Factors Affecting Compliance with the Safety Agenda

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University of Virginia

Building the Chain of Safety: Stakeholders Summit
College of Physicians, Philadelphia

June 7, 2011
25 years of progress

1984 → present

THE LANCET

NEEDLESTICK TRANSMISSION OF HTLV-III FROM A PATIENT INFECTED IN AFRICA

The Lancet has received news of worrying events in a British hospital and, to preserve confidentiality, an anonymous report seems appropriate.

A doctor in a hospital in northern Africa...
University Hospital, 1985

Overfilled trash

Needles in IV lines

Inappropriate trash disposal
Two Types of Advances:

1 - Pathogen-Specific
- Hepatitis B vaccine
- Effective therapies for HCV
- HIV: PEP for HCWs and ARVs for patients

2 - Exposure Prevention
- Improved sharps disposal systems
- Appropriate personal protective equipment
- Safety-engineered sharp devices
THE

GOOD NEWS . . .
1985
12,500 US HCWs
occupationally infected with HBV
250 deaths

HBV

2010

??
U.S. Health Care Workers with
Occupationally Acquired HIV/AIDS

Progress in Outcome of HCV Infections

Of 10 cases of occupational HCV infection occurring in Italian healthcare workers from 2003-2006 “viral clearance was eventually observed in all cases (3 spontaneously, 4 following therapy during the acute phase and 3 during the chronic phase)”
Exposure Prevention

NO DATA

NO PROBLEM
### Needlestick & Sharp Object Injury Report

**Last Name:**

**First Name:**

**Injury ID:**

**Date of Injury:**

**Type of Injury:**

**Department where Incident Occurred:**

**Home Department:**

**What is the Job Category of the Injured Worker?**

- Clinical Laboratory Worker
- Clerical/Office Worker
- Director/Infectious Disease Control Officer
- Emergency Department
- Infection Control Nurse
- Operating Room/Surgery
- Orthopedist
- Physician
- Radiology
- Respiratory Therapy
- Surgery
- Other

**Where Did the Injury Occur?**

- Patient Room
- Outside Patient Room (hallway, nurse's station, etc.)
- Emergency Department
- Infection Control
- Operating Room/Surgery
- Orthopedist
- Physician
- Radiology
- Respiratory Therapy
- Surgery
- Other

**Was the Source Patient Identified?**

- Yes
- No
- Unknown

**Was the Injured Worker the Original User of the Sharp Item?**

- Yes
- No
- Unknown

**The Sharp Item was:**

- Contaminated (known exposure to patient or contaminated equipment)
- Uncleaned (no known exposure to patient or contaminated equipment)
- Unknown

**For What Purpose was the Sharp Item Originally Used?**

- Unkown
- Incision/Catheterization
- Biopsy
- Biopsy/Resection
- Biopsy/Suturing
- Biopsy/Probing
- Biopsy/Injection
- Biopsy/Sampling
- Biopsy/Stitching
- Biopsy/Biopsy
- Biopsy/Other
- Unkown

**Did the Injury Occur?**

- Yes
- No
- Unknown

**Other:**

- Device
- Other

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**International Healthcare Worker Safety Center, University of Virginia**

**Multi-hospital surveillance in U.S. begins 1993**
A New Generation of Protective Devices

safety-engineered devices

conventional devices

illegal

International Healthcare Worker Safety Center, University of Virginia
Pulling Levers
guidelines, regulations, legislation

CDC 1987
- Universal Precautions Guidelines

OSHA 1991
- Bloodborne Pathogens Standard

FDA 1992 1999
- medical device Safety Alerts

state legislatures 1998
- California then others

national law 2000
- Clinton signs Nov 6, 2000
Dear Colleague:

This is to alert you to the risk of needlestick injuries from the use of hypodermic needles as a connection between two pieces of intravenous (I.V.) equipment. The use of exposed hypodermic needles on I.V. administration sets or the use of syringes to access I.V. administration set ports or injection sites are unnecessary and should be avoided. Hypodermic needles should only be used in situations where there is a need to penetrate the skin.
Injury Rates from Needles on IV Lines Before & After the 1992 FDA Safety Alert
EPINet hospitals, International Healthcare Worker Safety Center

- **1986**: 84/513 injuries per 100 hospital beds
  - 1 teaching hospital
  - FDA alert: 85%

