

# 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 +)

# Risk of Virus Transmission Following Percutaneous Injury

## Virus

## Chance of HCW Infection

HBV	6 – 30 out of 100 people
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HCV	3 – 10 out of 100 people
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HIV	1 out of 300 people
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# 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**

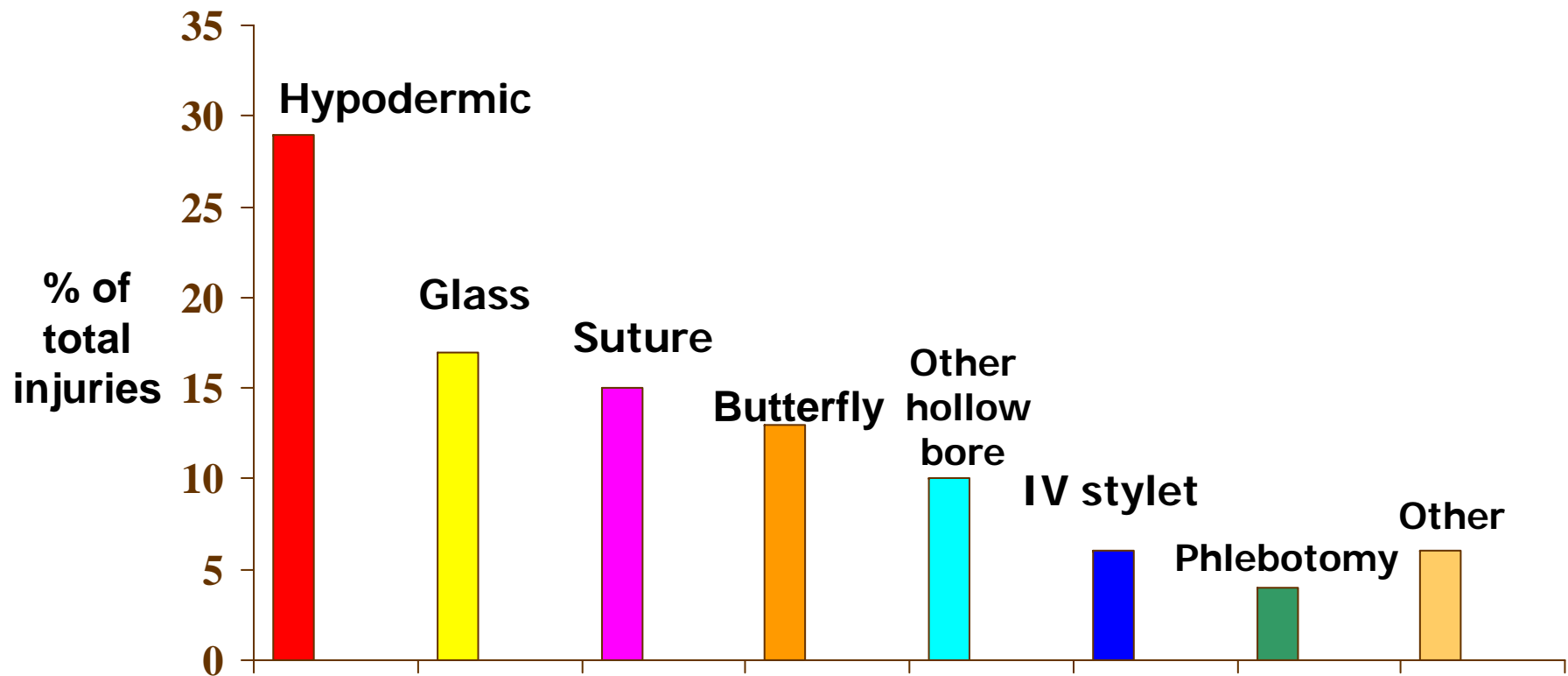
# **Risk Factors that Increase the Likelihood of HIV Transmission Following a Needlestick**

