The information in this guide is designed to help you understand and manage viral hepatitis and is not intended as medical advice. All persons with viral hepatitis should consult a medical practitioner for diagnosis and treatment.
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Foreword

Hepatitis is an inflammation of the liver. “Hepa” refers to the liver and “titis” means inflammation. Hepatitis can be caused by toxins, drugs, too much alcohol, or a variety of viruses. Viruses that infect the liver are called hepatitis viruses. Each virus is unique and is identified by a letter of the alphabet, in the order of its discovery. This fact sheet will discuss the basics of hepatitis A, B, and C and will touch on what we know about hepatitis D and E.

Alan Franciscus
Executive Director, Hepatitis C Support Project
Editor-in-Chief, HCV Advocate
HEPATITIS A (HAV)

Hepatitis A is a disease of the liver caused by the hepatitis A virus (HAV). HAV is a picornavirus that enters the bloodstream via the intestines. Once HAV enters the bloodstream, it is then transported to the liver where it replicates. HAV is excreted in feces or stool—which is the major transmission route. HAV is the most common type of viral hepatitis in the United States. The Centers for Disease Control estimate that about 3,000 new HAV infections occur annually in the United States, and approximately one-third of all Americans have been infected with HAV, most during childhood.

• **HAV Transmission**

Hepatitis A virus infection continues to be one of the most frequently reported, vaccine-preventable diseases in the United States. The incidence of HAV has dramatically decreased from 180,000 new infections in 1997 to an estimated 3,000 today. The decrease in new HAV infections is a result of the introduction of the HAV vaccine in 1995 and increased prevention measures.

Children play an important role in the transmission of HAV, which is why the U.S. Centers for Disease Control and Prevention recommends that all children be vaccinated against HAV at 12 months of age. Children are the ones who are most frequently infected, and because they rarely have symptoms, they are a silent source of infection for others. Only a small fraction of childhood HAV infections are ever reported to public health authorities, due to the lack of symptoms.

Unlike hepatitis B and C, which spread through contact with infected blood or body fluids, hepatitis A is spread through food and water contaminated by the feces (poop) of people infected with HAV. The virus is spread by hepatitis A virus infected fecal matter that is ingested (by mouth). This can happen even if you cannot see it or if it appears to be clean (i.e., a glass of water, ice cubes, etc.).

It is also transmitted through close, personal contact such as changing diapers and through some types of sexual contact (e.g., analingus, or anal/oral sex) and, rarely, injection drug use.

This virus is extremely hearty. It is able to survive the body’s highly acidic digestive tract, and at room temperature it can live for more than a week. In water, it can survive from 3 to 10 months, which is why it is found in some shellfish in sewage-contaminated bodies of water.

Workers in day care centers and long-term care facilities, such as nursing homes, have a higher risk of getting hepatitis A, as do
international travelers to areas that have substandard drinking water.

- **HAV Prevention**
  To prevent transmission of HAV, adults and children must wash hands thoroughly (10 to 20 seconds), especially after using the toilet or changing diapers. People who are acutely infected with HAV should avoid preparing food for others. Clean up spilled blood or body fluids with a 10:1 bleach solution (10 parts cool water to 1 part bleach). Wear gloves when touching blood, body secretions, or any cuts or sores. Do not share razors, toothbrushes, or needles. Practice safer sex, including latex condoms and latex or plastic barriers for oral/anal sex.

Thoroughly wash any fruits and vegetables especially if grown outside of the United States—some fruits and vegetables may become contaminated with unprocessed sewage accidently, or some growers in countries outside of the United States may use human waste as fertilizer.

- **HAV Symptoms and Progression**
  Hepatitis A has an incubation period that can be from 15-50 days but averages 28 days. When symptoms occur in adults, they appear suddenly and may include fever, exhaustion, loss of appetite, nausea and abdominal discomfort, dark urine and jaundice (yellowing of the skin and eyes).

Children younger than age 6, who make up the majority of those who become infected with HAV, usually have no symptoms. Because they are symptom-free, caregivers, parents, and household members are at risk of contracting HAV from infected children.

