Injection Safety

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Melissa Schaefer, MD

Division of Healthcare Quality Promotion

Centers for Disease Control and Prevention

Outline

- What is injection safety?
- Outbreak investigations linked to unsafe injection practices
- Common injection safety breaches
- Recommended injection and medication practices
- Injection safety resources

Injection Safety

- Measures taken to perform injections in a safe manner for patients and providers
- Prevent transmission of infectious diseases from:
  - Patient to patient
    Patient to provider
  - Provider to patient
- Prevent harms such as needlestick injuries

http://www.cdc.gov/ncidod/dhqp/injectionSafetyFAQs.html

Injection Safety Resources

IV.H. Safe injection practices
The following recommendations apply to the use of needles, cannulas that replace needles, and, where applicable intravenous delivery systems

IV.H.1. Use aseptic technique to avoid contamination of sterile injection equipment.
IV.H.2. Do not administer medications from a syringe to multiple patients, even if the needle or cannula on the syringe is changed. Needles, cannulae and syringes are sterile, single-use items; they should not be reused for another patient nor to access a medication or solution that might be used for a subsequent patient.

2007 Guideline for Isolation Precautions

administration set.
IV.H.4. Use single-dose vials for parenteral medications whenever possible.
IV.H.5. Do not administer medications from single-dose vials or ampules to multiple patients or combine leftover contents for later use.
IV.H.6. If multidose vials must be used, both the needle or cannula and syringe used to access the multidose vial must be sterile.
IV.H.7. Do not keep multidose vials in the immediate patient treatment area and store in accordance with the manufacturer's recommendations; discard if sterility is compromised or questionable.
IV.H.8. Do not use bags or bottles of intravenous solution as a common source of supply for multiple patients.
IV.I. Infection control practices for special lumbar puncture procedures Wear a surgical mask when placing a catheter or injecting material into the spinal canal or subdural space (i.e., during myelograms, lumbar puncture and spinal or epidural anesthesia.
IV.J. Worker safety Adhere to federal and state requirements for protection of healthcare personnel from exposure to bloodborne pathogens.

Safe Injection Practices

- Use aseptic technique
- Do not administer medications to multiple patients using the same syringe, even if the needle is changed
- Do not reuse a syringe to access medications from a vial that may be used on multiple patients

Guideline for Isolation Precautions, 2007

Safe Injection Practices

- Do not administer medications from single-dose vials to multiple patients
- Do not use bags or bottles of intravenous solution as a common source of supply for multiple patients
- Do not keep multi-dose vials in the immediate patient treatment area

Guideline for Isolation Precautions, 2007

What happens when facilities fail to adhere to safe injection practices?

Annals of Internal Medicine | REVIEW

Nonhospital Health Care–Associated Hepatitis B and C Virus Transmission: United States, 1998–2008

Nicola D. Thompson, PhD, MS; Joseph F. Perz, DrPH, MA; Anne C. Moorman, BSN, MPH; and Scott D. Holmberg, MD, MPH

In the United States, transmission of hepatitis B virus (HBV) and hepatitis C virus (HCV) from health care exposures has been considered uncommon. However, a review of outbreak information revealed 33 outbreaks in nonhospital health care settings in the past decade: 12 in outpatient clinics, 6 in hemodialysis centers, and 15 in long-term care facilities, resulting in 448 persons acquiring HBV or HCV infection. In each setting, the putative mechanism of infection was patient-to-patient transmission through failure of health care personnel to adhere to fundamental principles of infection control and aseptic technique (for example, reuse of syringes or lancing devices).

Difficult to detect and investigate, these recognized outbreaks indicate a wider and growing problem as health care is increasingly provided in outpatient settings in which infection control training and oversight may be inadequate. A comprehensive approach involving better viral hepatitis surveillance and case investigation, health care provider education and training, professional oversight, licensing, and public awareness is needed to ensure that patients are always afforded basic levels of protection against viral hepatitis transmission.

Ann Intern Med. 2009;150:33-39. www.annals.org
For author affiliations, see end of text.

- 33 outbreaks of HCV and/or HBV in 15 states
  - Outpatient clinics, n=12
  - Dialysis centers, n=6
  - Long term care, n=15

Thompson et al. *Ann Intern Med.* 2009;150:33-39.

