

Bloodborne Pathogens Profile

Bloodborne pathogens (BBPs) may be present in blood, unfixed tissues and certain other body fluids. BBPs are transmitted through breaks in the skin such as needle sticks or cuts involving BBP-containing materials. Direct contact of BBP-containing materials with damaged unprotected skin is another route of exposure. Finally, splashes to the eyes, nose or mouth involving BBP-containing materials can also lead to transmission.

In the case of human-derived materials, the 3 BBPs most commonly found in the U.S. are HIV, HBV & HCV. Features of these viruses and infections they cause are summarized below.

	Human Immunodeficiency Virus (HIV)	Hepatitis B Virus (HBV)	Hepatitis C Virus (HCV)
Symptoms	Acute: "flu-like", myalgia, arthralgia, diarrhea, nausea, headache, etc.	Acute: asymptomatic, or nausea, abdominal pain, fever, vomiting, jaundice, dark urine, etc.	Acute: asymptomatic or fatigue, myalgia, fever, RU quadrant pain, nausea, jaundice, rash, arthralgia, etc.
Incubation Period	<ul style="list-style-type: none"> Time to detectable antibodies: 1 to 3 months Time to AIDS <1 year to 15+ years 	24-180 days (average 60-90 days)	2 to 12 weeks
Complications	<ul style="list-style-type: none"> Without adequate treatment Acquired Immune Deficiency Syndrome (AIDS) can develop This immune system depletion leads to susceptibility to opportunistic infections 	Chronic Hepatitis B infection can develop which may lead to chronic liver diseases including cirrhosis of the liver and hepatocellular carcinoma	Up to 85% of cases lead to chronic infection which can result in chronic hepatitis, cirrhosis, and hepatocellular carcinoma
Epidemiology	<ul style="list-style-type: none"> Approximately 25 million HIV-related deaths and 40.3 (36 to 45.3) million infected individuals worldwide Approximately 95% of the individuals affected live in the developing world 	<ul style="list-style-type: none"> Approximately 2 billion people worldwide have been infected 360 million have chronic infections 600,000 individuals die yearly from HBV-related liver conditions 	<ul style="list-style-type: none"> Approximately 2.2 to 3% of the world population (170 million people) have been infected Highest prevalence in WHO's African and Eastern Mediterranean regions
Infection risk via needle stick	3 in 1000 (0.3%)	300 in 1000 (30%)	18 in 1000 (1.8%)
Stable/viable on environmental surfaces?	Not very (rapidly loses viral concentration; at least 7 days in serum drying on glass)	Very (at least 7 days on environmental surfaces)	Slightly (at least 16 hours in plasma drying on environmental surfaces)
Vaccine Available?	No	Yes, it is recommended	No
Post-Exposure Prophylaxis	Use of two to four antiretroviral drugs	Hepatitis B Immunoglobulin (HBIG) treatment	Not recommended
Treatment	<ul style="list-style-type: none"> HIV/AIDS is managed as a chronic disease Highly active antiretroviral therapy (HAART) is provided 	HBIG or one of seven available antivirals	Mono-therapy or combination therapy of interferon and ribavirin
Exposure risk features	Viral load is higher if source individual is not taking treatments	Viral load is highest in individuals with active infection	Mostly transmitted through blood-to-blood contact

Questions regarding BBP exposure risk associated with lab research?

Contact OCRS Biosafety at 322-2057 or biosafety@vumc.org

Information/Web Resources:

[CDC's Exposure to Blood: What Healthcare Personnel Need to Know](#)
[Health Canada Pathogen Safety Data Sheets](#)