Like all types of hepatitis viruses, HAV infects and inflames the liver. If the elderly, people who have a compromised immune system, or someone with another liver disease such as chronic hepatitis C or B get infected with HAV, they risk more damage to the liver due to an additional virus infecting their liver.

Hepatitis A resolves completely on its own. Symptoms usually last a few weeks, although fatigue may linger for months. About 10-15 percent of people experience a relapse over a 6-9 month period. There is no chronic or carrier state. Rarely, a person may develop fulminant (liver failure) hepatitis A, which is characterized by severe symptoms and may be fatal; fulminant hepatitis A is more likely in people who already have chronic hepatitis B, hepatitis C or other liver diseases or a compromised immune system. This is why it is important that anyone at increased risk for complications should be vaccinated against hepatitis A if they are not immune.

- **HAV Treatment**
  Because hepatitis A typically resolves on its own, there is no standard treatment for HAV. However, if a person has been exposed to HAV, an injection of HAV immune globulin (antibodies) given within 14 days of exposure may prevent the development of illness or lessen the severity of symptoms. During the acute period, general measures such as a healthy diet, plenty of fluids and adequate rest can help make a person feel more comfortable.

- **The HAV Vaccine**
  The HAV vaccine is considered safe and effective. The two-dose vaccine is
administered by injection, with the second dose given 6-12 months after the first. Antibody testing after vaccination is not recommended since 97-100% of people given two doses of the HAV vaccine develop protective anti-bodies within 1 month of receiving the first dose and 100% have protective levels after the second dose. Experts believe that the HAV vaccine will provide protection against hepatitis A for 25 years or longer. Some experts believe that people with compromised immune systems (such as people with HIV or people taking immunosuppressants) may require more doses of the HAV vaccine.

There have been no serious adverse reactions attributed to the HAV vaccine. Common side effects may include soreness/tenderness at injection site, headache, and malaise.

The HAV vaccine is recommended for anyone at risk of exposure to HAV, including men who have sex with men, day care center workers, and certain international travelers. People with hepatitis B or C or other types of liver disease should receive the HAV vaccine to prevent fulminant or severe hepatitis A.

HEPATITIS B (HBV)
Hepatitis B infection can cause either a short-term (acute) infection or a long-term or lifelong (chronic) infection. When newborns are born to HBV-infected mothers, they face a 90 percent risk of developing a chronic HBV infection unless there is intervention after birth. However, when adults are infected, only 5 percent de-velop chronic infection – most experience a brief, acute infection. Most people who experience acute hepatitis B do not have much liver damage, but people who develop chronic HBV infection can develop severe liver damage especially after years or decades of infection.

- **What Are the Symptoms?**
Up to 70 percent of people infected with HBV, especially children, experience no symptoms. The most common symptoms are jaundice (yellowing of the skin or the whites of the eyes), fatigue, stomach discomfort and abdominal pain, fever, loss of appetite, nausea and joint pain.

- **What Are the Tests for Hepatitis B?**
A health care provider will take a blood sample to test for HBV antigens, the proteins that make up the virus, and for HBV antibodies that the immune system creates to attack the antigens. These include the surface antigen (HBsAg), which makes up the covering of the virus, and the “e” antigen (HBeAg). When a person does develop surface antibodies, it means he or she has cleared the virus and is no longer infected or able to infect others. Doctors also test blood for HBV DNA, to assess viral load – the quantity or number of viruses in the blood – and for certain liver enzymes that are released into the bloodstream when liver cells die as a result of the infection.

- **Transmission and Prevention**
HBV is spread mainly through exposure to infected blood and bodily fluids, especially during childbirth or during sex, or when syringes are shared. This virus is very hardy; it can live in dried blood on
tabletops or in syringes for up to seven days. There is a safe and effective vaccine that can protect people against hepatitis B.

