

Hepatitis B: Questions and Answers

Information about the disease and vaccines

What causes hepatitis B?

Hepatitis B virus (HBV) is the cause of the liver disease called by the hepatitis B virus (HBV).

How does HBV spread?

The spread of HBV occurs when blood from an HBV-infected person enters the bloodstream of another person who is not infected. This can occur through having sex with an HBV-infected person without using a condom (the efficacy of latex condoms in preventing infection is not known, but their proper use may reduce the spread of HBV).

Sex contact is the most common reason for the spread of HBV infection in the United States. The spread of HBV from male to female or female to male accounts for about 1 out of 3 acute (recently acquired) HBV infections in adults. The risk of acquiring HBV increases if a person has multiple sex partners, a history of a sexually transmitted disease, or has sex with an HBV-infected person. About 1 out of 4 acute HBV infections occur among men who have sex with men.

HBV is also easily spread by sharing drugs, needles, and syringes. The risk of acquiring HBV from infection from HBV-contaminated needles/syringes is much greater than the risk of spreading HIV by this method. In the United States, illegal drug use injection accounts for about 16 out of 100 acute HBV infections in children. Other ways HBV is spread include sharing needles/syringes, sharing skin exposures, including tattooing and body piercing, have also been reported to result in the spread of HBV when good infection control practices have not been used. Unsafe injections in medical settings in many countries and might be a risk for HBV in U.S. residents traveling abroad. If medical care is required in settings that have poor infection control practices.

HBV is also spread through breastfeeding or sharp objects that pierce the skin. The risk of HBV infection to her baby during birth. Breastfeeding has not been associated with the spread of HBV.

HBV can also be spread during childhood. Most early childhood spread occurs in households of people with chronic (life-long) HBV infection, but HBV can also be spread from children in day care centers and schools. The most likely way that the

is discussed below. Even though people might eventually recover from their acute infection, a feeling of tiredness and poor health might last for months.

What does it mean to have chronic HBV infection?

People with chronic HBV infection are infected and have HBV in their blood and urine. Usually, chronically infected people do not feel sick and do not know they are infected. They generally have HBV infection for their entire lives. They are also at high risk of developing chronic liver disease, including cirrhosis (scarring of the liver), liver failure, and liver cancer.

What are the complications of chronic HBV infection?

Chronic HBV infection affects 11.2% of people age 100 with chronic HBV infection eventually develop serious liver disease. Chronic HBV infection is responsible for most HBV-related sickness and death, including cirrhosis, liver failure, and liver cancer. When people are infected, they do not appear usually until young adulthood or middle age.

Is HBV infection a serious problem in the world?

In the United States, an estimated 3,000-4,000 people die each year of HBV-related cirrhosis, and another 1,000-1,500 die each year of HBV-related liver cancer. Worldwide, the medical consequences of chronic HBV infection are estimated to be approximately 350 million people around the world are chronically infected with HBV and approximately 1 million of these people die each year from cirrhosis leading to liver failure or liver cancer. The number of people with chronic hepatitis B is the 10th leading cause of death worldwide.

What is the risk of getting HBV infection while traveling?

Short-term travelers to regions (Asia, Sub-Saharan Africa, Amazon Basin, Eastern Europe, and the Middle East) in which there are moderate to high rates of HBV infection are at risk for HBV infection only through exposure to blood. The risk of infection is higher if the traveler has a wound, sore, or healthcare or disaster-related activities; receipt of medical care that involves blood exposures; or sexual activity or drug use. The Centers for Disease Control and Prevention (CDC) recommends hepatitis B vaccination for travel to any of these regions, regardless of the length of stay.

How common is hepatitis B in the United States?

About 5 out of 100 people in the United States have chronic HBV infection sometime in their lifetime. If not vaccinated. Approximately 0.8 to 1 million

people have chronic HBV infection at the present time. Most of these people do not know they are infected.

From 1990-2005, the overall occurrence of re-infection with hepatitis B declined to a great extent. In 2004, the estimated number of acute infections was about 46,000—a decrease from an estimated 232,000 new infections in 1990. Racial and ethnic disparities for acute HBV infection were similar in 1990 and 2004. In Alaska, Hawaii, American Indian/Alaska Native, and Pacific Islander, acute HBV infection rates are high. The highest hepatitis B still remain among blacks. The highest occurrence of acute hepatitis B occurred among people ages 20-44 despite their race or ethnicity.

