

Hepatitis C

Surveillance Protocol

Summary

Hepatitis C virus is an enveloped RNA virus in the Flaviviridae virus family. Hepatitis C is most commonly spread through contact with infectious blood. Chronic hepatitis c is most often asymptomatic, and only about 25-30% person of persons with acute hepatitis c experience symptoms. While not every individual will display symptoms, symptoms include: malaise, anorexia, abdominal pain, jaundice, nausea, vomiting, diarrhea and dark urine. There is no vaccination or post-exposure prophylaxis for hepatitis c, however there is treatment for hepatitis c infection.

Healthcare Provider Responsibilities

1. Report newly diagnosed persons with acute hepatitis C within one week of diagnosis to the state health department. Forward the completed Confidential Reportable Disease Case Report and the laboratory report to the Division of Infectious Disease Epidemiology (350 Capitol St, Room 125; Charleston, WV 25301). Include the following information:
 - a. Patient's name, date of birth, address and phone number
 - b. Demographic information including race, sex, age, and ethnicity.
 - c. Symptoms: did the patient have symptoms of acute hepatitis C?
 - d. Laboratory results, including:
 - i. Hepatitis C test for antibody to Hepatitis C virus (Anti-HCV) i.e.:
 - Enzyme Immunoassay (EIA) **OR**
 - Enhanced chemiluminescence immunoassay (CIA) **OR**
 - Microparticle Enzyme Immunoassay (MEIA) **OR**
 - Chemiluminescent Microparticle Immunoassay (CMIA) **AND**
 - ii. Confirmatory testing, i.e.:
 - Hepatitis C virus detection By Nucleic Acid Testing (including quantitative, qualitative and genotype testing); **OR**
 - Detection of Hepatitis C virus Antigen; **AND**
 - iii. Transaminase levels (ALT and AST)
 - iv. Total Bilirubin levels
2. A single case of possible healthcare associated hepatitis C is defined as an outbreak and should be reported to the local health department immediately. Healthcare associated hepatitis C infection is often recognized in an index case who had an invasive medical procedure during the 2 weeks to 6 months period prior to onset of hepatitis and no other risk factors for hepatitis C.
3. Educate newly diagnosed persons about hepatitis C infection, especially ways to reduce transmission. [Information for the Public is available for this purpose.](#)

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4. Educate patients about appropriate [screening recommendations](#).
5. Encourage the use and practice of reflexive testing and point of care rapid testing.

For information and guidance on testing and treatment of hepatitis C visit the National Viral Hepatitis Action Plan at the following website:

<https://www.hhs.gov/hepatitis/learn-about-viral-hepatitis/hepatitis-c-basics/index.html#testing>

Laboratory Responsibilities

1. Send paper copies of positive laboratory results for hepatitis C infection via fax to 1-304-558-8736 or by mail to the Division of Infectious Disease Epidemiology (350 Capitol St, Room 125; Charleston, WV 25301) within one week, if not already reported via Electronic Laboratory Reports (ELR). For paper or electronic laboratory reports, make sure the following information is included:
 - a. Patient's name, date of birth, address and phone number;
 - b. Demographic information including race, sex, age, and ethnicity;
 - c. Physician name, address and phone number; and
 - d. Laboratory results, normal values and interpretation, including:
 - i. Hepatitis C test for antibody to Hepatitis C virus (Anti-HCV) i.e.:
 - Enzyme Immunoassay (EIA) **OR**
 - Enhanced chemiluminescence immunoassay (CIA) **OR**
 - Microparticle Enzyme Immunoassay (MEIA) **OR**
 - Chemiluminescent Microparticle Immunoassay (CMIA) **AND**
 - ii. Confirmatory testing, i.e.:
 - Hepatitis C virus detection By Nucleic Acid Testing (including quantitative, qualitative and genotype testing); **OR**
 - Detection of Hepatitis C virus Antigen; **AND**
 - iii. Transaminase levels (ALT and AST)
 - iv. Total Bilirubin levels
2. All laboratories should perform and report results of supplemental testing if test for anti-HCV is positive ([MMWR May 7, 2013, vol. 62](#)) through use of point of care rapid testing and reflexive testing.