The following guidelines will prevent the transmission of hepatitis B:

- Get vaccinated if not already immune
- Practice safer sex
- Don’t share needles or works (cookers, cotton, ties, water, etc.). Use needle exchange
- Don’t share personal items such as razors, nail clippers, toothbrushes, or pierced earrings
- Make sure tattoo and body piercing equipment is sterilized – use only new needles and separate ink pots
- Cover open sores or wounds with bandages
- Vaccinate newborns within 12 hours of birth

• **Staying Healthy with HBV**
If you have chronic hepatitis B, there are many things you can do to stay healthy including:

- See a healthcare provider for regular check-ups
- Eat a healthy and balanced diet
- Rest when fatigued
- Exercise regularly
- Get vaccinated against hepatitis A if not already immune
- Avoid alcohol or cut down on what you drink
- Be careful when using over-the-counter drugs such as Tylenol (acetaminophen) and Advil (ibuprofen, aspirin, etc.), which in excess can harm the liver. Never mix with alcohol
- Do not mix alcohol, drugs, or herbs
- Try not to worry too much
- Inform your medical provider about any medications, herbs, and supplements you are taking to make sure that you are safe

• **What about Treatment?**
Most people with hepatitis B lead normal, healthy lives. About 15 to 25 percent of people with chronic HBV infection develop liver disease, such as liver scarring or cirrhosis, often after many years or decades of infection. About 25 percent of people with cirrhosis may develop liver cancer.

Doctors generally treat people if they show signs of liver damage – elevated ALTs (liver enzymes), a high viral load, or those who have normal ALT levels but have had the infection for many decades and have moderately high viral load. It is important for people to educate themselves and talk to health care providers about what they can do to stay healthy. It is also important that people advocate for themselves and have others in their lives who can help advocate for them.

The medications approved by the U.S. Food and Drug Administration to treat hepatitis B include:

- *Pegylated interferon (Brand name Pegasys)*, which helps boost the immune system to suppress HBV, is
injected once a week for six to 12 months. Doctors recommend this as a first treatment choice if patients have elevated ALT levels, and if they have HBV genotype or strain A or B.

- **Antivirals**, which interfere with the HBV replication process. Antivirals that are recommended for a patient’s “first” treatment include tenofovir (Viread) and entecavir (Baraclude) for patients who test either positive or negative for the hepatitis B “e” antigen. Those two antivirals are the most potent, and they have the lowest rate of viral resistance.

There are other HBV medications, but they are not considered the first choice for treating chronic HBV. For more information about HBV, treatment options, and HBV patient assistance programs see our Easy B Fact Sheets.

- **Getting Support**
  It is important that people get the information and support they need. The only adult support group for hepatitis B on the Internet is at www.hblist.org. Many adults and families from the United States, Canada and around the world participate in this well-supervised list. All those affected by or concerned with hepatitis B are invited to join.

Information about hepatitis B in children is available at the Parents of Kids with Infectious Diseases (PKIDs) website at www.pkids.org.

### HEPATITIS C (HCV)

Hepatitis C is caused by the hepatitis C virus (HCV). It can cause acute and chronic infection. Many people with HCV do not even know that they have it. But some people may develop serious health problems especially after being infected for 10, 20, 30 years or longer.

- **What Are the Tests for HCV?**
  The tests to measure the proteins produced by the immune system are called HCV antibody tests. It can take 2 to 26 weeks before antibodies can be detected (window period). The commercial antibody tests are called EIA, CIA and OraQuick Rapid HCV Antibody Test. The HCV RNA or viral load tests are the TMA, PCR and bDNA. The viral load test is used to find out if the hepatitis C virus is replicating in the body.

  There are other tests to determine the strain or genotype of hepatitis C. There are 7 genotypes numbered 1 through 7. Genotype 1 is the most common genotype in this country (~70%) followed by genotype 2 and 3 (~30%). There are also tests to determine the health of the liver (liver biopsy, Fibroscan, Fibrotest, etc.) as well as other various blood tests to monitor the health of the liver.

- **Transmission/Prevention**
  Hepatitis C is transmitted by blood-to-blood contact. The most common transmission route is sharing needles and equipment used to inject drugs (cookers, tourniquets, cottons, water, etc.). Sharing non-injection drug paraphernalia (crack/meth) pipes is another possible
transmission route. Needles used for tattooing, body piercing, and acupuncture may also spread HCV. Sharing personal items such as razors, toothbrushes, or nails files is a less likely, but possible, transmission route.

Sexual transmission between monogamous couples in a stable long-term relationship is uncommon (estimated at 0-3%). Healthcare workers and emergency responders are at risk for HCV infection due to needle stick accidents and unavoidable situations that may result in direct contact with blood from an infected person.

