

Talking Points: Preventing Outbreaks Associated with Unsafe Injection Practices and Assisted Blood Glucose Monitoring Practices

As of 2019, at least 66 outbreaks (two or more cases) of viral hepatitis related to healthcare have been [reported to CDC \(2008 – 2019\)](#). Sixty-two (62) of these outbreaks (94%) have occurred in non-hospital settings. These outbreaks are most likely the tip of the iceberg. According to the [CDC](#), the number of outbreaks due to unsafe diabetes care practices identified to date are likely underestimated due to under-reporting and under recognition of acute infection, The long incubation period of some viral diseases, asymptomatic infection, the underestimated risk of infection related to certain practices in healthcare settings, and barriers to investigation may all contribute to this under-reporting. Although most of these outbreaks have occurred in the long-term care setting, the risk of infection is present in any setting where blood glucose monitoring equipment is shared or when there is failure to follow the basic principles of infection control.

Outbreaks of blood-borne pathogens such as Hepatitis B (HBV), Hepatitis C (HCV), and HIV have been associated with unsafe injection practices. These outbreaks have resulted in patient illness and death, and can lead to legal charges and malpractice suits, loss of clinician licenses, and criminal charges. Outbreaks of viral hepatitis have occurred in VA, WV, NC, SC, FL, and other states across the country. By adhering to the basic principles of infection control and using aseptic technique, outbreaks related to injection practice can be avoided.

The most common unsafe injection practices include reusing needles, using multiple-dose medications or bags of solutions, and administering the same intravenous medications to multiple patients.

The number one cause of outbreaks of viral hepatitis in the outpatient setting is the inappropriate use of syringes either by direct reuse (using the same syringe to administer medication to more than one patient, even if the needle is changed or the injection was administered through an intervening length of tubing), or by syringe reuse, or “double dipping”. Double dipping consists of accessing a medication vial or bag with a syringe that has already been used to administer medication to a patient, then reusing the contents from the vial or bag for another patient. Changing the needle does not make a syringe safe for reuse. Syringes cannot be reused that have been used to administer an injection through an intervening length of IV tubing. Even if you don’t see blood in the IV tubing or syringe, it does not mean that harmful infectious agents are not there. Remember, [One Needle. One Syringe. Only One Time!](#)

Other causes of outbreaks of viral hepatitis have been associated with the inappropriate use of single-dose and multi-dose medication vials, failure to use aseptic technique, and the practice of unsafe assisted blood glucose monitoring. Single use vials have no preservative and can be accessed only one time and for one patient. Any remaining contents must be discarded. Never pool leftover medication for reuse. Multiple outbreaks have been associated with the inappropriate use of single-use vials. Examples of failure to use aseptic technique include, not changing gloves and not performing hand hygiene, IV bags used as sources of fluid to flush catheters for multiple patients, IV bags that have had the stoppers removed in advance of use, medication prepared in advance, uncapped syringes for flushing IVs unwrapped and prefilled in advance, blood drawing equipment in med prep area, blood contamination of the clean area.

Unsafe practices during blood glucose monitoring and the administration of insulin provide opportunity for exposure to bloodborne pathogens, and are often under-recognized and under-reported. Outbreaks of Hepatitis B, Hepatitis C, and HIV have occurred through use of contaminated equipment and supplies used for glucose testing and insulin administration (fingerstick devices, blood glucose meters, insulin pens). Examples of unsafe blood glucose monitoring and diabetes care include sharing of blood glucose meters without proper cleaning and disinfection between uses, failure to perform hand hygiene or change gloves between procedures, and use of fingerstick devices or insulin pens on multiple persons. According to the [CDC](#), unless hands are visibly soiled, an alcohol-based hand rub is preferred over soap and water in most clinical situations due to evidence of better compliance compared to soap and water. Hand rubs are generally less irritating to hands and, in the absence of a sink, are an effective method of cleaning hands.

Do's and Don'ts of Safe Injection Practices and Assisted Blood Glucose Monitoring

Do's:

Injection Safety:

