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# Safe Injection Practices

**Injection Safety is  
Every Provider's  
Responsibility**

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Oregon  
Health  
Authority

# Objectives

- Describe how unsafe injection practices contribute to healthcare-associated infections (HAI)
- Identify four common misconceptions related to injection safety
- Explain three current evidence-based recommendations for safe medication handling practices
- List infection prevention resources that can be used to promote injection safety
- Understand steps a facility can take to prevent unsafe injection practices
- Become familiar with the CDC's One & Only Campaign and how Oregon is involved
- Identify three ways to get involved in injection safety work

# What are safe injection practices?

- A safe injection “does not harm the recipient, does not expose the health worker to any risk, and does not result in waste that puts the community at risk” (World Health Organization)
- Examples of breaches in injection practice include
  - Reinsertion of used needles into multi-dose vial (MDV) or solution container (e.g., saline bag)
  - Use of a single needle/syringe to administer intravenous (IV) medication to multiple patients
  - Preparing medications in a workspace where used needles/syringes were dismantled



## Steps Every Healthcare Provider Should Take



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.



# Why worry about injection practices?

- Clinicians self-report unsafe injection practices
  - Survey of 690 US nurses and physicians
    - 12% of physicians and 3% of nurses indicate syringe reuse on multiple patients occurs in their workplace
  - During outbreak investigations, “Providers reported that they believed that changing the needles on the device was sufficient to prevent the transmission of infection”
- Outbreaks confirm this does occur
  - 1998-2008: 33 hepatitis B (HBV) and hepatitis C (HCV) outbreaks in US healthcare settings resulting in 448 infected patients

# Why worry about injection practices?

## THE IMPACT OF UNSAFE MEDICAL INJECTIONS IN THE U.S.

### Unsafe Injection Practices Have Devastating Consequences<sup>1</sup>

Syringe reuse and misuse of medication vials have resulted in dozens of outbreaks and **THE NEED TO ALERT MORE THAN 150,000 PATIENTS...**

...to seek testing for bloodborne pathogens such as **HEPATITIS B, HEPATITIS C AND HIV,<sup>2</sup>** and have led to...



Patient illness and death



Legal charges/ malpractice suits



Loss of clinician licenses



Criminal charges

In just one clinic, syringe reuse to access medication vials for multiple patients resulted in an outbreak and one of the largest public health alerts in U.S. history.



**50,000 PEOPLE EXPOSED TO INFECTION**



# Patient impact

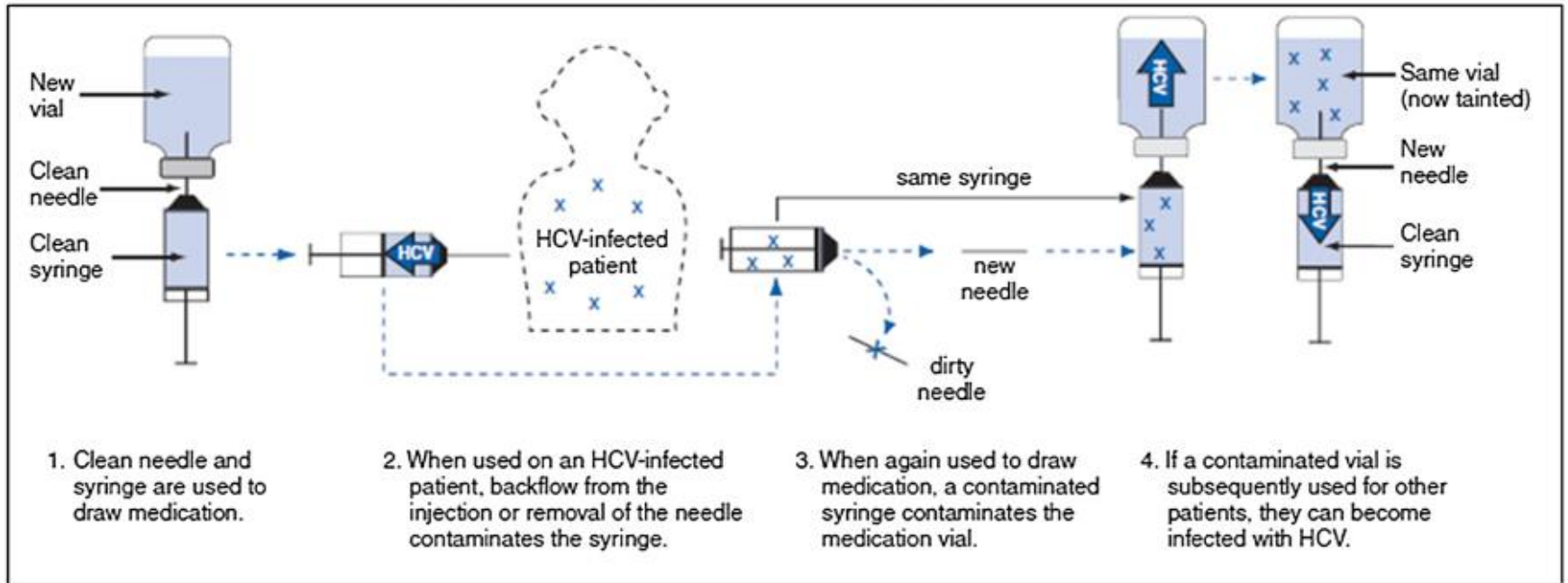
- Poor injection practice can lead to development of bloodstream infections (BSI)
  - Breaches in hand hygiene, skin prep, aseptic technique
- Morbidity and mortality of BSI
  - Poor outcomes for individual patients are common
  - Nearly 36,000 deaths in the US in 2008
- Major impact on general population
  - About 600,000 cases per year
  - Ranked as 11<sup>th</sup> leading cause of death in the US in 2008

# Patient impact

- Bloodborne viral pathogens
  - Human immunodeficiency virus (HIV)
  - Hepatitis B virus (HBV)
  - Hepatitis C virus (HCV)
- Other pathogens
  - Bacterial (*Staphylococcus aureus* – methicillin resistant and susceptible, *Streptococcus* spp.)
  - Fungal (*Exserohilum rostratum* & *Aspergillus fumigatus*)
  - Parasitic (*Plasmodium falciparum*)
  - Other viral pathogens

