

North Carolina
SPICE
Statewide Program for
Infection Control & Epidemiology

SAFE INJECTION PRACTICES & OUTBREAKS


Marty Cooney DrPH, MPH, ME, BSN, RN, CIC.
Associate Director
Statewide Program for Infection Control and Epidemiology (SPICE)
UNC School of Medicine

<https://spice.unc.edu/>
<https://spice.unc.edu/ask-spice/>

1

OBJECTIVES

1. Discuss the consequences of unsafe injection practices
2. Describe outbreaks
3. Discuss safe injection best practices
4. Describe One and Only Campaign



2

UNSAFE INJECTION PRACTICES CONSEQUENCES

The infographic illustrates the consequences of unsafe injection practices. It features a central newspaper clipping from the 'Post-Herald' with the headline 'OUTBREAK!'. Surrounding the newspaper are four blue callout boxes with icons and text: 'Patient illness and death' (with a person icon), 'Legal charges/malpractice suits' (with a gavel icon), 'Loss of clinician license' (with a 'REVOKED' stamp icon), and 'Criminal charges' (with a person in handcuffs icon). The SPICE logo is in the bottom right corner.

3

A-Z Index A B C D E F G H I J K L M N O P Q R S T U V W X Y Z #

Healthcare-associated Infections (HAIs)

Healthcare-associated Infections > Outbreak and Patient Notifications

f
t
+

Outbreaks and Patient Notifications in Outpatient Settings, Selected Examples, 2010-2014

The following table includes selected examples of recent outbreaks and patient notification events. These events occurred in a variety of outpatient settings including primary care clinics, pediatric offices, cosmetic surgery centers, pain remediation clinics, imaging facilities, cancer (oncology) offices, and orthopedic clinics. **Exhaustive list but it serves as a reminder that healthcare personnel fail to follow basic infection control practices.** These events include: infection transmission to patients, referral of patients to bloodborne pathogens, referral of patients for malpractice suits filed by patients.

- Selected examples of recent outbreaks and patient notification events (n=24)**
 - Primary care clinics (4)
 - Cosmetic surgery centers (3)
 - Pain remediation clinics (4)
 - Cancer clinics (3)
 - Oral surgery (2)
 - Orthopedic clinics (2)

Facilities and healthcare personnel are required to follow the *Outpatient Settings: Minimum Expectations for Infection Prevention Checklist (Appendix A)*, a tool to assess infection control practices. In order to prevent patient harm, facilities should conduct regular audits to review practices to assure they are in compliance.

https://archive.cdc.gov/www_cdc_gov/hai/settings/outpatient/outbreaks-patient-notifications.html. Retrieved 10/24/2025.

SPICE

4

HEPATITIS VIRUS TRANSMISSION IN HEALTHCARE (2008 – 2017) – CDC EXCERPT

60 outbreaks (two or more cases) of viral hepatitis related to healthcare reported to CDC during 2008-2017; of these, 57 (95%) occurred in non-hospital settings.

Hepatitis C (HCV) Outbreaks by Setting						
Setting	Year	State	Persons Notified for Screening ¹	Outbreak-Associated Infections ²	Known or suspected mode of transmission ³	Comments
Prolotherapy clinic (48)	2015	CA	>1,500	5	Syringe reuse contaminating medication vials used for >1 patient Use of single-dose vials for >1 patient	
Insulin infusion clinic (47)	2015	CA	92	9	Unsafe practices related to assisted blood glucose monitoring including use of fingerstick devices for >1 person and inadequate cleaning and disinfection of glucometer before reuse.	
Pain management clinic (48)	2015	MI	122	2	Syringe reuse contaminating medication vials used for >1 patient	
Cardiology clinic (49)	2015	WV	>2,000	5	Use of single-dose vials for >1 patient	



5

NC VIRAL HEPATITIS OUTBREAKS: REPORTED TO CDC (2008-2017)

