

Bloodborne Pathogens Across the Continuum of Care

Sue Sebazco, Arlington, Texas

A Webber Training Teleclass

Bloodborne Pathogens Across the Continuum of Care

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A Webber Training Teleclass www.webbertraining.com

Objectives

- Define occupational exposure to bloodborne pathogens
- Describe an exposure incident
- Review the principles of exposure management, including post exposure prophylaxis (PEP)
- Discuss management of the infected health care worker
- Emphasize "Prevention is Primary"

BLOODBORNE PATHOGENS

- Precautions to prevent occupational transmission
- Follow local, state, federal and provincial/territorial regulations and guidelines
- "Prevention is Primary"

Updated U.S. Public Health
Service Guidelines for the
Management of Occupational
Exposures to HBV, HCV, and
HIV and Recommendations for
Postexposure Prophylaxis

CDC. MMWR 2001;50(RR 11)
<http://www.cdc.gov/mmwr/PDF/rr/rr5011.pdf>

Updated U.S. Public Health
Service Guidelines for the
Management of
Occupational Exposures to
HIV and Recommendations
for Postexposure
Prophylaxis

September 30, 2005

Prevention and Control of Occupational Infections in Health Care

Health Canada. CCDR March
2002

Bloodborne Pathogens (Hepatitis
B Virus, Hepatitis C Virus, or
Human Immunodeficiency Virus)

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OSHA Definition

- **Occupational exposure:**
 - Reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the employee's duties

OSHA Definition

- **Exposure incident:**
 - A specific eye, mouth, or other mucous membrane, non intact skin, or parenteral contact with blood or other potentially infectious materials that results from the performance of an employee's duties

Public Health Agency of Canada

- Injuries in which one of the infected fluids comes into contact with the HCW's:
 - tissue under the skin (e.g. percutaneous or following a bite when the skin is broken)
 - non-intact skin (e.g. cut, chapped or abraded skin ±)
 - mucous membrane (e.g. eyes, nose, or mouth).

Other potentially infectious materials (OPIMs):

- semen
- CSF
- pleural fluid
- amniotic fluid
- any body fluid visibly contaminated with blood
- body fluids where it is difficult or impossible to differentiate between body fluids
- unfixed tissue or organ
- vaginal secretions
- synovial fluid
- pericardial fluid
- saliva (dental)

Preventing Transmission of Bloodborne Viruses in Healthcare Settings

- Promote hepatitis B vaccination
- Treat all patients as potentially infectious
- Use barriers to prevent blood/body fluid contact
- Prevent percutaneous injuries

Elements of an Effective Postexposure Management Program

- Clear policies/procedures
- Training of healthcare personnel (HCP)
- Rapid access to
 - clinical care
 - postexposure prophylaxis (PEP)
 - testing of source patients/HCP
- Injury prevention assessment

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Elements of Postexposure Management

- Wound management
- Exposure reporting
- Assessment of infection risk
 - type and severity of exposure
 - bloodborne infection status of source person
- Appropriate treatment, follow-up, and counseling

Postexposure Management: Wound Care

- Clean wounds with soap and water
- Flush mucous membranes with water
- No evidence of benefit for:
 - application of antiseptics or disinfectants
 - squeezing (“milking”) puncture sites
- Avoid use of bleach and other agents caustic to skin

OSHA’S BBP RULE REVISIONS 1-18-2001

- Modification of definitions relating to engineering controls
- Revision & updating of exposure control plan
- Solicitation of employee input
- Recordkeeping

OSHA SHARPS INJURY LOG

- Identification of device
- Location of the incident
- Circumstances surrounding the incident

OSHA SHARPS INJURY LOG

- Procedure being performed
- Body part affected
- Objects or substances involved
- **Protect privacy of the injured employee

HEPATITIS B

- Vaccine
- Post vaccine screening
- Revaccination
- Staff in chronic dialysis centers
- Postexposure-susceptible personnel

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Postexposure Management: Baseline HBV Testing of Exposed* Person

- Test for anti-HBs if person has been vaccinated, but vaccine response is unknown
- Baseline testing not necessary if exposed person has not been vaccinated or vaccine response is known

* Source HBsAg positive or status unknown

HEPATITIS B VACCINES

Are booster doses necessary?

- **NO**
- **Reliance on immunological memory rather than booster doses to protect against breakthrough memory**
- **Maintenance of antiHBs > 10mIU/ml is not necessary**

Lancet 2000; 355:561-65

HEPATITIS C Occupational Acquisition

- **1.8% risk of transmission per needlestick**
- **15% of those infected will resolve the illness**
- **1/4 of the 85% who develop chronic hepatitis will progress to cirrhosis and/or death**

Postexposure Prophylaxis for HCV

- Not recommended after exposure
 - immunoglobulin not effective
 - no data on use of antivirals (e.g., interferon), and may be effective only with established infection
 - antivirals not FDA approved for this setting

Postexposure Management: Follow-up of HCV-Exposed HCP

- Test for anti-HCV and ALT 4-6 months after exposure
- Test for HCV-RNA at 4-6 weeks for earlier diagnosis of HCV infection.
- Confirm anti-HCV EIA-positive results with supplemental test (e.g., RIBA)
- No guidelines for therapy during acute infection
 - when HCV infection identified early, refer worker to a specialist for proper management