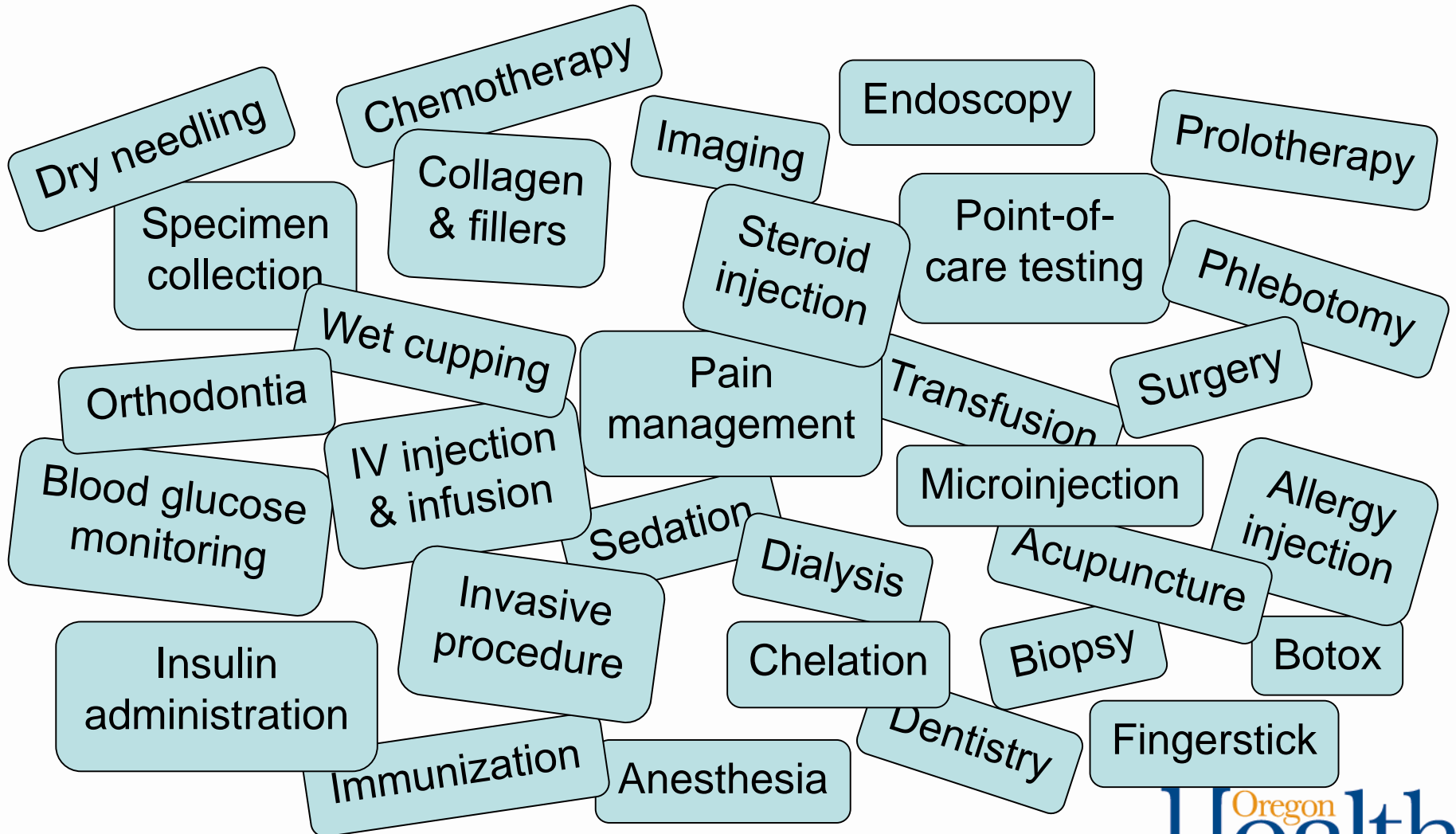


# Patient impact

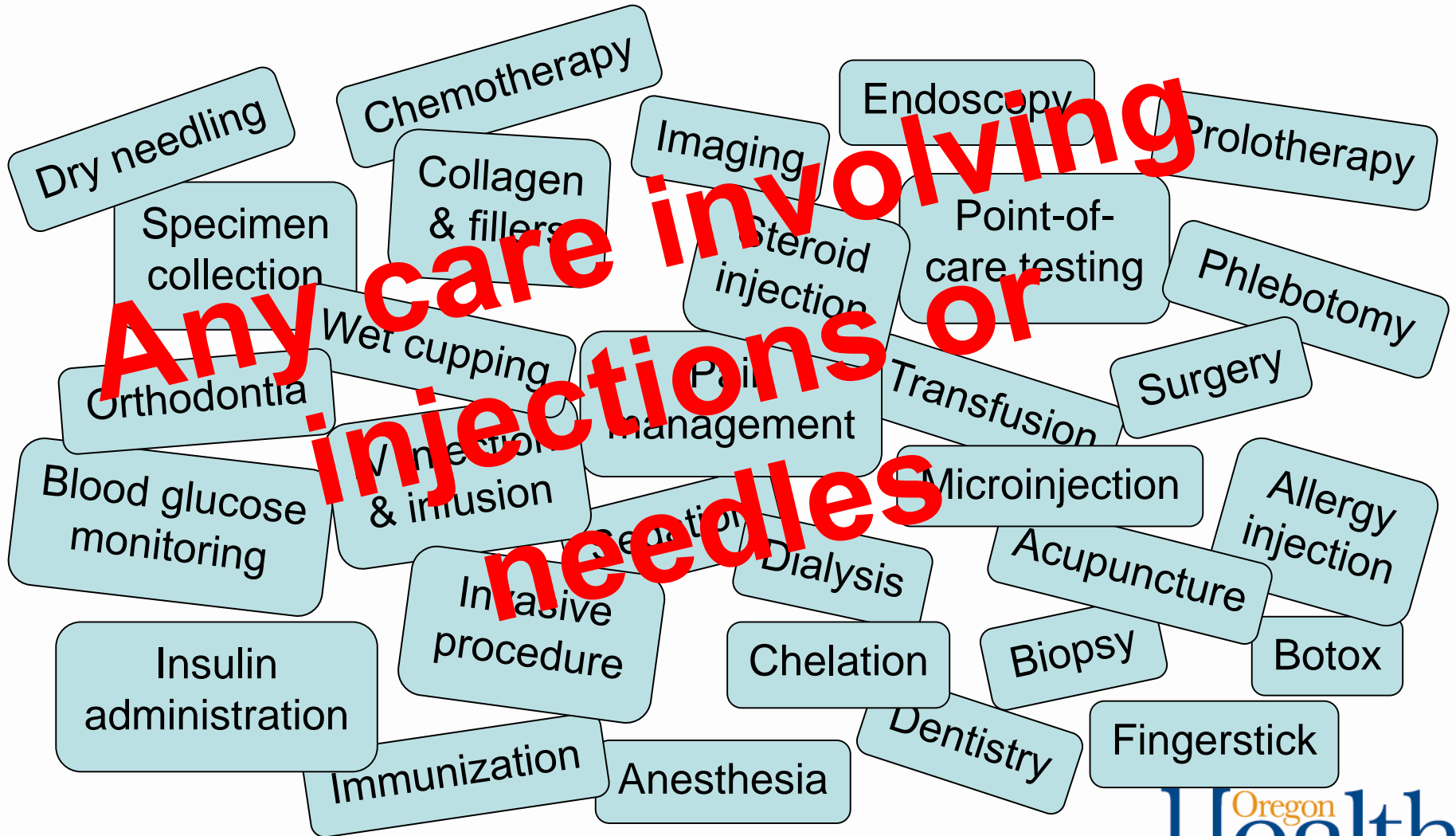


**Fig. 1.** Illustration of how indirect syringe reuse can lead to HCV contamination of a shared medication vial. (Data from Centers for Disease Control and Prevention (CDC). Acute hepatitis C virus infections attributed to unsafe injection practices at an endoscopy clinic—Nevada, 2007. *MMWR Morbid Mortal Weekly Rep* 2008;57:513–7.)

