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City Health Information

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Preventing Injection-Associated Infections in Outpatient Settings

- **Injection-associated infections are preventable, but they continue to occur in outpatient settings.**
- **Never use the same needle, syringe, or intravenous equipment for more than one patient.**
- **Dedicate multidose vials (eg, for a short-acting anesthetic) to a single patient whenever possible.**
- **Report suspected and confirmed health care-associated infections and unsafe infection control practices.**

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September 23 is National Falls Prevention Awareness Day!

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Injection-associated infections are preventable, but they continue to occur across the United States (US) and in New York City, particularly in outpatient settings such as doctors' offices, ambulatory surgical centers, and pain management clinics.[1-7]

Between 2001 and 2012, there were at least 49 outbreaks nationally due to contaminated injectable medical products; approximately 90% of these were in outpatient settings.[8] Twenty-one outbreaks involved hepatitis B virus (HBV) or hepatitis C virus (HCV), and 28 involved bacterial infections.[8] Hundreds of patients became infected as a result of the 49 outbreaks, and an estimated 150,000 other people were notified to undergo bloodborne pathogen testing.[8] HIV transmission due to unsafe injection practices is also possible in health care settings,[9] but is extremely rare.[10]

Health care-associated infections have occurred in patients receiving

- intravenous anesthesia in outpatient settings,[11,12]
- epidurals for pain management,[12,13]
- silicone and cosmetic injections,[12,14,15]
- intravenous chemotherapy,[12,16]
- hemodialysis.[2]

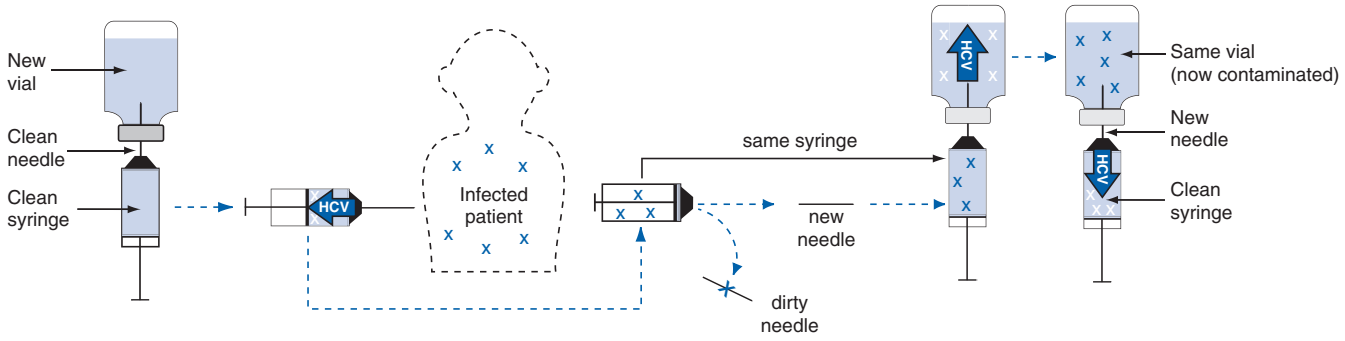
Assisted blood glucose monitoring has also been implicated in several HBV outbreaks, particularly in long-term care facilities.[6,17]

The most common mechanisms of transmission are[5,6,8]

- reuse of syringes when accessing medication vials, even after the needle is changed (**Figure**),[18]
- reuse of syringes between patients,
- use of single-dose vials for multiple patients,
- reuse of fingerstick devices between patients during blood-glucose monitoring.

Injection-related outbreaks are often identified through the investigation of case reports in which patients have no risk

FIGURE. UNSAFE INJECTION PRACTICES AND DISEASE TRANSMISSION[18]



1. Clean needle and syringe are used to draw medication.
2. When used on an infected patient, backflow from the injection or removal of the needle contaminates the syringe.
3. When again used to draw medication, a contaminated syringe contaminates the medication vial.
4. If a contaminated vial is subsequently used for other patients, they can become infected.

Adapted from *MMWR Morb Mortal Wkly Rep*. 2008;57(19):516. www.cdc.gov/mmwr/preview/mmwrhtml/mm5719a2.htm.