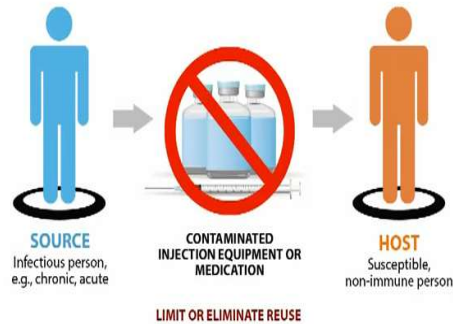
	Year	State	Persons Notified	Persons Infected	Breach	Comments
Assisted Living Facility		NC	87	8	Use of fingerstick devices for >1 resident Use of blood glucose meter for >1 resident without cleaning and disinfection	6 died as a result of Hepatitis complications
SNF	2010	NC	116	6	Unclear	
SNF	2010	NC	109	6	Unclear; however 4/6 received ABGM	
Cardiology Clinic	2008	NC	>1200	5	Syringe reuse and contamination of MDV	An additional 2 new infections were identified in probable source patients



6

STANDARD PRECAUTIONS: SAFE INJECTIONS

Unsafe Injection Practices Can Lead to Transmission of Life-Threatening Infections



The continued occurrence of outbreaks of hepatitis B and hepatitis C viruses in ambulatory settings indicated a need to re-iterate safe injection practice recommendations as part of Standard Precautions.



7

STANDARD PRECAUTIONS: INJECTION SAFETY PRACTICES



- All injections should be prepared and administered aseptically, in a dedicated clean area, avoiding touch or droplet contamination, away from potential sources of contamination (e.g., sinks)
- A syringe should only be used to administer medication to one patient
- Syringes should never be reused to access a medication container
- Medications that are labeled a single dose or for single-patient use should only be used for one patient

https://www.cdc.gov/injection-safety/hcp/resources/?CDC_AAref_Val=https://www.cdc.gov/injectionsafety/one-and-only.html



8

STANDARD PRECAUTIONS: INJECTION SAFETY PRACTICES

- **Do not** enter a vial with a used syringe or needle
- Bags or bottles of intravenous solution not be used as a common source of supply for more than one patient (e.g. flush)
- Cleanse the access diaphragm of medication vials before inserting a device into the vial
- Dedicate multi-dose vials to a single patient whenever possible
- Dispose of used sharps **at the point of use** in a sharps container that is closable, puncture-resistant and leak-proof
- Use facemasks when placing a catheter or injecting material into the epidural or subdural space (e.g., during myelogram, epidural or spinal anesthesia)



9

INJECTION AND MEDICATION SAFETY

SAFETY STEPS
FOLLOW THESE INJECTION SAFETY STEPS FOR SUCCESS!

BEFORE THE PROCEDURE
Carefully **read the label** of the vial of medication.

- If it says single-dose and it has already been accessed (e.g. needle-punctured), **throw it away**.
- If it says multiple-dose, **double-check the expiration date** and the beyond-use date if it was previously opened, and visually inspect to ensure no visible contamination.
- When in doubt, throw it out.

DURING THE PROCEDURE
Use aseptic technique.

- Use a new needle and syringe for every injection.

AFTER THE PROCEDURE
Discard all used needles and syringes and SDVs after the procedure is over.

MDVs should be discarded when:

- the beyond-use date has been reached
- doses are drawn in a patient treatment area
- any time vial sterility is in question

Click for more information:
FAQs Regarding Safe Practices for Medical Injections

1 ONE NEEDLE, ONE SYRINGE, ONLY ONE TIME.

https://www.cdc.gov/injection-safety/hcp/resources/?CDC_AAref_Val=https://www.cdc.gov/injectionsafety/one-and-only.html