Mother-to-Child transmission occurs about 6% of the time. Transmission may depend on the amount of the hepatitis C virus in the mother’s blood; women who are confected with HIV are more likely to transmit HCV to their babies. Breast feeding is considered safe.

People who received blood, blood products or organ transplants before 1992 should be tested for hepatitis C. People who received clotting factors before 1987 were at risk for being infected with hepatitis C. People who receive hemodialysis are also at risk for being infected with hepatitis C and should be tested blood-borne pathogens including hepatitis C on a regular basis.

The Centers for Disease Control and Prevention recommend that everyone born between 1945 and 1965 should have a one-time HCV antibody test.

To prevent transmission of hepatitis C do not share any needles or any other drug paraphernalia. Avoid sharing razors, toothbrushes, clippers, nail files, or any other items that come into contact with blood. Make sure that instruments used for tattooing, body piercing, acupuncture, and medical procedures are properly sterilized. Cover all cuts and wounds with a bandage.

People who are not in a long-term stable monogamous relationship can practice safer sex and take precautions to avoid contact with blood and other body fluids during sex. Proper dental hygiene can prevent bleeding gums, another potential HCV transmission route. Healthcare workers and emergency personnel should observe standard universal precautions when dealing with blood. If you are a woman with HCV, talk to your doctor if you are thinking about becoming pregnant.

- **Acute Infection**
  After exposure to the hepatitis C virus a person will develop antibodies. The initial stage is called acute infection. Most people (up to 85%) who become develop acute infection will progress to chronic or long-term infection. But for some people their body’s immune system will naturally fight off the virus.

- **Chronic Infection**
  If a person still has the virus in their body for longer than six months the person

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**NOTE**

HCV is not transmitted by hugging, kissing, sneezing, coughing, sharing eating utensils or glasses, or by casual contact.
is deemed to have chronic hepatitis C infection. About 10-25% of people with chronic infection will have serious disease progression over a period of 10 to 40 years. There are no tests to indicate who will and who will not progress on to serious liver disease progression. For this reason it is important to be medically monitored on a regular basis.

Chronic hepatitis C can lead to inflammation of the liver, light, moderate to severe fibrosis (scaring of the liver) and cirrhosis (compensated and decompensated), liver cancer, the need for liver transplantation and death.

- **Symptoms**
The most common symptoms of chronic hepatitis C include fatigue (mild, moderate, severe), nausea, headaches, muscle/joint pain, depression, “brain fog”, night sweats, and more. Acute and end-stage disease can have many more symptoms.

There are many other symptoms and conditions that have been linked to hepatitis C and information can be found on our website.

- **HCV Treatment**
Treatment of hepatitis C has made incredible advances in recent years. Interferon-free treatments are available that can cure more than 90% of people with hepatitis C. The current medications used to treat hepatitis C include direct acting antiviral medications or HCV inhibitors that directly attack the hepatitis C virus and are used with and without ribavirin an antiviral medication. Typical treatment duration is 12 weeks, but it can last anywhere from 8 to 24 weeks. The most common side effects fatigue, headaches, muscle/joint pain, nausea, diarrhea and insomnia. Most of the side effects are mild to moderate. If a person is virus free or undetectable at 12 to 24 weeks after treatment ends it is considered a sustained virological response or viral cure.

- **HCV Management**
There are many things that people can do to manage hepatitis C. The best strategy is to find a knowledgeable medical provider and have your health monitored on a regular basis. A well-balanced diet based on is a good place to start. If possible consult with a registered dietitian. Alcohol (especially heavy alcohol consumption) can damage the liver and should be avoided. If people can not stop drinking they should cut down and seek help.

People with hepatitis C should avoid toxic fumes from paint thinners, pesticides and aerosols if possible.

Be sure to tell your medical provider about any drug, herb or over-the-counter drug since it has the potential to harm the liver.