Viral Hepatitis Outbreaks - Outpatient Settings

State	Setting	Year	Type
NY	Private MD office	2001	HCV
NY	Private MD office	2001	HBV
NE	Oncology clinic	2002	HCV
OK	Pain remediation clinic	2002	HBV+HCV
NY	Endoscopy clinic	2002	HCV
CA	Pain remediation clinic	2003	HCV
MD	Nuclear imaging	2004	HCV
FL	Chelation therapy	2005	HBV
CA	Alternative medicine infusion	2005	HCV
NY	Endoscopy/surgery clinics	2006	HBV+HCV
NY	Anesthesiologist office	2007	HCV
NV	Endoscopy clinic	2008	HCV
NC	Cardiology clinic	2008	HCV
NJ	Oncology clinic	2009	HBV

Thompson et al. *Ann Intern Med*. 2009;150:33-39.

Examples of Bacterial Outbreaks due to Unsafe Injection Practices

- Pain Clinic – 7 cases – *Serratia marcescens*
  - Spinal injections; all patients hospitalized

    Cohen AL et al. Clin J Pain 2008;24(5):374-380.
- Primary care clinic – 5 cases – *S. aureus*
  - Joint and soft tissue injections; all patients hospitalized

    Kirschke DL et al. CID 2003;36:1369-1373.
- Primary care clinic – 5 cases – *S. aureus*
  - Joint injections; all patients hospitalized

    Archer W et al. Infectious Diseases Society of America 47th Annual Meeting, Philadelphia, PA, Oct 2009.

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

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 received by the Southern Nevada Health District (SNHD) regarding two persons recently diagnosed with acute hepatitis C. A third person with acute hepatitis C was reported

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

Nevada Hepatitis C Outbreak

- January 2008 – cluster of 3 acute hepatitis C cases identified in Las Vegas
- All 3 patients underwent procedures at the same endoscopy clinic during the incubation period
- Clinic performed upper and lower endoscopies
  - 50-60 procedures/day
  - 2 procedure rooms
- Reviews of surveillance records, laboratory records and a physician report identified 3 additional clinic-associated cases

MMWR; May 16, 2008; 57:19

Review of Anesthesia Delivery

- Started induction with syringe filled with lidocaine (1cc) and propofol (9ccs)

  Clean needle and syringe used to inject directly through intravenous catheter

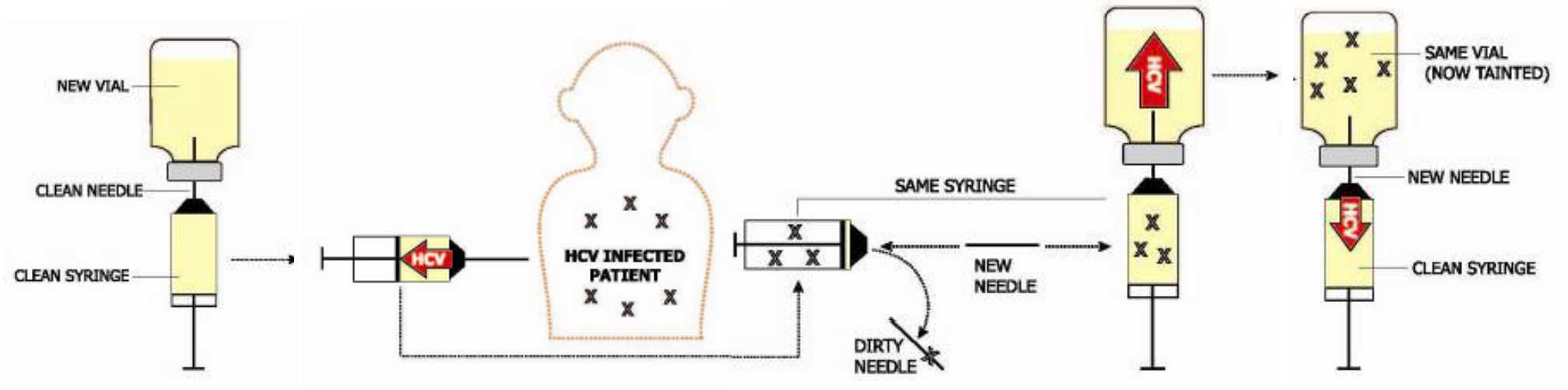
- If patient needed more anesthesia, some providers:
  - Removed needle from syringe and replaced with a new one
  - Used old syringe w/ new needle to draw more propofol
- Medication remaining in the single dose propofol vial was used to sedate the next patient

