



**Hepatitis B Vaccination Program
Question and Answers**

Prepared by

Military Vaccine (MILVAX) Agency,
Office of The Army Surgeon General, U.S. Army

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www.vaccines.mil

877-GET-VACC

vaccines@amedd.army.mil

Hepatitis B Vaccination Program Questions and Answers

The Disease

- Overview
- Symptoms
- Complications

The Vaccine

- Overview
- Administration
- Contraindications

Adapted from the Immunization Action Coalition (with permission) and the Centers for Disease Control and Prevention (CDC).

The Disease

Overview

1) What is hepatitis B?

Hepatitis B is a serious public health problem that affects people of all ages in the United States and around the world. In 2001, an estimated 78,000 people contracted hepatitis B virus (HBV) infection in the United States. Hepatitis B is caused by a highly infectious virus that attacks the liver.

HBV infection can lead to severe illness, liver damage, and, in some cases, death. The best way to prevent hepatitis B is to be immunized with hepatitis B vaccine, a vaccine used in the U.S. since 1981 and proven safe and effective.

2) Who is at risk for hepatitis B infection?

About 5% of people in the U.S. will get infected with hepatitis B sometime during their lives. If you engage in certain behaviors, your risk may be much higher. You may be at risk if you:

- have a job that exposes you to human blood
- share a household with someone who has lifelong hepatitis B infection
- have sex with a person infected with hepatitis B
- have sex with more than one partner during a six-month period
- received blood transfusions in the past before excellent blood testing was available (1975)
- are a person whose parents were born in Asia, Africa, the Amazon Basin of South America, the Pacific Islands, Eastern Europe, or the Middle East
- were born in an area listed above
- were adopted from an area listed above
- are an Alaska native
- have hemophilia
- are a patient or worker in an institution for the developmentally disabled
- inject drugs
- are an inmate of a long-term correctional facility
- travel internationally to areas with a high prevalence of hepatitis B

The largest outbreak of hepatitis B in the U.S. occurred in 1942 in military personnel who were given vaccine to protect them from yellow fever. It was unknown at the time that this vaccine contained a human blood component that was contaminated with hepatitis B virus. The outbreak caused over 50,000 cases of hepatitis B with jaundice.

3) How does hepatitis B differ from hepatitis A and C?

Hepatitis A, B, and C are the names of different viruses that attack and injure the liver. All can cause similar symptoms.

Usually, people get hepatitis A from household or sexual contact with a person who has hepatitis A. Hepatitis A virus is spread from person to person by putting something in the mouth that has been contaminated with the stool of a person with hepatitis A. This type of transmission is called "fecal-oral." For this reason, the virus is more easily spread in areas where there are poor sanitary conditions or where good personal hygiene is not observed. Casual contact, as in the usual office, factory, or school setting, does not spread the virus.

Hepatitis C, formerly known as hepatitis non-A non-B, is caused by the hepatitis C virus and is spread in much the same way as hepatitis B. Both hepatitis B and C can cause lifelong liver problems, while hepatitis A does not. Vaccines to prevent hepatitis A and hepatitis B are now available. There is no vaccine yet for hepatitis C. If you've had hepatitis A or C in the past, it is still possible to get hepatitis B.

4) How is hepatitis B spread?

Hepatitis B is found in blood and certain body fluids—such as serum, semen, vaginal secretions—of people infected with hepatitis B virus. Hepatitis B is not found in sweat, tears, urine, or respiratory secretions. Contact with even small amounts of infected blood can cause infection. Hepatitis B virus can be spread by:

- unprotected sex
- injecting drugs
- an infected mother to her child during birth
- contact with the blood or open sores of an infected person
- human bites
- sharing a household with a chronically infected person
- sharing items such as razors, toothbrushes, or washcloths
- pre-chewing food for babies or sharing chewing gum
- using unsterilized needles in ear or body piercing, tattooing, or acupuncture
- using the same immunization needle on more than one person

Hepatitis B virus IS NOT spread by:

- casual contact, like holding hands
- eating food prepared by an infected person
- kissing or hugging
- sharing silverware, plates, or cups
- visiting an infected person's home
- sneezing or coughing

Symptoms

1) What are the symptoms of hepatitis B?

