

Glossary

Acute Hepatitis Infection: A new, suddenly occurring infection. It occurs with a person's first exposure to the hepatitis B virus.

Adefovir dipivoxil (Hepsera): An oral nucleoside analogue drug that interferes with the replication of the hepatitis B virus (e.g. it can slow down or stop the virus from reproducing). It was approved for chronic hepatitis B in September 2002.

Albumin: A protein made in the liver that assists in maintaining blood volume in the arteries and veins. If the liver is damaged, then the albumin can drop to very low levels, which may cause fluid to leak into the tissues from the blood vessels, resulting in edema or swelling. In acute liver failure, there is an accumulation of fluid in the abdomen that is known as "ascites".

Alpha-fetoprotein (AFP): A protein secreted into the blood during pregnancy or when cancer cells are present. Increased levels may indicate the development of liver cancer, which is why the simple AFP blood test is included in the regular monitoring of those with chronic HBV.

Antibody: A protein molecule produced by the immune system in response to a foreign body, such as the hepatitis B virus. Antibodies can be produced in response to a vaccine or to a natural infection. They circulate in the blood to protect against future infections.

Anti-HCV (antibody to hepatitis C virus): The antibody produced against the hepatitis C virus (HCV). Its presence in the bloodstream often indicates HCV infection. This antibody has not been shown to protect people against hepatitis C.

Antigen: A protein on the surface of a virus, bacteria or cell that can stimulate the immune system to produce antibodies as a defense mechanism.

Ascites: A large, abnormal accumulation of fluid in the abdomen that can occur due to liver failure, cirrhosis and liver cancer. This condition requires immediate medical attention.

Asymptomatic: Refers to infection or disease without signs of illness. Many patients with hepatitis B or C do not have any symptoms during a new or chronic infection; they are considered to be asymptomatic.

Bilirubin: The liver usually clears this end product of hemoglobin (the portion of the red blood cell that carries oxygen in the blood) when it normally breaks down. If the liver is damaged and bilirubin accumulates in the blood, a person can become jaundiced (yellowed eyes and skin).

Bloodborne Pathogens: Substances present in the blood that can cause infection or disease. Hepatitis B and hepatitis C viruses are bloodborne pathogens since they are spread through blood and can cause a liver infection.

Carcinoma: A new growth or malignant tumor that can occur throughout the body (e.g. hepatocellular carcinoma refers to liver cancer).

Centers for Disease Control and Prevention (CDC): This federal organization is concerned with the prevention and control of communicable diseases such as hepatitis B and C. It conducts extensive research and provides information about public health topics.

Chronic Hepatitis B Infection: A patient who tests positive for the hepatitis B virus for more than 6 months is considered to have a chronic hepatitis B infection.

Cirrhosis: A serious liver condition characterized by irreversible scarring of the liver that can lead to liver failure and death. Alcohol and chronic viral hepatitis (such as chronic hepatitis B and C) can cause continuous inflammation of the liver, which can lead to excess scar formation or fibrosis. Scarring results in the loss of liver cells and impairs liver function.

Clinical Trials: Carefully controlled studies that are conducted in humans who volunteer to test the effectiveness and safety of new drugs, medical products or techniques. All drugs in the United States undergo three phases of clinical trials before being approved for general use.

Clotting Factors: Proteins made in the liver that are important in maintaining normal blood clotting. Disruption in the blood's ability to clot may indicate that the liver is not creating enough clotting factors. A severe shortage in clotting factors may indicate that a liver transplant is needed.

Complete Blood Count (CBC): A test that measures the number of red blood cells, white blood cells, the amount of hemoglobin, hematocrit, and platelets. Low white blood cell and platelet counts may indicate liver scarring.

Complications: New medical problems that arise while treating existing ones.

DNA Polymerase: An enzyme essential to the replication of the hepatitis B virus. Most of the current antiviral drugs used against HBV interfere with the DNA polymerase in order to stop the virus from reproducing.

Decompensated Cirrhosis: A late-stage cirrhosis accompanied by abnormal blood tests and other complications. At this stage of the disease, evaluation for liver transplant becomes an option.

E-Antibody (HBeAb or anti-HBe): Produced by the immune system temporarily during acute HBV infection or consistently during or after a burst in viral replication. Spontaneous conversion from e-antigen to e-antibody (a change known as "seroconversion") is a predictor of long-term clearance of HBV in patients undergoing antiviral therapy.