MMWR; May 16, 2008; 57:19

Review of Anesthesia Delivery

- Propofol is a single-dose medication
  - Preservative-free
  - Approved for use on a single patient for a single procedure
- Facility purchased 20-50cc vials but only used ~10-15cc per patient

Unsafe Injection Practices that Likely Led to HCV Transmission



1. Clean needle and syringes are used to draw medication

2. When used on an HCV-infected patient, backflow from the injection or removal of the needle contaminates the syringe

3. When again used to draw medication, contaminated syringe contaminates the medication vial

4. Contaminated vial that is reused exposes subsequent patients to risk of HCV infection

MMWR; May 16, 2008; 57:19

Nevada Outbreak – Epilogue

- Clinic immediately advised to stop unsafe injection practices
  - Business license revoked and clinic was closed
- Unsafe practices had been commonly used by some staff at the clinic for at least 4 years
  - Health department began notifying 40,000 persons to recommend HBV, HCV, HIV screening

Investigation Outcomes

- Transmission clearly identified on 2 separate dates
  - July 2007: 1 HCV-infected patient
  - September 2007: 7 HCV-infected patients
- Southern Nevada Health District identified 77 cases of HCV infection "potentially" associated with the clinic

Investigation Outcomes

- Endoscopy clinic had not undergone full inspection by state surveyors in 7 years
- Public trust in healthcare damaged
- Nevada requested assistance with infection control assessments at all of its Ambulatory Surgical Centers

LAS VEGAS SUN

Feds' blitz: 30 days, 50 clinics

Teams of investigators swooping into Nevada to get answers

ASC Infection Control Surveys

- 14.9 million procedures took place in ASCs in 2006
- Average survey interval 8.5 years
- Surveys did not specifically target basic infection control practices
  - Focused on record review (policies and procedures)
  - Surveyors with varying levels of expertise regarding infection control
  - Did not require observation of procedures

ASC Infection Control Surveys

- CDC tools adapted for Nevada focusing on core areas of infection control
  - Hand hygiene, Medication and injection safety, Reprocessing of equipment, Environmental cleaning, Blood glucose monitoring equipment
- 28 ASCs subjected to a federal survey

ASC Infection Control Pilot

- CMS pilot conducted in OK, NC, and MD
  - 68 ASCs inspected
  - Infection control problems were identified:
    - Failure to clean equipment between patients
    - Re-use of single-dose vials of medication or infusates for multiple patients
    - Re-use of single-use devices (e.g., bite blocks)

Infection Control Survey Tool

PART 2 – INFECTION CONTROL & RELATED PRACTICES

Instructions:

- Circle the applicable response, as well as information on the manner in which information was obtained
- Unless otherwise indicated, a "No" response to any question below must be cited as a deficient practice in relation to 42 CFR 416.51(a).
- If N/A is circled, please explain why there is no associated observation, or why the question is not applicable

I. Hand Hygiene

Additional Instructions:

- **Observations are to focus on staff directly involved in patient care (e.g., physicians, nurses, CRNAs, etc.).** Hand hygiene should be observed not only during the case being followed, but also while making other observations in the ASC throughout the survey. Interviews are used primarily to provide additional evidence for what the surveyor has observed, but may in some cases substitute

http://www.cms.hhs.gov/SurveyCertificationGenInfo/downloads/SCLetter09_37.pdf

ASC Surveys

- New Conditions for Coverage addressing infection control
  - ASC must maintain an infection control program based on nationally recognized guidelines
  - Must be directed by designated healthcare professional with training in infection control
- Infection control survey tool adopted nationally as part of survey process with support from stimulus package (American Recovery and Reinvestment Act)

We still have a lot of work to do…

Bacterial Outbreaks due to Unsafe Injection Practices

- Pain Clinic – 7 cases – *Serratia marcescens*
  - Spinal injections; all patients hospitalized

  Cohen AL et al. Clin J Pain 2008;24(5):374-380.
- Primary care clinic – 5 cases – *S. aureus*
  - Who has authority here?

  Kirschke DL et al. CID 2003;36:1369-1373.
- Primary care clinic – 5 cases – *S. aureus*
  - Joint injections; all patients hospitalized

  Archer W et al. Infectious Diseases Society of America 47th Annual Meeting, Philadelphia, PA, Oct 2009.