Most people who get hepatitis B infection as babies or children don't look or feel sick at all. Similarly, almost half of adults who get infected don't have any symptoms or signs of the disease. If people do have signs or symptoms, they may experience any or all of the following:

- loss of appetite
- clay-colored bowel movements
- yellowing of skin and eyes (jaundice)
- nausea, vomiting
- fever
- weakness, tiredness, inability to work for weeks or months
- abdominal pain and/or joint pain
- dark urine

2) I'm not in one of the risk groups name above. How did I get hepatitis B infection?

Many people don't know when or how they acquired the infection. When they get the blood test results

indicating they've been infected with hepatitis B, they are taken by surprise. Studies have demonstrated that 30% to 40% of people who acquire hepatitis B infection are unable to identify any risk factors explaining why they have the disease.

3) Do people usually recover from hepatitis B infection?

Nearly 95% of adults recover after several months. They clear the infection from their bodies and become immune. This means they won't get infected with hepatitis B again. They are no longer contagious and cannot pass hepatitis B on to others.

Unfortunately, of those who become newly infected with hepatitis B virus, about 5% of adults and up to 90% of children under age 5 are unable to clear the infection from their bodies. They become chronically infected and can pass the virus to others.

4) How do I know if I have or have had hepatitis B infection?

The only way to know if you are currently infected with hepatitis B, have recovered, are chronically infected, or are susceptible, is by having blood tests. The three standard blood tests are the following:

1. HBsAg (hepatitis B surface antigen): when this test is "positive" or "reactive," it means the person is currently infected with hepatitis B and is able to pass the infection on to others.
2. Anti-HBc [or HBc-Ab] (antibody to hepatitis B core antigen): when this test is "positive" or "reactive," it may mean the person has had contact with hepatitis B. This is a very complicated test to explain because the "anti-HBc" could possibly be a "false-positive" test result. The interpretation of this positive test usually depends on the results of the other two blood tests. Blood banks routinely run an "anti-HBc," but they do not routinely run an "anti-HBs."
3. Anti-HBs [or HBs-Ab] (antibody to hepatitis B surface antigen): when this test is "positive" or "reactive," it means the person is immune to hepatitis B infection, either from immunization or from past infection. If the person was previously infected, he or she cannot pass the disease on to others. Remember, this test is not routinely done by blood banks.

Interpretation of the Hepatitis B Blood Test Results		
Tests	Results	Interpretation
HBsAg	negative	Susceptible to hepatitis B infection
anti-HBc	negative	
anti-HBs	negative	
HBsAg	negative	Immune due to immunization
anti-HBc	negative	
anti-HBs	positive with >10mIU/mL*	
HBsAg	negative	Immune due to infection with hepatitis B
anti-HBc	positive	
anti-HBs	positive	
HBsAg	positive	Newly infected with hepatitis B virus
anti-HBc	positive	
IgM anti-HBc	positive	
anti-HBs	negative	
HBsAg	positive	Chronically infected with hepatitis B virus
anti-HBc	positive	
IgM anti-HBc	negative	
anti-HBs	negative	
HBsAg	negative	Four interpretations possible†

anti-HBc	positive
anti-HBs	negative

- * Post-immunization testing, when it is recommended, should be done 1 to 2 months after the final dose.
- †, 1. May be recovering from acute hepatitis B infection.
- 2. May be distantly immune and the test is not sensitive enough to detect a very low level of anti-HBs in serum.
- 3. May be susceptible with a "false positive" anti-HBc.
- 4. May be chronically infected and have an undetectable level of HBsAg present in the serum.

5) What does it mean if my blood bank said I tested positive for hepatitis B and can no longer donate blood?