- Use single-dose medication vials when possible and dispose of after one use - contains no preservative and should not be pooled for use later
- Maintain unused supplies and medications in clean areas, separate from used supplies and equipment
- Prepare injections (such as insulin) using aseptic technique in a centralized/dedicated clean area free from contamination or contact with blood, body fluids, or contaminated equipment, and outside the splash zone of a sink (approximately 3 feet)
- If multi-dose vials (MDV) of medication (insulin) must be used, dedicate to a single person when possible and label appropriately; discard within 28 days unless manufacturer specifies a different date for the open vial.
- If a MDV vial of medication (insulin) must be used for more than one person, always store and prepare the medication in a dedicated medication preparation area outside of the direct patient care environment and away from potentially contaminated equipment (if MDV vials enter the immediate patient treatment areas they should be dedicated for single-use and discarded immediately after use.
- Ensure that single-dose or single-use medications vials, ampules, and bags or bottles of IV solution are used for only one patient/resident
- Ensure that medication administration tubing and connectors are used for only one patient/resident
- Always use a new syringe and new needle to access/enter medication vials even when withdrawing additional doses for the same patient.
- Disinfect the rubber septum of medication vials with alcohol prior to piercing with a needle and syringe
- Dispose of used injection equipment at point of use in an approved sharps container (closable, puncture-resistant, and leak-proof)
- Always perform proper hand hygiene prior to preparing and administering medications

Fingerstick Devices:

- Select single-use lancets that permanently retract (auto-disabling) upon puncture when possible
- Restrict use of reusable fingerstick devices to individual persons
- Schedules for fingerstick blood sampling of individual patients should be reviewed regularly to reduce the number of percutaneous procedures to the minimum necessary for their appropriate medical management
- Wear gloves during blood glucose monitoring, administration of insulin, and during any other procedure that involves potential exposure to blood or body fluids
- Perform hand hygiene (with soap and water or use of an alcohol-based hand rub) immediately after removal of gloves

Glucometers:

- Blood glucose meters (glucometers) should be assigned to an individual person (appropriately labeled) and not be shared
- Glucometers and other environmental surfaces should be cleaned regularly and whenever contamination with blood or body fluids occurs or is suspected
- Always clean and disinfect a blood glucose meter after every use, following manufacturer's instructions using an approved/appropriate disinfectant, when they must be shared to prevent carryover of blood and infectious agents - the device can become contaminated with blood during use or via the contaminated gloved hands of HCP
- Wear gloves during blood glucose monitoring, administration of insulin, and during any other procedure that involves potential exposure to blood or body fluids
- Change gloves (and perform hand hygiene) between patient contacts, when gloves have touched potentially blood-contaminated objects or fingerstick wounds, before touching clean surfaces, and before touching other medical supplies intended for use on other persons
- Discard gloves in appropriate receptacles
- Perform hand hygiene (with soap and water or use of an alcohol-based hand rub) immediately after removal of gloves

Insulin Pens:

- Assign each individual person their own insulin pen - to prevent cross-contamination
- Clearly label insulin pens with the patient or resident's name or other identifying information to ensure that the correct pen is used only on the correct individual, and store in a clean location, preferably in patient's room
- Wear gloves during blood glucose monitoring, administration of insulin, and during any other procedure that involves potential exposure to blood or body fluids
- Perform hand hygiene (with soap and water or use of an alcohol-based hand rub) immediately after removal of gloves

Training/Education:

- Provide full hepatitis B vaccination series to all previously unvaccinated staff persons whose activities involve contact with blood or body fluids
- Establish responsibility for oversight of infection control activities
- The person(s) responsible for infection prevention at the facility should provide staff members who assume responsibility for fingersticks, blood glucose monitoring, and injections with infection control training, to include standard precautions and PPE, safe injection practices, aseptic technique, and instruction regarding reporting of exposures or breaches. Staff must demonstrate that they understand safe injection practices before being allowed to perform injections. Conduct training and assess competency at the time of hire, annually thereafter, and with changes to equipment/devices.
- Reinforce and monitor safe injection practices through routine audits by periodically observing staff who perform or assist with these procedures and tracking use of supplies
- Consider diagnosis of acute viral hepatitis infection in patients/residents with illness that includes hepatic dysfunction or elevated liver transaminases (ALT, AST)
- Promptly report any suspected instances of newly acquired bloodborne infection, such as Hepatitis B, in a patient, facility resident, or staff member to the public health authorities
- Check with state authorities for specific state and federal regulations regarding laboratory testing of the source and exposed persons

Don'ts:

Injection Safety:

- Never reuse needles or syringes
- Do not use supplies and medications that have been taken to a patient's bedside during fingerstick monitoring or insulin administration for another patient. Discard the unused supplies or clean/disinfect them when possible
- Do not carry supplies and medications in pockets
- Do not store clean supplies and medications with used supplies and equipment
- Never reuse needles or syringes to enter a medication vial or solution. Do not use needles or syringes for more than one patient (this includes manufactured prefilled syringes and other devices such as insulin pens), or for more than one time.
- If multi-dose vials of medication must be used, never access the vial in the patient care area or near contaminated equipment, and never within the splash zone (approximately 3 feet) of a sink
- Never wear the same gloves to care for more than one patient (remove gloves and perform hand hygiene between patient contacts)