Encephalopathy: Serious brain function abnormalities experienced by some patients with advanced liver disease. Symptoms most commonly include confusion, disorientation, insomnia, and may progress to a coma.

Entecavir: An oral nucleoside analogue drug that interferes with the replication of the hepatitis B virus (e.g. it can slow down or stop the virus from reproducing). It was the third oral drug approved for chronic hepatitis B in April 2005.

Enzymes: Naturally occurring chemical substances in the human body that help a chemical reaction take place.

Epidemiology: A field of medical science that studies the incidence, distribution, and control of disease in a population. This information is often used to determine causes and methods of controlling diseases.

False-Positive: A test result that mistakenly gives a positive reading.

Fatty Liver: Refers to a condition where fat accumulates in liver cells. This accumulation of fat does not generally cause liver damage, but it needs to be monitored. It is detected by liver biopsy.

Fibrosis (hepatic): Growth of fibrous tissue in the liver where there is usually liver cell damage or destruction. Fibrosis can lead to cirrhosis, an even more serious liver disease.

Food and Drug Administration (FDA): A federal organization charged with protecting the public health. It establishes safety and effectiveness guidelines for healthcare products such as the drugs that are used to treat hepatitis B and C.

Gastroenterology: The field of medicine that focuses on the function and disorders of the GI system, which includes the esophagus, stomach, pancreas, intestines, and liver.

Genome: Refers to the genetic material of an organism such as a human or a virus.

Genotype: A pattern of genetic information that is unique to an individual or group. The hepatitis B virus has a pattern of genetic information unique to itself. Doctors may determine the genotype to help decide the best treatment. Currently, there are seven known genotypes for hepatitis B; however, its significance is not well established for clinical use. Hepatitis C treatment can be based on genotype.

Hepatitis: Refers to “inflammation of the liver”, which can be caused by many things such as viruses, bacterial infections, trauma, adverse drug reactions, or alcoholism. Inflammation of the liver caused by viruses is called “viral hepatitis”. There are many different viruses that attack the liver:

Hepatitis A: Formerly called “infectious hepatitis”, it is caused by the hepatitis A virus (HAV) and is an acute infection. There is no chronic infection. Most patients recover completely within 6 to 10 weeks. Hepatitis A is spread mainly via feces and contaminated food and water. There is a safe vaccine for HAV.

Hepatitis B: Formerly called “serum hepatitis”, it is caused by the hepatitis B virus (HBV). Approximately 10% of infected adults progress to chronic hepatitis B; 90% of newborns born to HBV infected women develop chronic infections; and young children have a 30-50% chance of developing a chronic infection. It is spread primarily through blood, unprotected sex, shared needles, and from an infected mother to her newborn during the delivery process. There is a safe vaccine for HBV.

Hepatitis C: Formerly known as “non-A, non-B hepatitis”, it is caused by the hepatitis C virus (HCV). Approximately 85% of infected adults will develop chronic hepatitis C infections. It is spread through infected blood, primarily in those who use illicit street drugs and those who received blood transfusions prior to 1992 (the first year that a blood test for HCV became available for screening the blood supply). There is no vaccine.

Hepatitis D: Known as “delta hepatitis”, it is caused by the hepatitis D virus (HDV). This virus can only co-infect patients who are already infected with hepatitis B. Hepatitis D infection is rare in the United States. It occurs primarily in recipients of multiple blood transfusions, including patients with hemophilia or those undergoing renal dialysis, and among people who share contaminated needles. There is no vaccine.

Hepatitis E: Also referred to as “enterically transmitted non-A, non-B hepatitis”, it is caused by the hepatitis E virus (HEV). It is spread through fecal contamination of water; occurs primarily in developing countries; and is found rarely in the United States. Hepatitis E infection results in an acute infection much like hepatitis A; it does not cause chronic infection. There is no vaccine.

Hepatitis F: Only a handful of cases have been reported from France with subsequent experimental transmission to primates. The virology, epidemiology and clinical importance of the hepatitis F virus are uncertain. There is no commercial test nor is there a vaccine.

