



Hepatitis C is a viral infection of the liver caused by the hepatitis C virus (HCV), which is found in the blood of persons who have this disease. HCV was discovered in 1989 and was previously called “non A, non B hepatitis.” In 1992, a highly sensitive antibody blood test was implemented nationwide to screen blood donors and to identify people exposed to the HCV.

There are six major types or strains of hepatitis C referred to as genotypes. The most common genotype in the United States is genotype 1. Other major genotypes are 2, 3, 4, 5, and 6. Most patients have only one strain of the virus. Patients diagnosed with hepatitis C can have a blood test to determine the genotype of the virus causing their infection.

HCV is a major cause of chronic liver disease, including cirrhosis and liver cancer. In the U.S., an estimated 3-4 million Americans are chronically infected, with many showing no signs or symptoms and are not aware of their infection. Although less than 1000 cases were reported in recent years, it is likely that about 10,000 to 18,000 new infections actually occurred in 2012. Worldwide, 170 million persons are believed to have been chronically infected.

Hepatitis C is a slowly progressing liver disease, usually without symptoms, that may take 20 to 30 years to cause serious liver damage. About 30% of infected individuals will clear the virus within six months and liver injury resolves completely. In the remaining 70%, the infection becomes chronic and although the liver is damaged many do not feel sick from the disease. Cirrhosis (scarring of the liver) develops in about 10%-20% of people with chronic infection and liver cancer can develop in 1% to 5% of chronically infected patients over a period of 20 to 30 years. Cirrhosis or bridging fibrosis is almost always present before the onset of liver cancer. The liver disease due to hepatitis C advances more rapidly when drinking alcohol on a regular basis and when the individual is coinfecting with hepatitis B virus (HBV) or HIV. HCV-associated chronic liver disease is the most frequent indication for liver transplantation among adults.

## **TRANSMISSION OF HEPATITIS C**

HCV is spread primarily by direct contact with human blood of an HCV infected person. HCV is not spread by sneezing, hugging or kissing, coughing, breast feeding, food or water, sharing utensils or drinking glasses, or casual contact.

- Individuals who injected drugs, even if they did only once many years ago, are at risk and should be tested. HCV is rapidly acquired following the initiation of injection drug use and occurs from sharing needles, syringes, water, or other equipment associated with drug use. Of persons injecting drugs for at least 2 years, 60%-80% are infected with HCV.
- Recipients of clotting factors or solid organ transplants prior to 1987 and 1992, respectively are at increased risk of hepatitis C. Today in the U.S., the risk for transmission of HCV through donated blood is 1 in 2 million units of blood.
- It appears that HCV is not readily transmitted sexually. In relationships where there is one steady partner, sexual transmission is exceedingly unusual, less than 1% in sexually active couples. The risk of sexual transmission increases in those with multiple sex partners, where there is a history of sexually transmitted disease, when condoms are not used, and during traumatic sex that leads to blood exposure.
- There is no evidence indicating that HCV is transmitted through breast milk.
- HCV can be transmitted if the needles, ink, and other equipment used in tattoos or body piercing have someone else's infected blood on them or if the artist or piercer does not follow good health-safety practices.
- HCV can be spread by sharing razors or toothbrushes with HCV contaminated blood on them.
- Hemodialysis patients have about a 10% risk of infection.
- Hepatitis C transmission to infants born to an HCV-infected mother is about 3 - 5%. If the mother is coinfecting with HCV and HIV the risk of transmission of HCV to her infant is about 10%.

Despite recognition of these risk factors, risk factor-based screening for HCV infection has been unsuccessful in identifying infected individuals. As a consequence, the CDC & P now recommends one-time antibody to HCV screening of baby boomers born between 1945 and 1965, as well as continuing of risk-based screening.

## **SYMPTOMS**

- Most people who are newly infected or chronically infected with HCV do not have symptoms of liver disease. If they do have symptoms, they are often very mild, non-specific, and intermittent. These may be flu-like symptoms including fatigue, poor appetite, nausea, muscle and joint pains, or a mild discomfort in the area of the liver.

## **DIAGNOSIS**

Early diagnosis is important so you can be checked for liver disease, get treatment if indicated, learn how to protect your liver from further harm, and learn how you can prevent spreading HCV to others.

- The incubation period for HCV infection varies from 2 to 26 weeks (an average of 45 days).
- A specific blood test that detects antibodies to the virus does not differentiate between a past infection and a current infection. For diagnosis of acute or chronic HCV infection, a specific blood test for HCV is required. Follow up tests should be done to confirm HCV infection status and the presence of biochemical markers of liver injury (serum aminotransferases).
- Because blood tests checking for hepatitis C infection are not a part of a routine physical exam, you should ask your doctor for a hepatitis C test if you have a risk factor or were born between 1945 and 1965 or the years just before or after this time period.

