ELEMENT III

USE OF ENGINEERING AND WORK PRACTICE CONTROLS TO REDUCE THE OPPORTUNITY FOR PATIENT AND HEALTHCARE WORKER EXPOSURE TO POTENTIALLY INFECTIOUS MATERIAL IN ALL HEALTHCARE SETTINGS

LEARNING OBJECTIVES

Upon completion of course work or training on this element, the learner will be able to:

- Define healthcare-associated disease transmission, engineering controls, safe injection practices, and work practice controls;
- Describe specific high-risk practices and procedures that increase the opportunity for healthcare worker and patient exposure to potentially infectious material;
- Describe specific measures to prevent transmission of bloodborne pathogens from patient to patient, healthcare worker to patient, and patient to healthcare worker via contaminated injection equipment;
- Identify work practice controls designed to eliminate the transmission of bloodborne pathogens during use of sharp instruments (e.g., scalpel blades and their holders (if not disposable), lancets, lancet platforms/pens, puncture devices, injections); and
- Identify where engineering or work practice controls can be utilized to prevent patient exposure to bloodborne pathogens.

DEFINITIONS

Healthcare-associated infections (HAIs): Infections associated with healthcare delivery in any setting (e.g., hospitals, long-term care facilities, ambulatory settings, home care).

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.

Injection safety (or safe injection practices): A set of measures taken to perform injections in an optimally safe manner for patients, healthcare personnel, and others. A safe injection does not harm the recipient, does not expose the provider to any avoidable risks and does not result in waste that is dangerous for the community. Injection safety includes practices intended to prevent transmission of bloodborne pathogens between one patient and another, or between a healthcare worker and a patient, and also to prevent harms such as needlestick injuries.

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

CONTENT OUTLINE

I. **High risk practices and procedures (by exposure type) capable of causing healthcare acquired infection with bloodborne pathogens:**

A. Percutaneous exposures

1. Exposures occurring through handling/disassembly/disposal/reprocessing of contaminated needles and other sharp objects:

    a. Manipulating contaminated needles and other sharp objects by hand (e.g., removing scalpel blades from holders, removing needles from syringes),

    b. Delaying or improperly disposing (e.g., leaving contaminated needles or sharp objects on counters/workspaces or disposing in non-puncture-resistant receptacles),

    c. Recapping contaminated needles and other sharp objects using a two-handed technique.

2. Performing procedures where there is poor visualization, such as:

    a. Blind suturing,

    b. Non-dominant hand opposing or next to a sharp,

    c. Performing procedures where bone spicules or metal fragments are produced.

B. Mucous membrane/non-intact skin exposures

1. Direct blood or body fluids contact with the eyes, nose, mouth, or

other mucous membranes via:

a. Contact with contaminated hands,

b. Contact with open skin lesions/dermatitis,

c. Splashes or sprays of blood or body fluids (e.g., during irrigation or suctioning).

C. Parenteral exposures

1. Injection with infectious material may occur during:

a. Administration of parenteral medication,

b. Sharing of blood monitoring devices (e.g., glucometers, hemoglobinometers, lancets, lancet platforms/pens),

c. Infusion of contaminated blood products or fluids.

II. Safe injection practices and procedures designed to prevent disease transmission from patient to patient and healthcare worker to patient.

A. Unsafe injection practices have resulted in one or more of the following:

1. Transmission of bloodborne viruses, including hepatitis B and C viruses to patients;
2. Notification of thousands of patients of possible exposure to bloodborne pathogens and recommendation that they be tested

for hepatitis C virus, hepatitis B virus, and human immunodeficiency virus (HIV);

3. Referral of providers to licensing boards for disciplinary action; and
4. Malpractice suits filed by patients.

B. Pathogens including HCV, HBV, and human immunodeficiency virus (HIV) can be present in sufficient quantities to produce infection in the absence of visible blood.

1. Bacteria and other microbes can be present without clouding or other visible evidence of contamination.
2. The absence of visible blood or signs of contamination in a used syringe, IV tubing, multi-dose medication vial, or blood glucose monitoring device does NOT mean the item is free from potentially infectious agents.
3. All used injection supplies and materials are potentially contaminated and should be discarded.

C. Providers should:

1. Maintain aseptic technique throughout all aspects of injection preparation and administration:

a. Medications should be drawn up in a designated "clean" medication area that is not adjacent to areas where potentially contaminated items are placed.
b. Use a new sterile syringe and needle to draw up medications while preventing contact between the injection materials and the non-sterile environment.
c. Ensure proper hand hygiene before handling medications.
d. If a medication vial has already been opened, the rubber septum should be disinfected with alcohol prior to piercing it.
e. Never leave a needle or other device (e.g. “spikes”) inserted into a medication vial septum or IV bag/bottle for multiple uses. This provides a direct route for microorganisms to enter the vial and contaminate the fluid.
f. Medication vials should be discarded upon expiration or any time there are concerns regarding the sterility of the medication.