Hepatitis G: The hepatitis G virus (also called hepatitis GB virus or HGBV-C) is a distant relative of the hepatitis C virus. It appears to be transmitted through transfusions (one to two percent of US blood donors have HGV RNA detectable in their serum). Its role in acute

and chronic hepatitis remains unclear. Recent studies suggest that the virus may not even replicate in the liver. At the present time, HGV does not appear to be an important cause of clinical liver disease. There is no commercial test nor is there a vaccine.

Hepatitis B Blood Panel: There are three common hepatitis B tests that make up the Hepatitis B Blood Panel. This is a simple test that requires only one blood sample, which can be obtained during an office visit to the doctor.

1. **Hepatitis B Surface Antigen (HBsAg):** The surface protein of the hepatitis B virus that is used as a marker to detect infection. If this blood test is positive, then the hepatitis B virus is present.
2. **Hepatitis B Surface Antibody (HBsAb or anti-HBs):** The antibody formed in response to the surface protein of the hepatitis B virus. It can be produced in response to vaccination or recovery from an actual hepatitis B infection. If this test is positive, then the immune system has successfully developed a protective antibody against the hepatitis B virus that provides long-term immunity.
3. **Hepatitis B Core Antibody (HBcAb or anti-HBc):** This antibody only refers to a part of the virus itself; it does not provide any protection or immunity against HBV. This test is often used by blood banks to screen blood donations. A positive test indicates a person may have been exposed to the hepatitis B virus, but the result can only be confirmed in relationship to the above two tests.

HBeAg: A marker of a high degree of HBV infectivity, it correlates with a high level of HBV replication. It is primarily used to help determine the clinical management of patients with chronic HBV infection.

Hepatitis B Immune Globulin (HBIG): A medication that is given as a “post-exposure” treatment to prevent hepatitis B. This means that HBIG is given after a person has been exposed to potentially infected blood or infected bodily fluids, which can include but is not limited to - contact with blood or through a needlestick, infants born to infected women, and through sexual contact or close household contact with an infected person. HBIG is often used as a post-liver transplant treatment.

HBV-DNA: A marker of viral replication. It correlates well with infectivity. It is used to assess and monitor the treatment of patients with chronic HBV infection.

Hepatocellular Carcinoma (HCC): A malignant tumor of the liver, otherwise known as liver cancer. Chronic hepatitis B and C infections may increase the risk of developing liver cancer.

Hepatocyte: A liver cell.

Hepatologist: A doctor who specializes in the study and treatment of liver disease. Ideally, patients with chronic hepatitis B or C should see a “hepatologist”.

Hepatology: The field of medicine that focuses on diseases of the liver. It is a subspecialty within gastroenterology.

Histology: The field of medicine that studies tissue under the microscope. Histological evaluations of liver biopsy samples are helpful in the diagnosis and monitoring of possible liver damage in chronic HBV and HCV carriers.

IgG anti-HBc: A subclass of the hepatitis B core antibody (HBcAb or anti-HBc) is a marker of past or current infection with HBV. If it and HBsAg are both positive (in the absence of IgM anti-HBc), this indicates chronic HBV infection.

IgM anti-HBc: A subclass of the hepatitis B core antibody (HBcAb or anti-HBc). Positivity indicates recent infection with HBV (less than 6 months). Its presence indicates acute infection.

Immune System: The body’s defense system against invasion by foreign bodies such as bacteria, viruses, fungi, parasites, and malignant cells.

Immunology: The branch of medicine that studies the immune system, immunity, and allergies.

Infection: The results of the presence of harmful microorganisms in the body. Infections can be acute (sudden) or chronic (persistent).

Injection: A method of administering drugs or nutrients into the body using a needle.

- * Intramuscular (IM): into muscle tissue.
- * Intravenous (IV): into a vein.
- * Subcutaneous (SQ): beneath the skin.

Interferon: A protein that is produced by the body to protect against infection. Many different cells including liver cells produce natural interferon. Interferon also can be manufactured artificially through biotechnology for the treatment of chronic hepatitis B and C.

Interferon Alpha-2b (Intron A): A drug that mimics naturally occurring “interferon”, which is an infection-fighting immune substance produced by the body. It is self-administered at least three times a week by injection. This was the first drug approved for chronic hepatitis B in 1991. Available for both adults and children greater than 2 years old.

Investigational Drug: A new drug that is undergoing clinical trials to prove its effectiveness and safety (see clinical trials).

