

TAKING A SHOT AT INJECTION SAFETY

The safety of medical injections is a given in the developed world. Or is it?

Hippocrates famously stated, “*primum non nocere*”: first, do no harm.⁺ Where medical injections are concerned, this should be a straightforward rule to follow. Unfortunately, however, that’s not always the way things work out. During 1998–2014, the Centers for Disease Control logged more than 50 outbreaks in the U.S. attributable to unsafe injections. These outbreaks resulted in >700 patients infected with hepatitis B virus, hepatitis C virus, or bacterial pathogens.¹ During 2001–2012, >150,000 patients in the U.S. were notified that they were potentially exposed to pathogens as a result of unsafe injection practices.¹ And, surely some outbreaks or clusters of infections go unnoticed or unreported. In spite of the best intentions of health care personnel, there are likely many isolated cases of infection due to breaches in safe injection practices that are not part of larger outbreaks. This issue of the *CD Summary* describes some of the practices and settings where injection safety is a concern, and reviews actions being taken in Oregon to address this important topic.

WHERE IS INJECTION SAFETY A CONCERN?

The triad of needle, syringe, and medication vial immediately springs to mind. While it should be obvious that equipment should be single-use or sterilized, and sterile technique should be followed religiously, outbreaks continue to occur when corners are cut. Reusing *any* type of injection equipment that comes into contact with blood or body fluids can transmit disease, even when contamination is invisible.

⁺Although, you might well ask, “The guy was Greek, so why do they always translate this in Latin?”

KEY ELEMENTS OF INJECTION SAFETY*

- Follow proper infection control practices and maintain aseptic technique during the preparation and administration of injected medications (e.g., perform hand hygiene).
- Never administer medications from the same syringe to more than one patient, even if the needle is changed.
- Never enter a vial with a used syringe or needle.
- Do not use medications packaged as single-dose or single-use for more than one patient.
- Do not use bags of intravenous solution as a common source of supply for more than one patient.
- Limit the use of multi-dose vials and dedicate them to a single patient whenever possible.
- Always use facemasks when injecting material or inserting a catheter into the epidural or subdural space.

*Adapted from: Guideline for isolation precautions: preventing transmission of infectious agents in health care settings 2007. Atlanta, GA: US Department of Health and Human Services, CDC; 2007. Available at www.cdc.gov/hicpac/pdf/isolation/isolation2007.pdf. Accessed 11 Jul 2017.

In 2015, a hospital telemetry unit nurse in Texas infected one patient with hepatitis C virus (HCV) and two with hepatitis B virus (HBV) by reusing the same prefilled saline syringe to flush the intravenous lines of multiple patients; 392 patients were notified afterwards of potential exposure.²

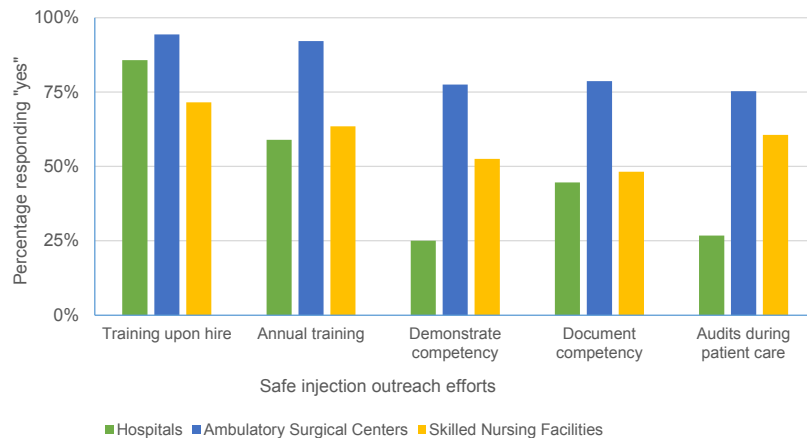
Mishandling of other types of patient care equipment can also result in unsafe injections. In 2010, inappropriate sharing of blood glucose monitoring equipment – including reusable fingerstick lancing devices – at a North Carolina assisted living facility caused eight hospitalizations and six deaths related to HBV.³

Similarly, the watchful eye should extend beyond traditional settings where we imagine injection safety might come into play, for example in use of alternative and cosmetic modalities. In 2015, the Oregon Public Health Division (OPHD) investigated a prolotherapy clinic after a case of acute hepatitis C was linked to injections at an affiliated clinic in California. “Prolotherapy” involves injection of bone marrow, fat, plasma, or sugar solutions in an effort

to treat joint, ligament, and tendon pain or weakness by stimulating a healing response.⁴ A provider at both clinics admitted to reusing syringes on different patients to draw medications from multi-dose vials. The HCV-infected person in California was diagnosed during a routine blood donation, had no behavioral risk factors for the disease, and had received injections at the California practice within an incubation period for HCV. OPHD found no illnesses linked to injections at the Oregon prolotherapy clinic, but on-site investigation turned up a number of unsafe infection control practices. OPHD’s Health-care-Associated Infections Program reached out to the Centers for Disease Control and Prevention (CDC) regarding the retrospective investigation of acute HCV among patients of this clinic through our reportable disease registries; and to the Oregon Medical Board. The prolotherapy clinic is no longer in operation.

