Module D

OUTBREAKS AND SAFE INJECTION PRACTICES IN DENTAL SETTINGS

OBJECTIVES

1. The Big Picture
2. Outbreaks and best practices
3. Beyond the outbreaks
4. Resources
THE BIG PICTURE
UNSAFE INJECTION PRACTICES HAVE DEVASTATING CONSEQUENCES

- Patient illness and death
- Loss of clinician license
- Legal charges/ malpractice suits
- Criminal charges

UNSAFE INJECTION-RELATED OUTBREAKS SINCE 2001

- 48 recognized outbreaks
  - Viral hepatitis (n=21) or bacterial infections (n=27)
  - 90% (n=43) occurred in outpatient settings
    - 10 in pain management clinics
    - 9 in outpatient oncology clinics
- >150,000 patients potentially exposed

*CDC Grand Rounds 11/14/12 & Guh et al, Medical Care 2012
HEPATITIS B VIRUS OUTBREAKS RELATED TO BLOOD GLUCOSE MONITORING, 2001-2011

- 23 recognized outbreaks due to the assisted monitoring of blood glucose (AMBG)
- ~2,000 notifications
- >170 incident infections
- Accounted for 92% of all hepatitis B virus outbreaks in long term care facilities


UNSAFE INJECTION RELATED OUTBREAKS IN DENTISTRY, 2001-2013

<table>
<thead>
<tr>
<th>Date</th>
<th>State</th>
<th>Type</th>
<th>Exposed (n)</th>
<th>Incident Infections</th>
<th>Lapse</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>New Mexico</td>
<td>HBV</td>
<td>1</td>
<td>1</td>
<td>Unknown</td>
<td>Patient – to-patient transmission</td>
</tr>
<tr>
<td>2009</td>
<td>West Virginia</td>
<td>HBV</td>
<td>&gt;1500</td>
<td>5</td>
<td>Multiple infection control breaches</td>
<td>3 patient cases, 2 volunteers</td>
</tr>
<tr>
<td>2011</td>
<td>Colorado</td>
<td>HIV, HBV, HCV</td>
<td>8000</td>
<td>6</td>
<td>Syringe Reuse</td>
<td>IV Anesthesia</td>
</tr>
<tr>
<td>2013</td>
<td>Oklahoma</td>
<td>HCV</td>
<td>7000</td>
<td>89</td>
<td>Syringe Reuse, rusty instruments</td>
<td></td>
</tr>
</tbody>
</table>
## NC EXPERIENCE, 2001 - 2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Setting</th>
<th>Type</th>
<th>Exposed (n)</th>
<th>Incident Infections (n)</th>
<th>Lapse</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>Nursing Home</td>
<td>hepatitis B virus</td>
<td>192</td>
<td>11</td>
<td>ABGM</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>Cardiology Clinic</td>
<td>hepatitis C virus</td>
<td>1200</td>
<td>5</td>
<td>Syringe Reuse Contaminating MDV</td>
<td>Strengthened .0206</td>
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<tr>
<td>2010</td>
<td>Assisted-living Facility</td>
<td>hepatitis B virus</td>
<td>87</td>
<td>8</td>
<td>ABGM</td>
<td>6/8 patients died, &quot;Act to Protect Adult Care Home Residents&quot;</td>
</tr>
<tr>
<td>2010</td>
<td>Skilled Nursing Facility</td>
<td>hepatitis B virus</td>
<td>116</td>
<td>6</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>Skilled Nursing Facility</td>
<td>hepatitis B virus</td>
<td>109</td>
<td>6</td>
<td>ABGM</td>
<td></td>
</tr>
</tbody>
</table>

ABGM – Assisted Blood Glucose Monitoring

## OUTBREAK CAUSES & BEST PRACTICES
OUTBREAK CAUSES

1. Syringe reuse (direct and indirect)
2. Misuse of single-dose/single-use vials
3. Failure to use aseptic technique
4. Unsafe diabetes care

SYRINGE REUSE

• Direct Reuse
  • Insulin pens, IV tubing, vaccines

• Indirect Reuse or “double dipping”
  • Common cause of large hepatitis outbreaks
  • Syringe that had been used to inject medication into a patient and reused to enter a medication vial
  • Contents of the vial are then used for subsequent patients
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

THE NEVADA OUTBREAK: MECHANISM

Two breaches contributed to transmission:

- Re-entering propofol vials with used syringes
- Using contents from these single-dose vials on more than one patient
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!