Local Health Responsibilities

1. Educate the general public of West Virginia about:
 - a. Hepatitis C risk factors **AND**

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- b. Prevention of hepatitis C transmission.
2. Educate providers about appropriate screening recommendations and reporting of acute hepatitis C infection to the state health department within one week of diagnosis.
3. Educate laboratories about reporting all positive hepatitis C laboratory results within one week to the Division of Infectious Disease Epidemiology.
4. Educate correctional facilities as follows:
 - a. Evaluate inmates for risk factors for HCV infection during the entry medical evaluation, and test inmates reporting risk factors for HCV, especially injection drug use.
 - Do appropriate diagnostic testing to differentiate acute hepatitis A, B or C for inmates with signs and symptoms of acute hepatitis and determine if the patient has chronic HBV or HCV infections.
 - Report cases of acute hepatitis C to the Division of Infectious Disease Epidemiology.
 - b. Do prompt epidemiologic investigation in collaboration with the public health authorities to identify the source of the infection for all inmates with acute hepatitis C, including those incarcerated >6 months.
5. When a Hepatitis C Case Report is received, evaluate to determine if the case meets the acute case definition (see Case Definitions section)
6. If the patient meets the case definition for acute hepatitis C case definition:
 - a. He or she should be investigated by using the [WVEDSS hepatitis form, Acute Hepatitis C section](#) and complete data entry in WVEDSS. Ask the patient about risk factors during the 2 weeks to 6-month incubation period.
 - b. If the patient had an invasive medical procedure during the 2 weeks to 6 months prior to onset of symptoms and does not report other risk factors, report this to Division of Infectious Disease Epidemiology (304) 558-5358, extension 1 immediately. A suspect case of healthcare associated hepatitis C infection warrants an investigation. Steps for investigating a single case of hepatitis C infection suspected of being related to health care delivery are available at <http://www.cdc.gov/hepatitis/Outbreaks/HealthcareInvestigationGuide.htm>
 - c. Ensure the patient is educated about hepatitis C transmission, prevention, and control (see Prevention section)
 - d. Fax paper copies of laboratory data to the Division of Infectious Disease Epidemiology at 304- 558-6335 if not already reported via ELR.
7. Laboratory reports not supporting an acute hepatitis C infection should be reported as chronic hepatitis C.
8. If the patient meets the chronic hepatitis C case definition:
 - a. If resources allow, educate the patient about hepatitis C infection (see

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- Preventative Interventions section).
- b. Offer hepatitis A and hepatitis B vaccine according to current recommendation at <https://www.cdc.gov/vaccines/schedules/hcp/imz/adult.html> to susceptible persons meeting the case definition for acute or chronic HCV infection.
9. A single suspect or confirmed case of Hepatitis C in association with a procedure at a single doctor's office or health care facility warrants further investigation. Refer to [health care associated investigation guide by CDC](#) for more information. Immediately report such cases to DIDE
 10. Each health department should maintain a policy on how to manage patients who are lost to follow up.
 - a. A case may be considered lost to follow up at the local level if the case is unable to be located two weeks after initial assignment, and after the Local Health Department has documented three good faith attempts in the WVEDDS to contact the patient which includes, but is not limited to:
 - i. Three phone call attempts on separate days **AND/OR**
 - ii. Two letters (at least one certified)
 11. If the Local Health Department determines that the case is lost to follow up, it may be submitted to the state as lost to follow up.

State Health Responsibilities

A. Surveillance Staff

1. Manage laboratory reports not supporting an acute hepatitis C infection as chronic hepatitis C investigations in WVEDSS.
2. Complete reporting of hepatitis C cases to the CDC through WVEDSS.
3. Provide technical expertise and consultation on surveillance, investigation, disease control and prevention of hepatitis C.
4. Assist local health jurisdiction during a suspected outbreak investigation.
5. Notify CDC of suspected outbreaks.
6. Summarize surveillance data on annual basis and share with partners.
7. Submit lost to follow up cases to Viral Hepatitis Disease Intervention Specialist.

B. Viral Hepatitis Disease Intervention Specialist

1. If the patient is located, interview the patient for all contacts including: sexual, household, and needle/drug paraphernalia sharing contacts
2. Provide partner notification services when applicable
3. Refer the patient back to the Local Health Department for follow-up
4. Update the WVEDSS with any additional information obtained through interview
5. Complete and submit a field record to the Disease Intervention Specialist Supervisor.

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6. The Viral Hepatitis Disease Intervention Specialist will attempt to locate the patient for up to four weeks after receiving the lost to follow up case. If the patient is unable to be located within four weeks, it will be closed as lost to follow up.
- C. Viral Hepatitis Prevention Coordinator
 1. Provide information
 2. Obtain information from partners regarding patients linked to care

Linkage to Care

- A. Linkage to care (LTC) refers to the initiation of care for those who are infected with hepatitis B and/or C. All persons who are chronically infected with hepatitis B and/or C should be linked to outpatient care for disease staging, treatment initiation, treatment completion, and testing for sustained virologic response (SVR).
 1. For the purposes of case management, the LHD should:
 - a. Document LTC information in the case report form in WVEDSS
 2. If possible, the LHD may also:
 - a. Share the contact information of any providers in the area/region able to provide care for hepatitis B and/or C with the patient for the purpose of follow-up and treatment.
 - b. Assist the case patient in making an appointment to see a provider in the respective area/region.

Occupational Health

There is no vaccine for hepatitis c virus and post exposure prophylaxis is not available after exposure to the hepatitis c virus. Any worker who is exposed to blood or bodily fluids should adhere to standard precautions to reduce risk of transmission. Standard Precautions include:

1. Use of Personal Protective Equipment (PEP) when in proximity of blood and other bodily fluids. PEP includes gloves, face masks, and protective eye wear.
2. Keep wounds covered at all times in health care settings
3. Wash hands regularly after being in contact with blood, other bodily fluids or possible contaminated objects or surfaces
4. Follow safe injection practice
5. Dispose of contaminated objects properly and timely

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Disease Control Objectives

1. Decrease transmission of hepatitis C virus infection.
2. Interrupt transmission of health care associated infection of hepatitis C virus.
3. Accurately capture public health action for acute hepatitis C cases.
4. Facilitate linkage to care for newly reported acute hepatitis C cases

Disease Prevention Objectives

1. Prevent transmission of hepatitis C infection through education of persons who have tested positive for HCV.
2. Reduce the incidence of acute hepatitis C through community education and programs to prevent drug use and sharing of needles.
3. Prevent transmission of health care associated hepatitis C infection through effective infection control measures.
4. Prevent transmission of hepatitis C through screening of blood and organ donors.
5. Prevent complications of hepatitis C by assuring that persons with hepatitis C receive education about current treatment options, hepatitis A and B vaccines, and the harmful effects of alcohol consumption
6. For national and federal goals and objectives refer to Action Plan Overview from The National Viral Hepatitis Action Plan at <https://www.hhs.gov/hepatitis/viral-hepatitis-action-plan/index.html>

Disease Surveillance Objectives

1. Determine the incidence of acute hepatitis C in West Virginia.
2. Annually estimate the number of reported cases of chronic hepatitis C in West Virginia.
3. Identify the risk factors associated with acute hepatitis C infection.
4. Identify demographic characteristics of persons with acute and chronic hepatitis C infection.
5. Detect outbreaks or cluster of hepatitis C infection.

Public Health Significance

Hepatitis C virus infection is the most common chronic blood-borne infection in the United States; an estimated 3.2 million persons are chronically infected (<http://www.cdc.gov/media/releases/2012/dpk0830-hepC.html>).

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Infection is most prevalent among those born during 1945–1965, the majority of whom were likely infected during the 1970s and 1980s. The high prevalence of HCV infection in this birth cohort is largely attributed to exposures that occurred during this period of increased incidence. Many of those exposures were associated with illicit drug use or blood transfusion. Injection drug use (IDU) continues to be the leading risk factor for HCV incidence in the United States, and people who inject drugs have the highest prevalence of HCV infection of any population, ranging from 40%–70% (Amon et al., 2008; Hagan et al., 2011; Williams, et al., 2011). Hepatitis C virus infection is the primary cause for serious liver damage requiring liver transplantation in the U.S. (Davis et al., 2010). No vaccine against HCV infection exists and prophylaxis with immune globulin is not effective in preventing HCV infection after exposure.

Seventy to 80% of persons newly infected with HCV are either asymptomatic or have only a mild clinical illness (<http://www.cdc.gov/hepatitis/HCV/HCVfaq.htm>). Most infected persons remain unaware of their infection because they are not clinically ill. However, infected persons serve as a source of transmission to others and are at risk for chronic liver disease (CLD) and other HCV-related chronic diseases for decades after infection (<http://www.cdc.gov/std/treatment/2010/hepc.htm>).

A CDC review of death certificate data found that mortality rate due to hepatitis C infection increased substantially during 1999–2007 (annual mortality rate change: +0.18 deaths per 100,000 population per year); in 2007, HCV caused more than 15,000 deaths (<http://www.cdc.gov/media/releases/2012/dpk0830-hepC.html>). Of the HCV-related deaths, 73.4% occurred among persons aged 45–64 years, with a median age at death of 57 years (approximately 20 years less than the average lifespan of persons living in the United States).

Investigation of a suspect case of healthcare associated hepatitis C is important as it can result in the identification of an outbreak or unsafe clinical practices that are putting additional patients at risk.

Clinical Description

Persons with acute hepatitis C infection are usually asymptomatic. About 25-30% of persons with acute hepatitis C infection will experience the classic symptoms of hepatitis, including malaise, anorexia, abdominal pain, jaundice, nausea, vomiting, diarrhea and dark urine. Acute hepatitis C infection is indistinguishable from acute hepatitis due to other viruses. A full set of tests for viral hepatitis, including hepatitis A IgM, HBsAg, HBcIgM, and Anti-HCV (with confirmation according to current guidelines) should be ordered, because of the frequency of

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co-infections. Acute hepatitis A superimposed on chronic hepatitis C infection can cause fulminant hepatitis.

An estimated 75-85% of HCV infected persons develop chronic infection. Again, most of these patients are asymptomatic. About 5–20% HCV infected persons will go on to develop cirrhosis over a period of 20–30 years. Hepatocellular carcinoma, a form of liver cancer, is estimated to occur in about 1-4% of persons with cirrhosis every year (El-Serag 2012).

Etiologic Agent

The hepatitis C virus is an enveloped RNA virus classified as a separate genus (Hepacivirus) in the Flaviviridae family. At least 6 different genotypes and approximately 100 subtypes of HCV exist. Genotype 1 (subtype 1a and 1b) is the most common (60 to 70%) of the HCV infection in U.S (Kohli et al., 2014).

Evidence is limited regarding differences in clinical features, disease outcome or progression to cirrhosis or hepatocellular carcinoma (HCC) among persons with different genotypes. However, differences do exist in responses to antiviral therapy according to HCV genotypes. Hepatitis C virus genotype 1 is more difficult to cure than genotype 2 or genotype 3 (Kohli et al., 2014).

Reservoir

This virus is found only in humans. Chimpanzees and mice have been infected experimentally, but they play no known role in transmission to humans.

Mode of Transmission

Hepatitis C is efficiently transmitted by the parenteral route mainly through percutaneous exposure of infectious blood. All injection drug users, even those who have used drugs only once, are considered at risk. IDU is currently the most common means of HCV transmission in the United States. Risk factors for transmission of HCV among drug users include: first-time use with an older user, frequent use, cocaine injection, and sharing of paraphernalia.

Other important risk factors include:

- transfusion or organ transplantation, especially prior to July 1992;

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- hemodialysis;
- high-risk sexual activity;
- unsafe injections (in developing countries);
- tattoo and body piercing instruments if not sterilized
- occupational exposure to blood (needle stick in health care setting);
- perinatal exposure. The risk of perinatal transmission is approximately 2 percent for infants of anti- HCV seropositive women.

HCV can also be spread infrequently through:

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

Healthcare associated transmission of hepatitis C virus infection has been reported from a variety of healthcare settings. Common known or suspected mode of transmission of healthcare associated hepatitis C infection are syringe reuse contaminating medication vials, use of single-dose vials for more than one patient, drug diversion by infected medical technician, use of fingerstick devices and blood glucose meters for more than one individual, preparation of medication in the same area where blood specimens are processed, phlebotomy and nail care performed at nursing home.

Hemodialysis patients are at increased risk for hepatitis C; probably because of unrecognized transmission during hemodialysis. A single suspect or confirmed case of Hepatitis C in association with a procedure at a single doctor's office or health care facility warrants further investigation. Refer to [health care associated investigation guide by CDC](#) for more information.

Healthcare workers have a similar or slightly lower prevalence of HCV infection than the general population, although they may have acquired their infection from occupational sources. Transmission from healthcare workers to patients has also been documented but is rare and confounded by other risk factors. HCV-infected healthcare workers should use standard (universal) precautions to prevent transmission and should not be restricted from work.

Transmission does not occur through casual contact (kissing, hugging, touching, coughing, sneezing, food, water, sharing eating utensils or drinking glasses, or other contact without exposure to blood etc.) Breast- feeding does not appear to transmit HCV.

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Incubation Period

Incubation period is two weeks to six months; average 45 days. Chronic infection may persist for up to 20 years before the onset of cirrhosis or hepatoma.

Period of Communicability

Persons with hepatitis C are infectious or viremic from about two weeks after exposure for an indefinite period of time. Persons with chronic hepatitis C are intermittently viremic. Peaks in virus concentration appear to correlate with peaks in ALT activity. Persons who test positive for hepatitis C should be assumed to be infectious unless repeated testing for hepatitis C RNA is documented to be negative.

Outbreak Recognition

Outbreaks have been described in association with cardiac surgery, colonoscopy, outpatient surgery and injectable narcotics diversion by an infected health care provider. Outbreaks have also been recognized in association with needle-sharing partners. If, one or more acute cases of hepatitis C occur in association with surgery, dialysis, another invasive procedure in patients without other risk factors within the 2 week to 6 month incubation period, Division of Infectious Disease Epidemiology should be notified immediately that a possible outbreak has been identified. Otherwise, an outbreak would also be recognized if multiple persons report the same risk factor. Outbreak identification should be facilitated by use of the WVEDSS hepatitis investigation form to investigate acute cases of hepatitis C.

Case Definition

Acute Hepatitis C, acute (2019 Case Definition)

CSTE Position Statement Number: 19-ID-06

All HCV cases in each category should be >36 months of age, unless known to have been exposed non-perinatally.

Clinical Criteria

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- Jaundice, OR
- A peak elevated total bilirubin levels ≥ 3.0 mg/dL, OR
- A peak elevated serum alanine aminotransferase (ALT) level >200 IU/L AND

The absence of a more likely diagnosis (evidence of acute liver disease due to other causes or advanced liver disease due to pre-existing chronic HCV infection or other causes, such as alcohol exposure, other viral hepatitis, hemochromatosis, etc.)

*A documented negative HCV antibody laboratory test result followed within 12 months by a positive test (as described in the laboratory criteria for diagnosis) result does not require an acute clinical presentation to meet the surveillance case definition.

Laboratory Criteria for Diagnosis

- A positive test for antibodies to hepatitis C virus (anti-HCV)
- 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 for HCV antigen(s) is approved by FDA and available.

Criteria to Distinguish a New Case from an Existing Case

A new acute case is an incident acute hepatitis C case that meets the case criteria for acute hepatitis C and has not previously been reported. A new probable acute case may be re-classified 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.

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Case Classification

Probable

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

Confirmed

- A case that meets clinical criteria and has a positive hepatitis C virus detection test (HCV 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).

Hepatitis C, chronic (2016 Case Definition)

CSTE Position Statement Number: 15-ID-03

Clinical Criteria

No available evidence of clinical and relevant laboratory information indicative of acute infection ([refer to the criteria for classification Table VII-B in CSTE position statement 15-ID-03](#)). Most hepatitis C virus (HCV)-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)
- 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 for HCV antigen(s) is approved by FDA and available

Criteria to Distinguish a New Case from an Existing Case

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A new chronic case is an incident chronic hepatitis C case that meets the case criteria for chronic hepatitis C and has not previously been reported. 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.

Case classification

Probable

- 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 anti-HCV antibody test, but no report of a positive HCV NAT or positive HCV antigen test

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

Preventive Interventions

See Hepatitis C prevention guidance at <https://www.hcvguidelines.org/unique-populations>

Treatment

See Hepatitis C treatment guidance at <https://www.hcvguidelines.org/evaluate/when-whom>

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Surveillance Indicators

1. Proportion of acute and chronic cases of hepatitis C with complete demographic information.
2. Proportion of acute cases of hepatitis C with complete risk factor information.
3. Proportion of acute cases of hepatitis C that have been educated and have linkage to care information documented.
4. Percent increase in the number of facilities (e.g. laboratories, and health clinics) that conduct hepatitis testing and submit reports to the health department.

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