viral hepatitis
and HIV
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Viral Hepatitis and HIV

Current anti-HIV drug therapy has made a tremendous difference in the lives of many people with HIV. The number of new opportunistic infections is still at an all-time low in the United States and many people are living longer with HIV – thanks to the availability and widespread use of these treatments.

Unfortunately, living longer with HIV has created a new set of problems for many people. Thousands of people with HIV are also infected – or at risk of being infected – with one of several hepatitis viruses. Some of these viruses can cause chronic infection, meaning that the infection doesn't go away and can lead to serious liver damage over time. And because many people with HIV are now at a much lower risk of becoming seriously ill or dying from an AIDS-related opportunistic infection, they now face the challenge of managing these other viral diseases that pose a threat to their health and lives.

This brochure is designed to help people with HIV better understand three hepatitis viruses that are a potential threat to their health: hepatitis A virus (HAV), hepatitis B virus (HBV), and hepatitis C virus (HCV). These are different and distinct viruses with one important thing in common – they each have the potential to damage the liver. This brochure includes a general review of hepatitis and the ways these three hepatitis viruses are transmitted, cause disease, and are treated, particularly in people with HIV. With this information, we hope that readers will talk with their healthcare providers about viral hepatitis, including the ways it can be prevented and managed.
The liver and its many functions
The liver is the largest organ in the human body. Approximately the size of a football, it is located in the upper right part of the abdomen.

We can’t live without a functioning liver. It’s the body’s filter and warehouse. Almost all cells and tissues in the body depend on the liver. When something goes wrong with the liver, it can have a serious effect on almost every other organ in the body.

A little over 1½ quarts of blood pump through the liver every minute, allowing the liver to quickly and effectively remove toxins and waste products from the bloodstream. At the same time, the liver stores important nutrients such as vitamins, minerals, and iron. The liver also plays a role in managing levels of certain substances in the body, such as cholesterol, hormones, and sugars, which are all necessary for survival and are potentially harmful when out of balance. The liver also has a key role in digesting food through the production of bile and controls blood-clotting factors, which prevent excessive bleeding.

What is hepatitis?
Hepatitis is a general term that means inflammation of the liver. “Hepa” refers to the liver and “itis” means inflammation (as in arthritis, dermatitis, and pancreatitis).

Inflammation of the liver – hepatitis – has several possible causes, including:
- Toxins and chemicals such as excessive amounts of alcohol;
- Autoimmune diseases that cause the immune system to attack healthy tissues in the body; and
- Microorganisms, including viruses.

HAV, HBV, and HCV infect liver cells – called hepatocytes – that provide the best
conditions for these viruses to reproduce. In response to the infection, the body's immune system targets the liver, causing inflammation (hepatitis). If the hepatitis is severe (which can happen with HAV and HBV) or goes on for a long period of time (which can happen with HBV and HCV), hardened fibers can develop in the liver, a condition called fibrosis.

Over time, more and more normal liver tissue can be replaced by hardened scar tissue, which can obstruct the normal flow of blood through the liver and seriously affect its structure and ability to function properly. This is called cirrhosis. If the liver is severely damaged, blood can back up into the spleen and the intestines, which can result in high pressure in these organs. Consequences of this condition - called portal hypertension - include bleeding (variceal bleeding) and fluid in the abdomen (ascites). Significant liver damage can also reduce the production of bile needed for proper digestion and decrease the liver's ability to store and process nutrients needed for survival. Other effects of a damaged liver include the inability to remove toxins from the bloodstream, which can eventually lead to mental confusion and even coma (encephalopathy).

There are five viruses known to affect the liver and cause hepatitis: HAV, HBV, HCV, the delta hepatitis virus (HDV, which only causes problems for people infected with HBV), and hepatitis E virus (HEV). There is no hepatitis F virus. The hepatitis G virus (HGV) was originally thought to cause liver damage, but has since been found to be an apparently harmless virus and has been renamed GB virus-C (GBV-C).

**Hepatitis A**

**What is hepatitis A and how is it transmitted?**

Hepatitis A is caused by the hepatitis A virus (HAV). HAV is spread from one person to another when the feces (shit) of someone with the virus gets into another person's mouth. People can be infected with HAV when they eat food - particularly food that is raw or not thoroughly cooked - that has been handled or prepared by someone who has hepatitis A (and may not know it). Drinking water or ice that is contaminated with feces is another possible source of infection, as are shellfish that have not been properly cooked. HAV can also be transmitted through “rimming” (oral-anal sex). Very rarely, HAV can be spread through blood-to-blood exposure.
Hepatitis A is an acute form of hepatitis, meaning that it does not cause long-term (chronic) infection. If you have had hepatitis A once, you cannot be infected with the virus again. However, you can still be infected with other hepatitis viruses.

What are the symptoms of hepatitis A?

Not everyone who is infected with HAV will experience noticeable symptoms. For example, many babies and young children infected with HAV do not experience any symptoms of infection. Symptoms are much more likely to occur in older children, adolescents, and adults.

Symptoms of hepatitis A (and acute hepatitis in general) can include:

- Yellowing of the skin and whites of the eyes (jaundice)
- Feeling tired and rundown (fatigue)
- Pain in the upper-right abdomen
- Loss of appetite
- Weight loss
- Fever
- Nausea
- Diarrhea
- Vomiting
- Dark urine and/or pale stool
- Joint pain

HAV infection can also cause enzymes produced by the liver to increase above normal levels in the bloodstream (see page 10).

It can take the immune system up to eight weeks to clear HAV from the body. If symptoms occur, they usually do so within two to four weeks after being infected. The symptoms of hepatitis A can last anywhere from a week to more than a month. Approximately 15% of people with hepatitis A experience symptoms that last between six to nine months. About one out of 100 people infected with HAV may experience a quick and severe (fulminant) infection, which – very rarely – can lead to liver failure and death.

How is hepatitis A diagnosed?

Hepatitis A can be diagnosed using blood tests. Your healthcare provider can order these tests if you have symptoms of hepatitis A or if you want to know if you were infected with HAV in the past.

The blood test looks for two different types of antibodies to the virus. First it looks for IgM antibodies, which are produced by the immune system five to ten days before symptoms appear and usually disappear within six months. It also looks for IgG antibodies, which replace IgM antibodies and protect against future HAV infection.

- If the blood test shows that you are negative for both IgM and IgG antibodies, you probably have never been infected with the virus and should consider getting the HAV vaccine.
• If you are positive for IgM antibodies and negative for IgG antibodies, HAV infection most likely took place within the past six months and is either in the process of being cleared by the immune system or getting worse.
• If you are negative for IgM antibodies and positive for IgG antibodies, either you were infected with HAV some time in the past or you have been vaccinated against hepatitis A; in either case, you are now immune to the virus.

What about for people with HIV?
People with HIV are not at greater risk of becoming infected with HAV than anyone else. However, some studies suggest that people with HIV are more likely to experience prolonged symptoms of hepatitis A, meaning that it might take longer for someone who is HIV-positive to recover fully from hepatitis A.

