

**Broad Overview of  
Hepatitis Transmission  
and Immunization**

0.25 CREDIT HOURS



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## PHARMACIST OBJECTIVES

1. Recognize vaccinations used in the US to protect against hepatitis B

## PHARMACY TECHNICIAN OBJECTIVES

1. Recognize vaccinations used in the US to protect against hepatitis B

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## OVERVIEW

Micro-learning opportunities were created in response to evidence that learning is maximized when delivered in short and focused 'bursts.' In this session, hepatitis is examined by its transmission and available vaccinations.

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## TARGET AUDIENCE

Pharmacist, Pharmacy Technician

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## AUTHOR DISCLOSURE

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I don't have a great fear of many viruses, but this one scares the living daylights out of me! I can't think of another virus that can be infectious 7 days later. Based on the fact that a blood spill can remain infective for 7 days, this virus has earned a great deal of respect from me!

Hippocrates described "epidemic jaundice" in the fifth century BC. "Serum hepatitis" was first reported in 1883 when a bunch of German shipyard workers got their smallpox vaccine that contained human lymph.

When I got my license to administer injectables 15 years ago, I was required to get immunized against hepatitis B, so now I have a healthy respect, but not as much fear!

## **Hepatitis B Treatment**

- Hepatitis (HBV) is a small, double-stranded DNA virus in the family Hepadnaviridae
- Spread when blood, semen, or other bodily fluid infected with the virus enters the body of a person who is not infected
- Incubation period of is 60-90 days
- People can become infected with the virus during activities such as:
  - Birth, via neonatal exposure
  - Sex with an infected partner through exposure to infected blood and body fluids such as saliva and menstrual, vaginal, and seminal fluids
  - Sharing needles, syringes, or other drug-injection equipment
  - Sharing items like razors or toothbrushes with an HBV-positive person
  - Direct contact with the blood or open sores of an HBV-positive person
  - Exposure to blood from needlesticks or other sharp instruments
- Most cases are asymptomatic, however persons with acute HBV may progress to chronic HBV. This is seen in approximately:
  - As many as 90% of infants
  - 30% to 50% of children between age 1 and 5
  - 5% of adults

## **Hepatitis B Prevalence From 2020 – The Numbers Are in**

- 2,157 new cases of acute hepatitis B reported
- 14,000 estimated acute hepatitis B infections
- 11,635 cases of newly reported chronic hepatitis B
- 5 newly reported cases of chronic hepatitis B per 100,000 people
- 76% of all acute hepatitis B cases were persons aged 30-59 years
- Source: <https://www.cdc.gov/hepatitis/statistics/2020surveillance/hepatitis-b.htm>

## **How Long Does the Hepatitis B Virus Survive Outside the Body?**

- Hepatitis B virus can survive outside the body for at least 7 days
- During that time, the virus can cause infection if it enters the body of a person who is not infected

## **How Should Blood Spills Be Cleaned From Surfaces to Make Sure That the Hepatitis B Virus Is Gone?**

- All blood spills — including those that have already dried — should be cleaned and disinfected with a mixture of bleach and water
  - One part household bleach to 10 parts water
- Gloves should always be used when cleaning up any blood spills - even dried blood can present a risk to others!

### **Signs, Symptoms, and Transmission of HBV**

- Caused by a DNA virus, it is one of the most common worldwide infections
  - There are 8 different genotypes (A-H) and 200-300 million chronic carriers worldwide
- Symptoms:
  - Malaise
  - Anorexia
  - Weakness
  - Nausea
  - Jaundice
  - Abdominal pain
  - Headache
  - Dark urine
  - Malaise and weakness may last for weeks to months after all other symptoms disappear
  - Fulminant hepatitis occurs in 1-2% with a mortality rate of up to 60%
- Complications with chronic infection:
  - Chronic hepatitis
    - About 25% of all carriers develop chronic hepatitis
    - Risk of becoming a carrier following infection is 6%-50%
  - Cirrhosis
  - Liver failure
  - Hepatocellular carcinoma
- Incubation period: 7-10 days
- Transmission: human-to-human by exposure to bodily fluids by parenteral or mucosal contact or sexual transmission
  - Perinatal transmission is a significant mode
- Prevalence in the USA: 800,000 to 1.4 million affected

### **Now for Some Good News!**

Rates of acute Hepatitis B in the United States have declined by approximately 82% since 1990.

