North Carolina SPICE Statewide Program for Infection Control & Epidemiology

SAFE INJECTION PRACTICES & OUTBREAKS

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Statewide Program for Infection Control and Epidemiology (SPICE)

UNC School of Medicine

https://spice.unc.edu/

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

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OBJECTIVES

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

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UNSAFE INJECTION PRACTICES CONSEQUENCES

Patient illness and death

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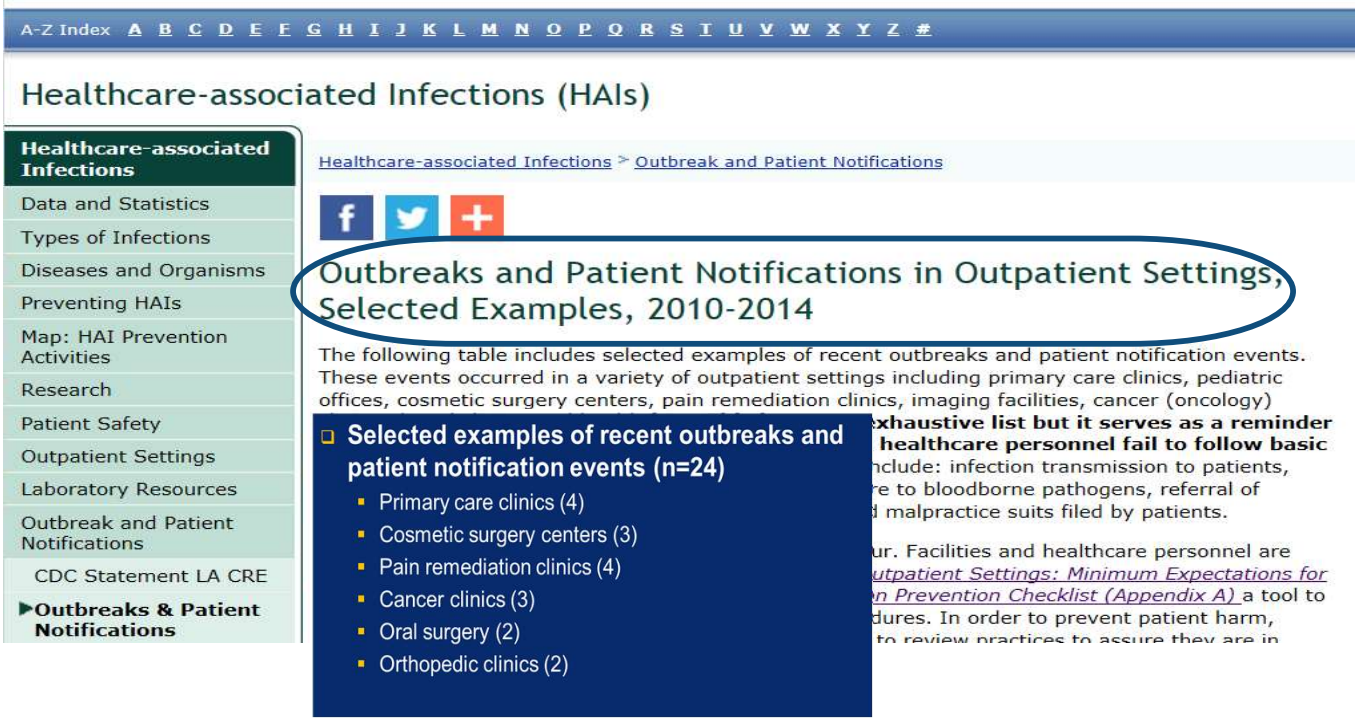

https://archive.cdc.gov/www_cdc_gov/hai/settings/outpatient/outbreaks-patient-notifications.html. Retrieved 10/24/2025.