Another important issue to consider is that many people with HIV are taking anti-HIV medications that can be toxic to the liver. Some of these medications can make symptoms of hepatitis A worse. In turn, it might be necessary to stop all anti-HIV medications until the hepatitis A has run its course or until liver enzyme levels have returned to normal. Talk with your healthcare provider before stopping any medications.

How is hepatitis A treated?
The usual treatment for hepatitis A is bed rest. It is also important to drink plenty of fluids, particularly if you are experiencing diarrhea or vomiting. Over-the-counter pain relievers, such as ibuprofen (Advil, Motrin, etc.), can help manage some of the symptoms of hepatitis A, although it’s best to consult with your healthcare provider before using them.

If you think that you may have recently been exposed to HAV – for example, if somebody in your household has been diagnosed with hepatitis A – you can talk to your healthcare provider about receiving an injection of immune globulin (also called gamma globulin). Immune globulin contains high levels of antibodies to HAV, which can help prevent the disease if you have been exposed to the virus. Immune globulin needs to be given within two to six weeks after possible exposure to HAV. People who receive immune globulin to prevent active hepatitis A should also receive the hepatitis A vaccine (discussed below).

How can hepatitis A be prevented?
The best way to prevent hepatitis A is to be vaccinated. Two HAV vaccines are
available: Havrix and VAQTA. Both of these vaccines require two injections, usually administered six months apart. If side effects from the hepatitis A vaccine occur, they are usually mild and may include soreness at the injection site and mild flu-like symptoms. A combination vaccine for HAV and hepatitis B virus (Twinrix) is also available.

The HAV vaccine is very effective – more than 99% of people who are vaccinated develop immunity against the virus and will never get HAV even if they are exposed to it. There is some concern that people with HIV with suppressed immune systems are less likely to benefit from the vaccine, so it is best to get the vaccine when CD4 cell counts are within healthy ranges.

If you do not think you were ever infected with hepatitis A, talk to your healthcare provider about the vaccine. Because people with HIV often experience worse symptoms of HAV infection and the liver plays such an important role in breaking down anti-HIV medications, the hepatitis A vaccine is strongly recommended for people with HIV. Getting vaccinated is especially important for people coinfected with HIV and hepatitis B or hepatitis C.

Even if you haven’t been vaccinated against hepatitis A, there are things you can do to prevent HAV infection:
- Avoid water that could be contaminated with fecal matter.
- Avoid undercooked or raw shellfish.
- Always wash your hands with soap and water after using the bathroom, changing a diaper, and before preparing and eating food.
- Use a latex barrier—such as a dental dam—for oral-anal sex (rimming).

**Hepatitis B**

**What is hepatitis B and how is it transmitted?**
Hepatitis B is caused by the hepatitis B virus (HBV). HBV is a noncytopathic virus, meaning that it does not cause direct damage to liver cells. Instead, it is the immune system’s aggressive response to the virus that usually leads to inflammation and damage to the liver.
As with hepatitis A virus, people can be vaccinated against HBV to prevent infection. HBV is very similar to HIV in the ways it is transmitted. HBV is present in blood, semen, and vaginal fluids and is transmitted through sexual activity, sharing injection drug equipment (including needles, cookers, tourniquets) and, possibly, sharing cocaine straws and crack pipes. Pregnant women who have hepatitis B can also transmit the virus to their babies, most likely during birth. Blood levels of HBV are much higher than for HIV or the hepatitis C virus, making it much easier to transmit in certain situations (from mother to child during delivery, for example).

The number of new hepatitis B infections in the U.S. has declined from about 260,000 a year in the 1980s to about 78,000 in 2001, with the greatest decline occurring in children and adolescents due to routine HBV vaccination.

Like hepatitis A, hepatitis B can cause acute, symptomatic hepatitis. But unlike hepatitis A, hepatitis B can become a chronic infection. This means that the immune system is not able to get rid of the virus within six months after infection. In other words, the virus continues to reproduce in the liver for several months or years after infection. This increases the risk of liver damage and liver cancer. What's more, someone with chronic HBV infection can transmit the virus to others.

Less than 10% of adults infected with HBV go on to experience chronic HBV infection. Approximately 90% of babies infected with HBV around the time of birth go on to experience chronic HBV infection. Medication can be given to the baby after birth to help prevent hepatitis B. Young children who are infected with HBV have a 25% to 50% risk of developing chronic hepatitis B.

With adults, the risk of developing chronic HBV infection depends on the health of the immune system. For example, people with weakened immune responses because they are recovering from organ transplants, undergoing dialysis for kidney problems or chemotherapy, receiving steroid therapy to suppress the immune system, or are HIV-positive are more likely to develop chronic HBV infection than people with strong immune responses.

Approximately 1.25 million people in the U.S. have chronic hepatitis B, and between 4,000 and 5,000 people die each year as a result of HBV-related liver disease. Studies suggest that more than 90% of all people with HIV have been infected with HBV at some point in their lives and that 15% are chronically infected with the virus.
What are the symptoms of hepatitis B?
Not everyone who is infected with HBV experiences symptoms of acute hepatitis. Between 30% and 40% of people infected with the virus do not experience any noticeable symptoms. If symptoms do occur, they usually do so within four to six weeks after infection and can last anywhere from a couple of weeks to several months. Symptoms of acute hepatitis B are similar to those of HAV infection (listed on page 4). Some people who experience symptoms of acute hepatitis B feel so sick and run down that they’re unable to do anything for weeks or months. As with HAV, less than 1% of people infected with HBV may experience a quick and severe (fulminant) infection, which – very rarely – can lead to liver failure and death.

If the immune system is not able to control HBV infection within six months, symptoms of chronic hepatitis B may appear. Not everyone with chronic hepatitis B will have symptoms. Some people experience occasional symptoms, while others have symptoms that never seem to go away.

Symptoms of chronic hepatitis B can be similar to those seen in acute hepatitis B. They tend to be mild to moderate in intensity and typically come and go. Additional symptoms can occur, particularly in people who have been dealing with chronic hepatitis B for many years. These include rash, hives (urticaria), arthritis, and burning/tingling in the arms and legs (polyneuropathy).

Symptoms of hepatitis, whether acute or chronic, should always be brought to the attention of a healthcare provider.

What laboratory tests do I need to know about?
There are laboratory tests to diagnose HBV infection and laboratory tests to monitor people with chronic hepatitis B.

Hepatitis B is first diagnosed using a blood test that looks for certain antigens (fragments of the hepatitis B virus) and antibodies (produced by the immune system in response to HBV). Initial blood tests to diagnose HBV infection look for one antigen – HBsAg (the hepatitis B surface antigen) and two antibodies – anti-HBs (antibodies to the HBV surface antigen) and anti-HBc (antibodies to the HBV core antigen). There are actually two types of anti-HBc antibodies produced: IgM antibodies and IgG antibodies.

