

Bloodborne Pathogens

Safety Guidelines



What are bloodborne pathogens?

- Bloodborne pathogens are infectious materials in blood, and other body fluids, that can cause disease in humans.
- Hepatitis B virus (HBV), Hepatitis C virus (HCV), and the Human Immunodeficiency Virus (HIV) are of primary concern for transmission, for health care workers.

(Center for Disease Control and Prevention [CDC], 2010)

Hepatitis B Virus

(HBV)



Transmission of HBV

Spread by parenteral contact with:

- o Infected blood
- o Infected blood products
- o Contaminated needles
- o Infected mother to her newborn
- o Sexual contact.

(Copstead & Banasik, 2010; Heymann, 2008)

Incubation of HBV

- o Usually 45-180 days
- o Average 60-90 days
- o Acute infection (lasting a few weeks)
- o Chronic infection (long term disease that can lead to liver failure or liver cancer).

(Copstead & Banasik, 2010; Heymann, 2008)

Diagnosis of HBV

- o Serologic detection of HBsAG (surface antigen)
- or**
- o Antibody to HBcAG (core antigen).

(Copstead & Banasik, 2010; Heymann, 2008)

Treatment of HBV

- Mostly supportive with acute hepatitis
- Most non-fulminant infections resolve spontaneously
- Approximately 5% of acute infections lead to chronic infections

(Copstead & Banasik, 2010; Heymann, 2008)

Prevention of HBV

- Vaccination with HBV vaccine given at 0, 1, and 6 months.
- After full course of vaccine antibodies are present in 95% of recipients.
- Recommended for all health care workers.
- Use of personal protective equipment.

(Copstead & Banasik, 2010; Heymann, 2008)

Hepatitis C Virus

(HCV)

Transmission of HCV

Spread primarily parenteral through:

- Contaminated blood or blood products
- Contaminated needles
- Other activities that break the skin (ex. unsterilized equipment, Tattooing, etc).
- Sexual and mother to child transmission has been documented, although rare.

(Copstead & Banasik, 2010; Heymann, 2008)

Incubation of HCV

- 2 weeks- 6months, usually 6-9 weeks.
- Chronic infection can be present for up to 20 years before liver disease ensues.
- Only 15% of acute infections resolve, the remainder progress to chronic infection which is one of the most common causes of cirrhosis and end-stage liver disease, can also cause liver cancer.

(Copstead & Banasik, 2010; Heymann, 2008)

Diagnosis of HCV

- o Serologic, antibody to HCV (anti-HCV).

(Copstead & Banasik, 2010; Heymann, 2008)

Treatment of HCV

- Supportive
- Can be treated if complications occur (liver failure).
- If liver failure ensues can be treated with medications: interferon and ribavirin
- Liver transplant can be an option if liver failure ensues

(Copstead & Banasik, 2010; Heymann, 2008)

Prevention of HCV

- o There is **no** vaccine.
- o Use of personal protective equipment.

(Copstead & Banasik, 2010; Heymann, 2008)

Human Immunodeficiency Virus (HIV)

Transmission of HIV

Spread through:

- o Contaminated blood or blood products
- o Bodily fluids
- o Sexual contact
- o Contaminated needles
- o Mother to child
- o Unsterilized equipment
- o Exposed cuts or scratches to hands

(Copstead & Banasik, 2010)

Incubation of HIV

- o Ranging from 3 weeks to 6 months after exposure
- o Rarely up to 14 months.

(Copstead & Banasik, 2010)

Diagnosis of HIV

- Enzyme-linked immunosorbent assay (ELISA)- to detect antibodies to HIV
- Western blot- also used to detect antibodies to HIV.
- AIDS is a CD4+ count of <200 uL **with** an opportunistic infection.

