Occupational Exposure to Bloodborne Pathogens

Epidemiology Objectives

• Compare the risk of injection from contaminated needlestick exposures for HIV, HBV, and HCV

• Describe the most common procedures where needlesticks occur

• Identify device and injury characteristics that affect risk of infection
Occupational Exposure to Bloodborne Pathogens

2 million exposures per year
In Healthcare workers:
• 40% of Hepatitis B
• 40% of Hepatitis C
• 4.4% of HIV
Are due to needlestick injuries (50% of hospitalized patients in sub-Saharan Africa are HIV +)

WHO Environmental Burden of Diseases Series No. 3
## Risk of Virus Transmission Following Percutaneous Injury

<table>
<thead>
<tr>
<th>Virus</th>
<th>Chance of HCW Infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBV</td>
<td>6 – 30 out of 100 people</td>
</tr>
<tr>
<td>HCV</td>
<td>3 – 10 out of 100 people</td>
</tr>
<tr>
<td>HIV</td>
<td>1 out of 300 people</td>
</tr>
</tbody>
</table>
Highest Risk Needlesticks

Of the 55 CDC documented cases of occupational transmission of HIV, 90% were from contaminated hollow-bore needles that pierced the skin.

CDC, HIV-AIDS Prevention, 12/98
Risk Factors that Increase the Likelihood of HIV Transmission Following a Needlestick

#1 Deep injury
#2 High viral titer in patient
#3 Visible blood on device
#4 Device in artery/vein

Treatment of healthcare workers with AZT following needlesticks involving an HIV positive source patient have been shown to decrease the risk of HIV transmission.

CDC, MMWR 6/98
Devices Associated with Percutaneous Injuries, 1999

N = 4951 injuries; Source: CDC NaSH data 1995-1999
Major Causes of Percutaneous Injuries with Hollow-bore Needles, USA, 1999

- Manipulating needle in patient: 27%
- Disposal related: 12%
- Handling / passing: 11%
- Cleanup: 11%
- Improper Disposal: 10%
- IV line-related: 8%
- Collision HCW: 8%
- Specimens: 5%
- Recapping: 5%
- Other: 4%

(N = 3,057  Source: CDC NaSH 1995 -1999)
Decline in HBV Cases Among Healthcare Workers Following Vaccination

This regulation had the greatest impact in eliminating HBV transmission among healthcare workers.

But . . . Over 80% of Healthcare Workers Remain Unimmunized in many parts of the world

Despite 95% Efficacy of HBV Immunization
Exposure control planning

• Management Commitment and Worker Involvement
• Determination of Exposure: case definition
• Hepatitis B immunization
• Post-exposure evaluation and follow-up
• Communication of hazards to employees and training
• Recordkeeping (sharps injury log and surveillance system) and use of info/data for prevention
• Procedure for evaluating circumstances surrounding an exposure
• Implementation of methods of exposure control (apply hierarchy of controls)
REPORTING IS IMPORTANT

Reporting Ensures

• Proper treatment & follow-up

• Financial compensation, if necessary

• Engineering or procedure changes
THANK YOU!

For Caring for those who Care!