The blood test used to check for HBV infection can be quite confusing, given that a number of different combinations of antigens and antibodies are possible and can mean different things. Here’s a look at the most important test results to know and what they mean:
Depending on these results, additional tests may be necessary. Somebody who has never been infected with HBV or has been vaccinated against the virus does not require any additional testing. Someone who was recently infected with HBV and has acute hepatitis B may want to get another blood test six months later to make sure that the necessary immune response has occurred. People with chronic HBV infection require additional testing to learn more about their hepatitis B.

If you have chronic hepatitis B, your healthcare provider will usually order additional tests to determine if the infection is active and the extent of liver damage:

**HBeAg and anti-HBe:** HBeAg is the hepatitis B envelope antigen, and anti-HBe are the antibodies produced against this antigen. If HBeAg is detectable in a blood sample, this means that the virus is still active in the liver (and can be transmitted to others). If HBeAg is negative and anti-HBe is positive, this generally means that the virus is inactive. However, this is not always the case. Some people with chronic hepatitis B are infected with what is known as a “precore mutant” of HBV. This can cause HBeAg to be negative and anti-HBe to be positive, even though the virus is still active in the liver.

**HBV Viral Load:** Similar to the technology used to measure the amount of HIV in the blood, viral load testing can determine if HBV is reproducing in the liver.
An HBV viral load greater than 100,000 copies/mL indicates that the virus is active and has the greatest potential to cause damage to the liver. When the viral load is above 100,000 copies/mL, especially if liver enzymes are elevated, treatment is recommended. A viral load below 100,000 copies/mL, particularly when HBeAg is negative and anti-HBe is positive, suggests that the virus is being controlled by the immune system. However, even if this is the case, the virus can still be transmitted to others.

Liver Enzyme Tests: Levels of liver enzymes – called alanine aminotransferase (ALT) and aspartate aminotransferase (AST) – are measured by a liver enzyme test. Elevated enzyme levels indicate that the liver is not functioning properly and that there may be a risk of permanent liver damage. During acute hepatitis B infection, liver enzyme levels can be temporarily elevated, but this rarely leads to long-term liver problems. In chronic hepatitis B, these levels, particularly ALT levels, can either be periodically or consistently elevated, indicating a higher risk of long-term liver damage.

Alpha-fetoprotein (AFP): This test looks for high levels of AFP, a protein that is produced by cancerous liver cells. Because people with chronic hepatitis B are at an increased risk of liver cancer, this test is often ordered by healthcare providers every six to 12 months. Using AFP levels to determine the presence of tumors can be misleading, so this test may be most useful for people with cirrhosis since they have a greater chance of developing liver cancer (hepatocellular carcinoma or HCC).

Ultrasound: Many liver experts also recommend ultrasound or “echo” machine to watch out for liver cancer in people with chronic hepatitis B since this procedure is more sensitive than AFP testing at detecting tumors. It is also much more expensive. Ultrasound uses a wand, called a transducer, which is placed on the upper abdomen and moved back and forth to examine the shape, size, and appearance of the liver. Ultrasound is painless and usually takes no more than ten or 15 minutes to conduct. Some experts recommend an abdominal ultrasound every six to 12 months although, as with monitoring AFP levels, it may be most useful for people with cirrhosis.

Liver Biopsy: Unfortunately, blood tests do not tell the whole story regarding the health of the liver. Measuring HBV viral load, liver enzyme levels, and AFP in the blood cannot determine if – and how much – liver damage exists. For this, a liver biopsy is needed. Liver biopsies are only recommended for patients who have a high HBV viral load (above 100,000 copies/mL) and elevated liver enzymes.

A liver biopsy is usually performed on an outpatient basis in a hospital.
Sometimes, a trained healthcare provider – such as a hepatologist or a gastroenterologist – can perform a liver biopsy in his or her office. An ultrasound is sometimes used to identify the best location for the biopsy. You lie on your back or slightly to the left side. The area of the skin where the biopsy will be done is carefully cleaned. Then, a local anesthetic agent is used to numb the skin and tissue below. A specially designed thin needle is inserted through the skin. At this point, the physician will instruct you to take a deep breath in and out and hold it for about five seconds. The needle is inserted into and out of the liver. This takes only one or two seconds. A slender piece of liver tissue is removed with the needle and is then processed in a laboratory. The entire procedure from start to finish lasts only 15 to 20 minutes. You then have to lie still for several hours to avoid the possibility of internal bleeding. There may be some discomfort in the chest or shoulder, but this is almost always temporary.

People have different responses to a biopsy – some find it painful, while most are surprised at how little pain they experience. Many people describe the procedure mostly as boring because of all that time laying still afterwards.

The results of the biopsy are usually available within a week and then explained to you by your healthcare provider.

**How is hepatitis B different for people with HIV?**

Although healthy adults who are infected with HBV have a less than 10% chance of seeing the infection develop into chronic hepatitis B, when an HIV-positive adult is infected, this risk jumps to almost 25%. In other words, people with HIV are more likely to develop chronic hepatitis B as a result of HBV infection than HIV-negative people with strong immune systems.

A number of reports also suggest that, as HIV disease progresses, the body’s immune response to HBV gradually decreases or is sometimes lost. This can cause the hepatitis B virus to become active again after being inactive, which can increase the risk of liver damage.

It is not entirely understood what impact HIV has on the severity of chronic HBV infection. There have been a number of reports showing that people infected with both viruses have higher HBV viral loads and more cirrhosis, regardless of the health of the immune system. There are also data from studies suggesting that people with HIV and chronic hepatitis B are more than twice as likely as their HIV-negative counterparts to experience liver failure, which means considering a liver transplant. It is not yet known if people with HIV and chronic hepatitis B are at a higher risk of liver cancer than their HIV-negative counterparts.
peers, but given the strong link between HBV and liver cancer, this seems likely.

As discussed below, people coinfected with HIV and chronic hepatitis B need to be particularly careful when choosing treatments for both infections.

**How is hepatitis B treated?**

People with acute hepatitis B do not require treatment. Bed rest, drinking lots of fluids, and over-the-counter pain relievers such as ibuprofen (Motrin, Advil, etc.) are usually all that is needed for someone who is experiencing symptoms of acute hepatitis B.

Treatment is only recommended for people with chronic hepatitis B. The goal of therapy is to reduce HBV viral load to undetectable levels and to return liver enzymes to normal levels, with the intent of getting rid of both HBeAg and HBsAg. If these antigens are cleared from the bloodstream, the virus is less likely to rebound once treatment is stopped.

The best time to begin anti-HBV therapy is when the HBV viral load is above 100,000 copies/mL and ALT levels are at least two times their normal levels. Starting therapy when the ALT levels are normal or only slightly elevated isn’t likely to be as effective.

There are three treatments approved for the management of chronic hepatitis B:

**Interferon-alfa (Roferon-A, Intron A, Infergen):** This drug mimics naturally occurring interferon-alfa, the body’s own antiviral. It has been approved for several years for the treatment of chronic hepatitis B. The usual dose is 5 million units every day or 10 million units three times a week – injected subcutaneously (under the skin) or directly into muscle – for four months.