# Vaccines for Hepatitis B per ACIP Recommendations

## ACIP: The Advisory Committee on Immunization Practices

- Administration of hepatitis B vaccine and hepatitis B immune globulin (HBIG) for infants born to HBV-positive mother within 12 hours of birth, followed by completion of the vaccine series and postvaccination serologic testing
- Universal hepatitis B vaccination within 24 hours of birth, followed by completion of the vaccine series; and
- Vaccination of children and adolescents aged <19 years who have not been vaccinated previously

## 3-Dose Vaccine Series for Infants (Including the "Birth Dose")

- Since 1991, ALL medically stable infants with a birth weight of at least 2,000 gm in the US are recommended to receive the first dose of hepatitis B vaccine within 24 hours of birth
  - The additional 2 doses are given at 1 month and 6 months of age
- There are four, 3-dose vaccine brands approved in the US; each dose should be administered on day 0, then one month after first dose; then six months after first dose
  - Recombivax HB (Merck) [FDA approved 1986]
    - 0.5 mL (5 mcg) pediatric/adolescent formulation single-dose vials and prefilled syringes
    - 1 mL (10 mcg) adult formulation single-dose vials and prefilled syringes
    - Recombivax HB dialysis formulation is a sterile suspension as 1 mL (40 mcg) single-dose vials
  - Engerix-B (GlaxoSmithKline) [FDA approved 1989]
  - Twinrix (GlaxoSmithKline) (Hep-A and HepB)[FDA approved 2001]
  - PreHevbrio (VBI Vaccines) [Approved November 2021]
    - PreHevbrio is only approved for adults aged 18 and over
    - Study results indicate that PreHevbrio might provide increased antibody protection compared to other three-dose vaccines, and may be a better option for those with well-managed chronic conditions

## 2-Dose Vaccine Series (Adults >18 Only)

- Heplisav-B (Dynavax) [FDA approved 2017]
  - 2-dose vaccine recommended in the U.S. for use in adults aged 18 and older
  - The vaccine is administered as two doses, given one-month apart
  - Seroconversion rate was higher for Heplisav-B (91.6%) than Engerix-B 72.6% for the 60-70-year-old age group

## **Hepatitis B Vaccine for Workers:**

- Employers **MUST** provide at-risk workers with a hepatitis B vaccine within 10 days of job assignment
- Employers must pay for the vaccine
- Must offer opportunity to get the vaccine while on company time, that is to reimburse patient for time going to get vaccine administered
- Exceptions:
  - Employee has contraindication
  - Employee proves immunity with antibody testing
  - Employees have been previously vaccinated
  - Employees opting the right to decline vaccine

## **Hepatitis B Immune Globulin (HBIG) (BayHep B and Nabi-HB)**

- HBIG needs to be given as soon as possible after exposure, otherwise it might not be effective. Post-exposure prophylaxis exposure in the following situations:
  - Acute exposure to blood containing HBsAg: needle sticks, mucus membrane contact
  - Perinatal exposure of infants to mother with HBsAg-positive mothers
  - Sexual exposure to an HBsAg-positive person
  - Household exposure to people with acute HBV infection

--Have a great day on the bench!!

# Activity Test

## Broad Overview of Hepatitis Transmission and Immunization

Activity tests must be completed online at [www.freeCE.com](http://www.freeCE.com).

A passing grade of 70 or higher and completion of an online activity evaluation are required to earn credit.

- 1. Which of the following is an appropriate vaccination regimen for an infant born to a hepatitis-B positive mother per ACIP recommendations?**
  - A. Universal dose given within 24 hours of birth by a delayed vaccination schedule
  - B. Universal dose given within 24 hours of birth + an additional dose at 6 months of age
  - C. Universal dose given within 24 hours of birth + full vaccination series
  - D. Hepatitis-B immunoglobulin given within 12 hours of birth + universal dose within 24 hours of birth + full vaccination series
  
- 2. This hepatitis vaccine includes protection against both hepatitis-B and hepatitis-A:**
  - A. Engerix-B
  - B. Recombivax-HB
  - C. PreHevbrio
  - D. Twinrix