Jaundice: A condition characterized by yellowing of the skin and eyes. Jaundice is a symptom of many disorders, which can include viral hepatitis, alcoholism, poisoning, and abnormal breakdown of red blood cells or gallbladder disease. This symptom requires immediate medical attention.

Lamivudine (Epivir-HBV, Zeffix, Heptodin): An oral nucleoside analogue drug that interferes with the replication of the hepatitis B virus (e.g. it can slow down or stop the virus from reproducing). It was the second drug approved for chronic hepatitis B in December 1998. Available for both adults and children.

Liver: The largest glandular organ in the body. The liver has many functions that include, but are not limited to the production of protein and cholesterol, the production of bile and clotting factors, the storage of sugar in the form of glycogen, and the breakdown of carbohydrates, fats, and proteins. The liver also breaks down and excretes many medications.

Liver Biopsy: The removal of a small piece of tissue from the liver using a special needle. The tissue is examined under a microscope to look for the presence of inflammation or liver damage (see histology).

Liver Enzymes: Proteins that catalyze chemical reactions needed for bodily functions. Levels of certain enzymes, such as ALT and AST are higher when the liver is injured, as they leak into the bloodstream when the cell is injured or destroyed.

Liver Function Tests (LFT's): Refers to a group of blood tests used to evaluate the function of the liver. The tests can be used to diagnose and monitor chronic viral hepatitis as well as other liver diseases. The two most common tests include the following liver enzymes:

- * **Aspartate Aminotransferase (AST):** An enzyme that is released into the blood by the liver and other tissues or organs. It is generally used as a marker for liver or biliary damage.

- * **Alanine Aminotransferase (ALT):** An enzyme that is released into the blood by damaged liver cell. It is used as a marker for liver cell damage. The ALT test is considered to be a more accurate reflection of liver inflammation than AST because other organs such as the heart can also produce AST. (e.g. the level of AST will increase on a blood test during a heart attack). ALT levels are included in the regular monitoring of all chronic hepatitis B patients; this test can also useful in deciding whether a patient would benefit from therapy or evaluating the effectiveness of an ongoing treatment.

Needlestick: Refers to an accidental puncture of the skin while handling hypodermic needles or syringes. This is most common among health care providers such as physicians, nurses, and emergency response personnel.

Non-Responders: Patients who do not respond to therapy or a vaccine within a specific period.

Patient Compliance: Patients who correctly follow all the instructions about a course of therapy as directed by their physician are considered to be “compliant” with a treatment protocol (see protocol below).

PCR (polymerase chain reaction): A highly sophisticated scientific method of detecting the presence of hepatitis B virus DNA or hepatitis C virus RNA in the blood. This test can be conducted on the same sample of blood obtained with the hepatitis B panel of blood tests; no extra doctor’s visit is needed.

Peg Interferon Alfa-2a (Pegasys): A pegylated interferon drug that mimics naturally occurring “interferon”, which is an infection-fighting immune substance produced by the body. It is self-administered once a week by injection and seems to have fewer side effects than the interferon alpha. Approved for treatment of chronic hepatitis B in May 2005.

Percutaneous: Passage or absorption of substances into the body through unbroken skin.

Perinatal Transmission (vertical transmission): Transmission of an infectious disease, such as hepatitis B, from mother to newborn. All pregnant women should be tested for hepatitis B since newborns have a 90% chance of becoming chronically infected if they do not receive the first dose of hepatitis B vaccine and a single dose of HBIG within 12 hours after delivery. The infant will also need additional doses of hepatitis B vaccine at one and six months of age to ensure a complete immune response.

Persistent: A disease or other medical condition that returns or continues over a long time.

Platelets: Cells that are produced in the bone marrow. Platelets control bleeding by causing the blood to clot. The liver produces the clotting factors involved in this process. If the liver is damaged, then clotting will also be impaired.

Post-Transfusion Hepatitis: Liver inflammation, or hepatitis, that occurs when the body reacts unfavorably to a blood transfusion. This is now rare in the United States due to careful blood screening procedures.

Protein: A substance made of a string of amino acids. Proteins are the “building blocks” of the human body.

Protocol: A detailed plan of a scientific experiment or medical treatment. A specific step-by-step procedure is used in clinical trials to test new drugs and treatments for diseases such as chronic hepatitis B.

