Injections Without Infections: Basic Patient Safety

Joseph Perz, DrPH
Team Leader, Ambulatory and Long-Term Care Prevention and Response Branch
Division of Healthcare Quality Promotion
Centers for Disease Control and Prevention

The findings and conclusions in this presentation are those of the author(s) and do not necessarily represent the views of the Centers for Disease Control and Prevention.
Injections and infusions of parenteral medications are the most common invasive procedure across all of healthcare:

- Sedation/anesthesia for surgical procedures, endoscopy, and imaging/diagnostic studies
- Spinal and intra-articular steroid injections
- Chemotherapy
- Intravenous antibiotics

Unsafe injection practices have been identified as the root cause of dozens of recent outbreaks:

- Hepatitis B and hepatitis C viruses
- Bacterial infections
Injection Delivery in Dialysis Settings

- Dialysis patients receive injected medications with every dialysis session
  - Consider that many patients receive epo, heparin, and vitamin D analogue at every visit… that works out to 468 injections per year!
  - Other common injected medications include saline flush, heparin lock, iron, calcium, antibiotics, and vaccines

- A dialysis clinic with 25 stations could easily deliver >20,000 injections per year

- Nationally, there may be upwards of 200 million injections administered in dialysis clinics every year
Risks of Medical Injections in the U.S. Outside of Recognized Outbreaks

- Case-Control Study of Hepatitis B and Hepatitis C
- 48 reported cases of symptomatic acute hepatitis B or C
  - Persons aged 55 years and older – NY and OR
  - Excluded nursing home residents and cases identified as a result of outbreak investigations
- 3 matched controls per case
  - age group (55-59, 60-69, and 70 years) and residential postal code
- In a multivariate model, behavioral risks (17% attributable risk), injections (37% attributable risk), and hemodialysis (8% attributable risk) were associated with case status
- Conclusion: Healthcare exposures may represent an important source of new HBV and HCV infections among older adults

- Perz et al. Hepatology 2013
## Hemodialysis-Associated HCV Outbreaks

<table>
<thead>
<tr>
<th>Year</th>
<th>State</th>
<th># Outbreak-associated infections</th>
<th>Breaches identified or suspected mode of transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>NY</td>
<td>9</td>
<td>Multiple breaches in infection control practice (unspecified)</td>
</tr>
</tbody>
</table>
| 2009 | MD    | 8                                | Breaches in medication preparation and administration practices  
Breaches in environmental cleaning and disinfection practices |
| 2009 | NJ    | 21                               | Breaches in medication preparation and administration practices  
Breaches in environmental cleaning and disinfection practices |
| 2010 | TX    | 2                                | Breaches in infection control practice (unspecified) |
| 2011 | GA    | 6                                | Breaches in medication preparation  
Failure to maintain separation between clean and contaminated workspaces |
| 2012 | CA    | 4                                | Specific lapses in infection control not identified at the time of the investigation |

Among the 16 healthcare-associated HCV outbreaks identified in the United States during 2008-2012, 6 (38%) were in outpatient hemodialysis centers

http://www.cdc.gov/hepatitis/Statistics/HealthcareOutbreakTable.htm
## Injections Without Infections

<table>
<thead>
<tr>
<th>Safe Production</th>
<th>Sterile medication for injection/infusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe Preparation</td>
<td>Right-sized dose in a ready-to-deliver format (typically a syringe)</td>
</tr>
<tr>
<td>Safe Administration</td>
<td>Adherence to Standard Precautions to <strong>minimize risk of infection to patients</strong> and healthcare personnel</td>
</tr>
<tr>
<td>Safe Disposal</td>
<td>Minimize risk of harm to patients and healthcare personnel</td>
</tr>
</tbody>
</table>
To Prevent Transmission of Infections in Healthcare

1. ONE NEEDLE, ONE SYRINGE, ONLY ONE TIME.

Safe Injection Practices Coalition
www.ONEandONLYcampaign.org

Injection Safety is Every Provider’s Responsibility
Three things every provider needs to know about injection safety

1. Needles and syringes are single use devices. They should not be used for more than one patient or reused to draw up additional medication.