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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[2]	Comments
Prolotherapy clinic (46)	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	

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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

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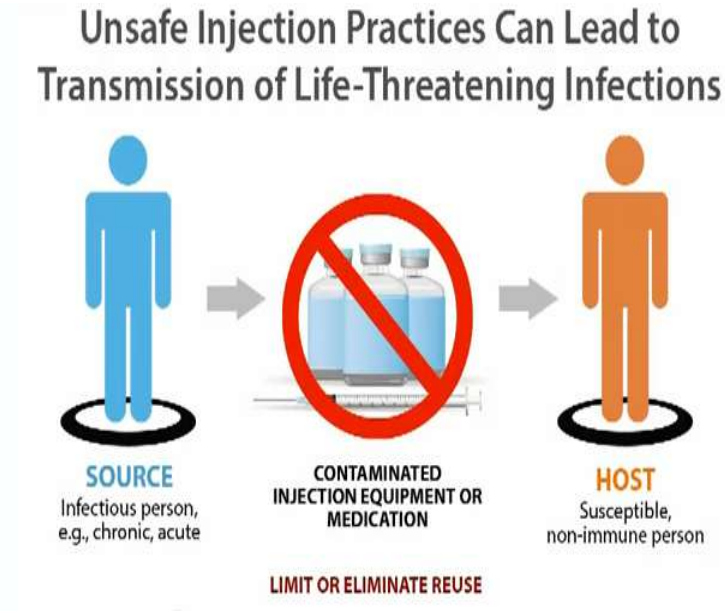
STANDARD PRECAUTIONS: SAFE INJECTIONS



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.

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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

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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)

INJECTION AND MEDICATION SAFETY

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

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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

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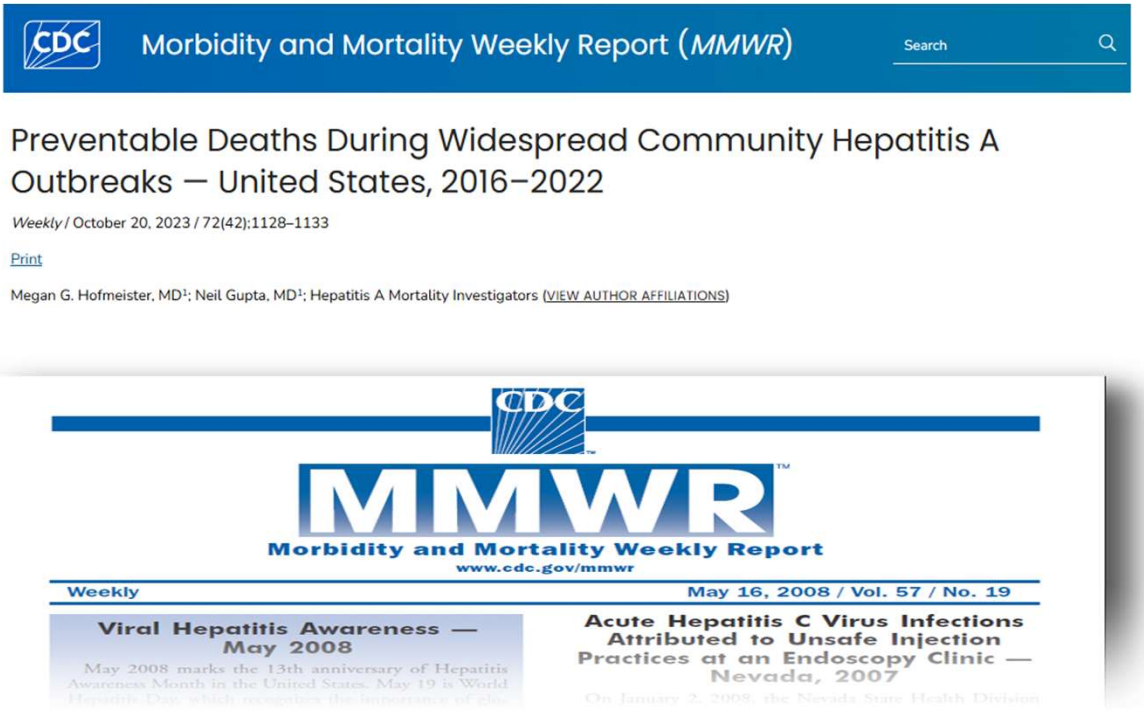
WHY DO OUTBREAKS HAPPEN?



