

# Hepatitis C



## Case Definition

**Chronic Case:** Confirmed positive hepatitis C virus (HCV) serology, with or without illness (see below), of six months duration or longer, or of unknown duration.

**Acute Case:** Requires either a documented seroconversion over a period of under six months, or all of the following:

- Confirmed positive serology for hepatitis C.
- Clinically compatible illness (e.g., jaundice, nausea, malaise, fatigue, dark urine, loss of appetite).
- Laboratory evidence of hepatitis (hyperbilirubinemia or aminotransferase levels >2.5 times the upper limit of normal).
- Negative test for HBsAg or anti-HBc IgM.
- Negative test for anti-HAV IgM.

## Reporting Requirements

- All confirmed positive HCV test results are reportable by laboratory and attending health professional.
- All cases are reportable by attending health care professional.

## Clinical Presentation/Natural History

Hepatitis C is diagnosed primarily by serology, as most incident HCV infections are clinically silent. However, the outcome of clinically silent and clinically expressed HCV infection appears to be similar.

Most persons infected with HCV (60-90%) develop chronic infection. At least 20-30% of infected persons will develop cirrhosis of the liver, and the risk for cirrhosis increases over time. A smaller proportion will develop hepatocellular carcinoma. Persons with cirrhosis are particularly at risk for carcinoma.

Chronic HCV infection can be marked by fluctuations in clinical symptoms and liver enzyme tests such as serum transaminases. Symptoms are often non-specific, and many persons complain of chronic or intermittent fatigue, which can be debilitating. The degree of fatigue is often not correlated with the severity of liver disease. Alcohol consumption and other exposures that adversely affect the liver have an additive effect on liver damage and progression to cirrhosis.

## Etiology

A small flavivirus-like, single stranded RNA virus.

## Epidemiology

**Reservoir and Source:** Humans

**Transmission:** HCV is spread primarily through direct blood-to-blood contact with an infected person. Transmission through sharing of contaminated needles and syringes by injection drug users is now the most common method of spread. People who received blood transfusions before the institution of screening of blood and blood products for HCV in July 1990 are also at risk. The current risk for HCV transmission from blood transfusion is very low, estimated to be between 1/10,000 and 1/100,000.

HCV is not spread through eating or drinking contaminated food or water (unlike hepatitis A). The risks of hepatitis C being transmitted sexually, from mother to child perinatally or through household contact, are low (probably less than 5%).

The risk of transmission of hepatitis C by accidental needlestick exposure is estimated to range from 4-10%.

In 10-20% of cases, risk factors cannot be identified. It is suspected that many of these infections are due to needle sharing that is not reported.

## Occurrence:

**General:** Worldwide. Before donor screening, HCV was the most common cause of post-transfusion hepatitis, accounting for about 90% of cases in North America. The prevalence of anti-HCV is highest in injection drug users, persons with hemophilia (50-90%) and in hemodialysis patients (10-20%).

**Manitoba:** There are probably 5,000-10,000 HCV-infected persons in Manitoba. Approximately 40 to 50 new cases of HCV infection are identified each month, but it is not known when infection was acquired. The primary risk factor for new HCV infections is injection drug use. In 1999, 600 newly identified cases were reported (50/100,000)

**Incubation Period:** Ranges from two weeks to six months; most commonly six to nine weeks.

**Susceptibility and Resistance:** Susceptibility is universal. The degree of protective immunity following infection is not known; repeated infections with HCV have been demonstrated in an experimental chimpanzee model.

**Period of Communicability:** From one or more weeks before onset of symptoms. Most persons are probably infectious indefinitely. Based on studies in chimpanzees, the blood titre required to transmit HCV is relatively low. Peaks in virus concentration appear to correlate with peaks in liver ALT activity.

## Diagnosis

It may take 12 to 14 weeks or longer after infection for antibodies to be detected.

Testing is performed by the Cadham Provincial Laboratory. It consists of a screening test, an enzyme immunoassay (third-generation ELISA), followed by confirmatory testing with either a recombinant immunoblot assay (third-generation RIBA), or a polymerase chain reaction (RNA-PCR) test. The RIBA is used as the confirmatory test if the specimen is low-positive on ELISA, or if transportation time to the laboratory is greater than 24 hours. RNA-PCR is used as the confirmatory test if the specimen is strongly positive on ELISA

and transportation time to the lab is under 24 hours.