10

STANDARD PRECAUTIONS: INJECTION SAFETY/POINT OF CARE TESTING

- If blood glucose meters must be shared
 - Purchase glucose meters designed for healthcare use
 - The device should be cleaned and disinfected after every use, per manufacturer's instructions (IFU), 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
 - "The disinfection solvent you choose should be effective against HIV, Hepatitis C, and Hepatitis B virus. Outbreak episodes have been largely due to transmission of Hepatitis B and C viruses. However, of the two, Hepatitis B virus is the most difficult to kill. Please note that 70% ethanol solutions are not effective against viral bloodborne pathogens and the use of 10% bleach solutions may lead to physical degradation of your device. [View a list of Environmental Protection Agency \(EPA\) registered disinfectants effective against Hepatitis B](#)"
- Use single-use auto-disabling (retractable) fingerstick devices

https://www.cdc.gov/injection-safety/hcp/infection-control/?CDC_AAref_Val=https://www.cdc.gov/injectionsafety/blood-glucose-monitoring.html



11

WHY DO OUTBREAKS HAPPEN?

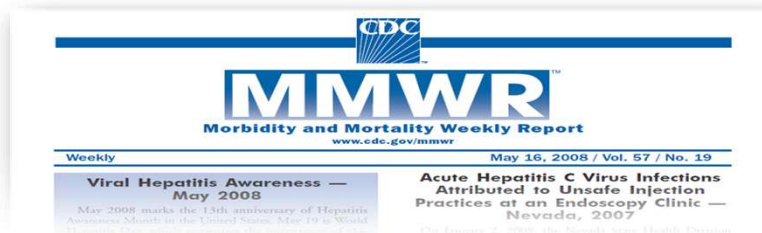


Preventable Deaths During Widespread Community Hepatitis A Outbreaks — United States, 2016–2022

Weekly / October 20, 2023 / 72(42):1128–1133





[Print](#)

Megan G. Hofmeister, MD¹; Neil Gupta, MD¹; Hepatitis A Mortality Investigators ([VIEW AUTHOR AFFILIATIONS](#))



12

THE BIG FOUR + ONE

1.  Syringe re-use, directly or indirectly
2.  Inappropriate use of single dose or single use vials
3.  Failure to use aseptic technique (contamination of injection equipment)
4.  Unsafe diabetes care/ assisted blood glucose monitoring (ABGM)

5. Plus 1 = Drug Diversion



13

1: SYRINGE RE-USE

Most common cause of outbreaks in the outpatient setting is inappropriate use of syringes