When used alone by people without HIV, interferon-alfa can clear HBeAg in up to 40% of otherwise healthy people and clear HBsAg in up to 15%.

For reasons that aren’t fully understood, interferon-alfa is less effective when used by people with HIV and chronic hepatitis B. Given the low likelihood of benefit, interferon should probably not be used to treat HBV in people with HIV.

Pegylated interferon (Pegasys, PEG-Intron), a drug that contains microscopic particles (polyethylene glycol) linked to an interferon molecule, is being studied for the treatment of chronic HBV. It only needs to be injected once a week, and early clinical trial results suggest that it is more effective than
standard interferon-alfa. Additional clinical trials are under way to determine how safe and effective pegylated interferon really is for the treatment of chronic hepatitis B.

**Lamivudine (Epivir, Epivir-HBV):** After being approved for the treatment of HIV, lamivudine was also approved for the treatment of chronic hepatitis B. People who are infected only with HBV (and not HIV) take one 100-mg lamivudine tablet every day. People who are coinfected with HBV and HIV should take the dose typically used for the treatment of HIV – 300 mg a day.

In clinical trials of lamivudine using the 100-mg daily dose, treatment was associated with a loss of HBeAg after a year of therapy in 17% to 33% of people with chronic hepatitis B. Decreased scarring (fibrosis) of the liver was also observed in patients who received lamivudine.

As in HIV, HBV resistance to lamivudine can and does occur. When lamivudine is used alone without other anti-HBV treatments, approximately 14-32% of people develop HBV resistance to the drug within one year. After four years of lamivudine use, approximately 66% have HBV strains resistant to the drug, and this percentage is even higher in people who have both HBV and HIV. While this suggests that using lamivudine alone to treat HBV is somewhat limited, it also suggests that lamivudine resistance develops much more slowly with HBV than it does with HIV. And even when HBV resistance to lamivudine does occur, the drug still appears to help keep HBV viral load low and slow the progression of HBV-related liver disease.

People with HIV who use lamivudine to treat both their HIV and chronic hepatitis B should be aware that, even if their HIV becomes resistant to lamivudine, it might be necessary to continue taking the drug to treat their HBV. If lamivudine is stopped too quickly, it can cause the amount of HBV in the body to increase sharply, resulting in symptoms (called “flares”). These “flares” – sometimes severe – can also occur if your HBV develops resistance to lamivudine. In addition to being used under the brand name, Epivir, as a single-drug component of anti-HIV combination therapy, lamivudine is part of the combination pills Combivir and Trizivir.

**Adefovir dipivoxil (Hepsera):** Originally studied as a potential treatment for HIV, the dose of adefovir needed to treat HIV was associated with kidney problems. For the treatment of HBV, the dose is much
lower - one 10-mg tablet every day - and carries a much lower risk of kidney-related side effects. In clinical trials, adefovir was found to be an effective treatment for people with chronic hepatitis B starting therapy for the first time and for people whose HBV had developed resistance to lamivudine.

In two major studies conducted by the manufacturer, adefovir was more likely to reduce liver inflammation, improve fibrosis, decrease HBV viral load, and normalize liver enzymes after almost a year of treatment than a placebo. Promisingly, no one with hepatitis B who took adefovir for a year developed resistance to the drug.

It is not clear if people with HIV and HBV should be treated with adefovir. Adefovir is very similar to tenofovir (Viread), a drug that is approved for the treatment of HIV and is also active against HBV. If an HIV-positive person's regimen includes Viread, there is no need to add adefovir. One possibility is to use adefovir to treat HBV before combination anti-HIV therapy - which should include Epivir and/or Viread - is necessary (if the person's CD4 count is high and viral load is low, for instance). However, this approach has not been studied in clinical trials.

Although Viread is active against HBV, it has not been well studied in clinical trials and is not yet approved to treat HBV. The same is true of Emtriva (emtricitabine), an anti-HIV drug which is very similar to lamivudine.

In the future, it is likely that we will hear a lot more about combination therapy for the treatment of hepatitis B. Just as a combination of drugs helps to keep HIV viral load undetectable and delays drug resistance, it's likely that a combination of anti-HBV drugs will help increase the effect of therapy for HBV and reduce the development of resistance.

**How can hepatitis B be prevented?**

The best way to prevent hepatitis B is to be vaccinated. Two HBV vaccines are available: Recombivax HB and Energix-B. Both vaccines require three injections administered over a six-month period. Side effects, if any occur, are usually mild and may include soreness at the injection site and mild flu-like symptoms. There is also a combined HAV and HBV vaccine available (Twinrix), which offers the added advantage of providing protection against both viral infections.

The HBV vaccine is effective for more than 90% of adults and children who receive all three doses. But some research suggests that people with HIV are less likely to develop immunity to HBV through vaccination, especially if they
have compromised immune systems. So it's best for people with HIV to receive the hepatitis B vaccine when their CD4 cell counts are within healthy ranges.

If you don't think you were ever infected with hepatitis B, talk to your healthcare provider. Because people with HIV have a greater chance of developing chronic hepatitis B and a healthy liver is necessary to break down anti-HIV medications properly, the hepatitis B vaccine is strongly recommended for people with HIV. Getting vaccinated is especially important for people with HIV and hepatitis C or any other liver disease.

If you haven't been vaccinated against hepatitis B, there are still things you can do to prevent HBV infection. These include using a condom or other type of latex barrier while having sex. If you are an injection drug user and share equipment, cleaning your syringes with bleach will not help you avoid hepatitis B – use new needles to prevent the risk of HBV infection. Also, don't share items that may have been contaminated with someone else's blood such as toothbrushes, razors, and needles used for body piercing, tattooing, or acupuncture.

If you haven't been vaccinated against hepatitis B and fear that you were recently exposed to HBV – for example, after being poked with a used hypodermic needle or having sexual contact with someone with hepatitis B – it's possible to receive an injection of hepatitis B immune globulin (HBIG). HBIG is recommended after exposure to hepatitis B virus because it provides immediate, short-term protection against the virus. A dose of the hepatitis B vaccine is given at the same time. Over time, two additional doses of hepatitis B vaccine are given to complete the series and ensure long-term protection.

**Hepatitis C**

**What is hepatitis C and how is it transmitted?**

Hepatitis C is caused by the hepatitis C virus (HCV). The virus can cause lifelong infection, cirrhosis of the liver, liver cancer, liver failure, and death. There is no vaccine to protect against HCV, and as many as five million people have been infected with the virus in the United States.

HCV infection is common among people with HIV, and liver failure as a result of
HCV infection is now a leading cause of death among people with HIV. Between one-quarter (25%) and one-third (33%) of all people with HIV in the United States are infected with HCV. This means that as many as 350,000 Americans are coinfected with HIV and hepatitis C.

HCV infection can cause liver disease to develop faster in people who are also infected with HIV and can make it more difficult to treat HIV. This is why the United States Public Health Service and the Infectious Disease Society of America consider hepatitis C to be an AIDS-related opportunistic infection in people with HIV (although having HCV does not necessarily mean that a person with HIV has an AIDS diagnosis).