# What kind of care is implicated?



# What kind of care is implicated?



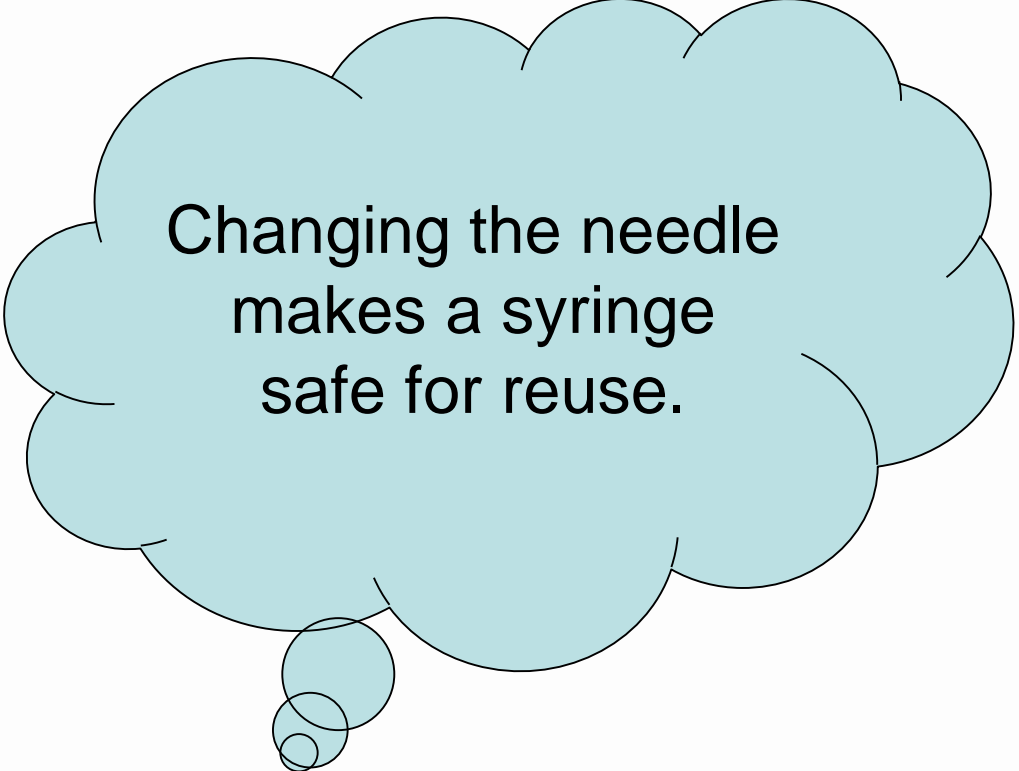
# What practices might lead to infection?

- Poor medication handling
  - Management and storage
  - Preparation
  - Compounding
  - Administration
- Poor hand hygiene
- Inappropriate equipment re-use and disposal
- Drug diversion

# Practice requirements

- CDC's Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (2007) – III.A.1.b, IV.H (1-8)
  - <https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html>
- OHA's OAR 333-019-0061, effective 1/1/18 requires all licensed healthcare providers to adhere to standard precautions defined in the CDC guideline
  - <https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=239050>

# Perceptions about injection practices

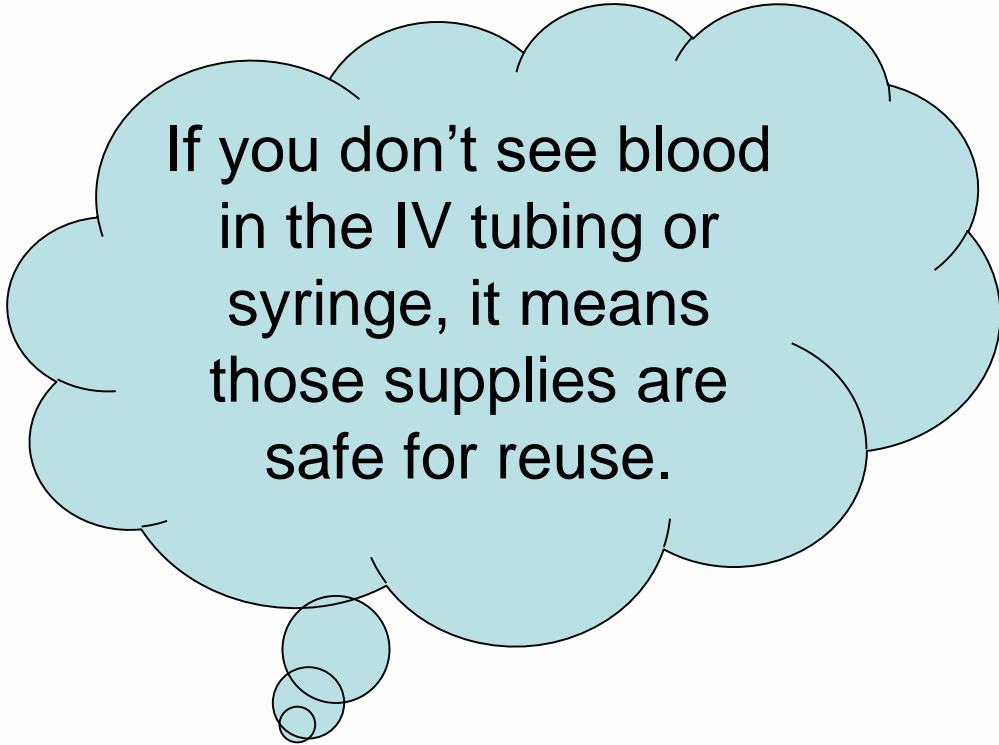


Changing the needle  
makes a syringe  
safe for reuse.

# Perceptions about injection practices

Once used, both needle and syringe are contaminated and must be discarded. A new sterile needle and new sterile syringe must be used for each injection and each entry into a medication vial.