- 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

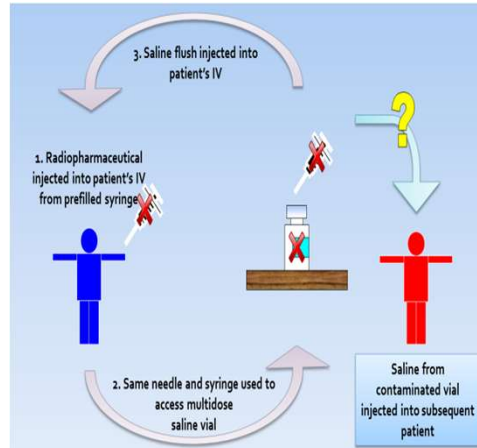


14

SYRINGE RE-USE

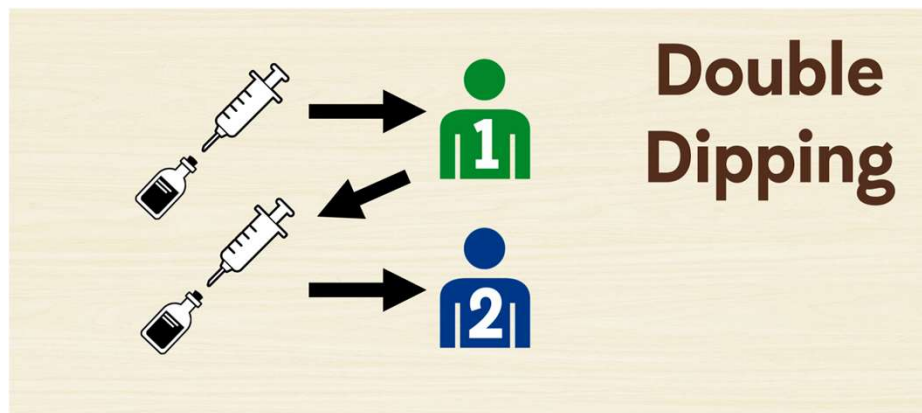


- Indirect reuse or “double dipping”:
 - Accessing a medication vial or bag with a syringe that has already been used to administer medication to a patient, then reusing the contents from the vial or bag for another patient



15

UNSAFE PRACTICE: DOUBLE DIPPING



16

ENDOSCOPY CENTER, NEVADA (2008)

- 9 clinic-associated hepatitis C virus cases
- 106 possible clinic-associated cases
- 63,000 potential exposures
- \$16–21 million total cost



Weekly May 16, 2008 / Vol. 57 / No. 19

Viral Hepatitis Awareness — May 2008

May 2008 marks the 13th anniversary of Hepatitis Awareness Month in the United States. May 19 is World Hepatitis Day, which recognizes the importance of global commitments to prevent liver disease and cancer.




Acute Hepatitis C Virus Infections Attributed to Unsafe Injection Practices at an Endoscopy Clinic — Nevada, 2007

On January 2, 2008, the Nevada State Health Division (NSHD) contacted CDC concerning surveillance reports



17

DANGEROUS MISPERCEPTIONS

-  1. Changing the needle makes a syringe safe for reuse.
-  2. Syringes can be reused as long as an injection is administered through an intervening length of IV tubing.
-  3. If you don't see blood in the IV tubing or syringe, it means that those supplies are safe for reuse.

Once they are used, both the needle and syringe are contaminated and must be discarded!



18

2: INAPPROPRIATE USE OF SINGLE-DOSE/SINGLE-USE VIALS



- Vials labeled as single use:
 - **NO PRESERVATIVE**
 - Can be accessed one time only and for one patient only and remaining contents must be discarded
- CDC is aware of at least 19 outbreaks involving single dose vial use
 - All occurred in outpatient setting with almost half in pain remediation clinics



19

SINGLE DOSE VIALS: CDC POSITION STATEMENT



- Vials labeled by the manufacturer as “single dose” or “single use” should only be used for a single patient.
- Ongoing outbreaks provide ample evidence that inappropriate use of single-dose/single-use vials causes patient harm.
- Leftover parenteral medications should never be pooled for later administration
 - In times of critical need, contents from unopened single dose vials can be repackaged for multiple patients in accordance with standards in United States Pharmacopeia General Chapter <797>

https://www.cdc.gov/injection-safety/hcp/clinical-safety/?CDC_AAref_Val=https://www.cdc.gov/injectionsafety/CDCposition-SingleUseVial.html



20

3: FAILURE TO USE ASEPTIC TECHNIQUE



- Two women diagnosed with HBV infection, receiving chemotherapy at the same physician practice
- Multidisciplinary team investigation
- Office closed; physician license suspended
- 2,700 patients notified
- 29 outbreak-associated cases of HBV