Injection drug users (IDUs) who share needles and other drug paraphernalia are at the highest risk of being infected with HCV. Between 50% and 90% of all IDUs with HIV are also infected with HCV. This is because both viruses can be transmitted easily through blood-to-blood contact. HCV can pass from the blood of an infected person into the blood of another person through means such as:

• Sharing paraphernalia (needles, syringes, cookers, cotton, water) used to inject drugs;
• Needlestick injuries;
• Open wounds or mucous membranes (e.g., inside the mouth, vagina, or anus) that are exposed to infected blood; and
• Blood products or blood transfusion (before 1992).

Unlike HIV, it is generally believed that HCV cannot be transmitted through semen or other genital fluids unless blood is present. Thus, the risk of becoming infected with HCV through unprotected sexual intercourse is low. But it is still possible, especially if sexually transmitted infections such as herpes are present or the sexual act increases the risk of mucous membrane tearing and blood-to-blood contact (fisting, anal sex, etc.). It is recommended that people with HCV practice safer sex using a condom or other barrier to protect their partners.

Women with HCV have a less than 6% chance of transmitting the virus to their babies during pregnancy or delivery, although the risk increases if the woman’s HCV viral load (the amount of HCV in the blood) is high. It is unlikely that HCV can be transmitted through breastfeeding or breast milk.

If you have not been tested for HCV, or don’t know whether you’ve been tested, you may want to discuss this with your healthcare provider. HCV testing is strongly recommended for anyone who is HIV-positive.
Does HCV infection affect everyone the same?

No. Simply because someone is infected with HCV does not necessarily mean that liver disease will occur. It’s also important to note that it can take many years – more than 20 or 30 years, in many cases – for HCV to cause life-threatening liver disease if it does occur.

Only a relatively small number of people (25% at most) experience symptoms when they are first infected (acute infection). Symptoms of acute hepatitis C infection (if they occur) are similar to those of hepatitis A and hepatitis B – fatigue, decreased appetite, nausea, and jaundice. More than half of people infected with HCV will have an increase in their ALT levels (an enzyme produced by the liver), but they will not “feel” this as a symptom. Many people may have normal ALT levels and still have liver disease.

About 20% of people infected with HCV clear the virus from their bodies, usually within six months. However, the majority of people (80%) who are infected with HCV develop chronic hepatitis C, and the infection will likely stay with them for the rest of their lives or until treatment clears the virus from their bodies. In other words, if 100 people are infected with HCV tomorrow, 20 of them will clear the virus from their bodies within six months, and 80 will remain infected with the virus.

Of the 80 people with chronic hepatitis C, approximately 28 (35%) of them will remain healthy. This means that their liver enzymes will remain normal and they will not go on to experience liver disease because of the infection. However, the virus can still be detected in the liver and bloodstream, which means that the infection can still be transmitted to others. The remaining 52 people (65%) with chronic hepatitis C will have some symptoms of liver disease, usually within 15 years. About 16 people (20%) with chronic hepatitis C will develop cirrhosis – scarring of the liver resulting from widespread fibrosis (an extreme overgrowth of the liver's connective tissue) – within 20 years after first becoming infected.

Although cirrhosis is not immediately life-threatening, it can seriously affect the liver’s ability to work properly and increases the risk of liver cancer. Of the 16 people with HCV who develop cirrhosis, four (25%) of them will likely experience liver failure or liver cancer within 25 years after becoming infected with the virus. These numbers refer to people who are infected only with HCV. Coinfection with HIV (see below), hepatitis B virus, or alcohol use severely affect the progression of HCV disease.
How is hepatitis C different for people with HIV?
A number of studies have shown that HIV can have a negative effect on the way HCV acts in the body. For starters, HIV can increase the chance that someone with chronic HCV infection will develop cirrhosis of the liver. Between 20 and 25 of every 80 people with healthy immune systems who have chronic HCV infection will go on to develop cirrhosis within 20 years. But if HIV is also present, between 30 and 35 of every 80 people are likely to develop cirrhosis. HIV infection can also speed up the rate at which HCV infection causes cirrhosis. In one study, people infected with both HIV and HCV were twice as likely to have cirrhosis after 13 years than people only infected with HCV (15% vs. 6%). Similar results have been seen in other studies.

People with both HIV and HCV are also more likely to experience liver failure - which is often fatal unless a transplant is performed - than people infected only with HCV. In one study, people with hemophilia who were infected with both viruses were 21 times more likely to die of liver failure than those only infected with HCV.

Another issue to consider is liver health and anti-HIV medications. Many anti-HIV drugs, including protease inhibitors and non-nucleoside reverse transcriptase inhibitors, are broken down (metabolized) by the liver. This can cause problems for people who have both HIV and HCV. First, the liver needs to be healthy in order to break down these drugs efficiently. If HCV damages the liver, it might not be possible to take anti-HIV therapy. Also, some of the drugs used to treat HIV can cause liver damage, even in people who aren’t infected with HCV. In turn, some anti-HIV drugs might worsen or speed up HCV-related liver disease.

What are the symptoms of hepatitis C?
As discussed above, only about one out of four people experience any symptoms when they’re first infected. Many people with chronic hepatitis C have no symptoms of liver disease either. That is, they don’t feel or look sick. If symptoms are present, they’re usually mild, not very specific, tend to come and go, and are similar to those seen in acute hepatitis C.

If HCV infection causes serious liver damage and/or cirrhosis, symptoms usually occur or become worse. In addition to fatigue, these may include poor appetite, nausea, headache, fever, vomiting, jaundice, weight loss, itching, depression, mood swings, mental confusion, muscle and joint pain, fluid retention, abdominal swelling, abdominal pain, and ankle swelling.
What laboratory tests do I need to know about?

There are laboratory tests to diagnose HCV infection and laboratory tests to monitor the health of people with HCV.

**HCV Antibody Testing:** Diagnosing HCV infection begins with an antibody test, similar to the one used to diagnose HIV infection. Antibodies to HCV can usually be detected in the blood within six or seven weeks after the virus enters the body, although it can take as long as three months or more for some people to develop detectable antibodies. If the HCV antibody test is positive, a second test is usually performed to confirm the result – either another antibody test or a PCR test.

If a person is positive for HCV antibodies, he or she has been exposed to the virus in the past. Since approximately 20% of people infected with HCV clear the virus from their bodies, usually within six months of exposure, the next step is to look for the actual virus in the bloodstream.

**HCV Viral Load Testing:** To look for HCV, a healthcare provider can request a qualitative PCR test to determine whether or not the virus is in a person's bloodstream. A healthcare provider can also order a quantitative PCR test – very similar to that used in HIV – to check for the presence of HCV and to figure out the person's HCV viral load (the amount of HCV in a measurement of blood).