Morbidity and Mortality Weekly Report (*MMWR*) Search

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

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

Print

Megan G. Hofmeister, MD[1]; Neil Gupta, MD[1]; Hepatitis A Mortality Investigators (VIEW AUTHOR AFFILIATIONS)

CDC

MMWR

Morbidity and Mortality Weekly Report

www.cdc.gov/mmwr

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 glob

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

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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

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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

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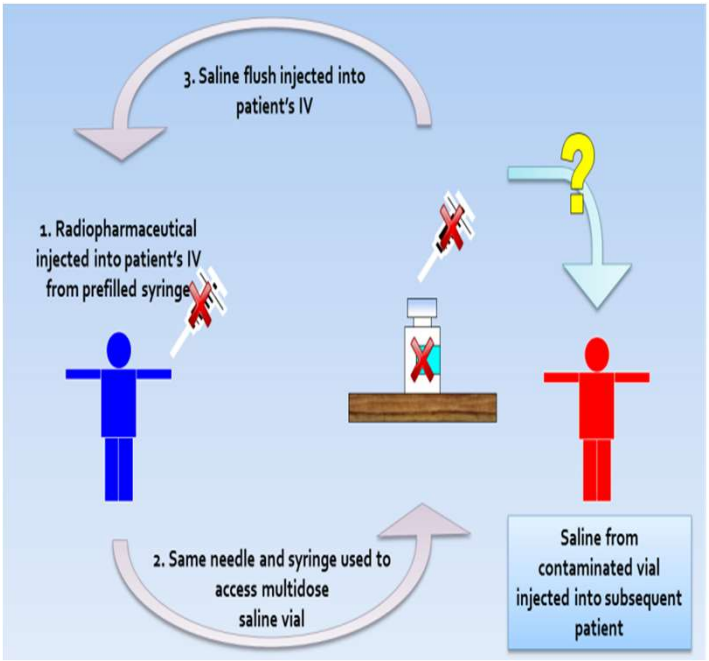
SYRINGE RE-USE

- 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



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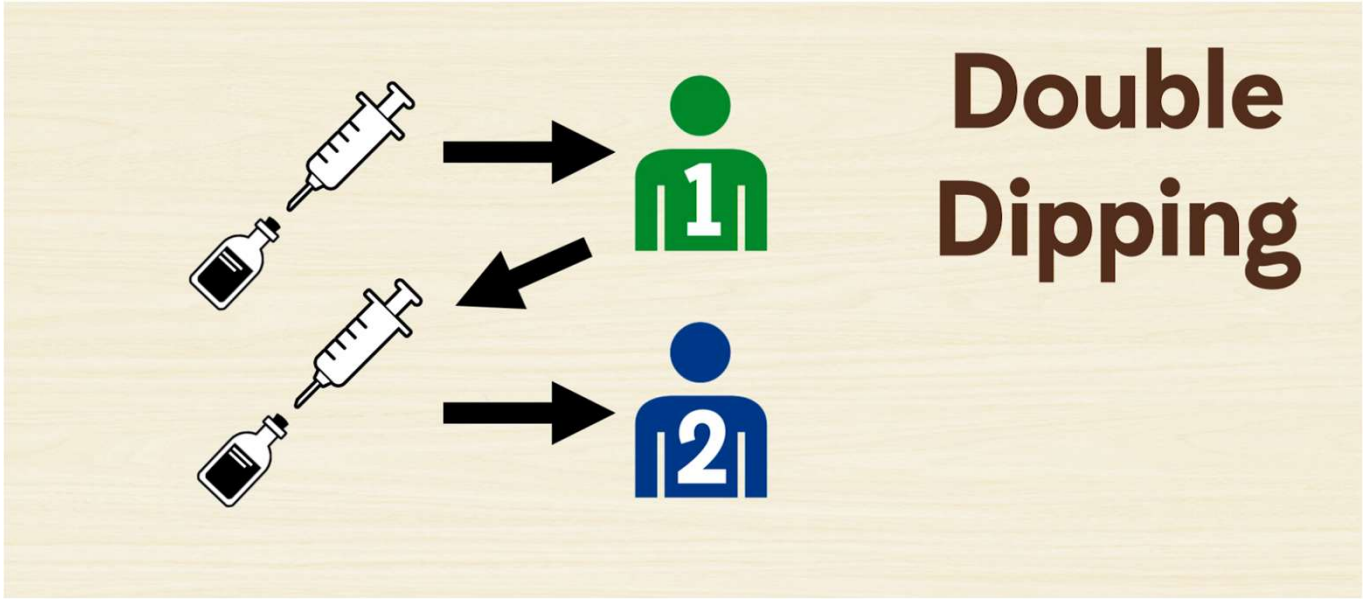
UNSAFE PRACTICE: DOUBLE DIPPING