(Copstead & Banasik, 2010)

Treatment of HIV

- Anti-retrovirals
- Nucleoside reverse transcriptase inhibitors
- Non-nucleoside reverse transcriptase
- Protease inhibitors
- Fusion inhibitors
- CCR5
- Other treatments

(Copstead & Banasik, 2010)

Prevention of HIV

- o There is **no** vaccine.
- o Use of personal protective equipment

(Copstead & Banasik, 2010)

Health Care worker Statistics



Hepatitis B

- Infections that occur in health care industry accounts for 3% of U.S. infections (Copstead & Banasik, 2010, p. 886).
- Transmission from a single needle stick risk is approximately 6-30%. (CDC, 2003)
- Vaccination almost eliminates risk (Copstead & Banasik, 2010, p. 887; CDC, 2003).

Hepatitis C

After a needle stick with an infected needle there is a 1.8% risk of transmission.

(CDC, Hepatitis C FAQ's, 2011)

HIV

- o There has been no documentation of confirmed cases of occupational transmission of HIV since 1999 (CDC, Occupational HIV Transmission, 2011).
- o Risk of exposure from a single needle stick is approximately 0.3% (Copstead & Banastik, 2010, p. 887).

Prevention

- Complete HBV vaccination
- Wash your hands before and after contact with patients
- Wear disposable gloves when there is a possibility of coming in contact with blood or blood products, anything contaminated by blood, performing an accu check, or a heel stick.
- When there is a potential risk of splashes or airborne droplets don gowns, mask, goggles, and face shields.

(Copstead & Banasik, 2010, p. 268)

Prevention Continued

- o Dispose of sharps appropriately (in labeled hospital approved containers) and immediately after use.
- o Use syringes and needles with safety devices in place and use them as directed
- o Use Resuscitation bags, no mouth to mouth.

(Copstead & Banasik, 2010, p. 268)

If Exposed...

- o Immediately wash needle stick area with soap and water.
- o Splashes: flush nose, mouth and skin with water.
- o Irrigate eyes with clean water, sterile saline, or sterile irrigants.
- o Report incident to immediate supervisor and follow hospital policy and procedure for post-exposure.
- o Begin Treatment if indicated

(CDC, 2003)

Post-Exposure Treatment Options

Hepatitis B Post-Exposure Treatment

Hepatitis B Immune Globulin (HBIG) alone or with concurrent Hepatitis B vaccination (if not vaccinated).

Treatment should occur as soon as possible after exposure, preferably within 24 hours, no later than 7 days.

(CDC, 2003)

Hepatitis C Post- Exposure Treatment

- o There is no vaccine.
- o There are no treatment recommendations.

(CDC, 2003)

HIV Post-Exposure Treatment

- Post-exposure prophylaxis (PEP) may be used after a high risk exposure.
- PEP should be discussed with physician due to serious side effects of the medications, and should not be used if there is no risk of transmission.
- PEP, if used, should be started within 72 hours of exposure and last 4 weeks.

(CDC, 2003)

References

- Center for Disease Control and Prevention. (2003). *Exposure to blood: What health care personnel need to know*. Retrieved from:
http://www.cdc.gov/ncidod/dhqp/pdf/bbp/exp_to_blood.pdf
- Center for Disease Control and Prevention. (2010). *Workplace safety & health: Bloodborne infectious diseases: HIV/AIDS, Hepatitis B, Hepatitis C*. Retrieved from: <http://www.cdc.gov/niosh/topics/bbp/>
- Center for Disease Control and Prevention. (2011). *Hepatitis C FAQ's for health professionals*. Retrieved from:
<http://www.cdc.gov/hepatitis/hcv/hcvfaq.htm#f1>
- Center for Disease Control and Prevention. (2011). *Occupational HIV transmission and prevention among health care workers*. Retrieved from:
<http://www.cdc.gov/hiv/resources/factsheets/PDF/hcw.pdf>
- Copstead, L. C. & Banasik. (2010). *Pathophysiology (4th Ed.)*. St. Louis, MO: Saunders Elsevier.
- Heymann, D. L. (2008). *Control of communicable diseases manual (19th Ed)*. Washington, D.C: American Public Health Association