

## Viral hepatitis facts

- Many illnesses and conditions can cause inflammation of the liver (hepatitis), but certain viruses cause about half of all hepatitis in people.
- Viruses that primarily attack the liver are called hepatitis viruses. There are several types of hepatitis viruses including types A, B, C, D, E, and possibly G. Types A, B, and C are the most common.
- All hepatitis viruses can cause acute hepatitis.
- Viral hepatitis types B and C can cause chronic hepatitis.
- Symptoms of acute viral hepatitis include fatigue, flu-like symptoms, dark urine, light-colored stools, fever, and jaundice; however, acute viral hepatitis may occur with minimal symptoms that go unrecognized. Rarely, acute viral hepatitis causes fulminant hepatic failure.
- The symptoms of chronic viral hepatitis often are mild and nonspecific, and the diagnosis of chronic hepatitis often is delayed.
- Chronic viral hepatitis often requires treatment in order to prevent progressive liver damage, cirrhosis, liver failure, and liver cancer.
- Hepatitis infections can be prevented by avoiding exposure to viruses, and through injectable immunoglobulins or by vaccines; however, vaccines are available for only hepatitis A and B.
- Those at risk for viral hepatitis B and C include workers in the health care profession, people with multiple sexual partners, intravenous drug abusers, and people with hemophilia. Blood transfusion is a rare cause of viral hepatitis.

## Viral hepatitis definition

Hepatitis means inflammation of the liver. Many illnesses and conditions can cause inflammation of the liver, for example, drugs, alcohol, chemicals, and autoimmune diseases. Many viruses, for example, the virus causing mononucleosis and the cytomegalovirus can inflame the liver. Most viruses, however, do not attack primarily the liver; the liver is just one of

several organs that the viruses affect. Hepatitis caused by a few specific viruses that primarily attack the liver and are responsible for about half of all human hepatitis. There are several hepatitis viruses; they have been named types A, B, C, D, E, F (not confirmed), and G. The most common hepatitis viruses are types A, B, and C. Reference to the hepatitis viruses often occurs in an abbreviated form (for example, HAV, [HBV](#), [HCV](#) represent hepatitis viruses A, B, and C, respectively.) Hepatitis viruses replicate (multiply) primarily in the liver cells. This can cause the liver to be unable to perform its functions. The following is a list of major functions of the liver:

- The liver helps purify the blood by changing harmful chemicals into harmless ones. The source of these chemicals can be external, such as medications or alcohol, or internal, such as ammonia or bilirubin. Typically, these harmful chemicals are broken down into smaller chemicals or attached to other chemicals that then are eliminated from the body in the urine or stool.
- The liver produces many important substances, especially proteins that are necessary for good health. For example, it produces albumin, the protein building block of the body, as well as the proteins that cause blood to clot properly.
- The liver stores many sugars, [fats](#) and [vitamins](#) until they are needed elsewhere in the body.
- The liver builds smaller chemicals into larger, more complicated chemicals that are needed elsewhere in the body. Examples of this type of function are the manufacture of a fat, [cholesterol](#), and the protein bilirubin.

When the liver is inflamed, it does not perform these functions well, which brings about many of the symptoms, signs, and problems associated with any type of hepatitis

What are the common types of viral hepatitis?

Although the most common types of viral hepatitis are HAV, HBV and HCV, some clinicians had previously considered the acute and chronic phases of hepatic infections as "types" of viral hepatitis. HAV was considered to be acute viral hepatitis because the HAV infections seldom caused or permanent liver damage that led to hepatic (liver) failure. HBV and HCV produced

chronic viral hepatitis. However, these terms are outdated and not currently used as frequently because all of the viruses that cause hepatitis may have acute phase symptoms (see symptoms below). [Prevention](#) techniques and [vaccinations](#) have markedly reduced the current incidence of common viral hepatitis infections.