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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

CDC
MMWR
Morbidity and Mortality Weekly Report
www.cdc.gov/mmwr
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

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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!

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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

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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

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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

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NEW JERSEY – ONCOLOGY OFFICE

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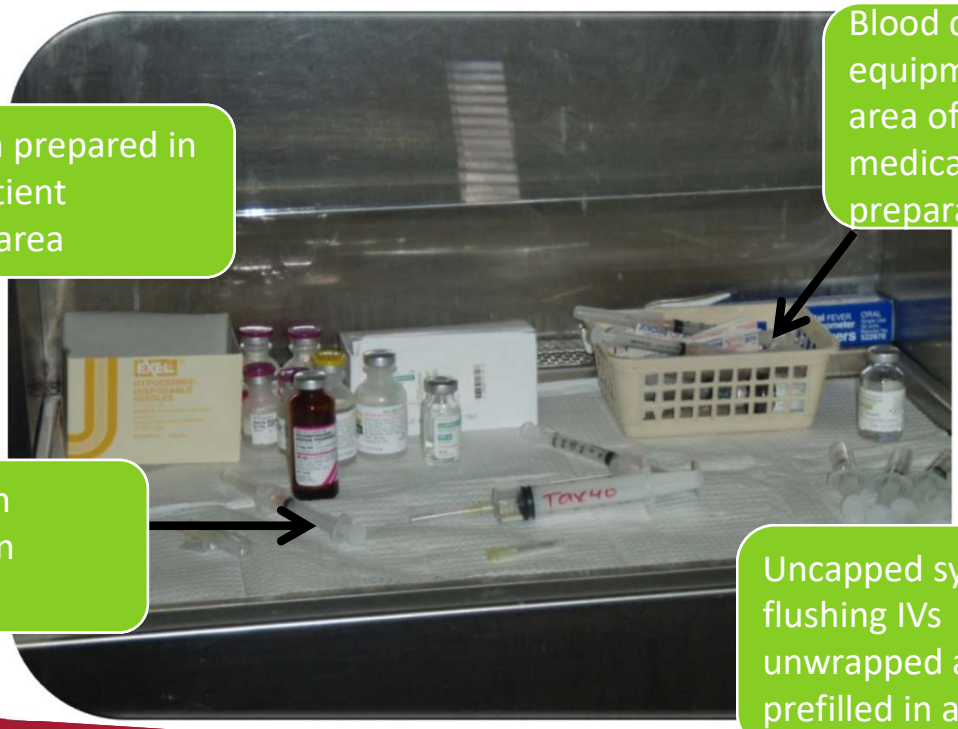
NEW JERSEY – ONCOLOGY OFFICE



