

Needlesticks and Bloodborne Pathogens

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RISK OF INFECTION

Following exposure, the risk of infection depends on:

- The pathogen involved
- The type of exposure
- The amount of blood involved in the exposure
- The amount of virus in the patient's blood at the time of exposure

BLOODBORNE PATHOGENS

HBV

- Hepatitis B Virus

HCV

- Hepatitis C Virus

HIV

- Human Immunodeficiency Virus

Tetanus

- *Clostridium tetani*

BLOODBORNE PATHOGENS

HBV

• Hepatitis B Virus

Number of healthcare personnel infected with HBV

- 95% decrease in annual number of occupational infections since 1982
 - 1983: >10,000
 - 2001: <400

Risk of infection following exposure

- Vaccinated persons
 - No risk
- Susceptible persons
 - 6 – 30%
 - Depends on HBeAg status

BLOODBORNE PATHOGENS

HBV

• Hepatitis B Virus

Signs and Symptoms of HBV

- Most children and immunosuppressed adults have no symptoms
- 30% – 50% of adults may have symptoms including:
 - Fever
 - Fatigue
 - Loss of appetite
 - Nausea
 - Vomiting
 - Abdominal pain
 - Dark urine
 - Clay-colored bowel movements
 - Joint pain
 - Jaundice

BLOODBORNE PATHOGENS

HBV

• Hepatitis B Virus

Severity of HBV

- Acute infection
 - Ranges from asymptomatic (mild) disease to fulminant hepatitis
 - More severe among adults > 60 years
 - Fatality rate among acute cases 0.5% – 1%
- Chronic infection
 - If infected during childhood – 25%
 - If Infected after childhood – 15%
 - Remainder remain asymptomatic until onset of cirrhosis or liver cancer
 - Premature death from cirrhosis or liver cancer
 - Causes 2,000 – 4,000 deaths/year

BLOODBORNE PATHOGENS

HBV

• Hepatitis B Virus

Statistics

- In United States
 - Estimated 43,000 persons newly infected with HBV
 - Overall incidence: 1.5 per 100,000 population
 - Estimated 800,000 to 1.4 million persons have chronic Hepatitis B virus infection
- Rates highest among adults, especially males aged 25 – 44 years

Prevention

- Effective vaccines available
 - Two single antigen and three combination vaccines available in the United States

BLOODBORNE PATHOGENS

HCV

• Hepatitis C Virus

Number of healthcare personnel infected with HCV

- No exact estimates
 - 1% of hospital healthcare personnel
 - 3% of the US population
 - Number acquired through occupational exposure is unknown

Risk of infection following exposure

- Susceptible persons
 - 1.8%

BLOODBORNE PATHOGENS

HCV

• Hepatitis C Virus

Signs and Symptoms of HCV

- Most persons have mild or no symptoms
- Symptoms are the same as with HBV
- 20% – 30% experience:
 - Fatigue
 - Abdominal pain
 - Poor appetite
 - Jaundice

BLOODBORNE PATHOGENS

HCV

• **Hepatitis C Virus**

Severity of HCV

- Acute infection
 - 15% – 25% of infected persons clear the virus from their bodies without treatment and do not develop chronic infections
 - Reasons are unknown
 - Fatality rate among acute cases 0.5% – 1%
 - HCV infection becomes chronic in 75% – 85% of cases
- Chronic infection
 - Most are asymptomatic
 - May have chronic liver disease, ranging from mild to severe
 - Including cirrhosis or liver cancer
 - Usually progresses slowly without signs or symptoms over several decades

BLOODBORNE PATHOGENS

HCV

• Hepatitis C Virus

Statistics

- In United States
 - Estimated 17,000 persons newly infected with HCV
 - Estimated 3.2 million persons have chronic Hepatitis C virus infection
- Of every 100 persons infected with HCV, approximately
 - 75 – 85 will develop chronic infection
 - 60 – 70 will develop chronic liver disease
 - 5 – 20 will develop cirrhosis over a period of 20 – 30 years
 - 1 – 5 will die from the consequences of chronic infection

Prevention

- There is no vaccine

BLOODBORNE PATHOGENS

HIV

- Human Immunodeficiency Virus

Number of healthcare personnel infected with HIV

- Occupationally-acquired HIV infection among healthcare personnel since 1985
 - 57 documented cases
 - 138 possible cases

Risk of infection following exposure

- Susceptible persons
 - 0.3% (or about 1 In 300)
 - 99.7% of needlestick exposures do **NOT** lead to infection

BLOODBORNE PATHOGENS

HIV

- Human Immunodeficiency Virus

Signs and Symptoms of HIV/AIDS

- Flu-like symptoms lasting about a week, occurring within a few weeks of infection
- No symptoms
- May appear and feel healthy for several years
- Untreated HIV infection is associated with many diseases
- AIDS is late stage of HIV infection
 - Destruction of the immune system
 - Difficulty fighting diseases and certain cancers

BLOODBORNE PATHOGENS

HIV

- Human Immunodeficiency Virus

Severity of HIV/AIDS

- Existing treatments may slow progression from HIV infection to AIDS
 - Medication must be taken for the remainder of the person's life
 - Patient requires careful monitoring
 - Medication is costly and has potential side effects
- Currently no cure

BLOODBORNE PATHOGENS

HIV

- Human Immunodeficiency Virus

Statistics

- 42,793 new cases of AIDS were diagnosed in 2009
 - 76% males
 - 24% females
- 16,769 deaths among people with HIV infection in 2008
- 679,589 persons living with HIV infection at the end of 2008

Prevention

- There is no vaccine

BLOODBORNE PATHOGENS

Tetanus

- *Clostridium tetani* infection

Tetanus

- Serious disease of the nervous system
- Caused by *Clostridium tetani* bacteria
- Causes painful tightening of the muscles, usually all over the body
- Can lead to “locking” of the jaw
 - Cannot open mouth or swallow
 - Leads to death in 1 in 10 cases

BLOODBORNE PATHOGENS

Tetanus

- *Clostridium tetani* infection

Signs and Symptoms of Tetanus

- Early symptoms:
 - Lockjaw
 - Stiffness in the neck and abdomen
 - Difficulty swallowing
- Later symptoms:
 - Severe muscle spasms
 - Generalized tonic seizure-like activity
 - Severe autonomic nervous system disorders

BLOODBORNE PATHOGENS

Tetanus

- *Clostridium tetani* infection

Severity of Tetanus

- Complications
 - Bone fractures
 - Abnormal heart rhythm

Statistics

- Death in 10% – 20% of cases
 - Highest rates occurring among older people

Prevention

- Effective vaccines readily available
 - **Everyone needs protection from tetanus**
 - Booster shot every 10 years

EXPOSURE FOLLOW-UP

If a needlestick exposure occurs:

- Wash area with soap and water
 - No scientific evidence for use of antiseptics or squeezing the wound
 - Do **NOT** use bleach or other caustic agent
- Report the exposure **IMMEDIATELY**

PREVENTION IS THE KEY



Public responsibility
with
Personal accountability

Thank you

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