#### Hepatitis A (HAV)

HAV accounts for an estimated 1,781 new infections per year according to the most recent CDC data. The hepatitis caused by HAV is an acute illness (acute viral hepatitis) that never becomes chronic. At one time, hepatitis A was referred to as "infectious hepatitis" because it could be spread easily from person to person like other viral infections. Infection with hepatitis A virus can be spread through the ingestion of food or water, especially where unsanitary conditions allow water or food to become contaminated by human waste containing hepatitis A (the fecal-oral mode of transmission). Hepatitis A typically is spread among household members and close contacts through the passage of oral secretions (intimate kissing) or stool (poor hand washing). It also is common to have infection spread to customers in [restaurants](#) and among children and workers in day care centers if hand washing and sanitary precautions are not observed.

#### Hepatitis B (HBV)

There were an more than 19,000 new cases of HBV infection estimated by the CDC in 2013 and more than 1,800 people die each year due to the consequences of chronic [hepatitis B](#) infection in the United States according to the CDC. HBV hepatitis was at one time referred to as "serum hepatitis," because it was thought that the only way HBV could spread was through blood or serum (the liquid portion of blood) containing the virus. It is now known that HBV can spread by sexual contact, the transfer of blood or serum through shared needles in drug abusers, accidental needle sticks with needles contaminated with infected blood, blood transfusions, [hemodialysis](#), and by infected mothers to their newborns. The infection also can be spread by tattooing, body piercing, and sharing razors and toothbrushes (if there is contamination with infected blood). About 6% to 10% of patients with HBV hepatitis develop chronic HBV infection (infection lasting at least six months and often years to decades) and can infect others as long as they remain infected. Patients with chronic HBV infection also are at risk

of developing cirrhosis, liver failure, and liver [cancer](#). It is estimated that there are 2.2 million people in the U.S. and 2 billion people world-wide who suffer with chronic HBV infections.

### Hepatitis C (HCV)

The CDC reported that there were about 16,500 reported new cases per year (unreported is 13.4 times more than reported) of [hepatitis C](#). HCV hepatitis was previously referred to as "non-A, non-B hepatitis," because the causative virus had not been identified, but it was known to be neither HAV nor HBV. HCV usually is spread by shared needles among drug abusers, blood transfusion, hemodialysis, and needle sticks. Approximately 90% of transfusion-associated hepatitis is caused by HCV. Transmission of the virus by sexual contact has been reported, but is considered rare. An estimated 50% to 70% of patients with acute HCV infection develop chronic infection. Patients with chronic HCV infection can continue to infect others. Patients with chronic HCV infection are at risk for developing cirrhosis, liver failure, and liver [cancer](#). It is estimated that there are about 3.2 million people with chronic HCV infection in the U.S.

### Types D, E, and G Hepatitis

There also are viral hepatitis types D, E, and G. The most important of these at present is the hepatitis D virus (HDV), also known as the delta virus or agent. It is a small virus that requires concomitant infection with HBV to survive. HDV cannot survive on its own because it requires a protein that the HBV makes (the envelope protein, also called surface antigen) to enable it to infect liver cells. The ways in which HDV is spread are by shared needles among drug abusers, contaminated blood, and by sexual contact; essentially the same ways as HBV.

Individuals who already have chronic HBV infection can acquire HDV infection at the same time as they acquire the HBV infection, or at a later time. Those with chronic hepatitis due to HBV and HDV develop cirrhosis (severe liver scarring) rapidly. Moreover, the combination of HDV and HBV virus infection is very difficult to treat.

Hepatitis E virus (HEV) is similar to HAV in terms of disease, and mainly occurs in Asia where it is transmitted by contaminated water.

[Hepatitis G](#) virus (HGV, also termed GBV-C) was recently discovered and resembles HCV, but more closely, the flaviviruses; the virus and its effects are under investigation, and its role in causing disease in humans is unclear.

