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APIC Position Paper: Safe Injection, Infusion and Medication Vial Practices in Healthcare

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The transmission of bloodborne viruses and other microbial pathogens to patients during routine healthcare procedures continues to occur due to unsafe and improper injection, infusion and medication vial practices being used by healthcare professionals within various clinical settings throughout the United States.¹⁻¹³

Breaches in safe injection, infusion and medication vial practices continue to result in unacceptable and devastating events for patients. More than 35 outbreaks of hepatitis have occurred in the United States in the past 10 years due to these unsafe practices and other breaches of infection prevention procedures. These outbreaks have resulted in the transmission of either hepatitis B or C to more than 500 patients.¹³ The unsafe practices that were used by physicians and/or nurses in these outbreaks can be categorized by:

- a) syringe reuse between patients during medication administration to multiple patients;
- b) contamination of medication vials or intravenous (IV) bags;
- c) failure to follow basic injection safety practices when preparing and administering parenteral medications to multiple patients;
- d) inappropriate use of glucometer equipment between patients.

In 2001, an anesthesiologist at a New York endoscopy clinic infected 19 patients with hepatitis C virus (HCV) by improperly reusing syringes and contaminating a multi-dose anesthesia medication vial subsequently used for multiple patients.³ A similar HCV outbreak due to unsafe injection practices occurred in New York in 2002 and 2007, affecting 102 patients in total.¹³ In 2002, nearly 100 Nebraska Hematology Oncology clinic patients contracted hepatitis C after a nurse used the same syringe and needle from a hepatitis C-positive patient's blood draw to obtain saline flush solution from an IV bag. As a result, the patient's blood that was on the needle of the syringe was inoculated into the IV bag which was then used as flushing solution for several other patients.² One of the most recent hepatitis C outbreaks occurred in Nevada in 2008 and was again due to unsafe injection practices involving the reuse of syringes and sharing single-use medication vials between patients. This outbreak occurred at an endoscopy center and received significant public media attention, in part due to the 63,000 persons identified as being at potential risk for acquisition of hepatitis. More than 12,000 patients have

been tested to date with at least 115 patients infected with one of the viruses. The investigation is ongoing.¹²

APIC recognizes these outbreaks as unacceptable. Each of them was preventable by the use of proper aseptic technique in conjunction with basic infection prevention practices for handling parenteral medications, administration of injections and procurement and sampling of blood. Responsibility for the oversight and monitoring of patient safety must be clearly designated in healthcare settings to assure that staff education is available for all healthcare professionals providing such services to patients. Furthermore, periodic monitoring for absolute adherence to safe injection practices in healthcare settings is vital in order to ensure effective engineering of and adherence to safe practices in everyday patient care.

APIC strongly supports adherence to the following safe injection, infusion and medication vial practices.¹⁴⁻²⁵

Aseptic Technique

- Perform hand hygiene prior to accessing supplies, handling vials and IV solutions, and preparing or administering medications.
- Use aseptic technique in all aspects of parenteral medication administration, medication vial use, injections and glucose monitoring procedures.
- Store and prepare medications and supplies in a clean area on a clean surface.
- Never store needles and syringes unwrapped as sterility cannot be assured.
- Discard all opened vials, IV solutions and prepared or opened syringes that were involved in an emergency situation.

IV Solutions

- Never use intravenous solution containers (e.g., bags or bottles) to obtain flush solutions, etc. for more than one patient.
- Never use infusion supplies such as needles, syringes, flush solutions, administration sets or intravenous fluids on more than one patient.
- Initiate administration of IV solutions within one hour of preparation, otherwise discard prepared IV solution/tubing.²²
- Disinfect IV ports using friction and 70% alcohol¹⁵, an iodophor¹⁵ or an approved antiseptic agent. Allow to dry prior to accessing.

Flushing

- Use single-dose containers for flush solutions.
- If a multidose vial must be used, it should be used for only one patient and then discarded. Each entry into the multidose vial (dedicated to the one patient) must be with a new unused sterile needle and syringe.