Results are reported as positive only if ELISA-positive specimens are confirmed positive. The specificity of this diagnostic approach is about 99%. The ELISA false negative rate is about 10%, partly because some persons being tested may be in a "window period" (i.e., infected but not yet producing detectable antibody), or may be immune-compromised and thus not capable of mounting a detectable antibody response.

## Key Investigations

- Efforts to identify the potential source and spread of infection.
- Cases: Education about HCV, interview for needle-sharing contacts if applicable, referral to the Viral Hepatitis Investigation Unit (VHIU) or another specialist for medical management.
- Needle-sharing contacts: Education about HCV, referral for testing, referral to the Viral Hepatitis Investigation Unit or another specialist for medical management if indicated.

## Control

### Management of Cases:

- **Screening:** Early detection of HCV infection is important, so that treatment may be initiated if indicated, and so that infected persons may be given the opportunity to initiate lifestyle changes to reduce other exposures that might lead to liver damage. Response to treatment may also be enhanced in persons with a shorter duration of infection. Persons with significant risk factors (e.g., injection drug use, history of incarceration, tattoos, ear or body piercing, blood transfusion before 1990) should be screened for HCV. Persons with unexplained fatigue and/or chronic liver disease should also be screened.
- Treatment with antiviral drugs, primarily interferon and ribavirin (Rebetron), is effective in eradicating infection in about 30-40% of cases of hepatitis C. Indications for initiating treatment include a serum ALT greater than

twice the normal value on two occasions at least six months apart, or a serum ALT one to two times normal, with a liver biopsy showing moderate or severe hepatitis. Treatment is most effective when given early in the course of the disease, before the development of liver fibrosis. Treatment is often associated with significant side-effects and is expensive, so it is recommended that HCV-infected patients be referred to the VHIU or another specialist for assessment before initiation of therapy. The duration of therapy is generally one year, and although 40-50% of patients may respond initially with normalization of serum ALT activity, many will relapse either by the end of treatment or shortly thereafter. In addition to the 10-20% remission rate, treatment may delay development of cirrhosis and prevent hepatocellular carcinoma.

- Persons who are anti-HCV positive should be tested for hepatitis B (for antibody to hepatitis B core antigen [anti-HBc IgG], or alternatively, by HBsAg and anti-HBs tests). Those with negative hepatitis B serology should receive the three-dose hepatitis B vaccine series. Vaccine is provided free by Manitoba Health to HCV-infected persons (see Hepatitis B protocol).
- Immunization against hepatitis A is also recommended for those who are anti-HCV positive and susceptible, i.e., anti-HAV IgG negative. Such persons should be screened for anti-HAV before hepatitis A vaccine administration. Manitoba Health also provides the hepatitis A vaccine free to HCV-infected persons.
- Persons testing positive for hepatitis C for the first time are automatically screened by the Cadham Provincial Laboratory for hepatitis A and hepatitis B.
- To improve compliance with immunization, at the time that blood is drawn for hepatitis A and B screening, the first dose of hepatitis B vaccine may be administered. If susceptible to both hepatitis A and B, the first doses of hepatitis A vaccine and the second dose of hepatitis B vaccine may be given simultaneously, but at

different sites, one month after the first dose. The second dose of hepatitis A vaccine and the third dose of hepatitis B vaccine can then be given six months later, completing both series. If the first dose of hepatitis B vaccine is not given during the screening visit, then a three-dose series of combined hepatitis A/B vaccine should be administered on a zero, one and six month schedule. Post immunization testing for anti-HBs, one to two months following receipt of the third dose of hepatitis B vaccine, should be performed to confirm development of a protective response ( $\geq 10$  I.U./L.). If results are  $< 10$  I.U./L., a second three-dose series should be completed, again followed by anti-HBs testing. Hepatitis A, B and A/B vaccines in pediatric\* and adult formulations can be ordered from Livingston Health Care Services or by using the Biologics Order Form.

\* for products currently in stock: A  $< 17$  years, B  $< 19$  years, A/B  $< 18$  years.

- HIV testing is recommended for clients involved in relevant risk activities.

