HEPATITIS B

GENERAL INFORMATION:

1. Infectious Agent:
   Hepatitis B virus (HBV) is a small, double-shelled virus in the Hepadnaviridae family. The virus has a small circular DNA genome that is partially double-stranded. HBV contains numerous antigenic components, including HBsAg, hepatitis B core antigen (HBcAg), and hepatitis B e antigen (HBeAg).

2. Reservoir:
   Humans are the only known reservoir.

3. Mode of Transmission:
   Spread – HBV is transmitted by parenteral or mucosal exposure to HBsAg-positive body fluids from persons who are carriers or have acute HBV infection. The highest concentrations of the virus are in the blood and serous fluids; lower titers are found in other fluids, such as saliva and semen. Saliva can be a vehicle of transmission through bites; however, other types of exposure to saliva, including kissing, are unlikely modes of transmission. There appears to be no transmission to HBV via tears, sweat, urine, stool, or droplet nuclei.

   Person-to-person – In the United States, the most important route of transmission is by sexual contact, either heterosexual or homosexual, with an infected person. Fecal-oral transmission does not appear to occur. However, transmission among homosexual men occurs possibly via contamination from asymptomatic rectal mucosal lesions.

   Direct percutaneous inoculation by needles during injection drug use is another mode of HBV transmission. Transmission of HBV may also occur by other percutaneous exposure, including tattooing, ear piercing, and acupuncture, as well as needle-sticks or other injuries from sharp instruments sustained by medical personnel. These encounters account for only a small proportion of reported cases in the United States. Breaks in the skin without overt needle puncture, such as fresh cutaneous scratches, abrasions, burns, or other lesions, may also serve as routes for entry.

   Contamination of mucosal surfaces with infective serum or plasma may occur in the laboratory during mouth pipetting, or by eye splashes or other direct contact with mucous membranes of the eyes or mouth, such as hand-to-mouth or hand-to-eye when contaminated with infective blood or serum. Transfer of infective material to skin lesions or mucous membranes via inanimate environmental surfaces may occur by touching surfaces of various types of contaminated hospital equipment. Contamination of mucosal surfaces with infective secretions could also occur with contact of semen.

   Perinatal transmission from mother to infant at birth is very efficient. If the mother is positive for both HBsAg and HBeAg, 70% - 90% of infants will become infected in the absence of postexposure prophylaxis. The risk of perinatal transmission is about 20% if the mother is positive only for HBsAg; up to 90% of these infected infants will become HBV carriers. An estimated 15% - 25% of these carriers will ultimately die at an early age of liver failure secondary to chronic active hepatitis, cirrhosis, or primary hepatocellular carcinoma.
4. **Incubation Period:**
The incubation period of HBV infection is an average of 60 - 90 days, with a range of 45 - 180 days.

5. **Period of Communicability or Infectious Period:**
Persons with either acute or chronic HBV infection should be considered infectious any time that HBsAg is present in the blood. When symptoms are present in persons with acute HBV infection, HBsAg can be found in the blood and body fluids of infected persons for several weeks before and days, weeks, or months after the onset of symptoms. Persons who have chronic hepatitis B (known as carriers) will be positive for HBsAg and remain infectious indefinitely.

6. **How to Reduce Exposure:**
Universal precautions must be used for all patients.
Vaccination

**REFERENCES:**
CDC Guidelines for Isolation in Hospitals: 2007
Control of Communicable Diseases in Man – Heymann: 2004
Iowa Department of Public Health Epi Manual: 2010