MSSA Outbreak Following Joint Injections

- 5 patients developed methicillin-susceptible *Staphylococcus aureus* after joint injections
  - All required hospitalization (≥ one week) and IV antibiotics
- Clinic staffed by physician assistant & unlicensed RN
  - Operated under the license of a physician located primarily off-site
  - High volume of injections and infusions (e.g., vitamins, IV fluids, antihistamines)
- Medication handling, injection preparation, hand hygiene and numerous other deficiencies

Archer, R et al. Methicillin-susceptible Staphylococcus aureus Infections after intra-articular injections. Presented at Infectious Diseases Society of America 47th Annual Meeting, Philadelphia, PA, Oct 2009.

Who has authority?

- Health department can engage when there is imminent public health threat
- No one agency responsible for oversight of medical offices
- Health departments required to take multi-faceted approach
  - Engage licensing board (medical or nursing)
  - Business licensing

What happened at this clinic?

- Clinic forced to hire infection preventionist (IP)
  - Assess policies and procedures
  - Help develop appropriate infection control plan
- Clinic not allowed to perform joint injections until IP evaluation complete
- Health department will do surprise follow-up inspection


INSPECTED
this facility has passed
and has met the standards
used in Columbus Public
Health's inspection process
THE CITY OF NEW YORK
DEPARTMENT OF HEALTH AND MENTAL HYGIENE
DIVISION OF ENVIRONMENTAL HEALTH
NOTICE
CLOSED
BY ORDER OF THE
COMMISSIONER
OF HEALTH AND MENTAL HYGIENE
Restaurant Inspection
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What can be done?

- Legislative changes
  - NY: requiring inspection of offices that do certain procedures
  - NV: state licensing given oversight of offices that provide certain levels of sedation

Back to Injection Safety…

What are some of the breaches we see?

Syringe Reuse

- Direct syringe reuse
  - Using the same syringe from patient to patient (with/without the same needle)
- Indirect syringe reuse
  - Using the same syringe to access medications from vials that will be used on subsequent patients (with/without the same needle)

How have providers justified syringe reuse?

- Mistaken belief that the following prevent infection transmission risks
  - Changing the needle
  - Injecting through intervening lengths of intravenous tubing
  - Presence of a check valve
  - Always maintaining pressure on the plunger to prevent backflow of body fluids

How have providers justified syringe reuse?

Mistaken belief that the following prevent

Syringes and needles are single-use devices and should NOT be reused

- intravenous tubing
- Presence of a check valve
- Always maintaining negative pressure on the plunger to prevent backflow of body fluids

Single-use medication reuse

- Using single-dose medications for more than one patient
- Purchase vials containing quantities in excess of those needed for a single patient
  - Mistaken belief that they can be used in a multi-dose fashion
- Commonly abused medications
  - Contrast agents
  - Propofol
  - Botox

Single-use medication reuse

- Using single-dose medications for more than
- Commonly abused medications
  - Contrast agents
  - Propofol
  - Botox

Single-use medications should be dedicated to a single patient for a single procedure

Inappropriate handling of multi-dose medications

- Kept in the immediate patient treatment area
  - In presence of contaminated supplies or patient equipment

Multi-dose medications should be:

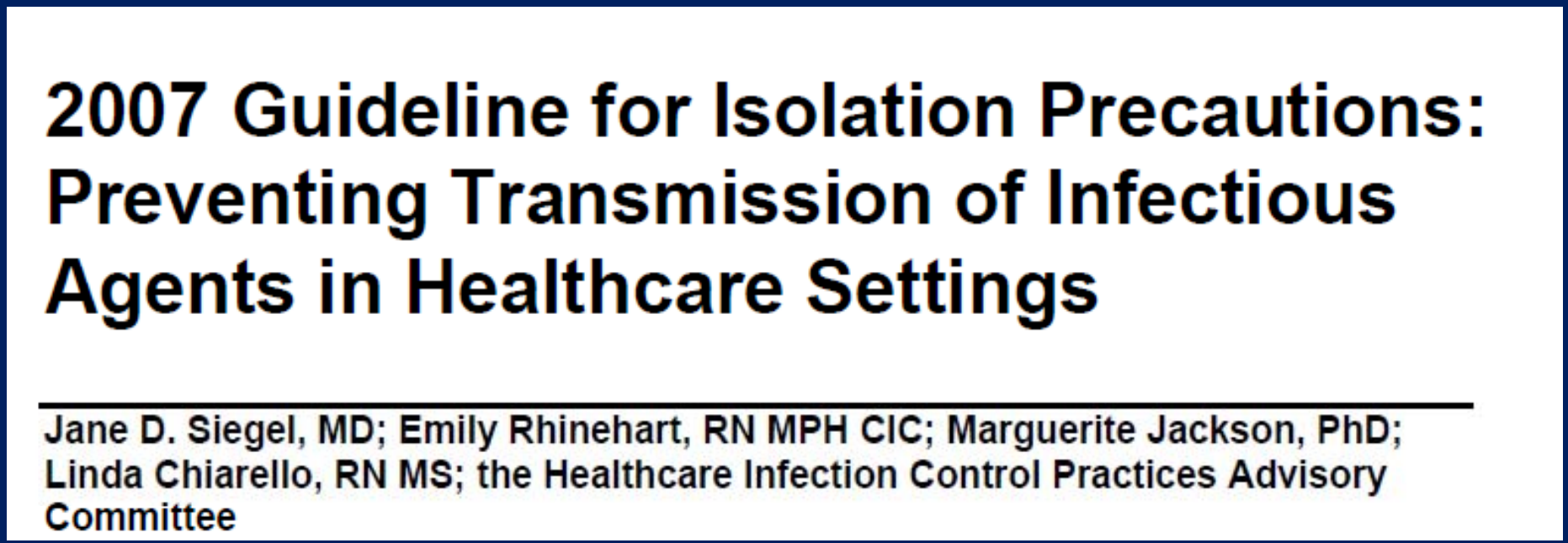
- Dedicated to single-patient, whenever possible
- Entered only with sterile needle and sterile inge
- Dated upon initial entry and discarded within 28 days of opening or according to manufacturer's instructions
- Discarded if sterility is compromised

Multi-dose medications should **NOT** be:

- Kept in the immediate patient treatment area

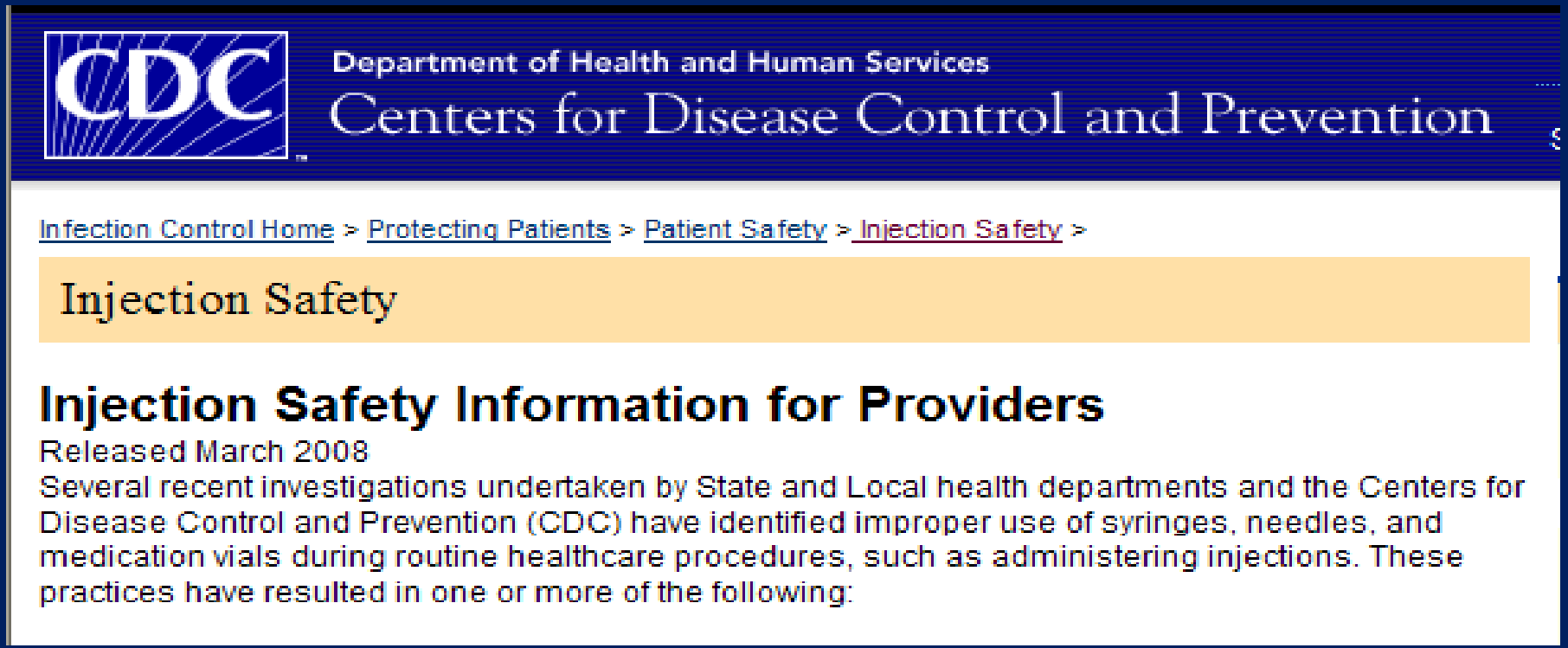
Where can providers go for more information?