- **1993**: 14/550 injuries per 100 hospital beds
  - 1 teaching hospital

- **1999**: 17/4,454 injuries per 100 hospital beds
  - 9 teaching hospitals
  - 99.9%
Glass Capillary Tubes: Joint Safety Advisory About Potential Risks

February 1999

Dear Colleague:

The Food and Drug Administration (FDA), the National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention (CDC), and the Occupational Safety and Health Administration (OSHA) want to alert you to the potential risk of injury and/or infection from bloodborne pathogens, including human immunodeficiency virus (HIV), hepatitis B and hepatitis C viruses, due to accidental breakage of glass capillary tubes...
Non-Breakable Plastic Hematocrit Tubes
**IV catheter injury rates per 100,000 devices**

- **1986**: 18.4 injuries per 100,000 devices (1 hospital)
- **1993**: 7.5 injuries per 100,000 devices (3 hospitals)
- **1993**: 1.2 injuries per 100,000 devices (3 hospitals)


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The Needlestick Safety and Prevention Act
November 6, 2000
U.S. Estimated percent market share* of safety compared to conventional devices, 1998 – 2009

* Market share (reflects $ spent/purchase volume) and is a proxy for conversion or use

87 hospitals; total injuries = 24,440 (excludes injuries occurring before use of device)

International Healthcare Worker Safety Center, University of Virginia
Figure 3

Device Specific Injury Rates

US EPINet 1993-2004: 87 hospitals; total injuries = 10,778. Excludes injuries occurring before use of device

- Conventional syringe: -22%
- Conventional phlebotomy: -59%
- Conventional butterfly: -23%
- Conventional IV catheter: -53%

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Two areas where progress lags:
Operating Room
Non-hospital settings
OR versus Non-OR Injury Rates


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A misconception about safety-engineered sharp devices
Question: What is the best safety device?

The answer is . . . . .
Wrong question

The correct question is . . . . .

What is the appropriate safety device for the procedure being performed?
<table>
<thead>
<tr>
<th>Safety Feature</th>
<th>IM/SC injection (complete injection)</th>
<th>IM/SC injection (partial injection*)</th>
<th>Blood drawing</th>
<th>Drug mixing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retractable needle</td>
<td>yes</td>
<td>no*</td>
<td>no**</td>
<td>not necessary</td>
</tr>
<tr>
<td>(spring-loaded or manual)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hinged-cap needle</td>
<td>yes</td>
<td>yes</td>
<td>yes***</td>
<td>not necessary</td>
</tr>
<tr>
<td>(with removable needle)</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(with fixed needle)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Articulated, unfolding shield</td>
<td>yes</td>
<td>yes</td>
<td>yes***</td>
<td>not necessary</td>
</tr>
<tr>
<td>(with removable needle)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(with fixed needle)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sliding sleeve</td>
<td>yes</td>
<td>yes</td>
<td>yes***</td>
<td>not necessary</td>
</tr>
<tr>
<td>(with removable needle)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(with fixed needle)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conventional syringe</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>(no safety feature)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* When residual fluid remains in the syringe after injection the plunger cannot be fully depressed and cannot engage the retraction mechanism.

** Safety mechanism cannot be activated before transfer of blood to a specimen container

*** Needle can be covered and removed before transfer of blood to a specimen container.

International Standardized Surveillance

Allows countries to share and compare data and to learn best practices and identify high risk practices wherever they are in use.
EPINet Distribution Around the World Color Coded by Language

International Healthcare Worker Safety Center, University of Virginia
Japan Fellows Program
2000-2004
Figure 1. Percentage of Hollow-Bore Needle Injuries to Healthcare Workers’ Feet, by Device

(Japan and U.S. EPINet Surveillance Networks, 1996-2001)

International Fellows

Dr. Bassem Zayed, Dr. David Meya, Dr. Sydney Shampile

International Healthcare Worker Safety Center, University of Virginia
World Health Organization Project Protecting Healthcare Workers
King Saud Bin Abdulaziz University for Health Sciences
Riyadh, Saudi Arabia, August 2009

International Healthcare Worker Safety Center, University of Virginia
Japanese colleague: Progress is slow, our steps are small.
Distance traveled

Look behind you to see how far you have come.