21

NEW JERSEY – ONCOLOGY OFFICE



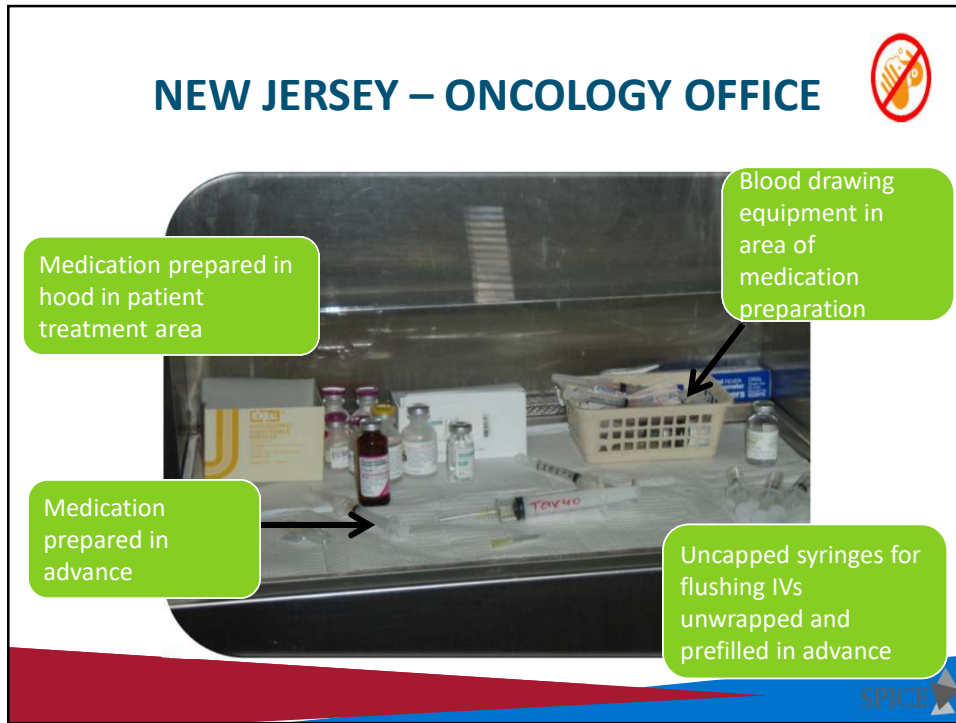
IV bags used as sources of fluid to flush catheters for multiple patients



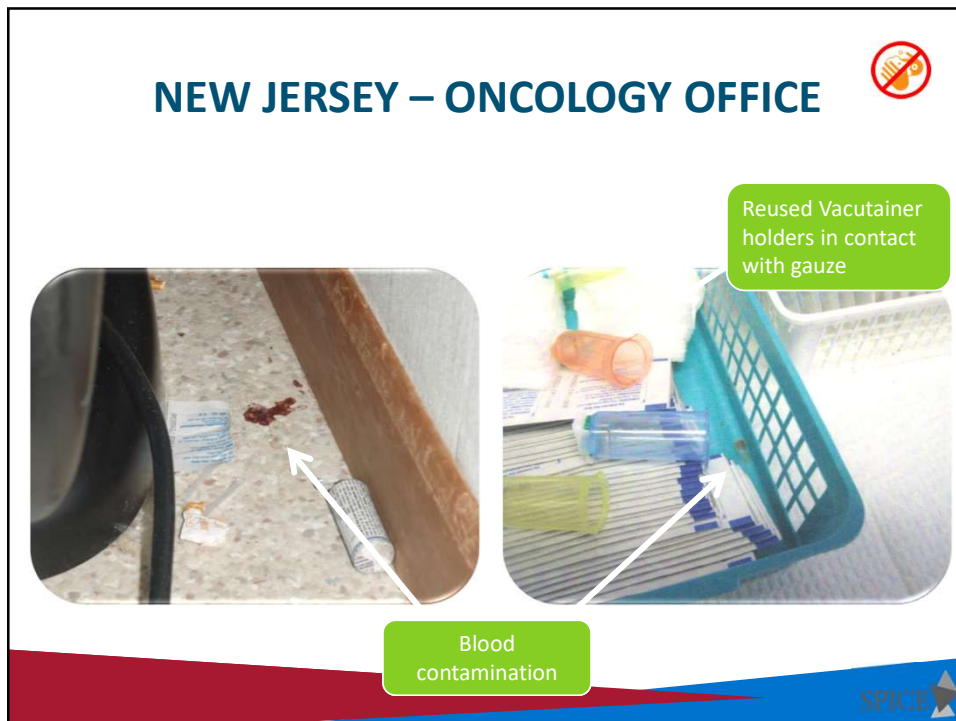
IV bags with stoppers removed



22



23



24

4: UNSAFE DIABETES CARE



Sharing of blood glucose meters without cleaning and disinfection between uses

Use of fingerstick devices or insulin pens on multiple persons



Failure to perform hand hygiene or change gloves between procedures

Patel et al. *ICHE* 2009; 30:209-14, Thompson et al. *JAGS* 2010, *MMWR* 2005; 54:220-3 