Medication prepared in hood in patient treatment area

Blood drawing equipment in area of medication preparation

Medication prepared in advance

Uncapped syringes for flushing IVs unwrapped and prefilled in advance

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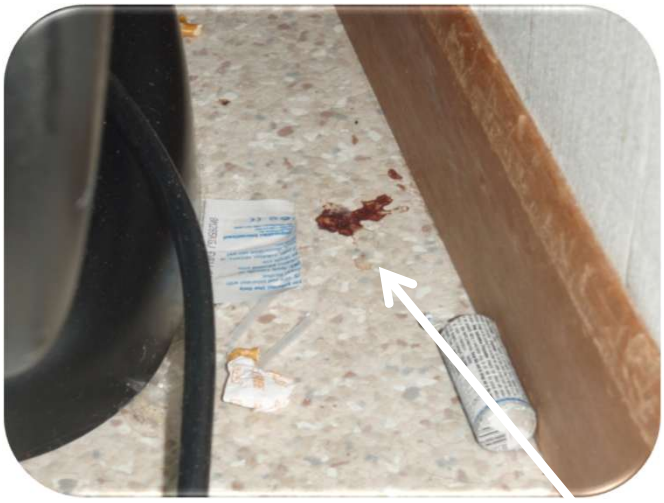
NEW JERSEY – ONCOLOGY OFFICE



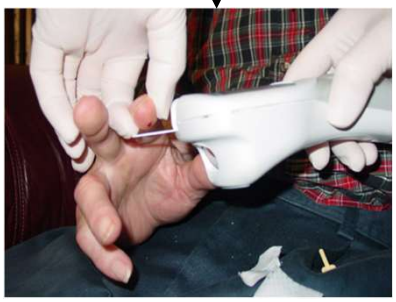
Reused Vacutainer holders in contact with gauze

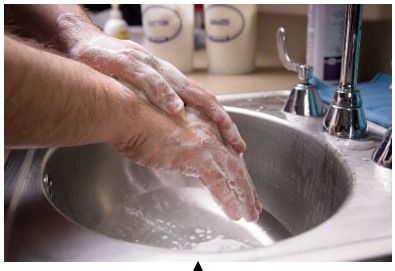
Blood contamination

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

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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

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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

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5: DRUG DIVERSION

- When prescription medicines are obtained or used illegally

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

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

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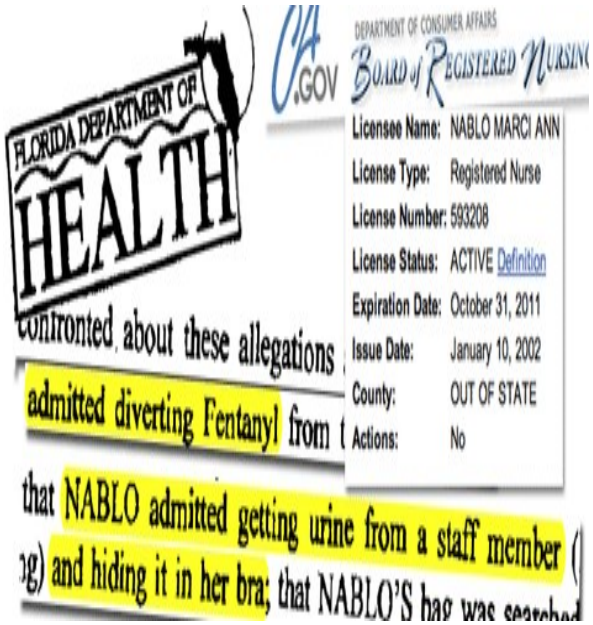
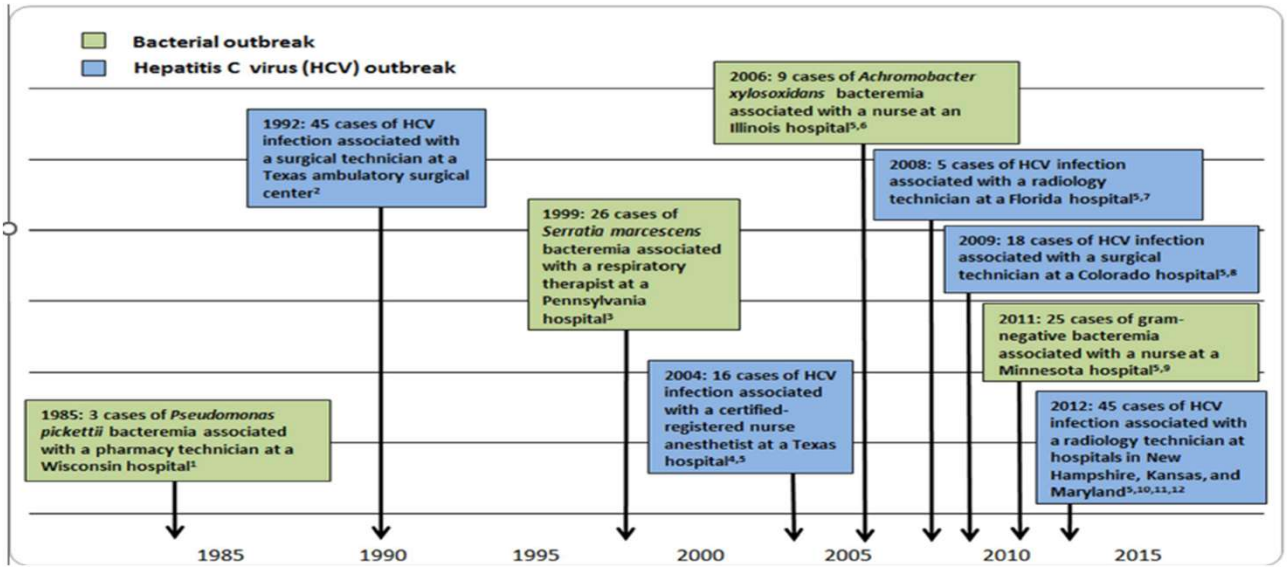
DRUG DIVERSION: THREE TYPES OF HARM