The quantitative HCV viral load is a very important lab test. Unlike viral load testing for HIV, which can help predict how quickly someone may progress to an AIDS diagnosis, the HCV viral load test cannot determine if or when someone with hepatitis C will develop cirrhosis or liver failure. However, the HCV viral load can help determine how likely it is that someone will respond to treatment. As a rule of thumb, the lower the HCV viral load, the better someone's chances that he or she will respond to anti-HCV treatment. HCV viral load testing is also used during treatment to determine if therapy is working.

It is very important to be aware that HCV viral load results are usually much higher than HIV viral load results. This can be confusing. While a low HIV viral load is considered to be less than 5,000 to 10,000 copies/mL, a low HCV viral load is considered to be anything less than two million copies/mL. HCV viral loads are now usually reported in International Units (IU). There is no standard way to convert from copies/mL to IU/mL. Each quantitative viral load test is different, so it is important to use the same laboratory and the same test whenever you have your viral load measured. Results are generally reported only as low or high:
Low – less than 2 million copies/mL (600,000-800,000 IU/mL)
High – over 2 million copies/mL (600,000-800,000 IU/mL)

**Genotypic Testing:** Not all hepatitis C viruses are the same. There are at least six different “genotypes” of HCV – meaning that their genetic structures differ somewhat from each other. What’s more, some of these genotypes can be divided into subtypes. For example, HCV genotype 1 is divided into subtypes “a” and “b.”

In the United States, HCV genotypes 1, 2, and 3 are the most common. The other genotypes are found mostly in the Middle East, Africa, and Asia.

HCV genotype does not predict the likelihood that someone with hepatitis C will develop cirrhosis or liver failure, nor does it affect the speed by which these problems can occur. In other words, the HCV genotype does not seem to affect disease progression. But HCV genotype can predict how effective treatment may be – HCV genotypes 1 and 4 are the most difficult to treat, whereas HCV genotypes 2 and 3 are much more likely to respond well to treatment, usually in a shorter period of time. Unfortunately, HCV genotype 1 is the most common among people with HIV in the United States, accounting for as many as 75% of all hepatitis C infections.

Knowing your HCV genotype can help you and your healthcare provider determine how best to approach treatment if and when the time comes. This might include decisions about which treatment to use as well as the length of your treatment.

**Liver Enzyme Tests:** As with hepatitis A and hepatitis B, the most important liver enzymes to monitor are alanine aminotransferase (ALT) and aspartamine aminotransferase (AST). In approximately two-thirds of people with chronic hepatitis C, ALT levels are always elevated, reflecting ongoing damage to liver cells. But for one-third of people with chronic hepatitis C, ALT levels remain normal. Many of these people will live with HCV infection without any liver-related problems, but others with normal or even low ALT levels may be experiencing progressive liver damage. AST levels are also often high in people with chronic hepatitis C. However, AST levels are usually lower than ALT levels. If cirrhosis develops, AST levels can rise above ALT levels – a sign that damage to the liver is worsening.

**Liver Biopsy:** HCV viral load and liver enzymes are very useful tests. However, they cannot determine if - and how much - damage has been done to the liver by HCV infection. In order to figure this out, a liver biopsy is often necessary, especially in terms of deciding when or whether to begin treatment. Information about the liver biopsy procedure is reviewed on page 10 in the discussion of hepatitis B.
How is hepatitis C treated?

When it comes to treating hepatitis C, the first question is: how do I know when it’s time to start?

Generally speaking, the National Institutes of Health recommend that treatment be started before cirrhosis occurs (this can be determined through a liver biopsy), but only for people who are considered to be at a “high risk” of developing cirrhosis in the future. This includes people who have all of the following:

• Elevated ALT levels;
• HCV that is detectable by viral load testing;
• A liver biopsy that shows moderate to severe signs of fibrosis, inflammation, and necrosis (cell death); and
• No safety concerns to indicate that treatment shouldn’t be offered.

If these criteria are met, a patient should be offered treatment, regardless of the presence or absence of symptoms, the route of HCV infection, HCV genotype, or HCV viral load.

Circumstances in which healthcare providers should make a decision about starting treatment on an individual basis after talking with the patient include:

• Normal ALT levels, even if HCV is detectable by PCR (treatment may not yet be necessary);
• A prior liver transplant;
• Kidney problems;
• Active substance use, including alcohol;
• A history of problems that might interfere with the safety or effectiveness of therapy, such as severe untreated depression (which can be made worse by the use of interferon-alfa, the standard treatment for hepatitis C).

Treatment is contraindicated (shouldn’t be used) under the following circumstances:

• Severe liver disease such as decompensated cirrhosis, when the liver is no longer able to compensate for the damage that it has suffered (a liver transplant may be the best option for these patients);
• Prior kidney or heart transplant;
• Women who are pregnant;
• Women who are unable or unwilling to use birth control (hepatitis C therapies can cause severe birth defects).

For people coinfected with HIV and HCV, there are additional factors to consider when figuring out if and when to begin HCV treatment. It’s very important that
people with both viruses thoroughly discuss their options with their healthcare provider. Issues to consider include:

• People with HIV and HCV may develop cirrhosis or liver failure faster than people singly infected with HCV. In turn, some liver experts recommend treatment, even if a biopsy reveals mild signs of fibrosis, inflammation, and necrosis (as opposed to moderate to severe signs in people with only hepatitis C).

• HCV may increase the risk of liver damage, which can prevent certain anti-HIV medications from being broken down in the body properly. Someone coinfected with HIV and HCV is more likely to benefit from HCV treatment when the immune system is strong (when the CD4 cell count is high and HIV viral load is low, for example). For these reasons, some liver experts recommend early treatment for HCV, before anti-HIV treatment is needed.

• Anti-HIV medications may cause side effects in the liver that can worsen a person’s hepatitis C. Some experts recommend HCV treatment to reduce the chance that hepatitis C will cause (more) damage to the liver once anti-HIV drugs are started.

Above all, deciding if and when to start treatment is a personal decision. Regardless of what “official” guidelines do or don’t say, it is up to you and your healthcare provider to figure out what’s best for you, based on your own thoughts, concerns, and circumstances.

Can hepatitis C be cured?
It all depends who you ask.

As a general rule, the success of treatment is determined at two time points: just as the course of treatment is completed, referred to as the end-of-treatment response (ETR); and six months after treatment is completed, referred to as the sustained response (SR). The tests that are most important at these time points are the liver enzyme tests and the HCV viral load. If a person’s liver enzyme levels are back to normal and HCV viral load is undetectable at the end of treatment, the person is said to have an effective ETR. If a person’s liver enzyme levels remain normal and the HCV viral load is still undetectable six months after completing treatment, he or she is said to have an effective SR.

If someone is no longer on hepatitis C treatment and his or her liver enzymes are normal and no HCV virus is present in the blood, wouldn’t this be considered a cure? Some liver experts say yes, this is a cure - the vast majority of people who
achieve a sustained response as a result of treatment maintain healthy livers for many years. However, some experts point out that most patients who achieve a SR still have traces of HCV in their liver that could, over time, become active again.