- Isolation Guidelines, 2007
  - http://www.cdc.gov/ncidod/dhqp/gl_isolation.html



Where can providers go for more information?

- CDC Website
  - http://www.cdc.gov/ncidod/dhqp/injectionsafety.html

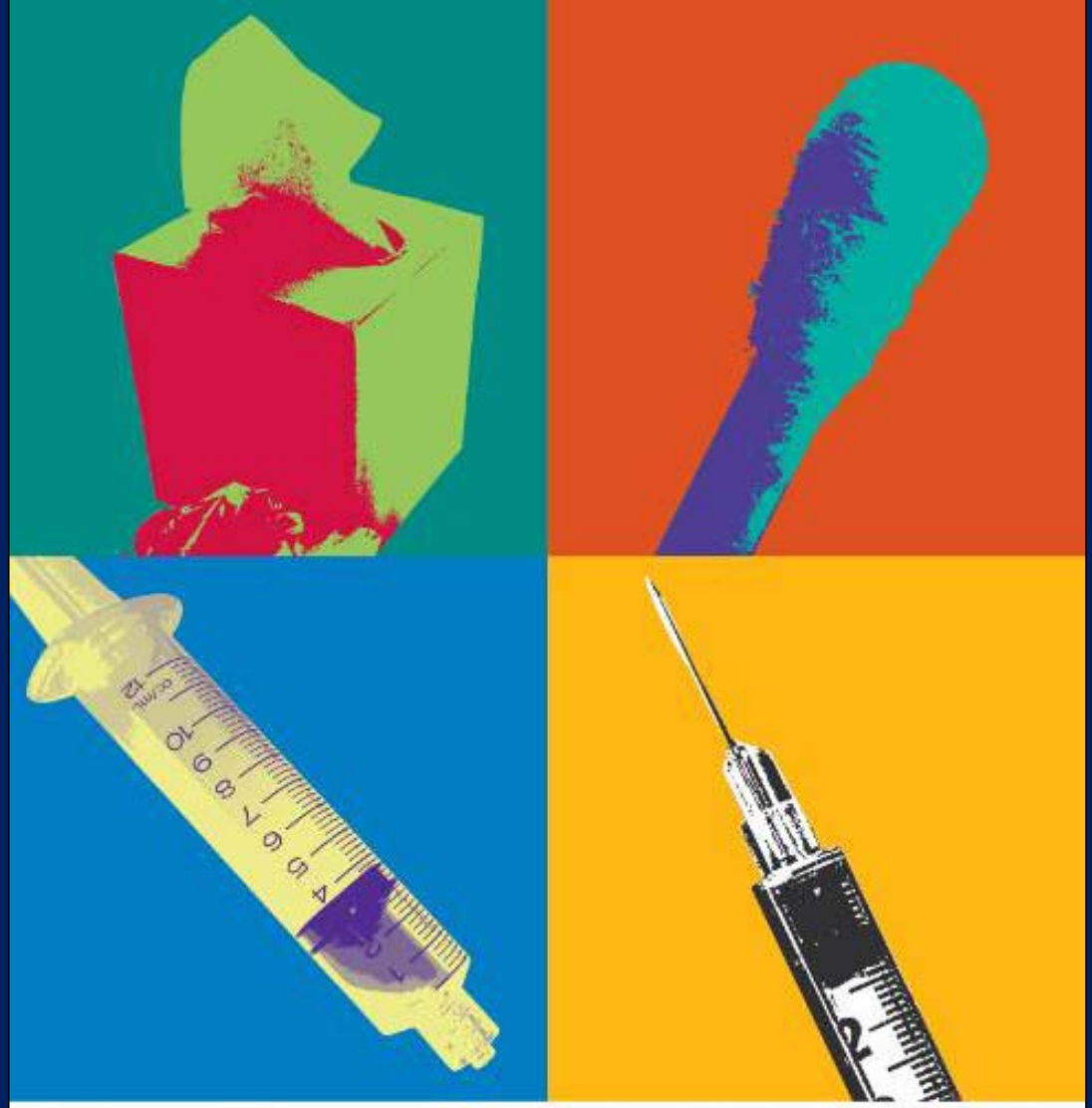


Where can providers go for more information?

- The One and Only Campaign
  - www.ONEandONLYcampaign.org

Safe Injection Practices Coalition

- Accreditation Association for Ambulatory Health Care (AAAHC)
- American Association of Nurse Anesthetists (AANA)
- Ambulatory Surgery Foundation
- APIC
- Becton, Dickinson and Company (BD)
- CDC
- CDC Foundation
- Covidien
- HONOReform Foundation
- Hospira
- Nebraska Medical Assocation
- Nevada State Medical Association (NSMA)
- Premier Safety Institute



Some things should not be reused

About the One & Only Campaign

The goal of the One & Only Campaign is to improve safe injection practices across healthcare settings. The practices within an organization are highly influenced by its culture or are an expression of its culture. Thus, through education, outreach, and grassroots initiatives, the One & Only Campaign will seek to influence the culture of patient safety. The One & Only Campaign is an education and awareness campaign aimed at both healthcare providers and the public to increase proper adherence to safe injection practices to prevent disease transmission from the misuse of needles, syringes, and medication vials in outpatient settings. While the campaign will be initially rolledout in targeted locations, the vision is to develop a concept that can be replicated nationwide. For more information, please visit: **www.OneAndOnlyCampaign.org.**

Coalition partners include the following organizations: Accreditation Association for Ambulatory Health Care (AAAHC), American Association of Nurse Anesthetists (AANA), Ambulatory Surgery Foundation, Association for Professionals in Infection Control and Epidemiology, Inc (APIC), BD (Becton, Dickinson and Company), Centers for Disease Control and Prevention (CDC), CDC Foundation, HONORcform Foundation, Nebraska Medical Association (NMA), and Nevada State Medical Association (NSMA).