BOX 1. CASE STUDY: HEPATITIS B AND C VIRUS INFECTIONS ASSOCIATED WITH ANESTHESIA FOR OUTPATIENT ENDOSCOPY[1,3,11,19-22]

In March 2007, a patient reported being infected with hepatitis C virus (HCV) as a result of anesthesia given for an outpatient endoscopy in 2006. One week before the procedure, the gastroenterologist screened the patient for HCV as part of his routine practice. The patient tested negative and had no risk factors for infection. Three months after the endoscopy procedure, the patient developed symptoms of acute HCV infection. As the timing of the infection suggested endoscopy-associated transmission, the NYC Health Department initiated an investigation, which found that

- 51 potentially at-risk patients had to be notified for testing,
- 12 other patients treated by the same anesthesiologist during outpatient endoscopy had been infected with viral hepatitis (6 HCV, 5 hepatitis B [HBV], and 1 HCV/HBV),
- infected patients were not exposed to common endoscopes or biopsy equipment in a manner that could explain viral transmission,
- **the anesthesiologist had incorrectly reused syringes and single-use propofol vials for multiple patients.**[11]

These findings are consistent with other studies indicating that contaminated anesthesia or other intravenous medication is far more likely to cause HBV or HCV infection than medical equipment, and they underscore the importance of proper injection safety.[1,19,20]

The NYC Health Department advised the anesthesiologist responsible for the HBV/HCV transmission to immediately discontinue reusing single-use propofol vials for more than one patient. The anesthesiologist stopped working during the investigation[3] and subsequently lost his medical license.[21] In 2009, the NYS Health Department mandated clinician training in safe injection practices and required all outpatient practices that perform procedures involving moderate or deep sedation or general anesthesia to obtain accreditation.[22]

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factors for exposure other than recent health care procedures or injections (**Box 1**[1,3,11,19-22]). If transmission occurred in a health care setting, other patients may be at risk and will need to be notified and tested, and the responsible provider can be exposed to malpractice lawsuits[23] and fines.

Make safe injection a priority in your practice by taking the following steps:

- Follow recommendations for safe injections (**Boxes 2**[4] and **3**[24]) and diabetes care (**Box 4**[25,26]).
- Train all staff on safe injection practices.
- Develop drug-diversion prevention protocols and adhere to them (**Box 5**[27,28]).
- Promptly report injection-associated infections, concerns about injection safety, and provider misconduct to the appropriate authorities (**Box 6**[29-32]).

FOLLOW SAFE INJECTION PRACTICES

Basic safe injection practices (**Boxes 2** and **3**) and safe point-of-care testing, such as for diabetes care (**Box 4**), help prevent infections in health care settings.[4,25] A new sterile needle and a new sterile syringe should always be used for each patient and to access medication vials.

BOX 2. KEY RECOMMENDATIONS FOR SAFE INJECTIONS[4]

- Use needles and syringes only once.
- Do not reuse a syringe to enter a medication vial or solution.
- Never administer medications from the same syringe to multiple patients, even if the needle is changed or the injection is administered through an intervening length of intravenous tubing.
- Use single-dose vials and do not administer medications from single-dose or single-use vials or ampoules to more than one patient.
- Do not use bags or bottles of intravenous solutions for more than one patient (eg, for flushing heparin locks).
- Dedicate multidose vials to a single patient whenever possible.
- **If you must use multidose vials for more than one patient, store and draw up medication in a clean central location, away from patient care areas.**
- Do not use fluid infusion or administration sets (eg, intravenous tubing) for more than one patient.
- Use aseptic technique when preparing and administering medications.
- Clean the access diaphragm of a medication vial with 70% alcohol before inserting a device into the vial.
- Dispose of used syringes and needles at the point of use in a sharps container that is closable, puncture resistant, and leakproof.

For more information, see Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care (**Resources**).

BOX 3. INJECTION SAFETY: MYTHS AND FACTS[24]

Myth: You can reuse a syringe if you change the needle.

Fact: After use, both the needle and the syringe are contaminated and should be discarded.