HBV infection is common in the occurrence of acute hepatitis B in the United States. The occurrence of acute hepatitis B in the United States has declined due to the increased use of hepatitis B vaccine and changes in risk reduction behaviors among at-risk populations in response to the HIV/AIDS epidemic. During the 1990s, the incidence of acute HBV infection among children and adolescents decreased due to the increase in hepatitis B vaccination coverage. Reporting of hepatitis B still remains a problem as many people do not exhibit symptoms recognized as hepatitis B. Many acute HBV infections are missed and therefore not treated with.

Despite the dramatic decrease in the number of new HBV infections in the United States, chronic HBV infection remains a major problem. As stated above, about 1 million people have chronic HBV infection in the United States. Most of these people do not know they are infected. They are also at high risk of developing liver disease, including cirrhosis, liver failure, and liver cancer. The number of people with chronic HBV infection in the U.S. are found in immigrants or refugees from areas of the world with moderate or high rates of hepatitis B. Some of these areas of the world include Asia, Africa, the Pacific Islands, and the Middle East. People from these areas of the world should be tested to find out if they are chronically infected.

How does a person know if she has HBV infection?

A blood test called IgM anti-HBc is needed to diagnose acute hepatitis B. There are additional blood tests for hepatitis B to determine other aspects of HBV infection. These other blood tests can tell whether or not a person has been infected in the past. If the tests indicate a person has been infected in the past, testing will also determine whether the person has chronic HBV infection. In addition to the virus (i.e., they have gotten over the infection) will not get infected with HBV again [this is called

<p>What hepatitis B blood tests are available</p> <p>Hepatitis B surface antigen (HBsAg)</p>	<p>A positive test means that you have hepatitis B virus in your blood and can pass the virus to others. You could be recently infected or you may have chronic (life-long) infection. A negative test means you do not have the virus in your blood.</p>
<p>Antibody to hepatitis B surface antigen (anti-HBc)</p>	<p>A positive test means that you are immune (cannot get hepatitis B). This positive test is usually present in people who were infected with hepatitis B virus either recently or in the recent past. A negative test means you have not had the actual infection (HBsAg), or you had the actual infection, but your immune system cleared the virus and you now have long-lasting and usually permanent immunity (means you will not get hepatitis B again). Anti-HBc produced by HBIG has a long shelf life (about 3 years).</p>
<p>Antibody to hepatitis B core antigen (anti-HBc)</p>	<p>A positive test means that you or your partner have had infection with hepatitis B virus at some undefined time period. The positive test has no relationship to having current infection. A negative test does not mean you had already been infected.</p>
<p>IgM antibody subclass of hepatitis B "e" antigen (HBeAg)</p>	<p>A positive test means that you were recently (within 6 months) infected with hepatitis B virus and have a large amount of hepatitis B virus in your blood. You are at a lower risk of serious liver problems due to chronic hepatitis B virus infection.</p>
<p>Antibody to hepatitis B "e" antigen (anti-HBe)</p>	<p>This blood test might be positive if you have chronic hepatitis B virus infection or if you were recently infected with hepatitis B virus. If there is chronic hepatitis B virus infection and this test is positive, this means that you have low levels of hepatitis B virus in your blood and are at a lower risk of liver problems due to your chronic hepatitis B virus infection.</p>
<p>HBV Deoxyribonucleic acid (HBV-DNA)</p>	<p>When this test is positive, it means you are infectious to others and the hepatitis B virus is present in your blood. This test is often used to determine success or failure of drug treatment for chronic hepatitis B virus infection.</p>

immunity) or whether they still have it, and if they have it, whether they might have chronic HBV infection.

Is there a medication to treat hepatitis B?

There are several Food and Drug Administration (FDA)-approved medications that might help a person who has chronic HBV infection. These medications might help decrease the chance of liver disease, not everyone is a candidate for these medications. Researchers continue to study new medications for chronic hepatitis B. There is no treatment (other than supportive care) for a person with acute hepatitis B.

How long can a person with HBV infection spread HBV?

A person with acute or chronic HBV infection may have the virus in their blood, which can be determined by blood testing. In general, a person with acute hepatitis B gets rid of the virus in their blood in six to eight weeks. However, it is not likely the person will become chronically infected with HBV for life.

What are some important facts and don'ts for people with chronic HBV infection?