# Perceptions about injection practices



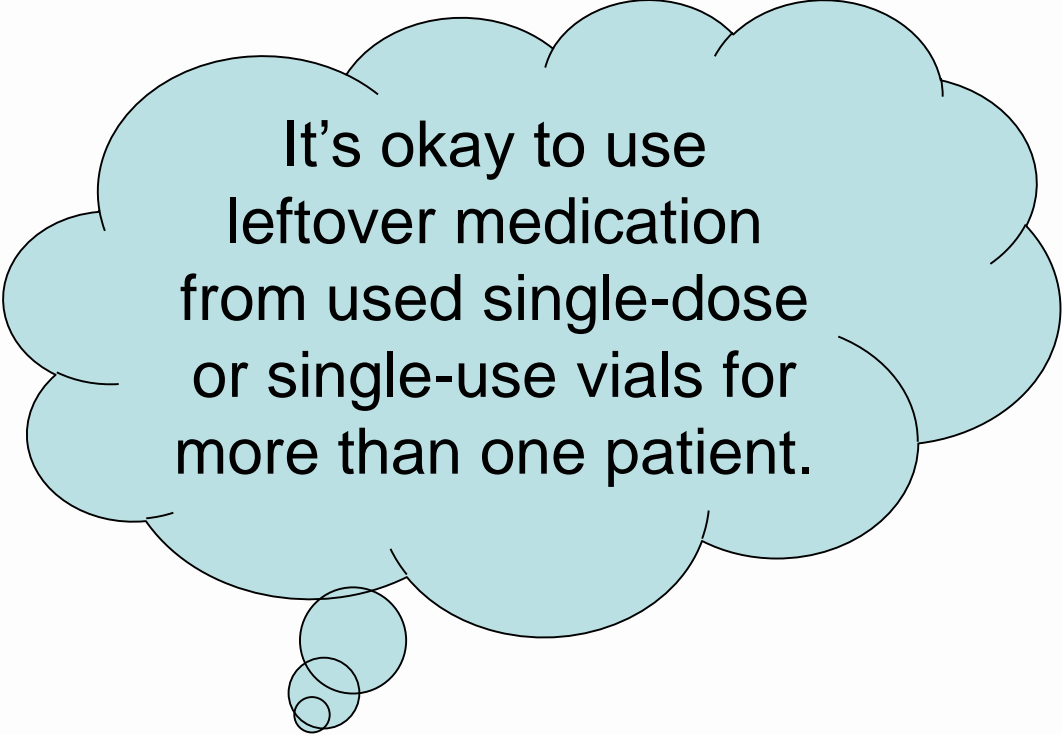
If you don't see blood  
in the IV tubing or  
syringe, it means  
those supplies are  
safe for reuse.



# Perceptions about injection practices

Pathogens are invisible to the naked eye, but can easily infect patients even when present in microscopic quantities. Do not reuse syringes, needles, or IV tubing.

# Perceptions about injection practices

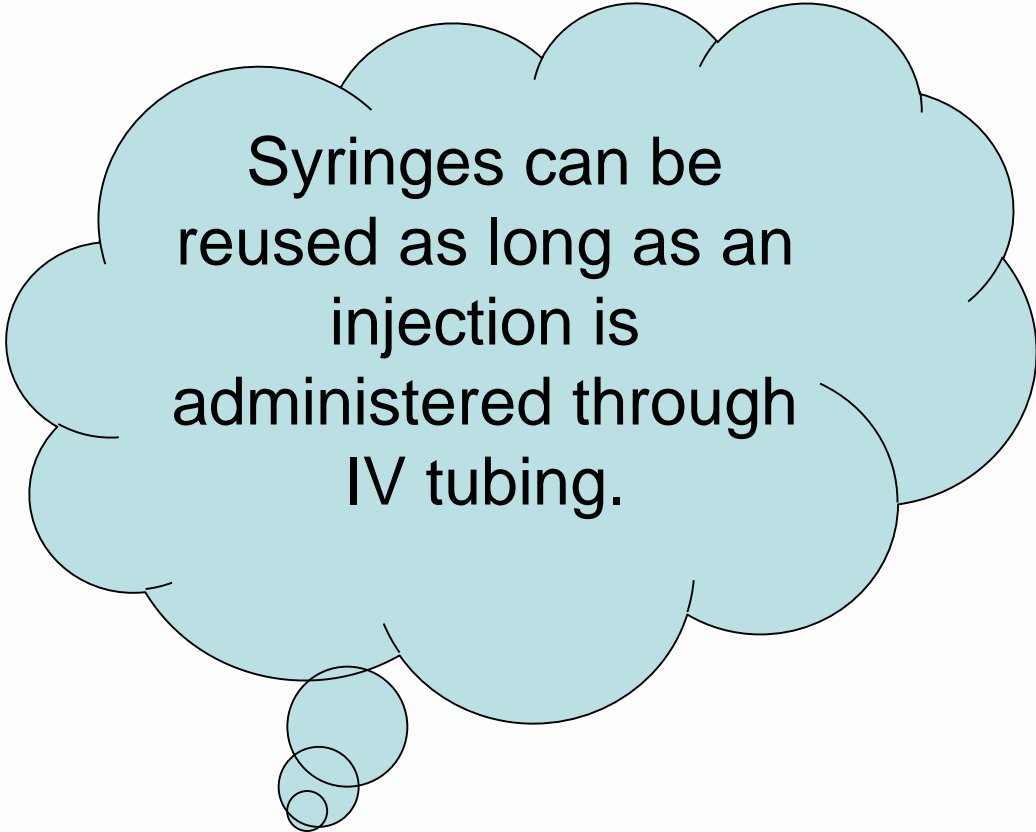


It's okay to use  
leftover medication  
from used single-dose  
or single-use vials for  
more than one patient.

# Perceptions about injection practices

Single-dose or single-use vials should not be used for more than one patient regardless of how much medicine is remaining.

# Perceptions about injection practices



Syringes can be reused as long as an injection is administered through IV tubing.

# Perceptions about Injection Practices

Syringes and needles should never be reused. IV tubing, syringes, and other components represent a single, interconnected unit. Distance from patient, gravity, and infusion pressure don't ensure that small amounts of blood won't contaminate the syringe once it has been connected to the unit.

# Medication handling



- Perform hand hygiene before handling medication
- Use new, sterile equipment for each patient, injection, and draw/access
- Examine integrity of cap on vial, and disinfect rubber septum with alcohol prior to piercing
- Draw up medications in designated clean areas separate from contaminated items and patients
- Disinfect multi-dose vials used on multiple patients

# Medication handling

- Draw up medication just prior to administration
- Label pre-drawn medications
  - Time of draw
  - Initials of person drawing up the medication
  - Name of the medication
  - Strength of the medication
  - Expiration date if not printed by manufacturer
- Do not carry medication syringes in clothing/pockets

# Multi-dose versus single-dose vials

## THE PROVIDER

### DO YOU MULTI-DOSE?

**A SINGLE-DOSE VIAL (SDV)** is approved for use on a **SINGLE** patient for a **SINGLE** procedure or injection.

**SDVs typically lack an antimicrobial preservative.** Do not save left over medication from these vials. Harmful bacteria can grow and infect a patient.

**DISCARD after every use!**

**SIZE DOES NOT MATTER!**

SDVs and MDVs can come in any shape and size. **Do not assume** that a vial is an SDV or MDV based on size or volume of medication.

**ALWAYS check the label!**

**A MULTIPLE-DOSE VIAL (MDV)** is recognized by its FDA-approved label.

Although MDV's can be used for more than one patient when aseptic technique is followed, **ideally even MDVs are used for only one patient.**

**MDVs typically contain an antimicrobial preservative** to help limit the growth of bacteria. Preservatives have no effect on bloodborne viruses (i.e. hepatitis B, hepatitis C, HIV).

**Discard MDVs** when the beyond-use date has been reached, when doses are drawn in a patient treatment area, or any time the sterility of the vial is in question!