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



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]

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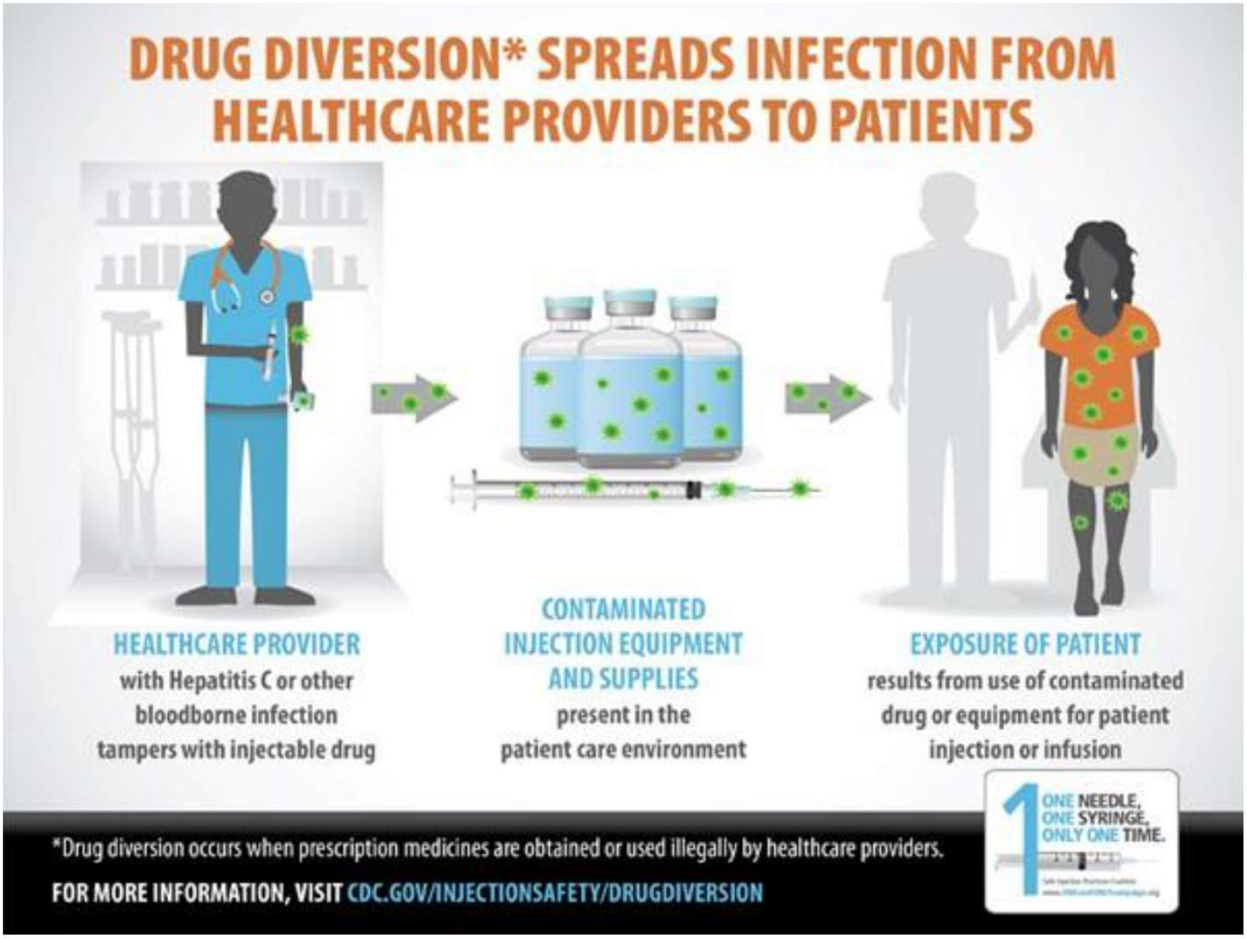
DRUG DIVERSION* SPREADS INFECTION FROM HEALTHCARE PROVIDERS TO PATIENTS
HEALTHCARE PROVIDER
with Hepatitis C or other bloodborne infection tampers with injectable drug
CONTAMINATED INJECTION EQUIPMENT AND SUPPLIES
present in the patient care environment
EXPOSURE OF PATIENT
results from use of contaminated drug or equipment for patient injection or infusion
*Drug diversion occurs when prescription medicines are obtained or used illegally by healthcare providers.
FOR MORE INFORMATION, VISIT CDC.GOV/INJECTIONSAFETY/DRUGDIVERSION
1 ONE NEEDLE, ONE SYRINGE, ONLY ONE TIME.