DO'S

- Cover all cuts and open sores with a bandage.
- Avoid shared items such as bandages and menstrual pads carefully so no one is accidentally exposed to your blood.
- Wash hands well after touching your blood or infectious body fluids.
- Clean up blood spills; then clean the spill with a solution of 1 part household chlorine bleach to 10 parts of water.)
- Tell your sex partner(s) you have hepatitis B so they can be tested and vaccinated (if not already infected or vaccinated).
- Get tested 1, 2, 3 months after three doses of vaccine are completed to be sure the vaccine worked.

DO NOT'S

- Use condoms (rubbers) during sex unless your sex partner has had hepatitis B or has been immunized.

blood, contaminated body fluids, enter another person's bloodstream. HBV and HCV infections can cause chronic liver problems. HAV does not. There are vaccines that will protect people from HAV infection and HBV infection. Currently, there is no vaccine for HCV infection. There are several FDA-approved medications that are approved by the FDA for treatment of chronic HBV and HCV infections. If a person has had one type of viral hepatitis in the past, it is still possible to get the other type.

When did hepatitis B vaccine become available?

The first hepatitis B vaccine became commercially available in the United States in 1982. In 1986, a recombinant hepatitis B vaccine was developed. This technology was licensed, and a second recombinant hepatitis B vaccine was licensed in 1989.

What are the names of the hepatitis B vaccines available in the United States?

The two recombinant vaccines (Recombivax HB® and Engerix-B®) are the only hepatitis B vaccine preparations currently used in the United States. (Preparations from other countries are not available that contain these vaccines in combination with other vaccines.)

What kind of vaccines are they?

The hepatitis B vaccines used in the United States are recombinant DNA vaccines, which means they are produced by inserting the gene for HBV into common bacteria so that when it is grown, harvested, and purified, the HBV protein cannot occur from recombining hepatitis B vaccine.

How is this vaccine given?

HBV should be given to infants (12 months of age and younger) in the thigh muscle. Either the thigh or the upper arm muscle may be used for young children. The upper arm muscle is used for the administration for adolescents and adults. The vaccine should be given in the deltoid muscle despite the age of the patient.

Who should get this vaccine?

HBV should be given to a three-dose series. It is recommended for all children 0-18 years of age. It is recommended for infants beginning at birth in the hospital. All older children who did not get all the recommended doses of hepatitis B vaccine as an infant should be vaccinated. It is also recommended for possible. Most states require hepatitis B vaccine for school entry. Adolescents who are just starting their series will need two or three doses, depending on their age and the brand of vaccine used. Adults at

- ited and has had a blood test (as described above) demonstrating immunity to HBV infection. (Condoms might also protect you from other sexually transmitted diseases.)
- Tell household members.
 - Get tested and vaccinated to see their doctors for testing and vaccination that you are chronically infected with HBV.
 - See your doctor every 6-12 months to check your liver for abnormalities, including cancer.
 - If you are pregnant, tell your doctor that you have HBV infection. It is critical that your baby is started on hepatitis B shots within a few hours of birth.
- DO NOT**
- Drink alcohol, use tobacco, or use intravenous needles for sex or body piercing, or anything that might have come in contact with your blood or infectious body fluids.
 - Don't share syringes and needles.
 - Don't donate blood, plasma, body organs, tissue, or sperm.

What should you do if you have been exposed to HBV?

If you think you've been exposed to HBV, don't delay. Contact your doctor or clinic. If you have not been vaccinated, it is recommended that you receive treatment with hepatitis B immune globulin (HBIG). HBIG is a blood product containing protective HBV antibodies. It should be given as soon as possible, preferably at the same time as the HBIG is given, but at a different site on your body. Following this, you will need to complete the full hepatitis B vaccine series (usually 3 total of three doses over a six month period).

Can you get hepatitis B more than once?

Yes, you can get hepatitis B more than once. If you are exposed to hepatitis B virus, you should have protective antibodies in your blood that will prevent any further infection with HBV. The medical literature does report possible immune strain of HBV infection, but these are rare and would be highly unlikely to occur.

How does HBV differ from hepatitis A virus (HAV) and hepatitis C virus (HCV)?

HBV and HCV are blood-borne viruses that attack and injure the liver, and can cause similar symptoms. Usually people get HAV infection from close personal contact with an infected person or from ingesting fecally-contaminated food or water. HBV and HCV are spread when an infected person's blood or

increased risk of acquiring HIV infection should also be vaccinated. In addition, the vaccine can be given to any person who desires protection from hepatitis B.