Drug diversion, when it involves the surreptitious use by health care personnel of medications meant

Figure. Safe injection practices, Oregon HAI Program Survey, 2016



for patients, can lead to contamination of patient care equipment and consequent exposure of patients to potentially life-threatening infections. Two Colorado patients developed acute HCV in 2009, after undergoing surgery at the same hospital. An HCV-infected surgical technician had stolen syringes prefilled with fentanyl from the operating room, injected herself, refilled the now-contaminated syringes with saline, and snuck them back into the OR. As a result, at least 18 patients became infected, and more than 8,000 patients were notified.⁵

WHAT ARE WE DOING IN OREGON?

After receiving regular reports of sub-optimal infection control practices in healthcare settings, OPHD's Healthcare-Associated Infections Program began to wonder whether this was merely the tip of a much larger iceberg. Some settings needing additional attention regarding unsafe injection practices (e.g., sharing of blood glucose monitors and misuse of medications packaged in multi-dose vials) include adult foster care homes, cosmetic spas, and outpatient physician clinics. Additionally, routes of transmission relating to reuse of patient care items and drug diversion have been documented and reported nationwide.

To identify risky practices like those detailed above, we surveyed hospitals, ambulatory surgery centers (ASCs), and skilled nursing facilities (SNFs) about injection practices using results to guide safe injection outreach efforts. While most types of facilities provided training upon hire, the numbers dropped for annual training, demonstrating and documenting

competency and performing audits during care (Figure). Clearly there is work to be done across care settings in improving safe injection practice.

To address these practices the Oregon Health Authority's Healthcare Acquired Infections program joined with CDC in its *One & Only* Campaign – promoting key educational messages and resources, and supporting health facilities in their efforts to keep patients and health care personnel safe from iatrogenic infection.

In addition, OHA is working with four Infection Control Assessment and Response (ICAR) Center of Excellence hospitals around the state to ensure safe injection practices, prompt recognition of high-impact communicable diseases, and effective use of infection control practices to protect health care personnel and the general public.

MOVING FORWARD: JACKSON COUNTY PILOT STUDY

To better understand injection practices in Oregon, the Healthcare-Associated Infections Program is launching a safe injections pilot project in Jackson County. We will assess procedures and practices of health care personnel in the county to characterize risk to patients, to provide targeted outreach and education, and to evaluate the impact of these efforts on adherence to safe injection practices.

WHAT CAN YOU DO?

Here are a few simple steps you can take to ensure safe practices and minimize risk of parenteral disease transmission in your practice.

- Check out the One & Only Campaign's [Injection Safety Checklist](#). It provides easy-to-follow guidance for training health care personnel

who give injections. This and other printed materials can be ordered, *gratis*, from [CDC-Info](#).

- Think outside the box! Many kinds of patient care equipment and healthcare settings could lead to injection-related pathogen exposures. Review safe practices with all health care personnel involved in vaccination, glucose or hemoglobin monitoring, collection of newborn screening samples, and therapeutic injections.
- If you become aware of a possible drug diversion or other dicey infection control issue, report the incident to your local public health authority; or discuss it with your facility's infection preventionist
- Join the *One & Only* Campaign. Members help raise awareness about safe injection practices by sharing the messages with colleagues. You'll receive updates, useful materials, and the gratitude of public health officials. To join, contact injection_safety@cdc.gov.
- Follow Oregon AWARE on [Facebook](#) or [Twitter](#) to receive regular updates related to injection safety, infection control and prevention, and antibiotic stewardship.

FOR MORE INFORMATION

- Visit the Healthcare-Associated Infections Program website at: healthoregon.org/hai

REFERENCES

1. APIC medication vial practices in health care (2016). Available at www.apic.org/Resource/_TinyMceFileManager/Position_Statements/2016APIC_SIP_Position_Paper.pdf. Accessed 11 Jul 2017.
2. Arnold S; Melville S; Morehead B; Vaughan G; et al. Notes from the Field: Hepatitis C transmission from inappropriate reuse of saline flush syringes for multiple patients in an acute care general hospital — Texas, 2015. *MMWR Recomm Rep* 669: 258-60. Available at www.cdc.gov/mmwr/volumes/66/wr/mm6609a4.htm Accessed 21 Jul 2017.
3. CDC. Deaths from acute hepatitis B virus infection associated with assisted blood glucose monitoring in an assisted-living facility — North Carolina, August–October 2010. Available at www.cdc.gov/mmwr/preview/mmwrhtml/mm6006a5.htm. Accessed 11 Jul 2017.
4. What is prolotherapy? The American Osteopathic Association of Prolotherapy Regenerative Medicine: 2017. Available at <http://prolotherapycollege.org/what-is-prolotherapy/>. Accessed 21 Jul 2017.
5. Brown, Jennifer. Hospital tech who spread hep C via drug thefts gets 30 years. *Denver Post*, Feb 24, 2010; updated May 6, 2016 Available at www.denverpost.com/2010/02/24/hospital-tech-who-spread-hep-c-via-drug-thefts-gets-30-years/. Accessed 21 Jul 2017.



Providence Portland Medical Center designates this enduring material for a maximum of .5 *AMA PRA Category 1 credit™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity. Portland Providence Medical Center is accredited by the Oregon Medical Association to sponsor continuing medical education of physicians.

You can get this document in other languages, large print, braille or a format you prefer. Contact the Public Health Division at 971-673-1222. We accept all relay calls or you can dial 711. for TTY.