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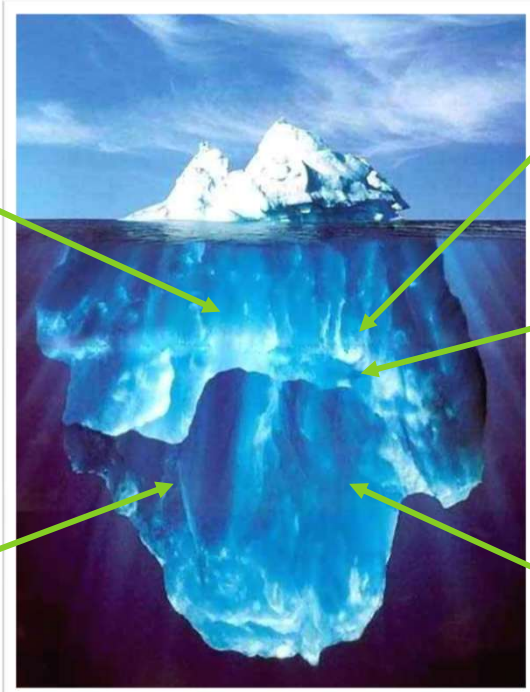
MOST OUTBREAKS ARE NEVER DETECTED

Asymptomatic infection

Long incubation period; difficult to identify single healthcare exposure



Under-reporting of cases

Under-recognition of healthcare as risk

Barriers to investigation, resource constraints

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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

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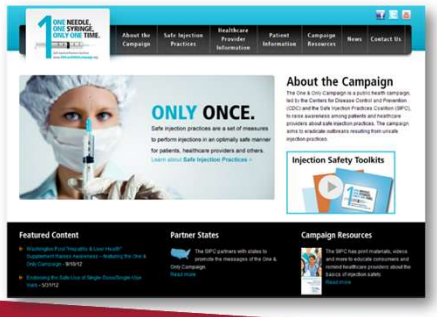
SURVEY FINDINGS

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%

BEST PRACTICE

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



ONE AND ONLY CAMPAIGN

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

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CAMPAIGN RESOURCES

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

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