## Public Health Investigation and Management:

- After a positive laboratory report is received by Manitoba Health, previously referred HCV cases will be culled out and a referral made to the appropriate regional health jurisdiction. It is recommended that the public health nurse responsible for the case liaise with the physician before contacting the client. The purposes of this liaison are:
  - Confirmation of receipt of the referral.
  - Determination of the reason for the test. This opportunity can be used to inform the physician about the reportability of HCV and the requirements for public health investigation (completion of the Investigation Form, client education and interview, contact follow-up, provision of resources). Additional

- epidemiologic information may also be collected at this time.
- Provision of literature/information for the physician and/or client.
  - Recommendation for referral to the VHIU or another specialist for additional testing, investigation and possible treatment.
  - Verification of the primary case manager.
  - Injection drug users should be given priority for follow-up by public health. This follow-up should consist of an in-person meeting, where possible, for the purposes of education and recommendations regarding future management. Possible needle-sharing partners may also be identified for follow-up. All cases require completion of an Investigation Form. If the primary physician elects to manage the case on his/her own, he/she should complete the Investigation Form and return it to Manitoba Health. The public health nurse may contact the client for further education and an interview. In many instances, the responsible public health nurse will be expected to complete the Investigation Form.

## Management of Contacts:

- Persons who are contacts of injection drug users should be given priority for follow-up by public health. A strategy of proactively trying to identify injection drug users individually or as a group may be preferable to individual contact tracing activities.
  - As most long-term sex partners of HCV-positive persons test anti-HCV negative, long-term sex partners need not be followed by public health. This does not preclude them from opting to be screened by their physician, and it is the responsibility of the attending physician to ensure they are informed about the potential risk for transmission.
- Needle-sharing partners who test negative for HCV should be re-tested every six to 12 months if needle-sharing continues.
  - As indicated above, the probability of perinatal transmission from mother to infant is very low. It is not recommended therefore that infants of HCV-positive mothers be routinely tested for hepatitis C, unless the mother was immune-compromised at the time of birth (e.g., was HIV-infected). If such infants are tested, the HCV-RNA test should be used until the age of one year, when anti-HCV testing can be employed. However, because of the potential for contamination of infant blood with maternal blood at birth, even RNA testing should not be performed until at least one month of age. No immediate intervention is recommended if the infant is positive, as infants who are infected may be more likely than adults to have a transient infection that does not progress to chronic disease. These infants should be followed later in life to monitor progression to chronic infection and concomitant sequelae.

## Preventive Measures:

- The identification of injection drug users, with harm reduction counselling and education about the infection, is critical for prevention. Harm reduction efforts may include participation in needle-exchange programs, participation in addictions programs, the use of safer injection procedures, needle/syringe sterilization and drug substitution. In this regard, street-based and prison-based programs are important for identifying and educating high-risk persons.
- Procedures such as tattooing and body piercing should either be discouraged or performed safely with sterile equipment.

- In the health care setting, routine precautions will minimize the risk of exposure for health care workers.
- Multiple sex partners can increase the risk for many sexually transmitted infections, so education regarding reduction in numbers of partners and the use of condoms is an important preventive measure.
- All blood donations are screened by Canadian Blood Services for HCV infection. Persons who are found to be HCV-positive in this manner are referred to their primary physician and to public health for appropriate follow-up. Persons who are HCV-positive should not donate blood or organs.
- Personal items and toilet articles, such as earrings, nail files, toothbrushes and razors, should not be shared.
- Long term sex partners of HCV-positive persons may wish to be tested. Condoms should be considered to minimize the risk of transmission to an uninfected partner. In the absence of condoms, unprotected sexual intercourse should be avoided during menses.

## Additional Resources

### For Health Professionals:

- Computer program and booklet on managing chronic hepatitis B and C infections: Minuk GY, Dusheiko GM, Lok AS and Cooksley WG. *A Simplified Approach to the Management of Patients with Chronic Hepatitis B or Hepatitis C Viral Infections*. Winnipeg: Mayer Zev Enterprises 1998.
- Hepatitis C: Information for physicians, public health nurses and other health practitioners. Manitoba Health Fact Sheet.
- Management of viral hepatitis: clinical and public health perspectives — a consensus statement. Canadian Association for Study of the Liver, 1997.

### For the Public:

- Canadian Liver Foundation pamphlet: “Hepatitis C: Risk, Transmission, Treatment.”

### For Street-Involved Persons:

- Hepatitis A-B-C educational pamphlets.

Resources available from Audiovisual and Publications Department, Manitoba Health, telephone (204) 786-7112, fax (204) 772-7213.