People who are most at risk for developing viral hepatitis are:

- Workers in the health care professions
- Asians and Pacific Islanders
- Sewage and water treatment workers
- People with multiple sexual partners
- Intravenous drug users
- [HIV](#) patients
- People with hemophilia who receive blood clotting factors

Blood transfusion, once a common means of spreading viral hepatitis, now is a rare cause of hepatitis. Viral hepatitis is generally thought to be as much as ten times more common among lower socioeconomic and poorly educated individuals. About one third of all cases of hepatitis come from an unknown or unidentifiable source. This means that a person does not have to be in a high risk group in order to be infected with a hepatitis virus. In countries with poor sanitation, food and water contamination with HAV increases risk. Some day care centers may become contaminated with HAV, so children at such centers are at a higher risk for HAV infections.

### **Symptoms and signs**

The period of time between exposure to hepatitis and the onset of the illness is called the incubation period. The incubation period varies depending on the specific hepatitis virus.

Hepatitis A virus has an incubation period of about 15 to 45 days; Hepatitis B virus from 45 to 160 days, and [Hepatitis C](#) virus from about 2 weeks to 6 months.

Many patients infected with HAV, HBV, and HCV have few or no symptoms of illness. For those who do develop symptoms of viral hepatitis, the most common are flu- like symptoms including:

- [Loss of appetite](#)
- [Nausea](#)
- [Vomiting](#)
- [Fever](#)
- [Weakness](#)
- [Tiredness](#)
- Aching in the abdomen

Less common symptoms include:

- Dark urine
- Light-colored stools
- Fever
- [Jaundice](#) (a yellow appearance to the skin and white portion of the eyes)

What is acute fulminant hepatitis?

Rarely, individuals with acute infections with HAV and HBV develop severe inflammation, and the liver fails (acute fulminant hepatitis). These patients are extremely ill with the symptoms of acute hepatitis already described and the additional problems of [confusion](#) or [coma](#) (due to the liver's failure to detoxify chemicals), as well as bruising or bleeding (due to a lack of blood clotting factors). In fact, up to 80% of people with acute fulminant hepatitis can die within days to weeks; therefore, it is fortunate that acute fulminant hepatitis is rare. For example, less than 0.5% of adults with acute infection with HBV will develop acute fulminant hepatitis. This is even less common with HCV alone, although it becomes more frequent when both HBV and HCV are present together.

What is chronic viral hepatitis?

Patients infected with HBV and HCV can develop chronic hepatitis. Doctors define chronic hepatitis as hepatitis that lasts longer than 6 months. In chronic hepatitis, the viruses live and multiply in the liver for years or decades. For unknown reasons, these patients' immune systems are unable to eradicate the viruses, and the viruses cause chronic inflammation of the liver. Chronic hepatitis can lead to the development over time of extensive liver scarring

(cirrhosis), liver failure, and liver [cancer](#). Liver failure from chronic [hepatitis C](#) infection is the most common reason for liver transplantation in the U.S. Patients with chronic viral hepatitis can transmit the infection to others with blood or body fluids (for example, sharing needles, sexually, and infrequently by organ donation) as well as infrequently by transmission from mother to [newborn](#).

## **Diagnosis**

Diagnosis of viral hepatitis is based on symptoms and physical findings as well as blood tests for liver enzymes, viral antibodies, and viral genetic materials.

### **Blood tests**

There are three types of blood tests for evaluating patients with hepatitis: liver enzymes, antibodies to the hepatitis viruses, and viral proteins or genetic material (viral DNA or RNA).

**Liver enzymes:** Among the most sensitive and widely used blood tests for evaluating patients with hepatitis are the liver enzymes, called aminotransferases. They include aspartate aminotransferase (AST or SGOT) and alanine aminotransferase (ALT or SGPT). These enzymes normally are contained within liver cells. If the liver is injured (as in viral hepatitis), the liver cells spill the enzymes into the blood, raising the enzyme levels in the blood and signaling that the liver is damaged.