- CDC is aware of at least 19 outbreaks involving single dose vial use
  - 7 outbreaks involved BBPs
  - 12 involved bacterial infections (majority of patients requiring hospitalization)
- All outbreaks occurred in outpatient settings
  - Almost half in pain remediation clinics (n=8)
INVASIVE S. AUREUS INFECTIONS ASSOCIATED WITH PAIN INJECTIONS AND REUSE OF SINGLE DOSE VIAL – ARIZONA AND DELAWARE, 2012

<table>
<thead>
<tr>
<th>Clinic Type</th>
<th>Suspected Breaches</th>
<th>Outcomes</th>
</tr>
</thead>
</table>
| Pain Clinic (AZ) | • Prepared ‘morning’ and ‘afternoon’ contrast solution from single dose vials at start of day for multiple patients  
• Failed to wear facemasks during spinal injections | • 3 MRSA infections among patients receiving ‘afternoon’ solution  
• All patients hospitalized, ranging from 4-41 days  
• 1 additional patient found deceased in home; invasive MRSA could not be ruled out |
| Orthopedic Clinic (DE) | • single dose vial accessed over the course of several hours for multiple patients until all contents were withdrawn | • 7 methicillin-susceptible S. aureus infections  
• All patients required debridement of infected sites and antimicrobial therapy  
• Average length of hospitalization was 6 days |

SINGLE DOSE VIALS: CDC POSITION STATEMENT, 2012

- 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 \(797\)

www.cdc.gov/injectionsafety/CDCposition-SingleUseVial.html
3. FAILURE TO USE ASEPTIC TECHNIQUE

Handling and preparing supplies used for injections in a manner that prevents microbial contamination between the injection materials and the non-sterile environment.

NEW JERSEY – ONCOLOGY OFFICE

Single use vials stored and used on subsequent days for multiple patients.
NEW JERSEY – ONCOLOGY OFFICE

IV bags used as sources of fluid to flush catheters for multiple patients

IV bags with stoppers removed

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
NEW JERSEY – ONCOLOGY OFFICE

Reused Vacutainer holders in contact with gauze

Blood contamination

4. UNSAFE DIABETES CARE

Use of fingerstick devices or insulin pens on multiple persons

Sharing of blood glucose meters without cleaning and disinfection between uses

Failure to perform hand hygiene or change gloves between procedures

UNSAFE INJECTIONS: CAUSES & BEST PRACTICES

1. 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.

2. 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.

UNSAFE INJECTIONS: CAUSES AND BEST PRACTICES

3. Failure to use aseptic technique
   • Use aseptic technique when preparing or administering medications.

4. 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.
BEYOND OUTBREAKS

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
ROLE OF HEALTHCARE-ASSOCIATED TRANSMISSION: BEYOND OUTBREAKS

- Among patients ≥55:
  - Those with acute hepatitis B virus or hepatitis C virus are 2.7x more likely to report having had injections in a health care setting.
  - Approximately 37% of acute hepatitis B virus and hepatitis C virus infections attributable to unsafe injections in health care settings.


GROWING RESERVOIR

- Aging population – more frequent interactions with the healthcare system
- “…growing reservoir of infected individuals who can serve as a source of transmission to others if safe injection practices and other basic infection control precautions are not followed”

2010 SURVEY OF PROVIDER PRACTICES

5,500 healthcare professionals
• 1% “sometimes or always” reuse a syringe on a second patient (direct)
• 1% “sometimes or always” reuse a multidose vial after accessing it with a reused syringe (indirect)
• 6% use single-dose/single use vials for more than one patient


WHY ARE WE MISSING THE MARK?

• Knowledge Gaps
  • Poor training
  • Lax or nonexistent policies and procedures
• Knowledge not translated into practice
  • Drug shortages
  • Economic/time pressure
• Malfeasance
  • Drug Diversion
SUMMARY

KNOW AND PRACTICE THESE SIMPLE RULES

Safe injections

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

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

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

Safe diabetes care

• Fingerstick devices should never be used for more than one person.

• Blood glucose meters should be assigned to an individual person.
  • If shared, it must be cleaned and disinfected per manufacturer’s instructions

• Injection equipment (e.g., insulin pens, needles and syringes) should never be used for more than one person.
BEYOND GOOD PRACTICE

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

ACKNOWLEDGMENTS

Slides adapted from the following sources:

- Perz, CDC Public Health Grand Rounds, 11/14/12
- Montana, B. Keeping the Infection out of Injection. NJ Department of Health and Senior Services
- Moore, Zack. Various Slides. NC DHHS.
Injection Safety is Every Provider’s Responsibility!

www.oneandonlycampaign.org

CAMPAIGN RESOURCES

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

Maybe they thought safe injection practices were no big deal...

POSTERS

To Prevent Transmission of Infections in Healthcare

1 needle
1 syringe

BE AWARE
DON'T SHARE

ONE INSULIN PEN, ONLY ONE PERSON

The One & Only Campaign is a public health campaign aimed at raising awareness among the general public and healthcare providers about safe injection practices.
PRINT MATERIALS

WWW.ONEANDONLYCAMPAIGN.ORG

North Carolina Information and State Contact:
http://oneandonlycampaign.org/partner/north-carolina
(919) 715-7461
THANK YOU!