Recombinant DNA: Genetic material that has been altered and recombined in the laboratory by cutting up DNA molecules and splicing together specific DNA fragments. Many drugs, including the hepatitis B vaccines, are produced using recombinant DNA methods.

Reconstitution: The process of adding liquid to a dry powder to make a new solution. Prescription drugs that are given by injection are often provided as a dry powder, which must be reconstituted (e.g. liquid must be added) before it can be used.

Recreational Drugs (illicit drug use): Illegal drugs, such as marijuana, crack, cocaine, and heroin. People who use these drugs have a much greater risk of acquiring a hepatitis B or C infection as a result of sharing needles or engaging in other behaviors that increase their risk of exposure to infected blood.

Relapse: The return (or recurrence) of symptoms of a disease after a period of improvement.

Remission: A period of time during which all or some of the symptoms of a disease have disappeared or decreased in severity. Remission may occur spontaneously or as a result of medical treatment.

Retreatment: Treatment that is restarted after a patient has suffered a relapse or has not responded to treatment the first time.

Risk Factors: Refers to behaviors and conditions that increase the possibility of an individual developing a disease. Smoking is a risk factor for lung cancer. Jobs that expose a person to blood or the use of illegal drugs are risk factors for acquiring a hepatitis B or C infection.

Screening: Testing blood samples or blood donations for the presence of disease. Before blood donations are accepted, they are screened for hepatitis B, hepatitis C, and HIV/AIDS and other bloodborne pathogens.

Self-Administration: Therapy, such as interferon injections, that patients give to themselves rather than having it done by a health care provider.

Seroconversion: A change in status from antigen positive/antibody negative to antigen negative/antibody positive. For example, seroconversion of e-antigen positive to e-antibody positive indicates a significant decrease in the amount of hepatitis B virus. Seroconversion of hepatitis B surface antigen positive/surface antibody negative to surface antigen

negative/surface antibody positive connotes being "cured" of a chronic HBV infection since the virus has been cleared from the liver and bloodstream.

Serology: Refers to the study of serum (the clear portion of a body fluid) for its antibody content. When a person is exposed to a microorganism, such as the hepatitis B or C virus, the body produces specific antibodies against it. In laboratory testing, the antibodies react with antigens in specific ways that can be used to confirm the identity of the microorganism, however, this test is not used to diagnose a current infection.

Spleen: An organ located in the left upper abdomen that removes old red blood cell and other blood cells from circulation. The spleen can enlarge in a person who has cirrhosis.

STD (sexually transmitted disease): A disease that is transmitted through sexual contact.

Sustained Response: A response to therapy that continues over a long time period. For example, a patient treated for chronic hepatitis B or C who remains free of the virus for at least 6 months after stopping treatment is considered to have a sustained response to therapy.

Symptom: Any change in the body or its functions, as perceived by the patient, which could indicate the presence of disease.

T-Cells: A type of white blood cells that are involved in rejecting foreign tissue, regulating immunity, and controlling the production of antibodies to fight infection.

Therapy: Treatment of a disease.

Transaminases: Refers to SGOT or SGPT, which are older terms for the ALT and AST amino transferases (see liver function tests).

Transfusion: The introduction of whole blood or components of blood (such as plasma, platelets) from one person to another.

Transmission: The way or method by which a disease can be spread.

Vaccine: A medication that stimulates the production of antibodies to protect against a specific disease. There is a hepatitis A vaccine, hepatitis B vaccine, and a combination vaccine that provides protection against both hepatitis A and B at the same time.

Variceal Bleeding: Abnormal bleeding from ruptured blood vessels in the esophagus that results from severely impaired blood flow through the liver. Patients with advanced cirrhosis are at greatest risk for this complication. This is a life-threatening emergency and requires immediate medical attention.

Viral hepatitis: Inflammation of the liver caused by viruses that specifically attack the liver: hepatitis A, B, C, D, E, F, and G viruses.

Viral Load: Measurement of the actual amount of virus in the bloodstream such as hepatitis B and C.

Viremia: Refers to the presence or amount of a given virus in the bloodstream.

Virus: A tiny microorganism, smaller than bacteria, which can invade the body and cause disease. A virus can reproduce itself exactly or mutate and make small changes. The ability of a virus to change slightly in each infected person is why treatment of viral diseases is so difficult.