Only time will tell what a SR really means. Because HCV was only identified in 1988, our knowledge of how treatments work and what we can expect out of them is still young. However, an ETR is considered a good response to treatment and a SR an excellent outcome. Both translate into liver-health improvements that are life-saving and life-enhancing.

But what about people with hepatitis C who don’t achieve either an ETR or a SR as a result of treatment? According to some recent studies, treatment has a great deal to offer people with hepatitis C who don’t achieve either. Even if you experience only mild improvements in your liver enzyme tests or moderate improvements in your HCV viral load – or see your lab results worsen after an initial good response during therapy – this usually translates into some long-term benefits to the liver. Researchers are conducting studies to determine what these benefits mean in terms of people with hepatitis C living longer, healthier lives.

What treatments are available for hepatitis C?
Until 1998, the only treatment available for chronic hepatitis C was interferon-alfa, a synthetic version of a naturally occurring hormone that has antiviral and immune-boosting properties. The drug was only moderately effective in terms of end-of-treatment response (ETR) and sustained response (SR) and was associated with a significant number of often debilitating side effects.

While interferon is still sometimes used today, improved versions of the drug are now available. Pegylated interferon (Pegasys, PEG-Intron) contains microscopic particles (polyethylene glycol) linked to an interferon molecule that keeps the drug in the bloodstream for longer. This allows for once-weekly injections (standard interferon required daily or three-times-a-week injections). What’s more, with pegylated interferon, drug levels in the bloodstream are higher and last longer than standard interferon, making the drug more effective against HCV. Although the side effects of pegylated interferon are similar to those of standard interferon, the benefit of treatment is more pronounced.

A second antiviral drug was approved by the Food and Drug Administration for use in combination with interferon for the treatment of hepatitis C. Ribavirin (Rebetol, Copegus) increases the chance of achieving an ETR and SR when it is combined with either standard or pegylated interferon. Combination therapy
with ribavirin and pegylated interferon is now the preferred HCV treatment. Here’s a look at the treatments available for chronic hepatitis C:

**Interferon-alfa (Roferon-A, Intron A):** If used alone, without ribavirin (not generally recommended), the usual dose is 3 million units (MU), three times a week, injected subcutaneously (under the skin). Therapy is continued for one year.

Only 10% to 20% of people using interferon-alfa alone achieve a SR – undetectable HCV viral loads six months after stopping treatment. Results have been similar in both HIV-positive and HIV-negative patients with hepatitis C.

Side effects of interferon-alfa are common, although their severity varies from one individual to the next. They occur with both standard and pegylated versions of the drug and can include:

- Fatigue
- Joint and muscle aches
- Low-grade fever and/or chills
- Headache
- Nausea and vomiting
- Skin irritation at the injection site
- Weight loss
- Low white and red blood cells
- Mild, reversible hair loss
- Irritability
- Depression
- Suicidal thoughts (rare)

These side effects tend to be worse during the first few weeks of treatment, especially after the first injection, but usually diminish over time. Nighttime injections of interferon may lessen the side effects since they will occur during sleep. Ibuprofen (Advil, Motrin, etc.) can lessen some of the flu-like side effects, and antidepressants can help control persistent depression.

**Pegylated Interferon (Pegasys, PEG-Intron):** If used alone, treatment is generally recommended for one year. The dose depends on the brand used. The dose of PEG-Intron varies according to body weight, whereas the Pegasys dose is the same regardless of weight. Pegylated interferon is injected subcutaneously (under the skin) once a week.

Using pegylated interferon alone, 25% to 40% of people with chronic hepatitis C (but not HIV) have an effective SR. Liver enzyme tests and HCV viral loads have improved in some patients with decompensated cirrhosis – an advanced form of liver disease that is usually not treated with standard interferon-alfa. There have also been studies demonstrating that pegylated interferon is equally effective in people with HIV and chronic hepatitis C.
The side effects of pegylated interferon are similar to those of standard interferon-alfa, and the same methods may help to alleviate them.

**Ribavirin (Rebetol, Copegus):** Ribavirin must be used in combination with either standard interferon-alfa or pegylated interferon (it is not effective against hepatitis C if it is used by itself). Ribavirin is taken orally twice a day, and the dose ranges from 800 mg to 1,200 mg a day depending on HCV genotype and body weight.

In addition to the side effects associated with interferon, ribavirin can cause anemia (low red blood cell counts), itching, skin rash, nasal stuffiness, and cough. The anemia can be severe and is sometimes treated with injections of erythropoetin (Procrit or Epogen), which stimulates the bone marrow to produce more red blood cells. Ribavirin can also cause serious birth defects. Women should be careful not to become pregnant while they or their sexual partner are taking ribavirin and for six months after stopping the drug. Both men and women should use birth control while taking ribavirin and for six months afterwards. If possible, ribavirin should not be taken with Videx (ddl) and, to a lesser extent, with Zerit (d4T) – two medications used in the treatment of HIV. Certain side effects of these drugs are more likely to occur when they are combined with ribavirin.

From studies in people with HCV (but not HIV), the length of combination treatment with interferon and ribavirin depends on a person's HCV genotype. With genotypes 2 or 3, therapy usually lasts six months. With genotype 1, it usually lasts a year. Unfortunately, with little information from clinical trials involving people with both HIV and HCV, it's difficult to say if this also holds true for them. Therefore, many liver experts feel it's best to treat people infected with both viruses for at least a year, regardless of genotype.

We also know from studies involving people living with HCV (but not HIV) that the effectiveness of therapy combining ribavirin and interferon depends on the type of interferon-alfa used and the HCV genotype being treated. Using standard interferon with ribavirin, 35% to 45% of people achieve a SR. Using pegylated interferon with ribavirin, overall sustained response rates in excess of 50% were seen in two important studies involving people with HCV (but not HIV). Between 42% and 46% of people in these studies with HCV genotype 1 had sustained responses. And between 76% and 82% of people with HCV genotypes 2 or 3 were sustained responders.

Early results from studies involving people with both HCV and HIV indicate that response rates to interferon (both standard and pegylated) combined with
ribovirin are lower and that the side effects are often worse. To increase the likelihood of a SR in people with both HIV and HCV – particularly those with HCV genotype 1 – some healthcare providers continue interferon/ribovirin treatment for 18 months (sometimes longer).

Using standard interferon-alfa with ribavirin, usually no more than 20% of coinfected people achieve a sustained response. Using pegylated interferon with ribavirin, the overall sustained response rates were between 27% and 40% in three clinical trials that have been reported (the U.S. study ACTG A5071, the international APRICOT study, and the French RIBAVIC study).

Sustained response rates differed, depending on the HCV genotype being treated. In these same studies of pegylated interferon plus ribavirin, 44% to 73% of people with HIV and HCV genotypes 2 or 3 had a sustained response, compared to only 14% to 29% of those with genotype 1.

A more complete list of factors that may influence a successful response to treatment (based on studies involving people with HCV, but not HIV) includes:

Most predictive

- genotype 2 or 3
- low HCV viral load when starting treatment (less than two million copies/mL or 600,000-800,000 IU/mL)

Somewhat predictive

- age under 40
- pre-menopausal female
- little fibrosis
- no cirrhosis
- low body mass index (BMI)

It's unclear how these somewhat predictive factors apply to people with HIV/HCV coinfection.