**Click for more information:**

[FAQs Regarding Safe Practices for Medical Injections](#)



# Multi-dose versus single-dose vials

**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.

- Be sure to clean your hands immediately before handling any medication.
- Disinfect the medication vial by rubbing the diaphragm with alcohol.
- Draw up all medications in a clean medication preparation area.

**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

# Spiking/priming IV bags in advance

## United States Pharmacopeia (USP) Convention

- One hour time limit from preparation (spiking bag) until beginning administration if not prepared in an International Organization for Standardization (ISO) 5 environment
  - Precludes microbial growth if contaminated
  - Organism replication can occur within 1-4 hours
- Longer timeframe if primed by pharmacy in ISO 5 environment

# Expiration date vs. beyond-use date

- Manufacturer expiration date
  - Date after which an unopened MDV should not be used
- Beyond-use date
  - Date after which an opened MDV should not be used
- Joint Commission requires a 28-day expiration date for MDVs from date of opening/puncture, unless manufacturer specifies otherwise
- Beyond-use date should never exceed manufacturer expiration date

# Sterile compounding

- Medication compounding
  - Combining, mixing, or altering ingredients of a drug to create personalized medication
- USP 797 requires sterile compounding of medications administered via injection, IV infusion, intraocular (eye), or intrathecal (spine)
  - Requirements for personnel, training, facilities, environmental monitoring, storage/testing of finished preparations

# Sterile compounding

- 2012: Start of 20-state outbreak investigation
- Contaminated preservative-free steroids compounded by the New England Compounding Center (NECC) directly injected into spine and joints
- Fungal meningitis and peripheral joint infections
  - Case count 753
  - Deaths 64
- Laboratory-confirmed organisms from NECC product samples included *Paenibacillus*, *Bacillus*, *Lysinibacillus*, *Kocuria*, *Penicillium*, *Cladosporium*, *Aspergillus*, and *Brevibacillus* spp.

# Insulin administration

- Assign insulin pens to individuals; never use for more than one person
- MDVs of insulin should be dedicated to an individual whenever possible
  - Enter medication vials with new equipment each time
  - Store and prepare vial away from patients and potentially contaminated equipment
- Dispose of used sharps in an approved sharps container

# Fingerstick devices

- Fingerstick devices should never be used for more than one person
- Select single-use lancets that permanently retract after puncture
- Dispose of used lancets at point of use in approved sharps container



# Blood glucose meters

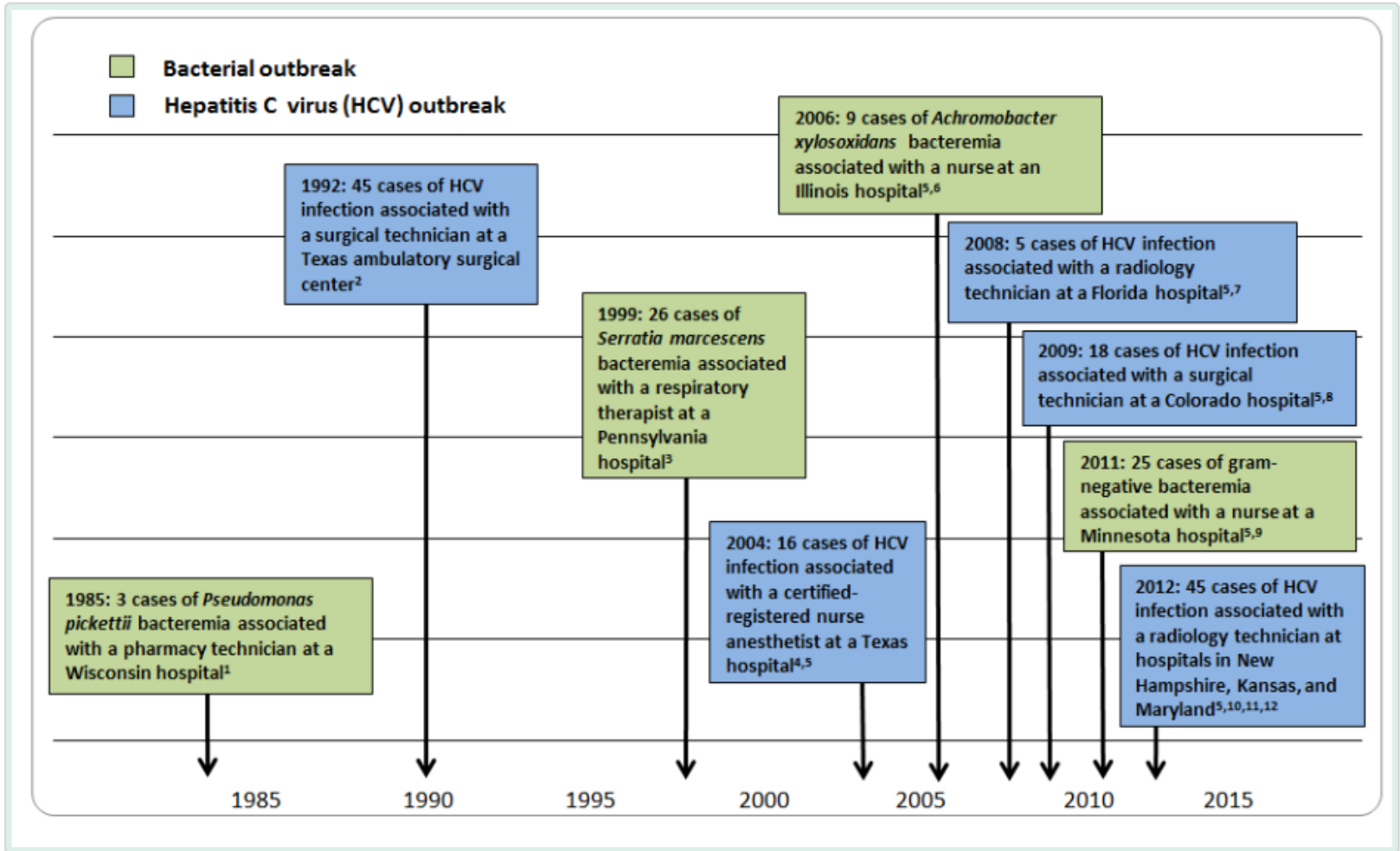
- Whenever possible, blood glucose meters should be assigned to an individual and not shared
  - If meters must be shared, device should be cleaned and disinfected after every use per manufacturer's instructions to prevent contamination with blood and infectious agents
  - If manufacturer does not provide instructions for cleaning/disinfection, then it may not be shared



# Drug diversion

- Removal or use of medications intended for patients
- Mechanisms of diversion
  - False documentation
  - Scavenging of wasted medication
  - Theft by tampering
- Harms to patients
  - Failure to receive prescribed medications
  - Exposure to substandard care from an impaired HCW
  - Exposure to potentially life-threatening infections