**Black Box Warning:** Ribavirin (aka Copegus, Moderiba, Rebetol and Ribasphere) may cause birth defects and/or death of the fetus. Extreme care must be taken to avoid pregnancy in female patients and in female partners of male patients. Women of childbearing age, their partners and female partners of male patients taking ribavirin must practice two forms of contraception during to 6 months post-treatment.
People with hepatitis C should be vaccinated against hepatitis A and hepatitis B if they are not already immune.

HEPATITIS D (HDV)
The hepatitis D virus (HDV) is a bloodborne virus that can cause acute and chronic illness. It is considered an incomplete virus because it requires the hepatitis B virus in order to replicate or make more copies of itself. HDV is transmitted through contact with infected blood and sexual contact. There is no vaccine for hepatitis D, but being vaccinated against hepatitis B will protect people against hepatitis D.

There is no vaccine or cure for hepatitis D, but treatment with interferon can put HDV into remission. Being infected with two hepatitis viruses (HBV and HDV) at the same time can lead to very severe and fast liver disease progression that can lead to cirrhosis, liver cancer and death.

HEPATITIS E (HEV)
The hepatitis E virus is a hepatotropic, single-stranded RNA virus. The main transmission route of HEV is fecal-oral due to HEV contaminated water supplies, but other sources of infection have been identified. The largest outbreaks of HEV usually occur in developing countries, but outbreaks also occur in developed countries.

HEV has 4 genotypes numbered 1 through 4 and 24 subtypes. HEV has been found in humans, and animals—genotype 1 and 2 is found only in humans whereas genotypes 3 and 4 have been found in humans and animals (pigs, boar, and deer). Genotypes 1 and 2 are mainly found in the subtropical and tropical areas of Asia, Africa, and the Americas. HEV genotype 3 is found worldwide, and genotype 4 is confined mostly to Asia.

Genotype distribution is indicative of transmission modes. For instance, genotypes 1 and 2 are mainly from contaminated water, whereas genotypes 3 and 4 can be transmitted from pigs or other animals to humans.

- Transmission
HEV is transmitted primarily by the fecal-oral route – by drinking or eating contaminated food or water especially in countries that do not have sanitized sewage and water systems. There is some evidence that HEV may also be transmitted by the consumption of uncooked or undercooked shellfish, pigs, wild game and rodents.

The incubation period is usually 40 days, but it can range from 15 to 60 days.

- Prevention
HEV can be prevented by following safety measures:
  o Always follow basic food safety guidelines for washing and cooking food.
  o Avoid eating uncooked or undercooked animal parts or organs that could possibly transmit HEV.
  o In areas where there is a high prevalence of HEV avoid the
drinking water (unless bottled), uncooked shellfish, unpeeled fruit and vegetables (unless personally prepared).

- **Symptoms**
The most common symptoms of HEV are the typical hepatitis symptoms – jaundice (yellowing of the skin and whites of the eyes), malaise (out of sorts), loss of appetite, fever, diarrhea, abdominal pain, and muscle and joint pain. However, most people who become infected with HEV do not develop symptoms.

Normally, infection with acute HEV will resolve and the infected individual will develop antibodies that are protective against future infection. Deaths associated with HEV are uncommon except that pregnant women and their unborn babies are at risk of death especially during the third trimester of pregnancy – although this is mostly confined to developing nations. In industrialized nations deaths related to HEV are rare and mostly occur in people who have received organ transplants and who have severely suppressed immune systems. Having another hepatitis virus could also lead to a more severe form of the disease.

There has been a vaccine developed but it has not yet been put into general distribution. There is no vaccine approved by the Food and Drug Administration (FDA) for use in the United States.

There is speculation that there have been outbreaks in the United States and Europe, but due to lack of surveillance the true number of cases of HEV is not known.

**CONCLUSION**
You are not alone. There are millions of people in the world living with hepatitis. For more information visit our website or one of the resources below.

**RESOURCES**
- **Hepatitis C Support Project:**  - www.hcvadvocate.org
- **Centers for Disease Control (CDC)**  - www.cdc.gov/hepatitis/HAV/index.htm
- **World Health Organization (WHO)**  - www.who.int/ith/vaccines/hepatitisA/en/

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*Estimates from 2013 DATA – There is no data on hepatitis D and hepatitis E prevalence in the United States.*
VIRAL HEPATITIS:
THE BASICS