2. Do not administer medications from a single-dose vial or IV bag to multiple patients.

3. Limit the use of multi-dose vials and dedicate them to a single patient whenever possible.

Source: Centers for Disease Control and Prevention (CDC).
http://www.cdc.gov/injectionsafety/providers/provider_faqs.html
Unsafe Injection Practices

- Reuse of syringes
  - For multiple patients (“direct reuse”)
    - Examples include injecting through IV tubing
  - To access shared medications (“indirect reuse” a.k.a. “double dipping”)
- Mishandling and inappropriate sharing of medication vials and containers
  - Administration of medication from a single-dose vial to multiple patients
  - Intravenous solution bags used as a common source of supply (e.g., for flush)
  - Handled in a contaminated environment
Las Vegas, NV, Hepatitis C Outbreak, 2008

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 used again 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
HCV: hepatitis C virus
Storage of multidose vials and preparation of injections in same area that used needles and syringes were dismantled and discarded

Ref: Samandari et al. ICHE 2005; 26: 745-750
Improper Medication Practices Identified During a Hepatitis C Outbreak Investigation

- Medication preparation in proximity to blood specimen processing
- Multidose medications drawn and stored on supply table
- Reuse of single-dose vials
Read the label – unless it is a manufactured vial with the term “multi-dose vial” printed on it, it is not a multi-dose vial
Resources for Education and Assessment

www.cdc.gov/injectionsafety

ONEandONLYcampaign.org
# 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.

<table>
<thead>
<tr>
<th>Injection Safety</th>
<th>Practice Performed?</th>
<th># answer is No, document plan for remediation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injection sites are prepared using aseptic technique in a clean area free from contamination or contact with blood, body fluids or contaminated equipment</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>Needles and syringes are used for only one patient (this includes prefilled syringes and cartridge devices such as insulin pens)</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>The rubber septum on a medication vial is disinfected with alcohol prior to piercing</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>Medication vials are entered with a new needle and a new syringe, even when obtaining additional doses for the same patient</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>Single dose (single-use) medication vials, ampoules, and bags or bottles of intravenous solution are used for only one patient</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>Medication administration tubing and connectors are used for only one patient</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>Multi-dose vials are dated by HCP when they are first opened and discarded within 28 days unless the manufacturer specifies a different (shorter or longer) date for that opened vial. <strong>Note:</strong> This is different from the expiration date printed on the vial.</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>Multi-dose vials are dedicated to individual patients whenever possible.</td>
<td>Yes No</td>
<td></td>
</tr>
<tr>
<td>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/ward) <strong>Note:</strong> If multi-dose vials enter the immediate patient treatment area they should be dedicated for single-patient use and discarded immediately after use.</td>
<td>Yes No</td>
<td></td>
</tr>
</tbody>
</table>

**RESOURCES**

- [www.cdc.gov/injectionsafety](http://www.cdc.gov/injectionsafety)
Safe Injection Practices: Protecting Yourself and Your Patients

A Bloodborne Pathogens Training Activity

http://www.oneandonlycampaign.org/content/bloodborne-pathogens-training
Safe Injection Practices - How to Do It Right

http://www.oneandonlycampaign.org/content/audio-video
Q and A
Question

- Many facilities draw saline from the saline bag hanging at a patient’s dialysis station to use as flush for that same patient.
- Is this a safe practice?
All the clean supplies needed for a patient’s dialysis initiation are gathered beforehand and stored in a clean plastic box -- it is for that patient only, labeled with the patient's name and identifiers. A multi-dose vial of heparin used by and belonging to that individual patient only is also stored in the box. After use, each box is cleaned inside and outside, then replaced to clean storage to be later refilled for the next treatment.

The staff practice is to draw up the heparin at the moment, right at the chair-side, not a separate location.

Is this a safe practice?

If all these multi-dose vials were instead stored in the same location wouldn’t that create a new patient safety issue? i.e. mixing up vials.
Question

How and where should we perform med prep if we don’t have a separate room for this and need to use a space in the treatment area?
Thank You

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