# U.S. Outbreaks Associated with Drug Diversion by Healthcare Providers, 1983-2013



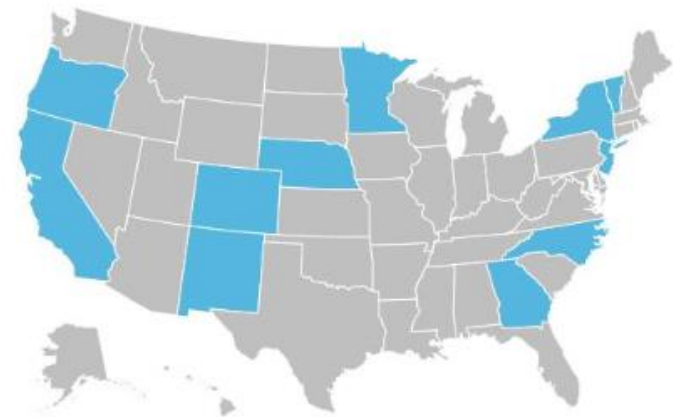
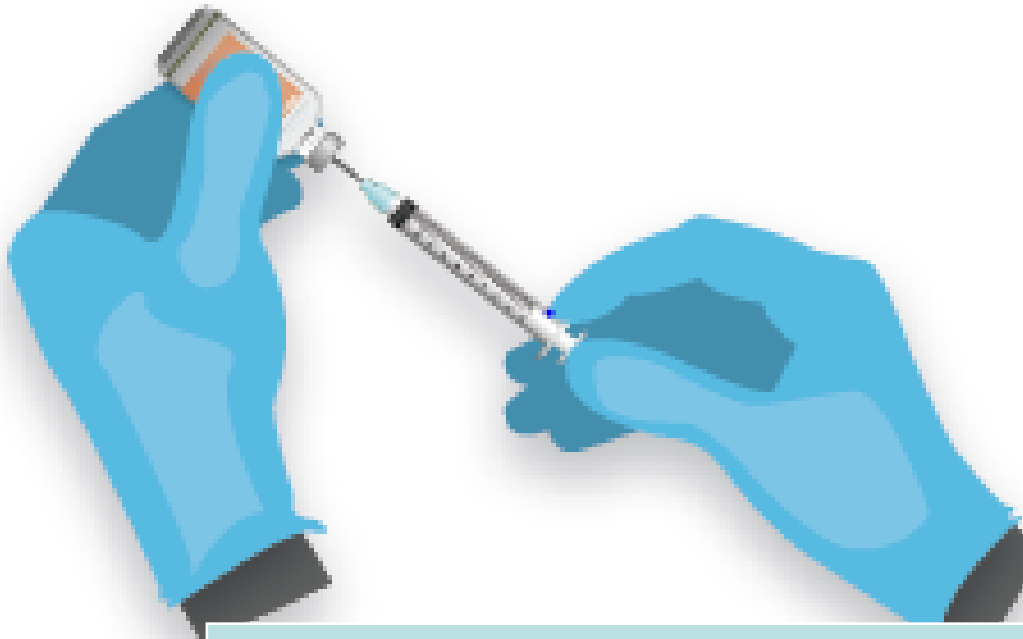
# Drug diversion prevention & response

- Develop a comprehensive approach to, and clear action plan for, suspected drug diversion
- Prevention
  - Offer non-punitive programs for staff affected by substance issues
  - Limit access to controlled substances
  - Improve processes for medication preparation and use, including use of locked storage
  - Enhance accountability and oversight
  - Minimize mobile medication boxes
- Response
  - Ensure no ongoing risk to patients while investigation occurs
  - Assessment of harm to patients
  - Communication with partners including public health, other facilities, and exposed patients
  - Prompt reporting to enforcement/regulatory agencies

# What can facilities do to promote injection safety?

- Designate staff member to oversee injection safety
- Develop written policies
- Provide competency-based training/education (at hire and ongoing)
- Conduct quality assurance assessments and quality improvement projects
- Think outside the box
- Communicate about possible issues early and often
- Constant vigilance!

# CDC's One & Only Campaign



Raise awareness and  
prevent outbreaks

# INJECTION SAFETY CHECKLIST

The following Injection Safety checklist items are a subset of items that can be found in the *CDC Infection Prevention Checklist for Outpatient Settings: Minimum Expectations for Safe Care*.

The checklist, which is appropriate for both inpatient and outpatient settings, should be used to systematically assess adherence of healthcare providers to safe injection practices. Assessment of adherence should be conducted by direct observation of healthcare personnel during the performance of their duties.

Injection Safety	Practice Performed?	If answer is No, document plan for remediation
Proper hand hygiene, using alcohol-based hand rub or soap and water, is performed prior to preparing and administering medications.	Yes No	
Injections are prepared using aseptic technique in a clean area free from contamination or contact with blood, body fluids, or contaminated equipment.	Yes No	
Needles and syringes are used for only one patient (this includes manufactured prefilled syringes and cartridge devices such as insulin pens).	Yes No	
The rubber septum on a medication vial is disinfected with alcohol prior to piercing.	Yes No	
Medication vials are entered with a new needle and a new syringe, even when obtaining additional doses for the same patient.	Yes No	
Single-dose or single-use medication vials, ampules, and bags or bottles of intravenous solution are used for only one patient.	Yes No	
Medication administration tubing and connectors are used for only one patient.	Yes No	
Multi-dose vials are dated by healthcare when they are first opened and discarded within 28 days unless the manufacturer specifies a different (shorter or longer) date for that opened vial. Note: This is different from the expiration date printed on the vial.	Yes No	
Multi-dose vials are dedicated to individual patients whenever possible.	Yes No	
Multi-dose vials to be used for more than one patient are kept in a centralized medication area and do not enter the immediate patient treatment area (e.g., operating room, patient room/cubicle). Note: If multi-dose vials enter the immediate patient treatment area, they should be dedicated for single-patient use and discarded immediately after use.	Yes No	

The *One & Only Campaign* is a public health effort to eliminate unsafe medical injections. To learn more about safe injection practices, please visit [OneandOnlyCampaign.org](http://OneandOnlyCampaign.org).

For the latest news and updates, follow us on Twitter @injectionsafety and Facebook/OneandOnlyCampaign.



This material was developed by CDC. The *One & Only Campaign* is made possible by a partnership between the CDC Foundation and Lilly USA, LLC.