Many people are evaluated after three months on treatment. If their HCV viral load hasn't dropped significantly, treatment is often stopped since this indicates that they're unlikely to achieve a sustained response. Some people go through treatment more than once if they don't achieve a sustained response the first time. While the likelihood of treatment working a second or third time is relatively low, re-treatment definitely works for some people. And some people use low-dose interferon as “maintenance therapy” following a course of treatment.
There are many experimental medications being developed for the treatment of chronic hepatitis C. These include medications that prevent HCV from binding to liver cells, drugs that attack viral enzymes that help HCV to reproduce, and treatments to strengthen the body's own immune response to HCV.

Because depression before and while on HCV treatment is common, people who are considering interferon therapy may find the help they need to see them through if they have a support network in place beforehand, including a mental health professional and/or a support group.

**How can hepatitis C be prevented?**

With no hepatitis C vaccine, the best way to prevent infection is to reduce the risk of coming into contact with another person's blood. This also applies to people who are already infected with HCV to prevent transmitting the virus to somebody else. And even if you're one of the lucky people whose immune system cleared the virus after infection or had a successful response to HCV treatment, you can be infected again with HCV. Unlike the antibodies to hepatitis A and hepatitis B, HCV antibodies do not protect from future HCV infection.

Stopping injection drug use would eliminate the most common route of HCV transmission, but stopping isn't a realistic possibility for everyone. If you inject drugs, always use a new, sterile syringe, cotton, cooker, and fresh water every time you inject - never reuse or share syringes, needles, water, or other drug preparation equipment. If you're splitting drugs, split them when they're dry (in powder form) or use a new, sterile syringe to split them. Don't backload into someone else's syringe, and be sure to clean the injection site and avoid contact with blood.

Don't share toothbrushes, razors, nail clippers, or other items that may have blood on them. If you're considering a tattoo or body piercing, be sure that the procedures are performed by reputable, licensed experts and that strict hygienic measures are in place, including sterile equipment and ink.

Although HCV is not transmitted efficiently through sexual activity, it is best to use barrier protection (condoms, latex gloves, etc.) to reduce the risk of transmitting HIV, HCV, and other sexually transmitted diseases.
Taking Care of Your Liver

Whether you have liver damage because of a viral hepatitis infection or for any other reason, talk with your healthcare provider about liver health and consider the following:

• Get vaccinated against hepatitis A and hepatitis B if you don’t already have the antibodies.
• Don’t share:
  — drug paraphernalia (needles, syringes, cookers, cotton, water, snorting straws);
  — toothbrushes, razors, manicure implements, and other items that can retain blood.
• Consider reducing or stopping your alcohol intake. Alcohol significantly increases the risk of developing cirrhosis and liver cancer.
• If you have chronic HBV or HCV, find a doctor who understands viral hepatitis – a gastroenterologist (digestive system specialist), hepatologist (liver specialist), and some infectious disease and primary care physicians. If you’re considering treatment, a team approach, including access to a psychiatrist, is best.
• Get regular health check-ups, including liver enzyme tests. Keep track of all appropriate test results – liver enzyme levels, viral load, and genotype.
• Eat a balanced diet of fresh vegetables, fruits, beans, whole grains, and lean meats.
• Cut down on foods with high salt, sugar or fat content: cheese, fast food, fried food, and processed foods (cookies, cakes, frozen dinners, packaged foods with long shelf lives, “instant” foods).
• Get a healthy balance of protein in your diet – too much protein can stress your liver.
• Drink lots of fluids – especially water – to flush toxins from your body.
• Get regular exercise and develop a stress reduction plan.
• Acetaminophen (Tylenol and other non-aspirin pain relievers), particularly in large amounts (2,000/mg day), are toxic to the liver. Acetaminophen is in many medications, so read the labels carefully. Acetaminophen and alcohol together can cause severe liver damage.
• Avoid high doses of vitamins A, D, E, and K.
• Herbs and herbal products that are sometimes used to promote liver health include: milk thistle (silymarin), astragalus, dandelion, bupleurum, garlic, licorice root, artichoke, thioctic (alpha-lipoic) acid, and ginkgo biloba. All substances, including herbs, can have side effects and may interact with other drugs you are taking, including anti-HIV medications.
• Avoid herbs that are known to be toxic to the liver: peppermint, mistletoe, yerba tea, sassafras, germander, chaparral, skull cap, nutmeg, valerian, Jin Bu Juan, comfrey (bush tea), pennyroyal, and tansy ragwortsenna.
• Don’t take iron supplements unless advised to by your healthcare provider – too much iron can be hard on the liver.
Selected Web Resources

**The Body**
Comprehensive website offering treatment information from a variety of sources, including many materials about viral hepatitis and the opportunity to submit questions about coinfection to the site's medical consultants.  thebody.com

**Department of Veterans Affairs–National Hepatitis C Program**
Useful, practical information on hepatitis A, B & C is available through the Education link.  hepatitis.va.gov

**Hepatitis C Support Project, HCV Advocate**
Thorough, consistently updated information about viral hepatitis and coinfection.  hcvadvocate.org

**Hepatitis Resource Network**
Information about medications in development for the treatment of HCV, clinical trials for hepatitis C, and slide presentations about HBV/HIV and HCV/HIV coinfection.  www.h-r-n.org

**HIVandHepatitis.com**
Regularly updated website featuring HIV, hepatitis B, hepatitis C & coinfection treatment information, news reports & conference coverage, including the opportunity to submit questions to the site's medical consultants.  HIVandHepatitis.com

**National AIDS Treatment Advocacy Project (NATAP)**
Treatment information, news reports & conference coverage, with a focus on HIV/HBV & HIV/HCV coinfection.  natap.org

**National Institutes of Health (NIH)**

**Treatment Action Group (TAG)**
Treatment updates & policy analysis concerning HCV/HIV coinfection.  aidsinfonyc.org/tag/index.html
ACRIA is an independent, non-profit community-based AIDS research and education organization committed to improving the length and quality of life for people living with HIV/AIDS through medical research and treatment education.

ACRIA conducts a free Treatment Education Program to offer people living with HIV/AIDS the tools and information to make informed treatment decisions. Education program services include: workshops conducted on site at community-based groups throughout the New York City area in English and Spanish; technical assistance trainings for staff of AIDS service organizations; individual treatment counseling; and publications, including our quarterly treatment newsletter, ACRIA Update, and brochures in English and Spanish on specific treatment-related topics. ACRIA’s National Treatment Education Technical Assistance Program offers ongoing support to help non-medical service providers and community members in various parts of the country acquire the skills and information needed to provide HIV treatment education in their communities.

To learn more about ACRIA’s research studies or the Treatment Education Program, please call 212-924-3934. Information about ACRIA’s programs and copies of ACRIA Update are also available on our website: www.acria.org.

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