What groups of adults are at increased risk of HIV infection?

- Healthcare workers and public safety workers with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids
- Men who have sex with men
- Sexually active people who are not in long-term, mutually monogamous relationships
- People seeking evaluation or treatment for a sexually transmitted disease
- Current or recent injection drug users
- Inmates of long-term correctional facilities
- People with end-stage kidney disease, including predialysis, hemodialysis, peritoneal dialysis, and kidney transplantation
- Staff and residents of institutions or group homes for the developmentally challenged
- Household members and sex partners of people with chronic HIV infection
- Susceptible (non-infected) people from United States populations known to previously or currently have been exposed to HIV infection, including Alaska Natives, Pacific Islanders, and immigrants or refugees from countries with intermediate or high rates of chronic HIV infection. To see a list of these countries, go to <http://www.cdc.gov/nidod/diseases/hepatitis/>.
- International travelers to regions with high or intermediate rates of HIV infection. To see a list of these countries, go to http://www.cdc.gov/nidod/diseases/hepatitis/country_listing.htm

In addition, any adult who wishes to be protected against HIV infection should be vaccinated without having to acknowledge a specific risk factor. If you have not been fully vaccinated with hepatitis B vaccine and you are cared for in any of the following settings, you should ask the setting's healthcare provider to fully vaccinate you with hepatitis B vaccine. Sexually transmitted disease treatment facilities
- HIV testing and treatment facilities
- Facilities providing drug-abuse treatment and prevention services
- Healthcare settings targeting services to injection drug users
- Correctional facilities

- Healthcare settings targeting services to men who have sex with men
- Chronic-hemodialysis facilities and end-stage renal disease programs
- Institutions and nonresidential day care facilities for developmentally challenged people

Who recommends this vaccine?

The Centers for Disease Control and Prevention (CDC), the American Academy of Pediatrics (AAP), the American Society of Travel Medicine (ASTM), the American College of Physicians (ACP), and the American College of Obstetricians and Gynecologists (ACOG) recommend this vaccine.

Is hepatitis B vaccine safe?

Yes. Hepatitis B vaccines have been demonstrated to be safe when administered to infants, children, adolescents, and adults. Since 1982, more than an estimated 100 million people have received more than 50 million infants and children have received at least one dose of hepatitis B vaccine in the United States. The majority of children who receive this vaccine have no side effects. Serious reactions are rare.

What side effects have been reported with this vaccine?

Of those children experiencing a side effect, most were reported within 24 hours of the vaccine. Side effects at the injection site (fewer than one out of three children) or low-grade fever. Adults are slightly more likely to experience such mild symptoms. Serious allergic reactions following hepatitis B vaccination are rare.

How effective is this vaccine?

After three properly administered doses of vaccine, more than 95 percent of children and more than 9 out of 10 infants, children, and adolescents develop protective antibodies and subsequent immunity to HIV infection.

Who is this vaccine recommended for all babies when most of them won't be exposed to HIV for many years, if then?

There are several reasons for recommending that all infants receive hepatitis B vaccine, starting at birth.

First, babies and young children have a very high risk for developing chronic HIV infection if they become infected at a young age.

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out of 100 chances of developing HIV infection sometime during his or her lifetime. By avoiding obvious means of exposure, people can reduce their chances of becoming infected. But while there are always ways to reduce the risk of HIV infection, there is no such thing as "no risk." Moreover, because this B vaccine is the first vaccine to prevent cancer—HIV-related liver cancer.

Real "Quasars" Cases of Hepatitis B Virus Transmits Risk! (Special?) Examples of the spread of HIV in a variety of settings.

Will your child need a booster shot later in life?
At the present time, booster doses are not recommended for children with immunocompetent systems. Although the level of protective antibodies in the blood of a vaccinated person seems to decline with time, the immune system seems to decline in "memory" and if the person is exposed to HIV, the system "kicks in" and provides the needed protection.

Experts are continuing to monitor the long-term effectiveness of hepatitis B vaccine and will issue recommendations on the need for booster doses if evidence shows that booster doses are necessary.

Should I be tested before I get the vaccine to see if I'm already infected or immune?

Blood testing before vaccination is not recommended for children because of the high risk of needle sticks and adhesions. However, certain children, such as those born in countries where HIV is moderate or highly endemic (see http://www.cdc.gov/nidod/diseases/hepatitis/country_listing.htm for details), should be tested before vaccination because they are not already immune. Testing can be done at the same visit when the first dose of hepatitis B vaccine is given. Vaccinating a person already immune to or infected with HIV will not help or harm the person.