2. Never administer medications from the same syringe to more than one patient, even if the needle is changed.
3. Never use the same syringe or needle to administer IV medications to more than one patient, even if the medication is

administered into the IV tubing, regardless of the distance from the IV insertion site.

a. All of the infusion components from the infusate to the patient's catheter are a single interconnected unit.
b. All of the components are directly or indirectly exposed to the patient's blood and cannot be used for another patient.
c. Syringes and needles that intersect through any port in the IV system also become contaminated and cannot be used for another patient or used to re-enter a non-patient specific multi-dose vial.
d. Separation from the patient's IV by distance, gravity and/or positive infusion pressure does not ensure that small amounts of blood are not present in these items.

4. Never enter a vial with a syringe or needle that has been used for a patient if the same medication vial might be used for another patient.
5. Dedicate vials of medication to a single patient.
    a. Medications packaged as single-use must never be used for more than one patient:
        1) Never combine leftover contents for later use;
        2) Medications packaged as multi-use should be assigned to a single patient whenever possible;

3) Never use bags or bottles of intravenous solution as a common source of supply for more than one patient.

6. Never use peripheral capillary blood monitoring devices packaged as single-patient use on more than one patient:
    a. Restrict use of peripheral capillary blood sampling devices to individual patients.
    b. Never reuse lancets. Consider selecting single-use lancets that permanently retract upon puncture.

III. Safe injection practices and procedures designed to prevent disease transmission from patient to healthcare worker.

A. Refer to OSHA guidelines, available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051

IV. Evaluation/Surveillance of exposure incidents

A. Identification of who is at risk for exposure,

B. Identification of what devices cause exposure,

1. ALL sharp devices can cause injury and disease transmission if not used and disposed properly.
    a) Devices with higher disease transmission risk (hollow bore), and
    b) Devices with higher injury rates ("butterfly"-type IV catheters, devices with recoil action)

c) Blood glucose monitoring devices (lancet platforms/pens).

C. Identification of areas/settings where exposures occur, and

D. Circumstances by which exposures occur.

E. Post exposure management- See Element VI.

V. **Engineering controls**

A. Use safer devices whenever possible to prevent sharps injuries

1. Evaluate and select safer devices
2. Passive vs. active safety features
3. Mechanisms that provide continuous protection immediately
4. Integrated safety equipment vs. accessory devices
   a. Properly educate and train all staff on safer devices,
   b. Consider eliminating traditional or non-safety alternatives whenever possible
   c. Explore engineering controls available for specific areas/settings

B. Use puncture-resistant containers for the disposal and transport of needles and other sharp objects

1. Refer to published guidelines for the selection, evaluation and use (e.g., placement) of sharps disposal containers
   a. National Institute for Occupational Safety and Health (NIOSH) guidelines – available at http://www.cdc.gov/niosh/topics/bbp/#prevent
   b. NYSDOH recommendations "Household Sharps-Dispose

of Them Safely", available at

http://www.health.state.ny.us/publications/0909.pdf

C. Use splatter shields on medical equipment associated with risk prone procedures (e.g., locking centrifuge lids).

VI. Work practice controls

A. General practices

1. Hand hygiene including the appropriate circumstances in which alcohol–based hand sanitizers and soap and water handwashing should be used (see Element II).

2. Proper procedures for cleaning of blood and body fluid spills:

   a. Initial removal of bulk material followed by disinfection with an appropriate disinfectant.

3. Proper handling/disposal of blood and body fluids, including contaminated patient care items.

4. Proper selection, donning, doffing, and disposal of personal protective equipment (PPE) as trained [see Element IV].

5. Proper protection of work surfaces in direct proximity to patient procedure treatment area with appropriate barriers to prevent instruments from becoming contaminated with bloodborne pathogens.

6. Preventing percutaneous exposures:
    a. Avoid unnecessary use of needles and other sharp objects.
    b. Use care in the handling and disposing of needles and other sharp objects,
        1) Avoid recapping unless absolutely medically necessary.
        2) When recapping, use only a one-hand technique or safety device.
        3) Pass sharp instruments by use of designated "safe zones".
        4) Disassemble sharp equipment by use of forceps or other devices.

B. Modify procedures to avoid injury:
    1. Use forceps, suture holders, or other instruments for suturing,
    2. Avoid holding tissue with fingers when suturing or cutting,
    3. Avoid leaving exposed sharps of any kind on patient procedure/treatment work surfaces.
    4. Appropriately use safety devices whenever available:
        a. Always activate safety features.
        b. Never circumvent safety features.