- #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.**

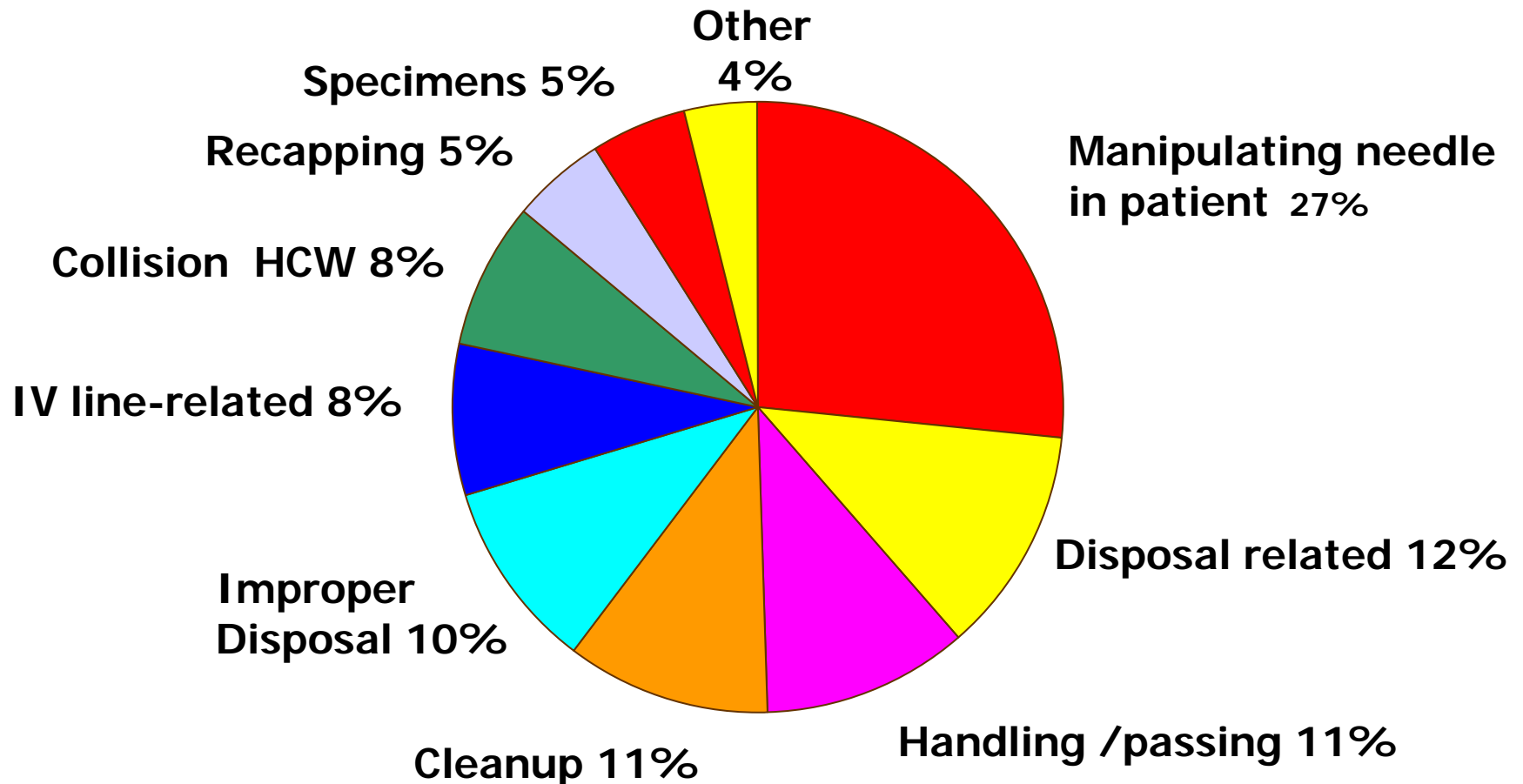
**CDC, MMWR 6/98**

# Devices Associated with Percutaneous Injuries, 1999



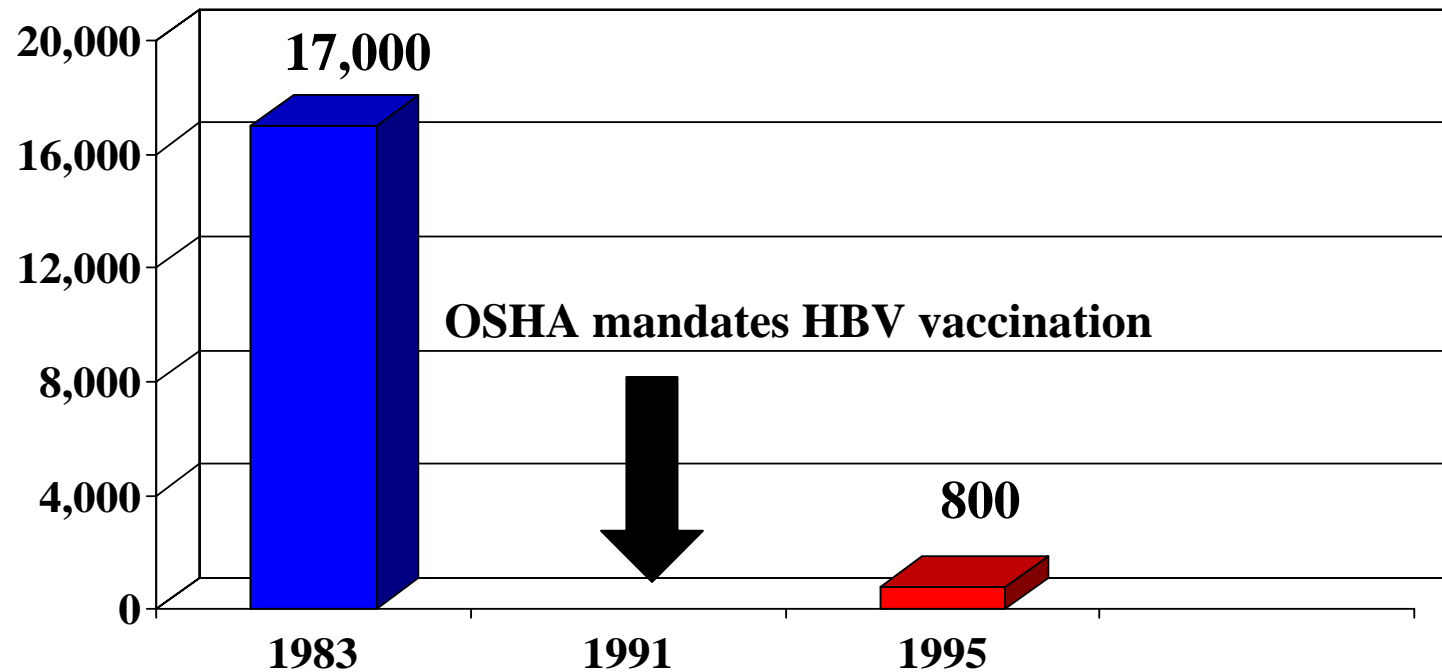
N = 4951 injuries; Source: CDC NaSH data 1995-1999

# Major Causes of Percutaneous Injuries with Hollow-bore Needles, USA, 1999



( 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.**

Mahoney F et al. Archives of Int Med 157 (1997): 2601-2603

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!

