



OCCUPATIONAL  
M E D I C I N E  
P H Y S I C I A N S

## FULL SERVICE OCCUPATIONAL HEALTH CLINICS EXPERIENCE THE DIFFERENCE

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## BLOODBORNE PATHOGENS

### WHAT ARE BLOODBORNE PATHOGENS(BBP)?

Bloodborne pathogens are infectious materials in blood that can cause disease in humans, including Hepatitis B (HBV), Hepatitis C (HCV) and HIV. Exposure to these pathogens can cause serious illness or death.

### PREVENTION OF OCCUPATIONAL EXPOSURE

Many needlesticks and other cuts can be prevented by using safer techniques – not recapping needles by hand, disposing of used needles in appropriate sharps disposal containers, and using medical devices with safety features designed to prevent injuries.

Also using appropriate barriers such as gloves, eye and face protection, or gowns when contact with blood is expected can prevent many exposures to the eyes, nose, mouth, or skin.

### TRANSMISSION IN OCCUPATIONAL SETTING:

- Needlestick/sharp injuries
- Mucous membrane exposure
- Non-intact skin exposure to contaminated blood or other potentially infectious materials

### OMP CAN PROVIDE THE FOLLOWING IN CASE OF A BBP EXPOSURE:

- Immediate treatment of the wound or exposed area
- Lab tests for BBPs
- Hepatitis B vaccines if indicated
- Counseling regarding the risks of BBP
- Testing of source blood
- Initiation of post exposure prophylaxis medication, if indicated
- Follow up testing
- Completion of Hepatitis B vaccine series.

[MORE SPECIFIC DETAILS ON FOLLOWING PAGES](#)

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### WHAT TYPE OF MATERIALS ARE CONSIDERED INFECTIOUS?

Potentially infectious materials are materials that can carry BBPs. They include:

- Human blood and blood products
- Semen
- Vaginal secretions
- Spinal fluid
- Amniotic fluid
- Other internal human body fluids from joints, chest cavity, heart sac or abdomen
- Saliva during dental procedures
- Breast milk(only by ingestion- known to transmit HIV)
- Human cell lines or strains that have not been documented to be free of BBPs by testing
- Unfixed human tissues or organs(living or dead)
- Blood or tissues from animals experimentally infected with BBPs.
- Cultures or other solutions containing BBPs, such as HIV, HBV, or HCV
- Equipment contaminated with human blood potentially infected materials
- Any blood fluid that is visibly contaminated with blood, or that is difficult or impossible to distinguish.

### WHAT IS *NOT* CONSIDERED A POTENTIALLY INFECTIOUS MATERIAL?

- Tears
- Sweat
- Saliva(except during dental procedures)
- Vomit
- Feces
- Urine
- Nose fluids
- Intact human skin(living or dead source)

*Unless* the material is visibly contaminated with blood, or is difficult or impossible to distinguish.

### WHO IS AT GREATEST RISK FOR A BBP EXPOSURE?

- Medical personnel
- Teachers
- Police officers
- Sanitation workers
- Laboratory personnel, including blood banks and hemodialysis clinics
- Plumbers
- Maintenance workers
- Dentists or dental assistants
- Healthcare clinics in industrial, educational, and correctional facilities
- Housekeepers and laundry personnel in medical facilities
- Employees of funeral homes and mortuaries
- Hospice and home healthcare workers

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- Staff and inmates of correctional facilities
- Staff of nursing homes, long-term facilities, and institutions for the developmentally disabled
- EMS personnel and firefighters

### TRANSMISSION

HIV and Hepatitis B are transmitted via the following routes:

- Sexual contact
- Sharing HIV or HBV contaminated needles or syringes
- To unborn child from mother

Hepatitis C is transmitted by blood and possibly by sexual contact.

The risk of infection may vary with factors such as:

- 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.

### TESTING

These are the following tests that are performed on BBP exposure.

Anti-HBs (quant) – this gives a number value to the Hepatitis B testing, telling us if the patient has developed antibodies sufficient to be immune. If the value is 10ml IU/mL, they have developed antibodies sufficiently.

They develop the antibodies from having the disease or vaccines. Some individuals may not be aware that they have had the disease because it can cause a viral like illness.

If the value is under 10, they will need a booster.

HbsAg – Hepatitis B surface antigen is a marker of infectivity. Its presence indicates either acute or chronic HBV infection.

HbcAb – Antibody to hepatitis B core antigen is a marker of acute, chronic, or resolved HBV infection.

It is NOT a marker of vaccine-induced immunity.

HCV – Antibody that indicates present or past infection with Hepatitis virus.

HIV – A positive test indicates past or present infection of disease. It may not turn positive for up to 6 months after exposure.

Because it may take time for the virus to show up in the blood, it is extremely important for patients to have their blood tested 6 weeks, 12 weeks, and 6 months after the initial exposure.

### CLINICAL MANIFESTATIONS OF HIV INFECTION

The spectrum of HIV infections ranges from an asymptomatic state to severe immunodeficiency and associated opportunistic infections, neoplasms, and other conditions.