Myth: You can reuse a syringe as long as you administer the injection through intervening IV tubing.

Fact: Everything from the medication bag to the patient's IV catheter is a single interconnected unit. Once the syringe is connected to the unit, it can be contaminated with blood—regardless of distance from the patient, gravity, or even infusion pressure—and must be discarded.

Myth: If you don't see blood in the IV tubing or syringe, it means that those supplies are safe for reuse.

Fact: Pathogens, including hepatitis B and C and HIV, can be present in previously used IV tubing or syringes in sufficient quantities to produce infection even without any visible blood. IV tubing and syringes can never safely be reused.

Myth: You can use single-dose vials with large volumes for more than one patient.

Fact: Single-dose vials should not be used for more than one patient, regardless of the vial size.

Adapted from Centers for Disease Control and Prevention. Dangerous Misperceptions. www.cdc.gov/injectionsafety/PDF/SIPC_MythsTruthsFlyer.pdf.

BOX 4. SAFE DIABETES CARE[25,26]

Prevent infections that can result from unsafe diabetes care[25]:

- Never share fingerstick devices or insulin pens.
- Never reuse lancets.
- Assign each patient a separate glucometer and label it with the patient's name.
- If a glucometer must be used for multiple patients, clean and disinfect it after every use, according to the manufacturer's instructions. *Do not share the device if the manufacturer does not give specific cleaning and disinfecting instructions.*[26]

USE ADMINISTRATIVE MEASURES TO ENSURE SAFE INJECTIONS

Provide job- or task-specific infection prevention education and training to all health care staff[a] (**Resources**) and ensure that proper infection prevention protocols are followed by all clinicians. Be aware that a physician may be subject to litigation for the actions of another clinician at his or her practice who is not an employee. In one case, a patient sued an anesthesiologist hired by a gastroenterology practice for using unsterile technique in sedating him prior to colonoscopy, which caused him to contract HBV. The anesthesiologist, who was implicated in several other hepatitis outbreaks, declared bankruptcy and

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had his medical license revoked. The gastroenterologist who retained the anesthesiologist was charged as vicariously liable in a lawsuit later brought by the patient's family.[33,34]

- Train all staff on the basic principles and practices for preventing infection (**Boxes 2, 3,** and **4**), as well as on bloodborne pathogens and patient safety.[4]
- Provide training at employee orientation and regularly (eg, annually) thereafter and whenever policies or procedures are updated.[4]
- Document role-appropriate competencies after each training—for example, following aseptic procedure—including hand hygiene and use of personal protective equipment.[4]
- Ensure that at least one individual with training in infection prevention is employed by or regularly available to the facility.[4]
- Develop a written infection control policy appropriate to the practices and procedures performed by the facility.[4]
- For an infection prevention checklist, see www.cdc.gov/HAI/pdfs/guidelines/ambulatory-care-checklist-07-2011.pdf.

PREVENT DRUG DIVERSION

Health care-associated infections can occur when clinicians or staff members tamper with injectable drugs.[28,35-37] In one recent case, an HCV-infected traveling radiology technician stole syringes filled with narcotics, self-injected the narcotic, and refilled those syringes with saline solution. The syringes were then used for patients, resulting in HCV infection in at least 32 patients in 3 states.[37]

Take steps to make sure no clinician or staff member engages in this type of practice (**Box 5**) and promptly report any such behavior. Prevention and reporting of drug diversion are your responsibility, and your actions may help prevent or stop an outbreak.

Help is available for anyone who may be struggling with addiction. If you suspect a colleague may have issues with addiction, sensitively approach the person and help locate treatment services (**Resources—Substance Use Treatment: New York State**).

BOX 5. PREVENT DRUG DIVERSION[27,28]

- Train staff on the dangers of drug diversion and the importance of preventing it (**Resources**).
- Keep a medicine log to track all medicines.
- Keep medicines, especially controlled substances, in a locked container or room.
- Dispense controlled substances in single-use vials.
- Keep prescription pads in a locked place.
- Report any suspicious activity to internal or external authorities (**Box 6**).
- Institute an investigation protocol to follow when diversion is suspected.

