

HEPATITIS C

Case definition

CONFIRMED CASE (does not distinguish acute from chronic infection):

- Detection of anti-hepatitis C antibodies (positive anti-HCV tests should be confirmed by a second manufacturer's EIA, immunoblot, or NAT for HCV RNA)

OR

- Detection of hepatitis C virus RNA

Anti-HCV testing should not be performed in infants < 18 months of age, as the anti-HCV may represent passive maternal antibody. As most infections occur at the time of childbirth, if testing for HCV RNA is considered, it should be delayed beyond 4 to 12 weeks to avoid false-negative HCV-RNA test results. Cord blood should not be used because of potential cross-contamination with maternal antibody.

Causative agent

Hepatitis C virus (HCV) is an RNA virus and a member of the flavivirus family. Multiple HCV genotypes and subtypes exist. Genotype 1 is the predominant type of hepatitis C in Canada, but all types have been seen.

Source

Humans.

Incubation

Usually 6–7 weeks, with a range of 2 weeks to 6 months.

Transmission

Hepatitis C is mainly spread parenterally. Transmission of HCV may also occur with activities involving percutaneous exposure and the use of contaminated equipment.

The primary sources of HCV infection include:

- unscreened donor blood and blood product transfusions, or products that have not had viral inactivation (Note: Since 1992, the Canadian blood supply is routinely tested for Hepatitis C, and the chance of a blood recipient becoming infected with HCV from a blood transfusion is extremely low in Canada.)
- exposure to HCV-contaminated blood by the use of contaminated or inadequately sterilized instruments and needles/equipment, including medical/dental practices
- injection drug use

- tattooing, ear or body piercing, acupuncture, or electrolysis
- practices using unsterilized objects [e.g., scarification, circumcision, etc.]

Other sources of transmission include

- sharing drug injection, snorting, or smoking equipment, such as needles, syringes, straws, pipes, cookers, wash and filters, etc.
- household exposure through sharing of personal hygiene equipment, such as toothbrushes, razors, nail clippers, etc.
- sexual contact [Note: Sexual contact is less likely to transmit HCV but it depends on the type of sexual activity [e.g., if blood exchange takes place]. Studies have shown low transmission rates with people in long-term monogamous relationships. The risk is higher with increased number of sexual partners, engaging in high-risk sexual practices, co-infection with sexually transmitted infections (STIs) and HIV, and engaging in sexual activities with those who are involved in high-risk behaviours. Transmission is lowest with oral sex, higher with vaginal sex, and highest with anal sex.]
- Vertical transmission [maternal–fetal/infant] has been documented but is rare [approximately 5 per cent].

Communicability

Individuals who are HCV-RNA positive are infectious.

Symptoms

Onset of symptoms is usually insidious. Symptoms are often mild and may include anorexia, vague abdominal discomfort, nausea and vomiting, and occasionally jaundice [occurs in fewer than 20 per cent of patients]. Abnormalities in liver function tests are less pronounced in HCV infection than hepatitis B. Between 70 and 80 per cent of individuals infected with hepatitis C develop chronic infection. Chronic infections may present with disease flares and similar symptoms and signs.

Diagnostic testing

HCV screening tests are performed at regional laboratories in Nova Scotia. All screen-positive HCV screening tests are sent to the QEII Health Sciences Centre virology laboratory for confirmatory testing. See Table 1 for lab result interpretation information for hepatitis C. There are two types of testing: nominal and non-nominal.

a. Nominal testing

Nominal testing means that the case's name is used on the form that is sent to the laboratory with the blood sample. The name is also used on the test result when the lab sends it back to the physician. If the result is positive, the lab and

the physician report the test result and name to the Medical Officer of Health (MOH) [or delegate] in the Public Health office covering the jurisdiction where the testing originated.

b. Non-nominal testing

Non-nominal testing for HCV is done in settings like the STI clinics and Corrections. A code is used on the form that is sent to the laboratory with the blood sample. The code is also used on the test result when the lab sends it back to the physician. If the result is positive, the lab and the physician report the test result to the MOH [or delegate]. Public Health must call the reporting physician for the case’s name.

TABLE 1: HEPATITIS C LAB RESULT INTERPRETATION

Result	Interpretation
Anti-HCV negative	Unlikely to have HCV infection. Occasionally immunosuppressed individuals, particularly HIV patients will not have any serologic evidence of infection but will be PCR positive. Clinical correlation is required.
HCV-RNA [PCR] positive	Active HCV infection
Anti-HCV positive HCV PCR negative HCV-RIBA positive	Past infection with resolution and viral clearance or current infection with viral RNA that is below the limit of detection. If clinically warranted, send a repeat specimen for HCV-RNA testing in one month.
Anti-HCV positive HCV PCR negative HCV-RIBA indeterminate	Window period during seroconversion or a false positive. Patient should have repeat testing in 3 months.

Treatment

There is treatment available for people with hepatitis C infection. Response to treatment varies depending on the genotype with which the person is infected. Combination therapy of Pegylated interferon-alfa [weekly injection] and Ribavirin [oral daily doses] has been effective. Future considerations include triple

combinations and newer treatments, such as polymerase inhibitors, protease inhibitors, and NS5A inhibitors. Many new advances in hepatitis C treatment are currently being implemented and further studies are reviewing promising treatment regimens. Newer treatments on the horizon include those with sustained virologic response, quicker response, less increase in side effects, and excellent tolerance. Consult with a specialist for the latest treatment.

PUBLIC HEALTH MANAGEMENT & RESPONSE

Case management

- Determine if the case is already known to be hepatitis C-positive (refer to the Nova Scotia Surveillance Guidelines for Notifiable Diseases and Conditions at novascotia.ca/dhw/populationhealth/surveillanceguidelines). If not, continue with the investigation.
- Contact the health-care provider named on the lab report and inform them of the role of Public Health in hepatitis C follow-up.
- Obtain preliminary information from the reporting health-care provider. Such information may include
 - reason for testing
 - referral to specialist
 - first-time diagnosis
 - patient aware of diagnosis
- Contact the case and document required case management information, including risk factors and receipt or donation of blood products, cells, tissues, or organs. If blood transfusion and/or donation has been identified, specific information with respect to the dates of transfusion and/or donation, institution, and the case's address at the time of transfusion and/or donation are collected with as much detail as possible.

Note: If there is a history of blood or blood product donation or receipt, please review with the MOH to consider the need for a Look-back or Trace-back as necessary. The Look-Back/Trace-Back protocol can be found in the Surveillance guidelines at novascotia.ca/dhw/populationhealth/surveillanceguidelines

- Discuss contacts with the case and determine next steps for contact tracing (see *Contact tracing* section below).
- Consult the Nova Scotia Department of Health and Wellness Environmental Health Consultant (EHC) and/or local MOH if exposure to the virus may have occurred in a facility offering personal services such as manicure/pedicure, tattoo, piercing, or dentistry. The EHC will initiate a follow-up investigation at the facility as deemed appropriate.

- Advise health-care provider and case about recommendations for vaccinations (e.g., hepatitis A, hepatitis B, and pneumococcal 23, and others that are publicly funded for adults, e.g., influenza and Tdap). More information about this policy can be found in Chapter 10.4 of the Nova Scotia Immunization Manual at novascotia.ca/dhw/cdpc/documents/Immunization-Manual.pdf. Make sure that the case and the primary care provider are aware of the vaccination schedule and follow-up doses required to complete the series.
- As needed, discuss possible referral options to an appropriate specialist for additional testing, investigation, and possible treatment.
- Make or facilitate linkages, when appropriate, to support services such as community outreach programs that have experience in safer sex and drug use supply, methadone treatment, and other harm reduction strategies, with the goal of reducing the risk of acquiring and transmitting blood-borne infection[s].

Exclusion

- Hepatitis C cases need not be excluded from work, school, play, child-care, or other settings on the basis of their HCV infection status.
- In situations where the case's work involves a high risk of transmission to others, consult with MOH about a plan of action and/or an education plan.
- Consult MOH in situations where recreational activities (e.g., boxing) could involve higher risk of transmission.

Education

Since there is no preventative HCV vaccine, advise infected cases about how to prevent transmission and offer the following recommendations:

- Do not share personal items, such as toothbrushes, dental floss, razors, earrings, manicure equipment, nail clippers, sexual toys, etc. [i.e., articles that might have traces of blood].
- Do not share drug injection, snorting, or smoking equipment, such as needles, syringes, straws and pipes, cookers, wash, filters, etc.
- Do not share needles and ink used for tattooing, and do not share needles used for body piercing and/or body modifications unless properly cleaned and sterilized.
- Clean blood spills appropriately. Use gloves, soak up the blood with paper towels and dispose of them in a sealed plastic bag, clean the surface with detergent and water, and then disinfect the surface with a fresh solution of 1 part bleach (100 mL) to 9 parts water (900 mL). Allow this to stay on the surface for 10 minutes before wiping off.
- Do not donate blood, semen, tissue, organs, or breast milk.
- Prevent blood and other potentially infective body fluids from coming into contact with other individuals. Cover open wounds and cuts until healed.

- Put articles with blood on them (e.g., tampons, pads, tissue, dental floss, and bandages) in a separate, sealed plastic bag before disposing of them in household garbage.
- Dispose of sharp items (e.g., razor blades, needles, etc.) in a hard-sided container and then tape it shut.
- Although individuals are not obligated to disclose HCV status, there are situations in which informing health-care providers (e.g., doctor, dentist, etc.) or others of disease status may enhance general care and safety.
- HCV-positive health-care workers or other workers who may be at higher risk to transmit HCV and who are uncertain about the potential transmission risks of HCV or proper practices to minimize the risk to patients should consult with employee health, an infection control practitioner, or patient safety group responsible for the quality of care for the patients.
- Practise a healthy lifestyle, including limiting or avoiding alcohol consumption, as alcohol is a risk factor for more rapid progression of the disease.
- Prescribed or over-the-counter medication and/or homeopathic products may pose risk(s) and/or be a contraindication to those with liver conditions, such as HCV. Consult a pharmacist before using any of these.
- Advise sex partners and practise safe sex (e.g., use condoms) due to the low but possible risk of sexual transmission to partners.
- If considering pregnancy, discuss with a health-care provider the risk of transmission to the infant and the transmission factors associated with breastfeeding.
- If nipples are cracked and bleeding, consider abstaining from breastfeeding until they are healed. Note: Transmission of HCV by breastfeeding has not been documented.
- Harm-reduction messages and other resources can be found at hepcinfo.ca/en/home?lang=en&level=s.
- Consider the risks involved with receiving services from a personal service facility where the skin may be intentionally or unintentionally broken (e.g., tattooing, piercing, or manicure/pedicure facilities).
- For further information about best practice recommendations for Canadian harm reduction programs, refer to catie.ca/en/programming/best-practices-harm-reduction.

Contact tracing

Public Health, or a primary care provider in association with Public Health, can help to notify contacts.

If the case is comfortable doing so, they can notify contacts themselves. Public Health can offer support and assistance to the case with this process.

If Public Health is notifying contacts, inform the contacts of the following:

- potential exposure
- explanation of the illness (description of the disease, symptoms, etc.)
- recommendation for testing
- potential further information as required (e.g., provide education on hepatitis C disease, symptoms, prevention, and transmission risks)

Contacts to be considered at risk include, **but are not limited to**, the following:

- those with whom drug equipment (needles, pipes, cookers, etc.) has been shared
- sexual contacts
- recipients of organ, tissue, and cell donations
- vertical transmission contacts (maternal–fetal/infant)

Shared drug equipment contacts:

Those who are identified as contacts of illicit drug users should be given priority for follow-up by Public Health personnel. They should be notified of possible exposure to HCV by the case or by Public Health personnel, and screening should be advised.

Sexual contacts:

Long-term partners in monogamous relationships are at a low risk of sexual transmission of HCV except with moderate-risk sexual activities. Therefore, testing for HCV may be considered.

Moderate risk of HCV infection is associated with

- a sexual partner with HCV
- multiple sexual partners
- STIs, including HIV and lymphogranuloma venereum
- sex that involved the potential for mucosal tearing (e.g., sex toys or fisting)
- vaginal sex during menstruation

Recipients or donors of organ, tissue, or cell donations:

Currently in Canada, all donors are screened for HCV. Contacts who have been identified as having received blood, organs, tissue, or cells from HCV-positive donors (prior to screening processes) should be recommended to be tested for HCV. Please see the Look-Back/Trace-Back protocol found at novascotia.ca/dhw/populationhealth/surveillanceguidelines

Vertical transmission [maternal–fetal/infant]:

Mother-to-infant transmission of HCV occurs in about 5 per cent of HCV-positive mothers. At this time, there are no known interventions that decrease vertical transmission. Newborns of HCV-positive mothers should be screened and followed by Public Health and a specialist, as appropriate.

Prophylaxis for contact(s)

There is no effective post-exposure prophylaxis (vaccines or immune globulin) available for hepatitis C.

Immunization of contact(s)

N/A

Exclusion of contact(s)

No exclusion is required.

Surveillance guidelines

Refer to the Nova Scotia Surveillance Guidelines for Notifiable Diseases and Conditions at novascotia.ca/dhw/populationhealth/surveillanceguidelines

General Information Sheet

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