- Initial infection can be followed by an acute flu-like illness.
- Features include fever, enlarged lymph nodes, sweats, muscle pain, joint pain, rash, fatigue, sore throat, and headache.
- The natural history of HIV infection can vary from person to person.
- Most cohort studies that have evaluated the natural history of HIV infection show that less than 5% of HIV-infected adults develop AIDS within 2 years of infection; without therapy, approximately 20-25% develop AIDS within 6 years after infection, and 50% within 10 years. Three clinical conditions account for >75% of initial AIDS-indicator diseases in 1992: *P. carinii* pneumonia, HIV wasting syndrome, and candidiasis of the esophagus.

### CLINICAL MANIFESTATIONS OF HEPATITIS B VIRUS

The clinical presentation of acute HBV ranges from asymptomatic, subclinical illness to fulminant liver failure.

- The disease has a long incubation period from 30 to 180 days.
- Initial symptoms are nonspecific, typically include fatigue, anorexia, vomiting, fever, rash, and pain in joints.
  
- These symptoms last 3-10 days.
- This is followed by the onset of jaundice (yellow color of skin or sclera of eyes) and/or dark urine.
- Fulminant viral hepatitis is defined as the development of severe acute liver failure with hepatic encephalopathy (causes problems in the brain) within 8 weeks of the onset of symptoms with jaundice.
- The most distinctive laboratory finding of viral hepatitis is dramatic elevations of aminotransferases (ALT and AST).
- The diagnosis of HBV rests on specific serologic testing, with the finding of HBV surface antigen (HbsAg) in the serum during the acute phase.

### HEPATITIS B VACCINE

- Given as a series of three injections, the vaccine produces a high antibody titer in over 90% of recipients under the age of 40-50 years.
- Older age, obesity, heavy smoking, and immunologic impairments have been associated with lower anti HBs responses.
- The higher the antibody titer after vaccination, the longer anti HBs persists.
- When the anti HBs titer falls below 10 MIU/ml, HBV infections may occur but are always subclinical and usually without detectable serum HbsAG.

### CLINICAL MANIFESTATIONS OF HEPATITIS C

- Hepatitis C is an infection of the liver caused by the hepatitis C virus.
- It is in blood, semen, other body fluids, and tissues of persons infected by

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### HCV

- Most HCV-infected persons( 75-85%) carry the virus for the rest of their lives; such persons can spread the virus for many years.
- Up to 20% of patients with chronic HCV develop cirrhosis or liver cancer, some as late as 20 years after HCV infection.
- In severe cases, liver transplantation is the only treatment.
- Symptoms in acute infection may include: jaundice, feeling tired, abdominal pain, loss appetite, and nausea and vomiting.
- Many persons have no symptoms of HCV infection. Symptoms may appear about 6-8 weeks after exposure. Some people find out when their blood is drawn for another reason.

### WHAT IF AN EXPOSURE OCCURS?

First of all, take immediate care of the exposed area:

- Wash needlesticks and cuts with soap and water
- Flush splashes to nose, mouth, or skin with water
- Irrigate eyes with clean water, saline, or sterile irrigants.

No scientific evidence shows that squeezing the wound will reduce the risk of transmission of a BBP. Using a caustic agent such as bleach is not recommended.

Secondly, the exposure should be reported immediately to those individuals responsible for managing exposures. Prompt reporting is essential because, in some cases, post exposure treatment may be recommended and it should be started as soon as possible. Counseling with the individual will need to be done by a healthcare professional to discuss the potential risks of a BBP exposure.

### ARE THERE VACCINES AVAILABLE TO PREVENT BLOODBORNE PATHOGENS?

#### Hepatitis B

Hepatitis B vaccine has been available since 1982 to prevent HBV. After an exposure, the individual should receive the series of 3 injections, if they have not previously been vaccinated. These are given immediately after exposure, and then at 1 month and 6 months after the exposure. If they have had the vaccine in the past, a titer should be performed to determine if they have developed sufficient antibodies to render them immune. Hepatitis B vaccinations are being advocated for all individuals and in some schools are required of each student by junior or senior high school.

#### Hepatitis C

There is no vaccine against Hepatitis C and no treatment after an exposure that will prevent infection.

#### HIV

There is no vaccine against HIV. However, results from studies suggest that use of some antiretroviral drugs after CERTAIN occupational exposures MAY reduce

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the chance of HIV transmission. If indicated, these medications should be started within 24 hours.

### IMPORTANT POINTS

- BBP exposure is everybody's responsibility.
- Prevention is the best way of avoiding the risks. Always wear gloves when doing anything where you might come in contact with another individual's body fluids.
  - This may include drawing blood, handling blood tubes, cleaning up suture trays, handling any urine specimens, cleaning, dressing wounds, and assisting with someone who may be bleeding or leaking body fluids.
  - Be especially careful if you have a cut or break in your skin that may come in contact with contaminated materials.
  - If you do get stuck with a needle or instrument, be sure to report immediately.
- All information regarding the patient and source is CONFIDENTIAL.
- If you have an employee that has come in contact with a possible BBP, they will need to be evaluated immediately to determine what level of risk they are at and what treatment will need to be done.
- BBP exposures that are considered "high risk" may require offering medication (post exposure prophylaxis (PEP) to the individual who has been exposed.
- The source, if known, should also be tested. This should be done as soon as possible after the exposure. It is important to test the source, although it is voluntary and they may not be forced to submit to the testing.

***If you have any questions regarding BBPs or would like an inservice at your company regarding this subject, please contact Amy McCulloch, RN, Client Service Coordinator at 812-283-2013.***