSAP.

Conclusions:
• OSAP encourages all dental practices to establish a written, comprehensive program that includes strategies to avoid occupational exposures to bloodborne pathogens.
• OSAP encourages the use of appropriate, effective devices that isolate sharps or provide a non-sharp alternative.
• OSAP discourages inappropriate manipulation of sharps by hand.
• OSAP encourages research into risk assessment of specific instruments and devices, prioritization of risk, product evaluation, and other mechanisms for DHCWs to assess the safety of devices.
• OSAP reminds DHCWs that products have an intended use and that manufacturers’ instructions must be reviewed and followed. In the event of product failure, an immediate report should be filed with the Food and Drug Administration’s Medwatch program.

References
Appendix I: Terminology

Administrative controls: education, training, and application of Standard Operating Procedures for preventing occupational exposure to blood and other potentially infectious fluids.

Engineering controls: controls (e.g., sharps disposal containers, self-sheathing needles, safer medical devices, such as sharps with engineered sharps injury protections and needleless systems) that isolate or remove the bloodborne pathogens hazard from the workplace.

Needleless systems: a device that does not use needles for (1) the collection of bodily fluids or withdrawal of body fluids after initial venous or arterial access is established; (2) the administration of medication or fluids; or (3) any other procedure involving the potential for occupational exposure to bloodborne pathogens due to percutaneous injuries from contaminated sharps.

Percutaneous: piercing mucous membranes or the skin barrier through such events as needlesticks, human bites, cuts, and abrasions.

Personal Protective Equipment: specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

Sharps with engineered sharps injury protections: a non-needle sharp or a needle device used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces the risk of an exposure incident.

Work practice controls: controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

Appendix II: Action Strategies to Prevent Pericutaneous Injuries

Administrative controls

- Educate, train, and apply Standard Operating Procedures for preventing occupational exposure to blood and other potentially infectious fluids in:
  - Dental education curricula,
  - Job orientation,
  - Periodic training.

- Assign responsibility: An individual knowledgeable in infection control guidelines and recommendations should manage the exposure control and prevention program.

- Examples: Written exposure control plan, annual bloodborne pathogens training, operatory layouts that remove or isolate percutaneous hazards.

Personal Protective Equipment (PPE)

- Create a physical barrier between the body and a source of contamination.
- Consistently use PPE appropriate to the task or procedure.
- Train staff on appropriate use, effectiveness, and limitations.

- Examples: Gloves, masks, protective eyewear, fluid-resistant garments, utility gloves for instrument clean-up.

Work practice controls

- Change or alter tasks or procedures to reduce the likelihood of exposure.

- Examples: One-handed scoop technique for needle recapping, minimizing uncontrolled movement of sharp instruments under force, using instruments instead of fingers to retract tissues during suturing and anesthetic injections, passing instruments with sharp ends pointing away from all persons, announcing instrument passes, replacing sharps containers before they are allowed to be overfilled.

Engineering controls

- Use technology intended to remove or isolate hazards in the workplace.

- Examples: Safety needles, safety scalpels, needleless IV ports, needle recappers, ultrasonic cleaners, washer/decontaminators, instrument cassettes, or other devices to minimize handling during clean-up procedures; sharps containers at the point of use, replaced at appropriate intervals to prevent overfilling.