The normal range of values for AST is from 5 to 40 units per liter of serum (the liquid part of the blood) while the normal range of values for ALT is from 7 to 56 units per liter of serum

**Viral antibodies:** Blood tests for the antibodies can be helpful in diagnosing both acute and chronic viral hepatitis.

The viruses continue to multiply and are released from the liver cells into the blood where their presence can be determined by measuring the viral proteins and genetic material. Therefore in chronic hepatitis, both antibodies to the viruses and viral proteins and genetic material can be detected in the blood.

Examples of tests for viral antibodies are:

- anti-HAV (hepatitis A antibody)
- antibody to hepatitis B core, an antibody directed against the inner core material of the virus (core antigen)
- antibody to hepatitis B surface, an antibody directed against the outer surface envelope of the virus (surface antigen)
- antibody to hepatitis B e, an antibody directed against the genetic material of the virus (e antigen)
- hepatitis C antibody, the antibody against the C virus

Viral proteins and genetic material: Examples of tests for viral proteins and genetic material are:

- hepatitis B surface antigen
- hepatitis B DNA
- hepatitis B e antigen
- hepatitis C RNA

Other tests: Obstruction of the bile ducts, from either [gallstones](#) or cancer, occasionally can mimic acute viral hepatitis. [Ultrasound](#) testing can be used to exclude the possibility of gallstones or cancer.

### **Treatment**

Treatment of acute viral hepatitis and chronic viral hepatitis are different. Treatment of acute viral hepatitis involves resting, relieving symptoms and maintaining adequate intake of fluids.

Treatment of chronic viral hepatitis involves medications to eradicate the virus and taking measures to prevent further liver damage.

Medications for chronic hepatitis C infection include:

- injectable alpha interferons (Pegasys)
- oral [ribavirin](#) ([Rebetol](#), [Copegus](#))
- oral [boceprevir](#) ([Victrelis](#))
- [simeprevir](#) ([Olysio](#))
- oral [sofosbuvir](#) ([Sovaldi](#))

- oral [simeprevir \(Olysio\)](#)
- oral daclatasvir (Daklinza)
- oral ledipasvir/sofosbuvir (Harvoni)
- oral ombitasvir/paritaprevir/[ritonavir](#) (Technivie)
- oral ombitasvir/paritaprevir/ritonavir/dasabuvir (Viekira Pak)

Medications for chronic hepatitis B infection include:

- injectable alpha interferons
- oral [lamivudine \(Epivir\)](#)
- oral adefovir ([Hepsera](#))
- oral entecavir (Baraclude)
- oral telbivudine (Tyzeka)
- oral [tenofovir \(Viread\)](#)

## Prevention

Prevention of hepatitis involves measures to avoid exposure to the viruses, using immunoglobulin in the event of exposure, and vaccines. Administration of immunoglobulin is called passive protection because antibodies from patients who have had viral hepatitis are given to the patient. Vaccination is called active protection because killed viruses or non-infectious components of viruses are given to stimulate the body to produce its own antibodies.

Hepatitis Vaccinations

Hepatitis A

Two hepatitis A vaccines are available in the US, [hepatitis A vaccine \(Havrix, Vagta\)](#).

Hepatitis B

For active vaccination, a harmless hepatitis B antigen is given to stimulate the body's immune system to produce protective antibodies against the surface antigen of hepatitis B.

[Hepatitis B vaccine](#) is recommended for:

- All infants
- Adolescents under 18 years of age who did not receive hepatitis B vaccine as infants
- People occupationally exposed to blood or body fluids

- Residents and staff of institutions for the developmentally disabled
- Patients receiving kidney hemodialysis
- People who with hemophilia and other patients receiving clotting factor concentrates
- Household contacts and sexual partners of patients infected with hepatitis B chronically
- Travelers who will spend more than 6 months in regions with high rates of hepatitis B infection
- Injection drug users and their sexual partners
- Men who have sex with men, men or women with multiple sex partners, or recent infection with a [sexually transmitted infection](#)
- Inmates of long-term correctional facilities