The main reason for testing people at increased risk for HIV is to determine if they are infected. If after testing they are found to be infected, they must be referred to a health professional for ongoing medical care for chronic HIV infection.

Should I get my blood tested after getting the vaccine series to make sure it worked?

Testing after vaccination is not recommended routinely because it is not necessary to know if you are only for people whose medical care depends on knowledge of their response to the vaccine. This includes infants born to HIV-infected mothers; healthcare and public safety workers at risk of con-

tracted their infection as infants or young children. Those with chronic HIV infection are most likely to spread the infection to others. Infants and children who become chronically infected have an increased risk of dying prematurely from liver cancer or cirrhosis.

In contrast to other vaccine-preventable diseases of childhood, HIV infection in infants and young children usually produces no symptoms. Thus, the small number of reported cases of hepatitis B among children in the United States is due to the high prevalence of hepatitis B. For every child with hepatitis B, there are at least 100 HIV-infected children with no symptoms—hence the increased risk to spread the infection to others without knowing it.

Most early childhood infections occur. About 16,000 children under 10 years of age were infected with HIV every year in the United States before routine infant hepatitis B vaccination was recommended. Although these infections represented few cases, they were serious because they resulted in at least one out of 100 people with chronic HIV infection in the United States acquired their infection during early childhood. Clearly, infections occur among unvaccinated infants born to mothers who are HIV-infected. More than 100,000 children are born each year with HIV. More effort needs to be placed on vaccinating these unprotected children.

Most early childhood spread of HIV occurs in households where a person has chronic HIV infection, but the spread of HIV has also been recognized in day care centers, schools, and other settings. In many ways children become infected with HIV are from skin puncture (e.g., biting) or from having their mucous membranes or cuts and scratches come in contact with the blood of an HIV-infected person. Seven days outside the body and can be found on such as washcloths or toothbrushes.

Third, long-term protection following infant vaccination is expected to last for decades and will ultimately protect against acquiring infection at any age.

Why should you child be protected against hepatitis B when most of them will not be exposed to the virus for many years, if then?

There are several reasons for recommending that all infants receive hepatitis B vaccine, starting at birth.

First, babies and young children have a very high risk for developing chronic HIV infection if they become infected at a young age.

It is estimated that about 1 out of 3 of the nearly 1 million Americans with chronic HIV infection acquired their birth in the United States had a S

timed exposure to blood on the job, immune compromised people (e.g. people with AIDS or on hemodialysis), and sex and needle-sharing partners of people with chronic HBV infection. Testing for babies born to HBV-infected mothers should be done before birth. For more information on the hepatitis B vaccine series, at age 9-18 months (generally at the next well-child visit). Testing for other persons should be performed 1-2 months after the last dose of vaccine.

What should be done if a person gets the first two doses of hepatitis B vaccine but never goes back for the third dose?
If a person does not return for the third dose, the series does not need to be restarted. If the series is interrupted after the first dose, the second dose should be given as soon as possible; the second and third doses should be separated by an interval of at least 16 weeks. If the second dose is delayed, it should be administered as soon as possible. The minimum recommended dosing intervals are 4 weeks between the first and second doses and 8 weeks between the second and third doses. The minimum interval between the first and third doses is 16 weeks.

Who should NOT receive hepatitis B vaccine?
People who had a serious allergic reaction to one dose of hepatitis B vaccine should not have another

dose of hepatitis B vaccine. People with a history of hypersensitivity to yeast should not receive this vaccine. People with a moderate or severe acute illness should postpone receiving the vaccine until their condition is improved.

Can I get this vaccine when I am pregnant?
Yes.

I'm an adult who wants hepatitis B vaccination. How can I pay for the shots?
If you have insurance, the cost of hepatitis B vaccination might be covered. If not, these shots are available through the local health department or from health departments. Call your local health department for details.

Will hepatitis B vaccination protect me from hepatitis A or hepatitis C?
No. Hepatitis A and hepatitis C are different diseases caused by different viruses. There is a vaccine for hepatitis A and hepatitis C. For more information on hepatitis A and hepatitis C, talk to your healthcare professional, call your local health department, or visit www.cdc.gov/hepatitis and www.cdc.gov/hepatitis.