If the blood bank told you your test was "positive," it is important to find out which test was positive. If the "HBsAg" was positive, this means that you are either chronically infected with hepatitis B or were recently infected. If only the "anti-HBc" was positive, it is most likely that you either had a "false-positive" test or are immune to hepatitis B. It is important that you understand the full meaning of your test results. If you are not sure how to interpret these test results, call your blood bank for an explanation or have the blood bank send the test results to your physician. You may need to provide written permission for the blood bank to release these results to your physician. Your physician may want to repeat the blood tests or perform additional tests such as an "anti-HBs." Bring this information sheet along with you to your doctor visit. And remember, you cannot contract hepatitis B from donating blood, because the equipment used during blood donation is sterile.

Complications

1) What does it mean to be chronically infected with hepatitis B virus?

People who do not recover from hepatitis B infection are chronically infected, and there are over 1 million chronically infected people in the United States today. A chronically infected person is someone who has had hepatitis B virus in her or his blood for more than 6 months.

About 5% of adults who acquire hepatitis B infection become chronically infected, but children younger than 5 years of age have a greater risk. The younger the child is at the time of infection, the greater the risk that the child will have a lifelong infection. Many babies born to chronically infected mothers will also become chronically infected with hepatitis B virus, unless the babies are given two shots in the hospital and at least two more during the 6 months after birth to protect them from the infection.

A chronically infected person usually has no signs or symptoms of hepatitis B infection, but remains infected for years or for a lifetime and can pass hepatitis B virus to others. Sometimes, chronically infected people will clear the infection from their bodies on their own, but most will not. Although most chronically infected people have no serious problems with hepatitis B and lead normal, healthy lives, some develop liver problems later. Chronically infected people are at much higher risk than the general population for liver failure or liver cancer.

2) How can I take care of myself, if I am chronically infected with hepatitis B?

A person with hepatitis B infection should see a physician knowledgeable about the management of liver disease every 6 to 12 months. The physician will do blood tests to check the health of the liver, as well as test for liver cancer. It is best for chronically infected people to avoid alcohol, because alcohol can injure the liver. Additionally, your physician should know about all the medicines you are taking, even over-the-counter drugs, because some medicines can hurt the liver. If there are any liver test

abnormalities, consult a liver specialist regarding your need for further testing and treatment.

3) If your liver disease has progressed...

If your physician tells you your liver disease has progressed, here are some extra precautions you should take:

- Get a yearly influenza immunization. Patients with severe liver disease (cirrhosis) should also receive pneumococcal vaccine.
- Get immunized against hepatitis A. Hepatitis A can further damage your liver, if you get infected with that virus.
- Don't eat raw oysters. They may carry bacteria called *Vibrio vulnificus*, which can cause serious blood infections in people with liver disease. About 40% of people with this blood infection die.

4) What can I do to protect others from hepatitis B infection?

People with hepatitis B infection might feel healthy, but can still be capable of passing the infection on to other people. To protect others from getting hepatitis B infection, it is important to protect them from contact with your infected blood and other infectious body fluids, including semen and vaginal secretions. Sweat, tears, urine, and respiratory secretions do not contain hepatitis B virus. Hepatitis B virus transmission via saliva has only been documented through biting.

5) Important DOs and DON'Ts for people with chronic hepatitis B infection:

DO:

- Cover all cuts and open sores with a bandage.
- Discard used items such as band-aids and menstrual pads carefully, so no one is accidentally exposed to your blood.
- Wash your hands well after touching your blood or infectious body fluids.
- Clean up blood spills. Then reclean the area with a bleach solution (one part household chlorine bleach to 10 parts water).
- Tell your sex partner(s) you have hepatitis B, so they can be tested and immunized (if not already infected). Partners should be tested after getting three doses, to be sure the vaccine worked.
- Use condoms (rubbers) during sex, unless your sex partner has had hepatitis B or has been immunized and has had a blood test showing immunity. (Condoms may also protect you from other sexually transmitted diseases.)
- Tell household members to see their doctors for testing and immunization for hepatitis B.
- Tell your doctors that you are chronically infected with hepatitis B.
- See your doctor every 6 to 12 months to check your liver for abnormalities, including cancer.
- If you are pregnant, tell your doctor that you have hepatitis B infection. It is critical that your baby is started on the hepatitis B shots within a few hours of birth.

DON'T:

- Share chewing gum, toothbrushes, razors, washcloths, needles for ear or body piercing, or anything that may have come in contact with your blood or infectious body fluids
- Pre-chew food for babies
- Share syringes and needles
- Donate blood, plasma, body organs, tissue, or sperm

6) What are the long-term effects of hepatitis B infection?

Each year, about 5,000 people in the U.S. die of hepatitis B-related liver failure. And another 1,500 people die from hepatitis B-related liver cancer.

Hepatitis B infection is the most common cause of liver cancer worldwide and ranks second only to cigarettes as the world's leading cause of cancer.

7) Is there a cure for hepatitis B?

At this time, there are three FDA-approved medications (interferon alpha, lamivudine, and adefovir) that can help a person who is already infected with hepatitis B. Their use is reserved for people who have certain blood test abnormalities. Be sure to ask your doctor if you are a candidate for treatment or if you might benefit from enrolling in a clinical trial. Researchers continue to seek additional cures for hepatitis B.

8) Why is hepatitis B so serious in pregnant women?

Pregnant women who are infected with hepatitis B can transmit the disease to their babies. Many of these babies develop lifelong hepatitis B infections, and up to 25% will develop liver failure or liver cancer later in life. All pregnant women should be tested early in pregnancy to see if they are infected with hepatitis B. If the blood test is positive, the baby should be immunized at birth with two shots, one of hepatitis B immune globulin (HBIG) and one of hepatitis B vaccine. The infant will need at least two more doses of hepatitis B vaccine by 6 months of age.

9) What should I do if I'm in a risk group?

If you are in a risk group for hepatitis B, get immunized! All people in risk groups should protect themselves from hepatitis B infection. Every day you delay getting immunized increases your chances of getting this highly contagious liver disease. The problems caused by hepatitis B—liver cancer and liver failure—are too great. See your doctor or visit your health department.

10) What does the term “hepatitis B carrier” mean?

“Hepatitis B carrier” is a term used for people who have chronic (long term) infection with hepatitis B virus. If infected, 2% to 6% of people over 5 years of age; 30% of children 1 to 5 years of age; and up to 90% of infants develop chronic infection. People with chronic infection can infect others and are at increased risk of serious liver disease, including cirrhosis and liver cancer. In the United States, about 1.25 million people are chronically infected with hepatitis B. There are three drugs licensed for the treatment of people with chronic hepatitis B: adefovir dipivoxil, interferon alpha, and lamivudine.

The Vaccine

Overview

1) How can hepatitis B be prevented?

If hepatitis B vaccine is administered before infection, it prevents the disease and the carrier state in almost all individuals.

The hepatitis B vaccine can provide protection in 90% to 95% of healthy young adults. The vaccine can be given safely to infants, children, and adults, usually in three doses over a 6-month period. Even pregnant women can be safely given these shots, if their risk factors warrant it. Hepatitis B shots are very safe, and side effects are rare. Hepatitis B vaccine is that first vaccine that prevents cancer—liver cancer.

2) How safe and effective is the vaccine?

Hepatitis B vaccine has an outstanding record of safety and effectiveness. Studies have shown that the vaccine is 95% effective in preventing children and adults from developing chronic infection.

3) What are the risks from hepatitis B vaccine?

A vaccine, like any medicine, is capable of causing serious problems, such as severe allergic reactions. The risk of hepatitis B vaccine causing serious harm or death is extremely small. Getting hepatitis B vaccine is much safer than getting hepatitis B disease.

4) Who should get immunized?

- All babies, at birth
- All children 0 to 18 years of age who have not been immunized
- People of any age whose behavior puts them at high risk for hepatitis B infection
- People whose job exposes them to human blood

5) If there is a moderate or severe reaction, what should I do?