Fingerstick Devices:

- Never use a fingerstick device/lancet for more than one person
- Reusable lancing devices are not recommended for healthcare settings as they are never to be used for more than one person. They should only be used by individual persons using these devices for self-monitoring of blood glucose.
- Never perform fingerstick procedures without changing gloves and performing hand hygiene between procedures

Glucometers:

- Do NOT share blood glucose meters whenever possible. They MUST be properly cleaned and disinfected after every use, per manufacturer's instructions if shared.
- Do NOT share use of a glucose meter if the manufacturer does not specify how the device is to be cleaned and disinfected

Insulin Pens:

- NEVER share insulin pens; never use an insulin pen for more than one person. They are for single use only even when the needle is changed

[Injection safety also includes to wear a facemask when placing a catheter or injecting material into the epidural or subdural space and recommendations are to never use a bag of IV solution as a common source of supply for more than one patient (ex. Flush),]

Key Terms:

Aseptic technique: aseptic technique refers to the manner of handling, preparing, and storing of medications and injection equipment/supplies (e.g., syringes, needles and IV tubing) to prevent microbial contamination. [FAQs regarding Safe Practices for Medical Injections](#)

Self-monitoring of blood glucose and insulin administration – where the individual performs all steps of the testing and insulin administration themselves.

Assisted monitoring of blood glucose and insulin administration – where another person assists with or performs testing and insulin administration for an individual. Settings where assisted monitoring may occur include hospitals, clinics, Long-term care facilities, senior centers, health fairs, correctional facilities, and schools or camps.

Bloodborne pathogens – Bloodborne pathogens are infectious microorganisms in human blood that can cause disease in humans. These pathogens include, but are not limited to, hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV). Needlesticks and other sharps-related injuries may expose workers to bloodborne pathogens.

<https://www.osha.gov/bloodborne-pathogens>

Blood glucose meters – devices that measure blood glucose levels; should be assigned to an individual person and not shared when possible; if they must be shared, the device must be cleaned and disinfected after every use to prevent carry-over of blood and infectious agents. If the manufacturer does not specify how the device should be cleaned and disinfected then it should not be shared.

Fingerstick devices – also called lancing devices, are devices that are used to prick the skin and obtain drops of blood for testing. Two types:

- Reusable Devices – looks like a pen; allows removal and replacement of the lancet after each use; should never be used on more than one person; are intended to be used by individual persons for self-monitoring of blood glucose (those who do not require assistance with BGM)
- Single-use, auto-disabling fingerstick devices – disposable devices that prevent reuse through an auto-disabling feature; single use, should be used in settings where assisted monitoring of blood glucose is performed. These devices are designed to be used only once, after which the blade is retracted, capped or otherwise made unusable. These may also be called ‘safety’ lancets.”

Insulin pen – pen shaped injector device that contains a reservoir for insulin or an insulin cartridge; designed to be used multiple times for a single person, using a new needle for each injection. (Both blood and skin cells can reflux back into cartridges as insulin is administered. Using the same pen for more than 1 patient is equivalent to using the same syringe to administer medication to multiple patients. This practice can expose patients to bloodborne pathogens, including hepatitis B, C, and HIV. Changing the needle on the insulin pen or syringe does not make it safe for reuse on additional patients)

Rule of the “3”s – The risk of acquiring infection (with HBV, HCV, and HIV) if stuck with a needle used on an infected patient. For Hepatitis B, the risk is approximately 30% or 30 out of 100, for Hepatitis C, the risk is approximately 3%, or 3 of every 100, and for HIV, the risk is approximately 0.3%, or 0.3 of every 100.

References and Resources:

<https://www.vdh.virginia.gov/haiar/infection-prevention/>

<https://www.cdc.gov/injectionsafety/index.html>

https://www.cdc.gov/injectionsafety/providers/blood-glucose-monitoring_faqs.html

https://www.cdc.gov/injectionsafety/providers/provider_faqs_general.html

<https://www.cdc.gov/handhygiene/providers/guideline.html>

<https://www.train.org/main/course/1081807/>

https://spice.unc.edu/wp-content/uploads/2021/03/04-Safe-Injection-3_19_21-final_2pp.pdf

<https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5409a2.htm>

<https://www.cdc.gov/injectionsafety/one-and-only.html>

To download a competency validation tool, visit spice.unc.edu. Click on “All Resources” and search for “[injection safety](#).”

For examples of outbreak statistics see:

<https://www.cdc.gov/hepatitis/outbreaks/healthcarehepoutbreaktable.htm>