Safe Injection Practices Coalition

1 ONE NEEDLE, ONE SYRINGE, ONLY ONE TIME.

Safe Injection Practices Coalition
www.OneAndOnlyCampaign.org


Can I use that
when you're done?
You wouldn't share this with anyone.
Your provider shouldn't share your syringe.
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www.ONEandONLYcampaign.org
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ONE NEEDLE,
ONE SYRINGE,
ONLY ONE TIME.
Safe Injection Practices Coalition
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1 Needle

1 Syringe

+ 1 Time

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0 Infections

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www.ONEandONLYcampaign.org

Where can providers go for more information?

- CMS infection control worksheet
  - http://www.cms.hhs.gov/SurveyCertificationGenInfo/downloads/SCLetter09_37.pdf

II. Injection Practices (injectable medications, saline, other infusates)

Additional Instructions:

Observations are to be made of staff who prepare and administer medications and perform injections (e.g., anesthesiologists, certified registered nurse anesthetists, nurses).

Practices to be Assessed	Was practice performed?	Manner of confirmation
A. Needles are used for only one patient	1 Yes 2 No 3 N/A	4Observation 5Interview 6Both
B. Syringes are used for only one patient	1 Yes 2 No 3 N/A	4Observation 5Interview 6Both
C. Medication vials are always entered with a new needle	1 Yes 2 No 3 N/A	4Observation 5Interview 6Both
D. Medication vials are always entered with a new syringe	1 Yes 2 No 3 N/A	4Observation 5Interview 6Both

Conclusions

- Injection safety is a basic expectation in patient safety
- Safe practices should not be sacrificed in efforts to save time or money
- If you have to justify or qualify your injection practices, you might be doing something wrong

Thank you

The findings and conclusions in this presentation are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention.