

HEPATITIS C

REPORTING INFORMATION

- **Class B:** Report the case, suspected case and/or a positive laboratory result to the local public health department where the patient resides by the close of the next business day. If patient residence is unknown, report to the local public health department in which the reporting health care provider or laboratory is located.
- Health care providers and laboratories report using the following form(s) and/or mechanisms: [Viral Hepatitis Case Report form](#), [Ohio Confidential Reportable Disease form](#) (HEA 3334, rev. 1/2009), [Positive Laboratory Findings for Reportable Disease form](#) (HEA 3333, rev. 8/2005), Ohio Disease Reporting System (ODRS), electronic laboratory reporting, or telephone.
- Local public health departments report the case, suspected case and/or a positive laboratory result to the Ohio Department of Health (ODH) via ODRS by the end of the next business day. Information should not be sent to ODH, unless requested.
- Key fields for ODRS reporting include:
 - Patient Demographics
 - First and last name
 - Date of birth or age (including age type),
 - Sex
 - Race
 - Laboratory Information
 - Test name
 - Result (qualitative)
 - Numeric results (quantitative)
 - Reference range for numeric test results
 - Do not enter result if the test is anti-HCV, HCV RNA, or ALT, as these tests do not identify the organism.
 - Clinical Information (for acute hepatitis C)
 - Is patient symptomatic?
 - Symptom onset date
 - Was patient jaundiced?
 - Elevated ALT (enter in Laboratory Information)
 - Epidemiology Information – pay special attention to questions related to health-care associated transmission (e.g. transfusion, dental work), drug use, incarceration, tattooing, and piercing.

AGENT

Hepatitis C virus (HCV) is classified in the *Flaviviridae* family and, until recently, was the only member of the *Hepacivirus* genus. Hepatitis C virus is a single-stranded RNA virus, 55-65 nm in diameter. At least seven different genotypes and more than 80 subtypes of hepatitis C virus exist.

TEST NAME ABBREVIATIONS

ALT (SGPT)	Alanine aminotransferase
Anti-HCV	Antibody to hepatitis C virus
HCV RNA	Hepatitis C virus ribonucleic acid
HCV NAT	Nucleic acid test for hepatitis C virus

CASE DEFINITION

Clinical Criteria for Diagnosis

Acute

An illness with discrete onset of any sign or symptom consistent with acute viral hepatitis (e.g., fever, headache, malaise, anorexia, nausea, vomiting, diarrhea, and abdominal pain) AND a) jaundice OR b) a peak elevated serum alanine aminotransferase (ALT) level greater than 200 IU/L during the period of acute illness.

Chronic

No available evidence of clinical or relevant laboratory information indicative of acute infection. Most hepatitis C virus-infected persons are asymptomatic; however, many have chronic liver disease, which can range from mild to severe.

Laboratory Criteria for Diagnosis

- A positive test for antibodies to hepatitis C virus (anti-HCV) positive, OR
- Hepatitis C virus detection test:
 - Nucleic acid test (NAT) for HCV RNA positive (including qualitative, quantitative or genotype testing)
 - A positive test indicating presence of hepatitis C viral antigen(s) (HCV antigen – when and if a test is approved by FDA and available)

Case Classification

Acute, Confirmed

- A case that meets clinical criteria and has a positive hepatitis C virus detection test (NAT or HCV antigen), OR
- A documented negative HCV antibody, HCV antigen, or NAT laboratory test result followed within 12 months by a positive result of any of these tests (test conversion)

Acute, Probable

- A case that meets clinical criteria and has a positive anti-HCV antibody test, but has no reports of a positive HCV NAT for HCV RNA or HCV antigen, AND
- Does not have test conversion within 12 months or has no report of test conversion

Chronic, Confirmed

- A case that does not meet clinical criteria or has no report of clinical criteria, AND
- Does not have test conversion within 12 months or has no report of test conversion, AND
- Has a positive HCV NAT or HCV antigen test

Chronic, Probable

- A case that does not meet clinical criteria or has no report of clinical criteria , AND
- Does not have a test conversion within 12 months or has no report of test conversion, AND
- Has a positive anti-HCV antibody test, but no report of a positive HCV NAT or positive HCV antigen test

Criteria to distinguish a new case of this disease or condition from reports or notifications which should not be enumerated as a new case for surveillance

A new case is an incident case (new acute or newly diagnosed chronic) that has not previously been reported meeting case criteria for hepatitis C. A new probable acute case may be reclassified as confirmed acute case if a positive NAT for HCV RNA or a positive HCV antigen(s) test is reported within the same year. A confirmed acute case may be classified as a confirmed chronic case if a positive NAT for HCV RNA or a positive HCV antigen is

reported one year or longer after acute case onset. A confirmed acute case may not be reported as a probable chronic case (i.e., HCV antibody positive, but with an unknown HCV RNA NAT or antigen status). States and territories may choose to track resolved hepatitis C cases in which spontaneous clearance of infection or sustained viral response to treatment are suspected to have occurred before national notification or are known to have occurred after national notification as a confirmed or probable case to CDC.

SIGNS AND SYMPTOMS

Acute hepatitis C is defined as the first six months after an individual is infected with hepatitis C. Acute infection is usually asymptomatic. Symptomatic infection is generally mild, with malaise being the most common manifestation. Fulminant disease is rare. When symptoms do occur, they can include fever, fatigue, dark urine, clay-colored stools, abdominal pain, loss of appetite, nausea, vomiting, joint pain, and jaundice. After acute infection, approximately 15% - 25% of persons resolve their infection without sequelae as defined by sustained absence of HCV RNA in serum and normalization of ALT levels.

Chronic hepatitis C is defined as infection with hepatitis C virus that continues beyond the acute phase (or six months). Chronic infection develops in 75% - 85% of those infected. Chronic liver disease develops in 60% - 70% of chronically infected persons and is accompanied by persistent or fluctuating ALT levels; the progression of disease is usually slow and without symptoms or physical signs during the first two or more decades after infection. Cirrhosis develops in 5% - 20% of the chronically infected over a period of 20-30 years, and hepatocellular carcinoma develops in 1% - 5%.

A small percentage of persons with chronic HCV infection develop medical conditions due to hepatitis C that are not limited to the liver. These conditions are thought to be attributable to the body's immune response to HCV infection. Such conditions can include:

- Diabetes mellitus – occurs three times more frequently in HCV-infected persons
- Glomerulonephritis – a type of kidney disease caused by inflammation of the kidney
- Essential mixed cryoglobulinemia – a condition involving the presence of abnormal proteins in the blood
- Porphyria cutanea tarda – an abnormality in heme production that causes skin fragility and blistering
- Non-Hodgkin's lymphoma – might occur somewhat more frequently in HCV-infected persons

DIAGNOSIS

Testing for hepatitis C begins with either a rapid or a laboratory-conducted assay for hepatitis C virus antibody in blood.

A nonreactive hepatitis C virus antibody result indicates no hepatitis C virus antibody was detected.

A reactive result indicates one of three things: 1) current hepatitis C infection, 2) past hepatitis C infection that has resolved, or 3) false positivity.

A reactive result should be followed by a nucleic acid test (NAT) for hepatitis C RNA.

- If hepatitis C RNA is detected, that indicates current hepatitis C infection.
- If hepatitis C RNA is not detected, that indicates either resolved hepatitis C infection or false hepatitis C antibody positivity.

The table below summarizes interpretation of laboratory findings:

Laboratory Findings		Interpretation
Anti-HCV screening	Anti-HCV supplemental test	
Negative	Not applicable	Not infected with HCV unless recent infection is suspected or other evidence exists to indicate HCV infection
Positive	Not done	Indicates a resolved infection
Positive	HCV RNA positive	Indicates active HCV infection
Positive	HCV RNA negative	No further action required in most cases. In certain situations* follow up with HCV RNA testing and appropriate counseling

* If the person tested is suspected of having hepatitis C exposure within the past six months, or has clinical evidence of hepatitis C, or if there is concern regarding the handling or storage of the test specimen.

EPIDEMI OLOGY

Source

Hepatitis C virus (HCV) is found in human blood and blood products.

Occurrence

Hepatitis C infection is prevalent throughout the world and is the most common chronic bloodborne infection in the United States. Each year, about 17,000 people in the United States become infected with HCV and an estimated 3.2 million people have chronic infection. Nationally, the peak prevalence is in persons born between approximately 1945 and 1965, the majority of whom were likely infected during the 1970s and 1980s when rates for hepatitis C were the highest. In 2014, Ohio peak prevalence occurred in persons 20-29 years of age. Individuals that are chronically infected serve as a source of transmission to others and are at risk for chronic liver disease or other hepatitis C-related sequelae.

Mode of Transmission

Currently, hepatitis C is rarely transmitted by blood transfusion (less than one chance per two million units transfused) or organ transplantation; however, prior to donor screening, both blood transfusion and organ transplantation carried a high risk for transmission of hepatitis C. Injection drug use, through transfer of infected blood by sharing needles or other drug paraphernalia, is currently the predominant mode of hepatitis C transmission in the U.S. Healthcare-associated transmission of hepatitis C is possible if infection control techniques or disinfection procedures are inadequate and contaminated equipment is shared among patients. Healthcare, emergency medical and public safety workers who are exposed to blood in the workplace are at risk of being infected with blood borne pathogens, including hepatitis C. Sexual transmission of hepatitis C appears to occur, but the virus is inefficiently spread in this manner. Having a sexually transmitted disease (STD) or HIV, sex with multiple partners, or rough sex appears to increase a person's risk for Hepatitis C. Hepatitis C transmission to non-sexual household contacts, presumably through direct or inapparent percutaneous or permucosal exposure to infectious blood or body fluids containing blood, is uncommon. Approximately six percent of infants born to HCV-infected

mothers become infected with the virus. As transmission occurs at the time of birth, there is no prophylaxis available to prevent it. The risk is increased by the presence of maternal HCV viremia at delivery and is two to three times greater if mother is co-infected with HIV. A person may become infected with a different strain of hepatitis C after clearing the initial infection. Prior infection with HCV does not protect against later infection with the same or different genotypes of the virus. This is because persons infected with HCV typically have an ineffective immune response due to changes in the virus during infection. For the same reason, no effective pre- or postexposure prophylaxis (i.e., immune globulin) is available.

Period of Communicability

Communicability lasts from one or more weeks before onset of first symptoms through the acute clinical course of the disease and indefinitely in the chronic stage.

Incubation Period

The incubation period averages 6 to 9 weeks with a range of 2 weeks to 6 months. The time from exposure to the development of viremia (the presence of virus in the blood) is 1 to 3 weeks.

“At-Risk” Groups

Groups at high risk of acquiring this infection are:

- Current or former injection drug users, including those who injected only once many years ago
- Recipients of clotting factor concentrates made before 1987, when more advanced methods for manufacturing those products were developed
- Recipients of blood transfusions or solid organ transplants before July 1992, when better testing of blood donors became available
- Chronic hemodialysis patients
- Persons with known exposures to HCV, such as
 - Health care worker after needlesticks involving HCV-positive blood
 - Recipients of blood or organs from a donor who tested HCV-positive
- Persons with HIV infection
- Children born to HCV-positive mothers

PUBLIC HEALTH MANAGEMENT

Case

Investigation

Determine through the patient’s physician if the patient is/was acutely ill (symptoms, symptom onset date, jaundice, or an elevated ALT).

Treatment

For information regarding treatment of hepatitis C, please refer to the [2009 AASLD Practice Guidance](#) (American Association for the Study of Liver Diseases). The same treatment regimens are used for the treatment of both acute and chronic HCV. The goal of hepatitis C treatment is a sustained virologic response (SVR), which can be considered a cure. Treatment will also reduce liver-related adverse consequences of long-term HCV infection, such as end-stage liver disease, liver cancer, and death.

It has been suggested that treatment should be initiated after monitoring HCV RNA for spontaneous clearance of the virus. For someone with acute hepatitis C, if the decision is made to begin treatment during the acute infection, the recommendation is to monitor HCV RNA for at least 12 weeks to 16 weeks to allow for spontaneous clearance of the virus before starting treatment.

Treatment is recommended for those with chronic HCV infection

- The highest priority should be given to those with:
 - Advanced liver disease (advanced fibrosis)
 - A liver transplant
 - Type 2 or 3 essential mixed cryoglobulinemia with end-organ manifestations (e.g., vasculitis)
 - Proteinuria, nephrotic syndrome, or membranoproliferative glomerulonephritis
- A higher priority for treatment is assigned to the following due to their high risk for complications:
 - Fibrosis
 - HIV-1 coinfection
 - Hepatitis B coinfection
 - Other liver diseases
 - Debilitating fatigue
 - Type 2 diabetes mellitus
 - Porphyria cutanea tarda
- The following have an elevated risk of transmitting the virus to others and treatment may reduce this risk:
 - Men who have sex with men
 - Active injective drug users
 - Incarcerated persons
 - Persons on long-term hemodialysis
 - HCV-infected women of child-bearing years who wish to become pregnant

Currently, treatment varies according to hepatitis C genotype and any comorbidities. At least six distinct HCV genotypes (genotypes 1–6) and more than 50 subtypes have been identified. Genotype 1 is the most common HCV genotype in the United States. Knowing the genotype can help predict the likelihood of treatment response and, in many cases, determine duration of treatment. Once the genotype is identified, it need not be tested again; genotypes do not change during the course of infection.

All persons with chronic hepatitis C should be vaccinated against hepatitis A and B because of the high rate of severe hepatitis in those with chronic liver disease from hepatitis C who become coinfecting with one of these infections.

Isolation

Use universal Precautions. Persons diagnosed with hepatitis C should not donate blood, organs, tissue, or semen.

Contacts

Prevention and Control

General control measures against hepatitis B virus infection apply for hepatitis C virus infection as well (see hepatitis B elsewhere in this manual). The value of prophylactic immunoglobulin (IG), however, is not clear. Current data suggest that postexposure prophylaxis with IG is not effective in preventing hepatitis C infection. No assessments have been made of postexposure use of antiviral agents (e.g. interferon) to prevent hepatitis C infection. Mechanisms of the effect of interferon in treating patients with hepatitis C are poorly understood, and an established infection might need to be present for interferon to be an effective treatment. Interferon is currently FDA-approved only for treatment of chronic hepatitis C. There is no vaccine available.

Children Born to Mothers with Hepatitis C Infection

Children born to mothers with hepatitis C should be tested to identify the approximately 5% of infants who will acquire hepatitis C perinatally. Because an infant may have passive maternal antibodies for as long as 18 months, an infant should not be tested for anti-HCV until after 18 months of age. The infant can be tested for HCV RNA at 1 to 2 months of age if an earlier diagnosis is desired.

Special Information

Personnel from the Ohio Department of Health Bureau of Infectious Diseases are available to answer questions regarding hepatitis C. Please call 614-995-5599.

Many excellent fact sheets and other resources are available at the CDC Website:

<http://www.cdc.gov/hepatitis>.

Disease Fact Sheet Hepatitis C

What is hepatitis C?

Hepatitis C is a virus that uses liver cells to reproduce. As the body's immune system works to defend against this virus, inflammation, injury, and ultimately scarring of the liver may occur. The hepatitis C virus is found in the blood of persons who have this disease. Hepatitis C is spread by contact with the blood of an infected person.

How is hepatitis C diagnosed?

Two blood tests can be done to determine if you have been infected with hepatitis C. Your doctor may order just one or both of these tests. The following are the types of tests your doctor may order and the purpose for each:

- Anti-HCV (antibody to hepatitis C)
This test is usually done first. If positive, it should be confirmed with a HCV RNA. A positive anti-HCV in a person who has not been previously reported meets the case definition for probable acute hepatitis C if clinical criteria are present or the case definition for probable chronic hepatitis C if clinical criteria are not present.
- HCV RNA (also referred to as NAT or PCR)
This test will tell you if you have the virus present in your blood, which indicates that you are currently infected. A positive HCV RNA without clinical criteria meets the case definition for confirmed, chronic hepatitis C, while a positive HCV RNA with clinical criteria meets the case definition for confirmed, acute hepatitis C.

Who should be tested for hepatitis C?

HCV testing is recommended for anyone at increased risk for HCV infection, including:

- Persons born from 1945-1965
- Persons who have ever injected illegal drugs, including those who injected only once many years ago
- Recipients of clotting factor concentrates made before 1987
- Recipients of blood transfusions or solid organ transplants before July 1992
- Patients who have ever received long-term hemodialysis treatment
- Persons with known exposures to HCV, such as
 - Health care workers after needlesticks involving HCV-positive blood
 - Recipients of blood or organs from a donor who later tested HCV-positive
- All persons with HIV infection
- Patients with signs or symptoms of liver disease (e.g., abnormal liver enzyme tests)
- Children born to HCV-positive mothers (to avoid detecting maternal antibody, these children should not be tested before age 18 months)

How is hepatitis C virus spread from one person to another?

Hepatitis C virus is spread primarily by direct contact with human blood, particularly through large or repeated percutaneous (i.e., passage through the skin) exposures to infectious blood, including:

- Injection drug use (currently the most common means of HCV transmission in the United States)
- Receipt of donated blood, blood products, and organs (once a common means of transmission, but now rare in the United States since blood screening became available in 1992)
- Needlestick injuries in health care settings

HCV can also be spread infrequently through:

- Sex with an HCV-infected person (an inefficient means of transmission)
- Sharing personal items contaminated with infectious blood, such as razors or toothbrushes (also inefficient vectors of transmission)
- Other health care procedures that involve invasive procedures, such as injections (usually recognized in the context of outbreaks)

Is there any evidence that hepatitis C virus has been spread during medical or dental procedures done in the United States?

Medical and dental procedures done in most settings in the United States do not pose a risk for the spread of hepatitis C. There have, however, been some reports that hepatitis C virus has been spread between patients in hemodialysis units where supplies or equipment may have been shared between patients and in outpatient clinics where proper infection control was not maintained. If health care-associated HCV infection is suspected, this should be reported to state and local public health authorities.

Can hepatitis C virus be spread by sexual activity?

Yes, but this does not occur very often. If you are having sex, but not with one steady partner:

- You and your partners can get other diseases spread by having sex (e.g. HIV, hepatitis B, syphilis, gonorrhea or chlamydia);
- You should use condoms correctly and every time you have sex; and
- You should be vaccinated against hepatitis B.

Can hepatitis C virus be spread within a household?

Yes, but this does not occur very often. If hepatitis C virus is spread within a household, it is most likely due to direct exposure to the blood of an infected household member.

Should pregnant women be routinely tested for anti-HCV?

No. Pregnant women have no greater risk of being infected with hepatitis C virus than non-pregnant women, and interventions to prevent mother-to-child transmission are lacking. Pregnant women should be tested for anti-HCV only if they have risk factors for HIV infection.

What is the risk that hepatitis C virus-infected women will spread hepatitis C virus to their newborn infants?

Approximately six of every 100 infants born to HCV-infected mothers become infected with the virus. Transmission occurs at the time of birth, and no treatment is available to prevent it. Most infants infected with HCV at birth have not symptoms and do well during childhood. More research is needed to find out the long-term effects of perinatal HCV infection.

Is it safe for a mother infected with hepatitis C virus to breastfeed her infant?

Yes. There is no evidence that breastfeeding spreads hepatitis C. Therefore, having hepatitis C is not a contraindication to breastfeeding. The hepatitis C virus is transmitted by infected blood, not by human breast milk.

Is it safe for the hepatitis C-positive mother to breastfeed if her nipples are cracked and bleeding?

Data are insufficient to say yes or no. However, the hepatitis C virus is spread by infected blood. Therefore, if the hepatitis C-positive mother's nipples and/or surrounding areola are cracked and bleeding, she should stop nursing temporarily. Instead, she should consider expressing and discarding her breast milk until her nipples are healed. Once her breasts

are no longer cracked or bleeding, the hepatitis C-positive mother may fully resume breastfeeding.

How can you protect yourself from getting hepatitis C and other diseases spread by contact with human blood?

- Do not ever shoot drugs. If you shoot drugs, stop and get into a treatment program. If you cannot stop, never reuse or share syringes, water or drug works, and be vaccinated against hepatitis A and hepatitis B.
- Do not share toothbrushes, razors or other personal care articles. They might have blood on them.
- If you are a healthcare worker, always follow Standard Precautions and safely handle needles and other sharps. Get vaccinated against hepatitis B.
- Consider the health risks if you are thinking about getting a tattoo or body piercing. You can get infected if:
 - The tools that are used have someone else's blood on them.
 - The artist or piercer doesn't follow good health practices, such as washing hands and using disposable gloves.
 - The ink used for your tattoo is contaminated with someone else's blood.

What can persons with hepatitis C virus infection do to protect their livers?

- Stop drinking alcohol.
- See the doctor regularly.
- Do not start any new medicines or use over-the-counter, herbal and other medicines or supplements without a physician's knowledge.
- Get vaccinated against hepatitis A and hepatitis B.

What other information should patients with hepatitis C be aware of?

- Hepatitis C virus is not spread by sneezing, hugging, coughing, food, or water, sharing eating utensils or drinking glasses, or casual contact.
- Persons should not be excluded from work, school, play, child-care, or other settings because of their hepatitis C virus infection status. There is no evidence of hepatitis C transmission from food handlers, teachers, or other service providers in the absence of blood-to-blood contact. There is a low but present risk for transmission with sex partners.
- Sharing personal items that might have blood on them, such as toothbrushes or razors, can pose a risk to others.
- Cuts and sores on the skin should be covered to keep from spreading infectious blood or secretions.
- Donating blood, organs, tissue, or semen can spread hepatitis C to others.
- Involvement with a support group may help patients cope with hepatitis C.

What are the chances of persons with hepatitis C virus infection developing chronic HCV infection, chronic liver disease, cirrhosis, liver cancer, or dying because of hepatitis C?

Of every 100 persons infected with HCV, approximately:

- 75-85 persons will develop chronic HCV infection
- 60-70 persons will develop chronic liver disease
- 5-20 persons will develop cirrhosis over a period of 20 to 30 years
- 1-5 persons will die from the consequences of chronic infection (liver cancer or cirrhosis)

What is the treatment for chronic hepatitis C?

Because of advances in the field of antiviral therapy for chronic hepatitis C, individuals with hepatitis C should consult with physician specialists knowledgeable about hepatitis C to obtain the most up-to-date recommendations regarding treatment.

What is the risk for hepatitis C virus infection from a needle stick exposure to hepatitis C virus contaminated blood?

After needle stick or sharps exposure to hepatitis C virus-positive blood, the risk of HCV infection is approximately 1.8% (range 0% - 10%).

Other than needlesticks, do other exposures, such as splashes to the eye, pose a risk to healthcare personnel for hepatitis C transmission?

Although a few cases of hepatitis C transmission via blood splash to the eye have been reported, the risk for such transmission is expected to be very low. Avoiding occupational exposure to blood by following Standard Precautions is the primary way to prevent transmission of bloodborne infections among healthcare personnel. Depending on the medical procedure involved, Standard Precautions may include the appropriate use of personal protective equipment such as gloves, masks, gowns, and protective eyewear.

What are the recommendations for follow-up of healthcare workers after exposure to hepatitis C virus-positive blood?

1. For the source, baseline testing for anti-HCV
2. For the person exposed to a hepatitis C virus-positive source, perform baseline and follow-up testing, including:
 - o Baseline testing for anti-HCV and ALT activity AND
 - o Follow-up testing for anti-HCV (e.g., at four to six months) and ALT activity (If earlier diagnosis of hepatitis C virus infection is desired, testing for HCV RNA may be performed at four to six weeks.)
3. Confirmation by supplemental testing of all anti-HCV results reported as positive by enzyme immunoassay.

Should hepatitis C virus-infected healthcare workers be restricted in their work?

There are no CDC recommendations to restrict a healthcare worker who is infected with hepatitis C virus. The risk of transmission from an infected healthcare worker to a patient appears to be very low. All healthcare personnel, including those who are hepatitis C virus-positive, should follow strict aseptic technique and Standard Precautions, including appropriate hand hygiene, use of protective barriers, and safe injection practices.