Any unusual condition, such as a serious allergic reaction, high fever or unusual behavior should be reported to your health care provider. Serious allergic reactions are extremely rare with any vaccine. If one were to occur, it would be within in a few minutes to a few hours after the shot. Signs can include difficulty breathing, hoarseness or wheezing, hives, paleness, weakness, a fast heart beat or dizziness. If any of these symptoms occur, you should seek immediate medical attention, then explain the details of the event to your doctor and ask them to report the event to the Vaccine Adverse Event Reporting System (VAERS, www.vaers.hhs.gov).

6) At what age are hepatitis B shots routinely given?

In the U.S., hepatitis B shots are routinely recommended for all children 0 to 18 years of age. For babies, the first hepatitis B shot is recommended to be given in the hospital just after birth. Older children and teens should be immunized at the earliest opportunity. Any adult who is at risk for hepatitis B infection should start the vaccine series right away.

7) Where can I get hepatitis B shots?

At any military immunization clinic. In the private sector, Tricare and children's health insurance often cover the cost of this vaccine. If a child is uninsured, ask your local health department for assistance. For adults, contact the healthcare provider first, to find out if the vaccine is covered under the health plan. For people who are uninsured, call your local health department for advice.

Administration

1) How many shots are needed?

Usually three shots are needed for the best protection against hepatitis B, but some protection is provided from receiving as little as one dose. The shots are usually given on a schedule of 0, 1, and 6 months, but there is flexibility in the timing of these injections. As with other vaccines, if one falls behind on the schedule, just continue from where you left off. Hepatitis B shots will not help or cure a person who is already infected with the hepatitis B virus.

2) How is the vaccine administered?

A recombinant vaccine is used to prevent hepatitis B. The vaccine is given in a three-dose series (0, 1 and 6 months), injected into the muscle (intramuscularly) into the upper thigh of an infant or the deltoid muscle of an adult.

3) For how long is hepatitis B vaccine effective?

Long-term studies of healthy adults and children indicate that hepatitis B vaccine protects against chronic hepatitis B infection for at least 15 years, even though antibody levels might decline below detectable levels.

4) Are booster doses of hepatitis B vaccine needed?

No, booster doses of hepatitis B vaccine are not recommended routinely. Data shows that vaccine-induced hepatitis B surface antibody (anti-HBs) levels might decline over time. But immune-cell memory remains intact indefinitely after immunization. People with declining antibody levels are still protected against clinical illness and chronic disease.

5) If my hepatitis B immunization series is interrupted, do I have to start over?

No. If the immunization series is interrupted, resume with the next dose in the series.

Contraindications

1) Are there any contraindications to hepatitis B vaccine?

Some people should not get hepatitis B vaccine or should wait.

People should not get hepatitis B vaccine if they have ever had a life-threatening allergic reaction to baker's yeast (the kind used for making bread) or to a previous dose of hepatitis B vaccine.

People who are moderately or severely ill at the time the shot is scheduled should wait until they recover before getting the hepatitis B vaccine.

2) Where can I receive more information about hepatitis B?

Contact your local and state health departments for more information. You can also contact the following organizations:

- Immunization Action Coalition
Hepatitis B Coalition
(651) 647-9009
www.immunize.org
www.vaccineinformation.org
- American Liver Foundation
(800) 465-4837
www.liverfoundation.org
- Centers for Disease Control and Prevention
(888) 443-7232 Hepatitis Hotline, automated
(800) 232-2522 Immunization Hotline
www.cdc.gov/hepatitis
www.cdc.gov/nip
- Hepatitis B Foundation
(215) 489-4900
www.hepb.org
- Hepatitis Foundation International
(800) 891-0707
www.hepfi.org
- Parents of Kids with Infectious Diseases (PKIDS)
(877) 557-5437
www.pkids.org

3) Sources

CDC Hepatitis B: www.cdc.gov/ncidod/diseases/hepatitis/b/

CDC Vaccine Information Statement: www.cdc.gov/nip/publications/VIS/vis-hep-b.pdf

Immunization Action Coalition: www.vaccineinformation.org/hepb/qandadis.asp

World Health Organization: www.who.int/csr/disease/hepatitis/whocdscsrlyo20022/en/

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