25

SAFE INJECTIONS: BEST PRACTICES



Syringe reuse (direct and indirect)

- Never administer medications from the same syringe to multiple patients
- Do not reuse a syringe to enter a medication vial or solution
- Limit the use of multi-dose vials and dedicate them to a single patient whenever possible



Misuse of single-dose/single-use vials

- Do not administer medications from a single dose vial or IV solution bag to more than one patient, more than one time

SPICE 

26

SAFE INJECTIONS: BEST PRACTICES



Failure to use aseptic technique

- Use aseptic technique when preparing or administering medications



Unsafe diabetes care

- Use insulin pens and lancing devices for only one patient
- Dedicate glucometers to a single patient. If they MUST be shared, clean and disinfect after each use



27

5: DRUG DIVERSION

- When prescription medicines are obtained or used illegally



28

DRUG DIVERSION FACTS

- Drug diversion ~costs per year:
 - \$120 **billion** in lost productivity
 - \$72.5 **billion** in medical insurer costs
 - \$61 **billion** in criminal justice costs
 - \$11 **billion** in health care costs
- HCPs with a drug/alcohol dependency
 - 15% of pharmacists
 - 10% of nurses
 - 8% of physicians



29

DRUG DIVERSION: ASHP REPORT (2022)

ASHP REPORT

GUIDELINES ON PREVENTING DIVERSION OF CONTROLLED SUBSTANCES

Procurement and Storage

- Purchase order and packing slip removed from records
- Unauthorized individual orders CS on stolen DEA 222 form
- Product container is compromised

Prescribing

- Prescription pads are diverted and forged to obtain CS
- Prescriber self-prescribes CS
- Verbal orders for CS created, but not verified by the prescriber
- Written prescriptions altered by patients

Preparation and Dispensing

- CS are replaced by product of similar appearance when prepackaging
- Removing volume from pre-mixed solutions
- Multi-dose vial overfill is diverted
- Prepared syringe contents replaced with saline solution

Administration

- CS are withdrawn from an ADC on discharged or referred patient
- Medication is documented as given but not administered to patient
- Waste is not adequately witnessed and subsequently diverted
- Substitute drug is removed and administered while CS are diverted

Waste, Removal, and Destruction

- CS waste is removed from unsecure waste container
- CS waste in syringe is replaced with saline
- Expired CS are diverted from holding area



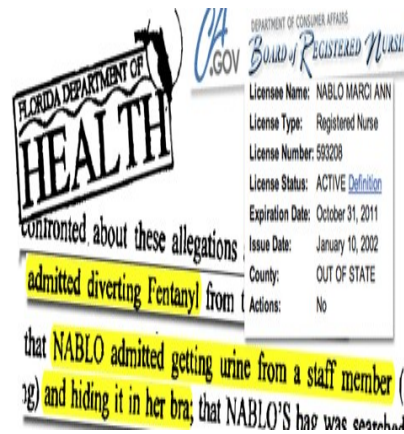
<https://www.ashp.org/-/media/assets/policy-guidelines/docs/guidelines/preventing-diversion-of-controlled-substances.ashx>