# Free online and print resources via CDC-INFO

**One & Only Campaign Materials** For Order Via CDC-INFO

**Safe Injection Practices DVD**  
Item 22-0087

**Rx for Safe Injections Poster**  
Item 22-0696

**It's Elementary Poster**  
Item 22-0697

**Provider Brochure**  
Item 22-0702

**Patient Brochure**  
Item 22-0701

**Injection Safety Infographic**  
Item 22-1504

**Single-Dose & Multi-Dose Vial Infographic**  
Item 22-1599

**Injection Safety Pocket Card**  
Item 22-0713

**Logo Poster for General Public**  
Item 22-0699

**Injection Safety Dangerous Misperceptions Flyer**  
Item 22-1178

**Injection Safety Healthcare Provider Checklist**  
Item 22-1176

**Be Aware Don't Share Insulin Poster**  
Item 22-1503

**Be Aware Don't Share Insulin Brochure**  
Item 22-1501

**Injection Safety Fact Sheet**  
Item 22-1502

**Injection Safety Healthcare Provider Toolkit**  
Item 22-1177

**You Can Order 3 Ways**

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**CALL**  
1-800-CDC-INFO

**CLICK**  
[www.cdc.gov/pubs/CDCInfoOnDemand.aspx](http://www.cdc.gov/pubs/CDCInfoOnDemand.aspx)  
Select Injection Safety—One & Only Campaign to order materials

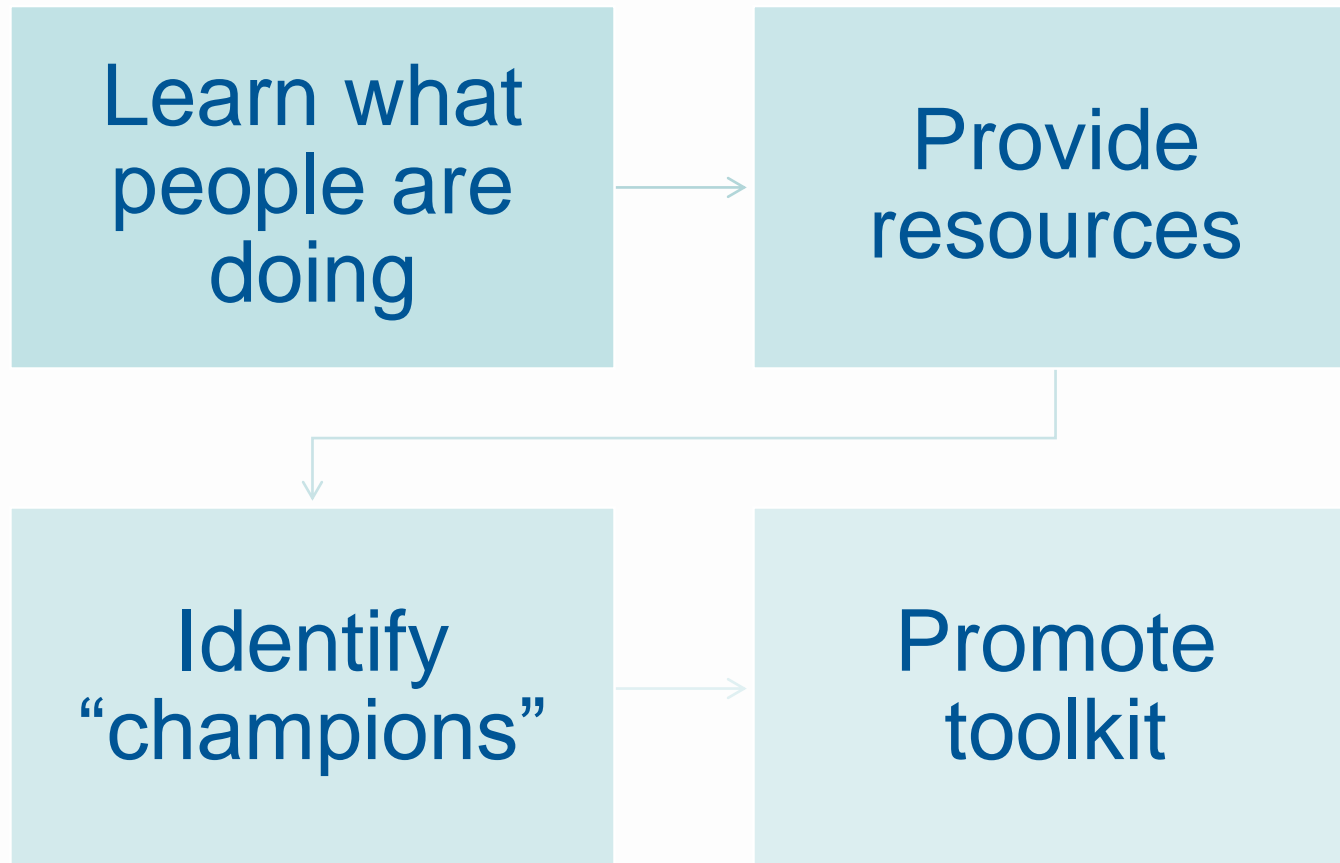
The One & Only Campaign is made possible by a CDC Foundation partnership with Eli Lilly and Company

# Special project background





# Survey goals



## Toolkit goals

Promote *One and Only Campaign* membership

Share resources on injections and needle use

Encompass diverse practice settings and care types

## Oregon is a Partner State in the CDC's One & Only Campaign

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The **One & Only Campaign** is a public health campaign, led by the Centers for Disease Control and Prevention (CDC) and the Safe Injection Practices Coalition (SIPC), to raise awareness among patients and healthcare providers about safe injection practices. The campaign aims to eradicate outbreaks resulting from unsafe injection practices.

Raising awareness among healthcare providers and patients is critical to eliminating preventable infections caused by unsafe injections.



## Injection and Needle Safety Toolkit

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Although injections and needle use in professional settings are generally safe, unsafe practices do happen and may cause serious harm.

Unsafe practices, like reusing vials or syringes, have the potential to spread disease by cross-contaminating body fluids. Since 2001, more than 150,000 people in the U.S. have been notified of potential exposure to viral hepatitis and HIV due to lapses in injection and needle safety.

### Do your part. Three ways to help stop these infections!

1. **Join the One & Only Campaign!** This campaign is led by the Centers for Disease Control and Prevention (CDC) and the Safe Injection Practices Coalition (SIPC) and raises awareness about safe injection practices.
2. Learn about best practices by using this toolkit.
3. Share what you learn from the toolkit with those in your workplace.

*Disclaimer:* The resources below contain overlapping information on best practices, but are by no means comprehensive, as new resources continually emerge. In addition, the links provided do not serve as an endorsement of the organizations.

## Toolkit Contents

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### For the Public

- [What to know about receiving healthcare involving needles](#)
- [At-home injections and needle use](#)

### For Health Professionals

- [Guidelines and Recommendations](#)
- [Aseptic Technique](#)
- [Needle Safety](#)
- [Medication and Treatment Management](#)
- [Diabetes Care](#)
- [Reports of Disease Transmission](#)
- [Specialty Specific Resources](#)
- [Additional Resources](#)
- [References](#)

### Feedback

- We want to hear from you! Let us know what you think about this toolkit by completing this quick [feedback form](#).

## For Health Professionals

### Guidelines and Recommendations

- [CDC's One & Only Campaign](#)  
**Toolkit:** A collection of injection and needle safety resources that includes free print materials, multimedia materials and additional resources.
- [WHO Injection Safety Campaign](#)
- **Toolkit:** A collection of best practice resources that provides guidelines, educational and evaluation tools and print materials.
- [Oregon Patient Safety Commission: Safe Injection Practices](#)  
**PowerPoint:** HAI Program presentation from the acute care breakout session of the Oregon Patient Safety Commission Fundamentals of Infection Prevention training. The slides describe the impact of unsafe needle and injection practices, including CDC recommendations for best practice, and how health professionals can champion needle and injection safety in their facilities.
- [CDC Grand Rounds: Preventing Unsafe Injection Practices in the U.S. Health-Care System](#)  
**MMWR:** CDC overview of the impact of unsafe injection practices, state and federal government response, public health's role, and an illustrative case study.
- [CDC Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings \(2007\)](#)  
**Guidelines:** The CDC summary of recommendations for infection control in healthcare settings, guidelines that, as of 1/1/18, are required for licensed health professionals in Oregon (see above).