Syringes

- Remove sterile needle/cannula and/or syringe from package just prior to use.
- Never use medication in a syringe for more than one patient even if the needle is changed between patients. Changing the needle but not the syringe is unacceptable.

- Utilize sharps safety devices whenever possible.
- Discard syringes, needles and cannulas after used directly on an individual patient or in their IV administration system.
- Dispose of used needles at the point of use in an approved sharps container.

Vials

- Always follow the manufacturer's instructions for use.
- Use single-use or single-dose vials whenever possible.
- Always use a sterile syringe and needle/cannula when entering a vial. Never enter a vial with a syringe or needle/cannula that has been used on a patient.
- Cleanse the access diaphragm of vials using friction and 70% alcohol. Allow to dry before inserting a device into the vial.
- Discard single-dose vials after use. Never use them again for another patient.
- Use multidose medication vials for a single patient whenever possible and access all vials using a new sterile syringe, needle/cannula and adherence to aseptic technique. The risk of transmission posed by multi-dose vials has been clearly demonstrated and mandates a practice of one vial per one patient whenever possible. Infection transmission risk is reduced when multi-dose vials are dedicated to a single patient.
- Keep multidose vials away from the immediate patient environment.
- Never store vials in clothing or pockets.
- Never pool or combine leftover contents of vials for later use.
- Never leave a needle or cannula inserted into a medication vial rubber stopper because it leaves the vial vulnerable to contamination.
- Dispose of opened multidose medication vials 28 days after opening.²² Date vial to reflect date opened and/or date of expiration. CDC Immunization Program states vaccines are to be discarded per manufacturer's expiration date.²⁵
- Inspect vials and discard if sterility has been, or is thought to be compromised. Examine the vial for any particulate matter, discoloration or turbidity. If present, do not use and discard immediately. All vials used during an emergency should be discarded as sterility cannot be guaranteed.

Blood Glucose Monitoring Devices

- Assign glucometers to individual patients. Clean and disinfect glucometers if they must be reused between patients.
- Restrict use of fingerstick capillary blood sampling devices to individual patients.
- Maintain supplies and equipment such as fingerstick devices and glucometers within individual inpatient rooms, if possible.
- Use single-use lancets that permanently retract upon puncture.
- Never reuse fingerstick devices and lancets. Dispose of them at the point of use in an approved sharps container. Lancets in a pen are to be removed by mechanical means (hemostat) to avoid finger contact.
- Thoroughly clean all visible soil or organic material (e.g., blood) from glucometer prior to disinfection.

- Disinfect the exterior surfaces of the glucometer after each use following the manufacturer's directions. Use an EPA-registered disinfectant effective against HBV, HCV and HIV, or a 1:10 bleach solution (one part bleach to 9 parts water).

Healthcare Workers

- Provide the hepatitis B vaccination series to all previously-unvaccinated healthcare personnel whose activities involve contact with blood or body fluids.¹⁸
- Check and document post-vaccination titers one to two months after completion of the vaccination series.¹⁸
- Report body fluid and needlestick/sharps injuries immediately.
- Ensure staff preparing or administering injections or other parenteral medications are competent to aseptically perform these tasks.
- Periodically assess compliance with safe injection practices by observing and evaluating personnel performing these procedures.

Conclusion:

Use of safe injection practices is critical to prevent microbial contamination of products administered to patients. The ongoing United States reports of hepatitis B and C transmission to patients is an indication that much more is needed to assure that these preventive practices are being scrupulously followed in all healthcare settings. Healthcare workers and their managers must understand and practice these procedures safely. Administrators of medical facilities must be aware of safe injection practices and ensure that employees have the knowledge, training and equipment to safely implement these procedures. We must see to it that injectable medications, intravenous delivery systems and blood glucose monitoring are safely utilized in all healthcare settings. As Infection Preventionists we have an obligation to reiterate and ensure that safe injection, infusion and medication vial practices are the absolute standard of care throughout the variety of healthcare settings that exist today. We must take a lead role to assure adherence by healthcare workers to these safe practices in order to protect the health and safety of our patients.

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