30

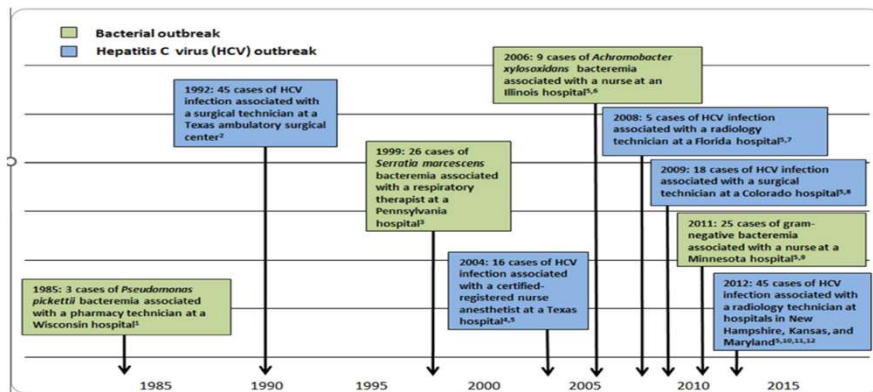
DRUG DIVERSION: THREE TYPES OF HARM

- Substandard care delivered by an impaired provider
- Denial of essential pain medication or therapy
- Risks of infection
 - Bloodborne Pathogen
 - Bacterial contaminants.



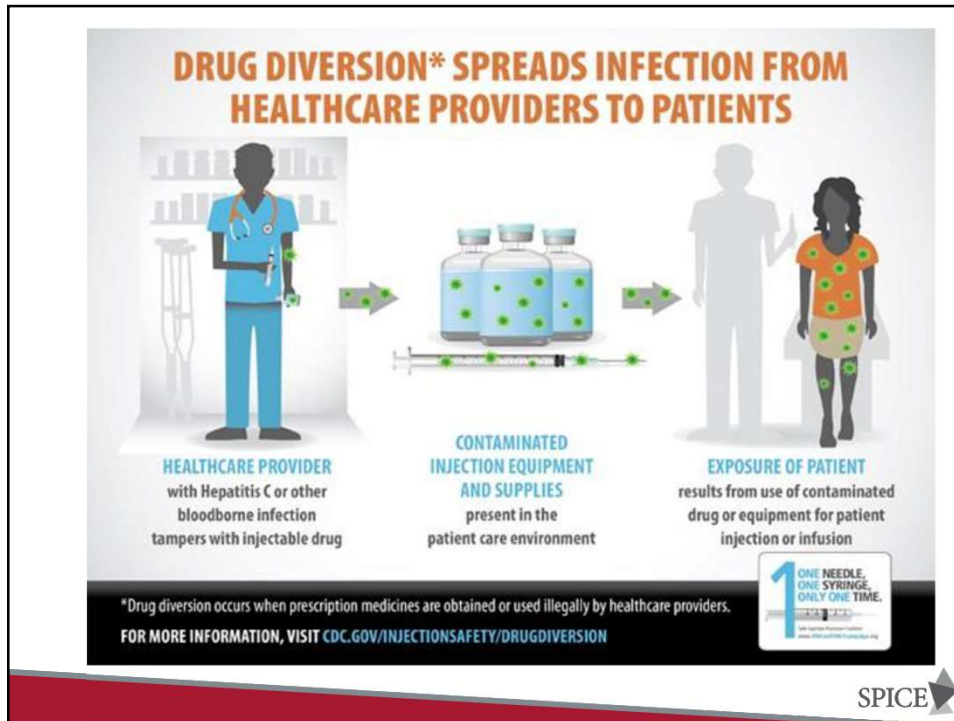
31

U.S. OUTBREAKS ASSOCIATED WITH DRUG DIVERSION 1985-2018 (CDC)