### Rules and Regulatory Guidance

- [Oregon Administrative Rule \(OAR\) 333-019-0061: Infection Prevention in Health Care Settings](#)  
**Requirements:** Effective 1/1/18, all licensed health professionals are required to follow standard precautions defined in the CDC: Guideline for Isolation Precautions (2007).
- [CMS: Safe Injection Practices in Ambulatory Surgical Centers \(ASCs\) \(pdf\)](#)  
**Requirements:** The Center for Medicare & Medicaid Services identifies the requirement that every ambulatory surgical center adhere to best practices for injection and needle use and establish a program to identify and prevent infections. Best practices are defined by CDC guidelines linked in the document.

## Tools for Facility Assessment

- [One and Only Campaign: Insulin Pen Safety 60 Second Check \(pdf\)](#)  
**Checklist:** Colorado, a partner state of the One and Only Campaign, provides a 60-second checklist for assessing insulin pen safety practices.
- [One & Only Campaign Finger-stick Lancing Device Safety 60 Second Check \(pdf\)](#)  
**Checklist:** Colorado, a partner state of the One and Only Campaign, provides a 60-second checklist for assessing finger-stick lancing device safety practices.
- [One & Only Campaign Blood Glucose Meter Safety 60 Second Check \(pdf\)](#)  
**Checklist:** Colorado, a partner state of the One and Only Campaign, provides a 60-second checklist for assessing blood glucose meter safety practices.
- [One & Only Campaign Injection Safety Checklist \(pdf\)](#)  
**Checklist:** CDC-recommended minimum standards for care involving injections checklist for inpatient and outpatient settings.
- [APIC Preventing Infection in Ambulatory Care - Winter 2011/2012 \(part I p. 4-8\)](#)  
[APIC Preventing Infection in Ambulatory Care - Spring 2012 \(part II p. 9-14\)](#)  
[APIC Preventing Infection in Ambulatory Care - Summer 2012 \(part III p. 10-15\)](#)  
**Checklists:** Infection Prevention and Control Clinic Survey Tool (parts I, II and III) assesses compliance with needle and injection safety standards in ambulatory care settings.
- [Centers for Medicare and Medicaid Services: Ambulatory Surgical Center \(ASC\) Infection Control Surveyor Worksheet \(pdf\)](#)  
**Checklist:** Survey to assess infection control compliance for the Code of Federal Regulations &#sect;416.51 Conditions for Coverage - Infection Control for ambulatory surgical centers.
- [Centers for Medicare and Medicaid Services: Hospital Infection Control Worksheet \(pdf\)](#)  
**Checklist:** Survey to assess infection control compliance in the hospital setting.
- [National Nursing Home Quality Improvement Equipment Cleaning Assessment Tool \(pdf\)](#)  
**Checklist:** Assessment for the appropriate cleaning and disinfection of equipment and environment.
- [The Minnesota Hospital Association Road Map to Controlled Substance Diversion Prevention 2.0 \(pdf\)](#)  
**Checklist:** An assessment tool for evaluating drug diversion prevention measures in place at a healthcare facility.

# Join the One & Only Campaign

## Who can be a member?

- Professional and nonprofit organizations
- Healthcare systems
- Provider groups
- Private companies

## What do members do?

- Raise awareness
- Share materials
- Receive updates
- Be recognized

To join, email [injectionsafety@cdc.gov](mailto:injectionsafety@cdc.gov)

# Read the injection safety issue of CD Summary

- 2-page newsletter followed by short quiz for free CMEs
- Audience: licensed health care providers, public health and health care agencies, media representatives, medical laboratories, hospitals, those interested in epidemiology and public health



**TAKING A SHOT AT INJECTION SAFETY**



# Follow us on Facebook

<https://www.facebook.com/Oregon.aware>



# Resources & references

- World Health Organization: <http://www.who.int/infection-prevention/campaigns/injections/en/>
- Centers for Disease Control and Prevention
  - One and Only Campaign: <http://www.oneandonlycampaign.org>
  - Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (2007) – III.A.1.b, IV.H (1-8): <https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html>
  - Info on Demand: <https://www.cdc.gov/pubs/cdcinfoondemand.aspx>
  - Injection safety website: <https://www.cdc.gov/injectionsafety/index.html>
- Oregon Health Authority
  - Oregon's One and Only Campaign partner state web page: <http://www.oneandonlycampaign.org/partner/oregon>
  - CD Summary:  
<http://www.oregon.gov/oha/PH/DISEASESCONDITIONS/COMMUNICABLEDISEASE/CDSUMMARYNEWSLETTER/Documents/2017/ohd6607.pdf>
  - Injection safety website:  
<http://www.oregon.gov/oha/PH/DISEASESCONDITIONS/COMMUNICABLEDISEASE/HAI/PREVENTION/Pages/one-and-only.aspx>
- Oregon Patient Safety Commission
  - Infection Prevention & Control Toolkit (Safe Injection Practices 5.00-5.02): <https://oregonpatientsafety.org/resource-center/opsc-resources/oregon-ambulatory-surgery-center-infection-prevention-control-toolkit/436>
  - Video: Preventing Infection During Blood Glucose Monitoring and Insulin Administration:  
[https://www.youtube.com/watch?v=dddSV0Tu\\_AE](https://www.youtube.com/watch?v=dddSV0Tu_AE)
- United States Pharmacopeia General Chapter 797:  
<https://www.sefh.es/fichadjuntos/USP797GC.pdf>

# Resources & references

- Severe bloodstream infections: A population-based assessment
  - <https://www.ncbi.nlm.nih.gov/pubmed/15071391>
- Overall burden of bloodstream infection and nosocomial bloodstream infection in North America and Europe
  - <https://www.sciencedirect.com/science/article/pii/S1198743X1461507X#bib1>
- Outbreaks of Infections Associated with Drug Diversion by US Health Care Personnel
  - [http://www.mayoclinicproceedings.org/article/S0025-6196\(14\)00342-5/fulltext](http://www.mayoclinicproceedings.org/article/S0025-6196(14)00342-5/fulltext)
- One needle, one syringe, only one time? A survey of physician and nurse knowledge, attitudes, and practices around injection safety
  - [http://www.ajicjournal.org/article/S0196-6553\(17\)30680-6/pdf](http://www.ajicjournal.org/article/S0196-6553(17)30680-6/pdf)
- US Outbreak Investigations Highlight the Need for Safe Injection Practices and Basic Infection Control
  - [http://www.liver.theclinics.com/article/S1089-3261\(09\)00085-3/pdf](http://www.liver.theclinics.com/article/S1089-3261(09)00085-3/pdf)
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# Questions & discussion

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