## **HEPATITIS C TESTING RECOMMENDED FOR PERSON WHO:**

- Ever injected illegal drugs.
- Received clotting factors made before 1987.
- Received blood or organs before July 1992.
- Ever were treated with hemodialysis.
- Are infected with HIV.
- Have a needlestick/sharps or mucosal exposure to HCV-positive blood.
- Are 12 to 18 months of age, and are born to HCV-positive women.
- Are baby boomers born between 1945 and 1965

## **MEDICAL EVALUATION AND MANAGEMENT FOR CHRONIC HCV INFECTION**

Persons testing positive for the hepatitis C virus should be assessed for evidence of chronic liver disease and for possible treatment. Antiviral drugs are available for the treatment of chronic hepatitis C, but they are not suitable or effective for everyone. Persons with chronic liver disease should protect the liver by vaccination for hepatitis A and hepatitis B and should abstain from alcohol use. It may be helpful to locate a support group to meet with others who are infected or affected by hepatitis C. Learn all that you can about the disease and how it is affecting you and learn how to protect your family. Fatty liver due to obesity, diabetes, and other causes may lead to faster progression and interfere with the response to treatment in chronic hepatitis C.

## **TREATMENT**

- Combination therapy with pegylated interferon and ribavirin had been the standard of care until May 2011, when triple therapy adding either telaprevir (Incivek) or boceprevir (Victrelis) to the combination of pegylated interferon plus ribavirin was FDA-approved for the treatment of genotype 1, chronic hepatitis C. Sustained response rates of 66% when treating naïve patients with boceprevir and 79% when using telaprevir have been reported, a marked improvement from the lower rates achieved prior to the introduction of these drugs. Additionally, 58% of patients begun on triple therapy for 12 weeks with telaprevir, have undetectable HCV RNA at weeks 4 and 12. In these patients, continuing treatment with pegylated interferon and ribavirin for 12 more weeks resulted in a sustained virologic response in nearly 90%. For boceprevir, triple therapy, treatment is begun after a 4-week lead-in of just peginterferon and ribavirin. In about 45% in whom viral levels fell significantly at week 4, triple therapy for 24 more weeks after the lead-in resulted in a sustained virologic response of about 80%. Thus both of the new treatment regimens can shorten the duration of treatment and increase the response rates. However, neither telaprevir nor boceprevir can be used without peginterferon and ribavirin. Additionally, the duration of treatment is determined by the virologic response while on therapy. High sustained response rates have been reported for relapsed patients who were previously treated with peginterferon plus ribavirin when retreated with triple therapy. However, for so-called null responders, both triple therapy with telaprevir and triple therapy with boceprevir have been far less successful. Because the metabolism of both drugs affects the metabolism of other drugs, several drugs are contraindicated, and others must be carefully monitored. For both drugs, marked anemia is common, discontinuation for adverse events may be seen in 12 to 16%, and in the case of telaprevir a severe rash is seen in about 4%.
- Pegylated interferon is given by injection and may cause a number of side effects, including flu-like symptoms of headache, fever, fatigue, loss of appetite, nausea, vomiting, depression and thinning of the hair. Interferon can reduce the number of circulating white blood cells and platelets.
- Ribavirin, given by mouth, can cause birth defects in animals. Women who are pregnant or planning a pregnancy should not take ribavirin. Pregnancy should not be attempted until 6 months after treatment has ended. Ribavirin also causes early destruction of red blood cells and may cause severe anemia requiring frequent monitoring and treatment with erythropoietin. Women of reproductive age, need to be on two forms of contraception and if treatment with telaprevir or boceprevir is planned, two barrier forms of contraception are required because the oral contraceptives are less effective when these drugs are used.
- Almost half of all liver transplants in the US are performed for end-stage liver disease due to hepatitis C infection. However, the virus usually infects the transplanted liver and a second transplant may be required years later.
- Maintain as normal a life as possible, eat a well-balanced diet, exercise, and keep a positive attitude. Plan physically exhausting tasks for the morning when your energy level is at its peak. Rest when you feel tired.
- There is no specific evidence proving that herbal supplements relieve hepatitis symptoms or fight the virus. Many herbs are toxic to the liver.
- A number of new oral anti-viral, direct-acting drugs are in development including those that are effective in all genotypes, do not require pegylated interferon, and may not require ribavirin.

## **PREVENTION**

- There is NO vaccine to prevent HCV infection. Vaccines for hepatitis A and B do not provide immunity against hepatitis C but are essential to avoid coinfection. Two liver infections are worse than one liver infection.
- Don't touch or share anything that might have the blood of an infected person on it, such as razors, scissors, toothbrushes, nail clippers, tampons, or sanitary napkins. Wipe up blood spills with disposable towels soaked in 1:10 dilution of household bleach and use rubber or latex gloves to protect your hands. All soiled materials should be put in a plastic, leak-proof bag for disposal.
- Don't share anything that might have blood on it; don't share drugs, needles, water, syringes, or any drug "works."
- Use latex condoms correctly and every time including during foreplay to reduce possible exposure to HIV, hepatitis B and C, gonorrhea, chlamydia or other sexually transmitted diseases.
- Notify your physician and dentist that you are infected with HCV.
- Get vaccinated against hepatitis A and B.
- If you are infected with HCV do not drink alcohol because it accelerates the liver damage and use caution with prescription and over the counter medications.

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