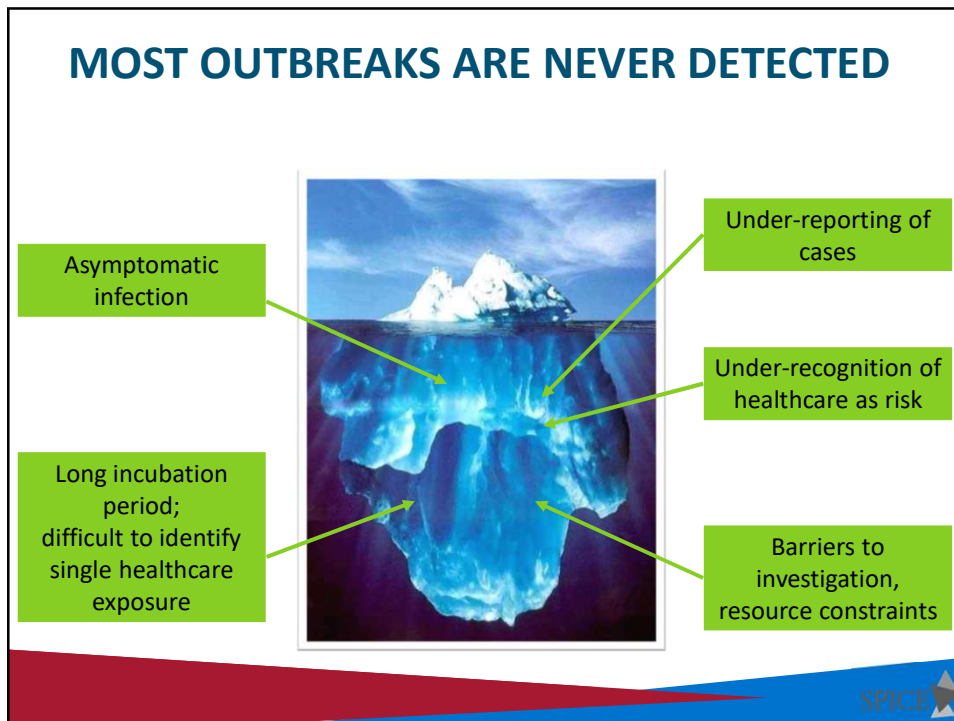


Year	Cases	Outbreak
2018	12	HCV infections associated with an emergency department nurse at a hospital in Washington [2]
2018	6	Sphingomonas paucimobilis bacteremia associated with a nurse at a cancer center in New York [3]
2015	7	HCV infections associated with a nurse at a Utah hospital [4]
2014	5	Serratia marcescens bacteremia associated with a nurse in a post-anesthesia care unit at a hospital in Wisconsin [5]

32



33



34

SURVEY OF PHYSICIAN AND NURSE PRACTICES AROUND INJECTION SAFETY

- 370 Physicians
- 320 Nurses
- Eight States Included
 - NC, NY, NJ, Nevada, Colorado, Tennessee, Wisconsin, Montana
- Types of healthcare settings:
 - Acute care, long term care, outpatient settings

<https://www.sciencedirect.com/science/article/pii/S0196655317306806?via%3Dihub>



35

SURVEY FINDINGS

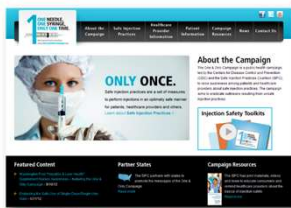
Topic Is Acceptable Practice	Physician Response	Nurse Response
Reuse of syringe for > one patient	12.4%	3.4%
Reentering a vial with a used needle/syringe	12.7%	6.7%
Using SDVs for multiple patients	34%	16.9%
Using source bags as diluent for multiple patients	28.9%	13.1%



36

BEST PRACTICE

- Designate someone to provide ongoing oversight
- Develop written infection control policies
- Provide training
- Conduct quality assurance assessments



37

ONE AND ONLY CAMPAIGN

<https://www.cdc.gov/injection-safety/media/pdfs/Safe-Injection-for-Patients-P.pdf>



38

CAMPAIGN RESOURCES

- Print Materials
- Audio & Visual
- Social Media
- Toolkits



39



INFECTION CONTROL SAFE INJECTION PRACTICES



THANK YOU

40