Postexposure Management: HCV Postexposure Counseling

- Refrain from donating blood, plasma, organs, tissue, or semen.
- No need for:
 - modification of sexual practices or refraining from becoming pregnant
 - special precautions to prevent secondary transmission.
 - modification to patient care responsibilities for exposed person, even if HCV infected

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OCCUPATIONALLY ACQUIRED AIDS/HIV in US THROUGH JUN 2001 in HCWs

OCCUPATION	DOCUMENTED	PROBABLE
TOTAL	57	137
Nurse	24	34
Lab, clinical	19	17
Physician, nonsurgical	6	12

CASE CONTROL STUDY

- 33 Case patients
 - 23 US
 - 5 France
 - 3 UK
 - 2 Italy
- 679 Controls
 - All US

NEJM 1997

CASE CONTROL STUDY

RISK INCREASES FOR EXPOSURES INVOLVING

- Deep injury
- Visible blood on device
- Device in source's vein or artery
- Source died of AIDS within 60 days post exposure

Average Risk of HIV Infection by Exposure Route

Percutaneous	0.3%
Mucous membrane	0.1%
Non-intact skin	<0.1%

POSTEXPOSURE MANAGEMENT HIV Testing of Exposure Source

- ELISA/EIA
 - Consider rapid test if turnaround > 24-48 hours
- Direct virus assays not recommended
- HIV testing of needles/other sharps not recommended
- If source person is HIV negative and has no clinical evidence of HIV infection, further testing of the source is not indicated

CONSIDERATION WHEN USING PEP

- Risk of transmission
- Risk of adverse effects

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HIV PEP

- If indicated, start PEP ASAP after exposure
 - Hours rather than days
 - Regard as an urgent medical concern
- Consider re-evaluation of the exposed person within 72 hours
 - Additional information about the source person may become available
 - If the source person is determined to be HIV-negative, stop PEP

Resistance to Antiretroviral Agents: Implications for PEP

- Resistance to antiretroviral drugs reported
- Transmission of resistant virus reported
- Relevance of exposure to resistant virus not understood
- Patients take many drugs; difficult to know to which drug virus is resistant
- Cross-resistance within drug classes

Resistance to Antiretroviral Agents: Implications for PEP (cont.)

- Recommend selection of drugs to which the source person's virus is unlikely to be resistant
 - Testing of the source person's virus for resistance at the time of exposure is not recommended
- EXPERT CONSULTATION IS ADVISED

HIV PEP Considerations in Pregnant Exposed Women

- **General principles**
 - pregnancy is not a contraindication for PEP
 - exposed person should make informed decision about PEP
- **Choosing regimen is more complex**
 - may exacerbate physiologic changes in pregnancy
 - short/long-term effects on fetus/newborn unknown
 - most data are on zidovudine
 - some drugs contraindicated during pregnancy

Postexposure Management: Follow-up HIV Testing of Exposed Person

- If source HIV positive, test at 6 weeks, 3 months, 6 months
 - EIA standard test
 - direct virus assays not recommended
- Extending follow-up to 12 months
 - recommended for HCP who become infected with HCV following exposure to co-infected source
 - optional in other situations

Postexposure Management: Monitoring for PEP Toxicity

- Tests at baseline and 2 weeks after starting PEP
 - complete blood count
 - renal and hepatic profiles
- Follow-up testing if taking protease inhibitor
 - monitor for hypoglycemia
 - monitor for crystalluria, hematuria, hemolytic anemia, and hepatitis if on indinavir
- Modify regimen if toxicity noted
- Expert consultation encouraged

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Postexposure Management: HIV Postexposure Counseling

- Side effects of PEP drugs
- Signs and symptoms of acute HIV infection
 - fever
 - rash
 - flu-like illness
- Prevention of secondary transmission
 - sexual abstinence or condom use
 - no blood/tissue donation
- Transmission and PEP drug risks if breastfeeding

No work restriction indicated

Infected HCW

- Should seek testing for HIV, HBV, HCV
 - Previous significant exposure
 - Personal risk factors
- Disclosure of positive status not permissible without HCW's consent

Infected HCW

- HCWs with infectious disease that could put a patient at risk
- Fundamental ethical principle
- Seek medical evaluation

Infected HCW

- Physicians who care for infected HCWs encouraged to seek advice on assessing work practices and potential risk for transmission

Canadian Definition Exposure Prone Definition

- HBV, HCV, HIV transmission from HCW to Pt most likely to occur:
 - Digital manipulation of needle tip in a body cavity/simultaneous presence of HCW's finger and needle/sharp instrument in a blind or highly confined site

Canadian Definition Exposure Prone Definition

- HBV, HCV, HIV transmission from HCW to Pt most likely to occur:
 - Repair of major trauma injuries
 - Major cutting or removal oral or perioral tissue

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Prevention
is
Primary

Centers for Disease Control

The Next Few Teleclasses

July 18	<i>Infection Surveillance in the UK</i> ... with Dr. Allan Johnson, NHS
July 27	<i>Dermal Absorption of Alcohol Disinfectants</i> ... with Dr. Axel Kramer, Germany <small>Teleclass sponsored by Deb SBS www.debsbs.com</small>
August 17	<i>The Spectre of a Flu Pandemic – Is It Inevitable?</i> ... with Dr. Lance Jennings, New Zealand
August 24	<i>How to Assess Risk of Disease Transmission When There is a Failure to Follow Recommended Disinfection and Sterilization Principles</i> ... with Dr. William Rutala, UNC <small>Teleclass sponsored by Virox Technologies Inc www.virox.com</small>

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