REPORT INFECTIONS, CONCERNS, AND MISCONDUCT

Report suspected and confirmed health care-associated infections, unsafe infection control practices, and provider misconduct to the appropriate authorities[35] (**Box 6**).

SUMMARY

Clinicians can help prevent injection-associated infections in outpatient settings. Dedicate multidose vials (eg, for a short-acting anesthetic) to a single patient whenever possible and never reuse a needle, syringe, or intravenous equipment. Report injection-related infections, as well as other suspected and confirmed health care-associated infections, unsafe infection control practices, and provider misconduct, to the appropriate authorities. ◆

BOX 6. REPORTING INFORMATION FOR AMBULATORY CARE AND NON-ARTICLE 28 FACILITIES[a,29-32]

- Report health care-associated infections.
  Call the NYC Health Department Provider Access Line at 866-692-3641(24 hours a day/7 days a week).
- Report infection control concerns.
  File a complaint with the NYSDOH Center for Consumer Health Care Information.
- Report misconduct by a physician, physician assistant, or specialist assistant (orthopedic specialist assistant, urologic specialist assistant, or radiologic specialist assistant).
  Contact the NYSDOH Office of Professional Medical Conduct.
- Report misconduct by a registered nurse or other licensed clinical staff.
  Contact the NYS Department of Education Office of the Professions.

[a]Inpatient and outpatient Article 28 facilities (eg, hospitals and nursing homes) must report suspected and confirmed health care-associated infections to NYSDOH.

RESOURCES

Infection Control Guidance and Tools

- Centers for Disease Control and Prevention:
  - Healthcare-associated Infections (HAIs) in Outpatient Settings: www.cdc.gov/hai/settings/outpatient/outpatient-settings.html
    Includes *Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care* and Infection Prevention Checklist
  - Injection Safety: Patient Notification Toolkit: www.cdc.gov/injectionsafety/pntoolkit/index.html
  - Frequently Asked Questions (FAQs) Regarding Safe Practices for Medical Injections: www.cdc.gov/injectionsafety/providers/provider_faqs.html

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- New York City Department of Health and Mental Hygiene. Health Care-Associated Infections: Information for Providers: nyc.gov/html/doh/html/diseases/cd-healthcare-infections.shtml
- New York State Department of Health. Health Care Provider Infection Control Training: www.health.ny.gov/professionals/diseases/reporting/communicable/infection/hcp_training.htm
- Safe Injection Practices Coalition. One and Only Campaign. Healthcare Provider Information: www.oneandonlycampaign.org/content/healthcare-provider-information
  Includes provider toolkit, printable materials, and patient information

Training Videos

Medscape, CDC Expert Commentaries:

- Keeping Patients Safe From Infection in Outpatient Settings: www.medscape.com/viewarticle/763348
- New Infection Prevention Guidance for Outpatient Settings: www.medscape.com/viewarticle/744295
- Drug Diversion in Healthcare Settings: www.medscape.com/viewarticle/825801
- Unsafe Injection Practices: Outbreaks, Incidents, and Root Causes: www.medscape.org/viewarticle/745695

Drug Diversion Prevention

- Centers for Disease Control and Prevention. Injection Safety: Risks of Healthcare-associated Infections From Drug Diversion: www.cdc.gov/injectionsafety/drugdiversion/

Substance Use Treatment

- New York State Treatment Provider Search and Directory: www.oasas.ny.gov/treatment/directory.cfm
- LIFENET (a free, confidential help line for New York City residents; 24 hours a day/7 days a week):
  In English: 800-LIFENET/800-543-3638
  In Spanish: 877-AYUDESE/877-298-3373
  In Korean and Chinese (Mandarin and Cantonese dialects): 877-990-8585
  For other languages, call 800-LIFENET and ask for an interpreter.
  For TYY hard of hearing, call 212-982-5284.
  nyc.gov/html/doh/html/mental/lifenet.shtml

City Health Information archives:
nyc.gov/html/doh/html/data/chi1.shtml

- *Preventing and Managing Hepatitis B*
- *Diagnosing and Managing Hepatitis C*

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