Injection Safety

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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
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, cannulas 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.

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?
33 outbreaks of HCV and/or HBV in 15 states

- Outpatient clinics, n=12
- Dialysis centers, n=6
- Long term care, n=15

### Viral Hepatitis Outbreaks - Outpatient Settings

<table>
<thead>
<tr>
<th>State</th>
<th>Setting</th>
<th>Year</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>NY</td>
<td>Private MD office</td>
<td>2001</td>
<td>HCV</td>
</tr>
<tr>
<td>NY</td>
<td>Private MD office</td>
<td>2001</td>
<td>HBV</td>
</tr>
<tr>
<td>NE</td>
<td>Oncology clinic</td>
<td>2002</td>
<td>HCV</td>
</tr>
<tr>
<td>OK</td>
<td>Pain remediation clinic</td>
<td>2002</td>
<td>HBV+HCV</td>
</tr>
<tr>
<td>NY</td>
<td>Endoscopy clinic</td>
<td>2002</td>
<td>HCV</td>
</tr>
<tr>
<td>CA</td>
<td>Pain remediation clinic</td>
<td>2003</td>
<td>HCV</td>
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<tr>
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<td>Nuclear imaging</td>
<td>2004</td>
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<tr>
<td>FL</td>
<td>Chelation therapy</td>
<td>2005</td>
<td>HBV</td>
</tr>
<tr>
<td>CA</td>
<td>Alternative medicine infusion</td>
<td>2005</td>
<td>HCV</td>
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<tr>
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<td>Endoscopy/surgery clinics</td>
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<tr>
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</tr>
<tr>
<td>NV</td>
<td>Endoscopy clinic</td>
<td>2008</td>
<td>HCV</td>
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<tr>
<td>NC</td>
<td>Cardiology clinic</td>
<td>2008</td>
<td>HCV</td>
</tr>
<tr>
<td>NJ</td>
<td>Oncology clinic</td>
<td>2009</td>
<td>HBV</td>
</tr>
</tbody>
</table>

Examples of Bacterial Outbreaks due to Unsafe Injection Practices

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

- 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
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.
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
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
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

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

- 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
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

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
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 from being single-use devices and should NOT be reused:

- 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 one patient

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

- Commonly abused medications
  - Contrast agents
  - Propofol
  - Botox
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

2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings

Jane D. Siegel, MD; Emily Rhinehart, RN MPH CIC; Marguerite Jackson, PhD; Linda Chiarello, RN MS; the Healthcare Infection Control Practices Advisory Committee
Where can providers go for more information?

- CDC Website
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 Association
- 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 extension 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 reuse of needles, syringes, and medication vials in outpatient settings. While the campaign will begin initially in 14-20 targeted locations, the vision is to develop a concept that can be replicated nationwide. For more information, please visit www.ONEandONLYcampaign.org.

Safe Injection Practices Coalition

Centers for Disease Control and Prevention (CDC), CDC Foundation, WONDER/Johns Hopkins, Nebraska Medical Association (NMA), and Nevada State Medical Association (NSMA).

Co-chaired by John R. Snow, Inc. (JRSI), National Cytomegalovirus Network (NCVN), National Foundation for Infectious Diseases (NFID), New York State Department of Health (NYSDOH), Ohio State Medical Association (OSMA), Pennsylvania Medical Society (PAMS), South Carolina Medical Association (SCMA), and the Virginia State Medical Association (VAMA)
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
1 Needle
1 Syringe
+ 1 Time

0 Infections

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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, HONOSReform Foundation, Nebraska Medical Association (NMA), and Nevada State Medical Association (NSMA).

www.ONEandONLYcampaign.org
Where can providers go for more information?

- CMS infection control worksheet

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).

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