HEPATITIS C

Case definition

The Hepatitis C case definitions can be found in the NS Surveillance Guidelines:
https://novascotia.ca/dhw/populationhealth/surveillanceguidelines/hepc.pdf

Information

Hepatitis C virus (HCV), discovered in 1989, became a leading cause of liver disease and cirrhosis. Advances in treatment have changed the HCV landscape, and it is now a curable infection. However, in Canada there are populations experiencing a disproportionate burden of HCV infection. These populations include:

- People who inject or use drugs
- Indigenous peoples (First Nations, Inuit, Métis)
- People with experience in the federal or provincial prison system
- Immigrants and newcomers from countries where HCV is common
- Gay, bisexual and other men who have sex with men
- The 1945 to 1975 birth cohort: adults living with hepatitis C

There is no vaccine to prevent hepatitis C. Reducing rates of hepatitis C infection can be achieved through i) HCV prevention through harm reduction and behavioral change, and ii) increasing access to HCV testing and diagnosis, which then enables access to care and treatment.

Case and contact management can support these HCV control measures.
The objectives of Case Management are:

- To reduce ongoing transmission through:
    - case education on methods to reduce transmission.
    - supporting linkages to opioid agonist treatment (OAT) and other harm reduction approaches, when indicated.
    - supporting linkages to treatment.
- To reduce morbidity and mortality through:
    - facilitating linkages to support and treatment
    - recommending vaccinations based on high-risk eligibility

The objective of contact tracing is to identify new cases of HCV by recommending testing to contacts.

Causative agent

HCV is an enveloped 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

While most people with hepatitis C do not have symptoms, in people who do develop symptoms the time from exposure to symptoms is usually 6 to 9 weeks, with a range of 2 weeks to 6 months.

The window period from exposure to detection of hepatitis C antibodies (anti-hcv) is 5 to 12 weeks. It can be greater than 6 months in immunocompromised individuals.

The window period from exposure to detection of RNA by nucleic acid amplification tests (NAAT) is 1 to 2 weeks.

Communicability

Individuals who are HCV-RNA or Antigen (Ag) positive are infectious.

Transmission

HCV is highly transmissible via percutaneous exposures to infectious blood. Permucosal transmission is less efficient but may occur if blood is present. Sexual contact is less likely to transmit HCV than the above modes, but the level of risk does increase if blood is exchanged through mucosal tearing. Household exposure through sharing personal hygiene equipment, such as toothbrushes, razors, nail clippers, is possible.

Vertical transmission has been documented but is not common (approximately 5% to 6%). It is associated with presence of HCV viremia at or near the time of delivery and is more likely with HIV co-infection (antiretroviral therapy may reduce risk of HCV transmission to infants). The exact timing of HCV transmission from birth parent to infant is not established. People who have cleared an initial HCV infection spontaneously or after HCV treatment, and then become pregnant have virtually zero chance of transmitting HCV infection to their infant, unless reinfected. It is unclear if there is a maternal HCV RNA threshold above which transmission is more likely.

Table 1: Likelihood of transmission

Likelihood	Transmission	Activity	Comments
High  **Low**	Parenteral	Injection Drug Use (IDU)	-IDU causes the majority of new infections in Canada
		Potential iatrogenic exposures	-Receipt of health care with contaminated or inadequately sterilized medical or dental instruments and equipment -If blood products received prior to 1992, Canadians may be at increased risk.
		Tattooing, body piercing or acupuncture	-If unsterilized objects or equipment are used.
	Permucosal	Non-injection drug use	-The mucosa may be damaged with use of equipment for snorting or smoking, such as straws, pipes, cookers, wash and filters, etc.
	Sexual	Condomless sex, multiple partners or concurrent drug or alcohol use	- Increased risk when blood is exchanged through mucosal tearing
	Vertical	Birth parent to infant	-Increased risk with HIV co-infection.
	Sexual	Condomless sex, with one long-term partner	
	Horizontal	Sharing personal hygiene items	
	Occupational	Accidental needle stick injury	
	Breastfeeding		-No documented evidence of HCV transmission via breastmilk. Exposure risk if nipples are cracked and/or bleeding.

Adapted from the BC Centre for Disease Control.

Symptoms and Clinical Course

Acute hepatitis C infection is asymptomatic in most individuals (60% to 75%).

If symptoms are present, onset is usually insidious and may include anorexia, vague abdominal discomfort, nausea and vomiting, malaise, and occasionally jaundice. Symptoms may last for 2 to 12 weeks. About 25 per cent will spontaneously clear infection within the first 6 months, though most individuals (approximately 75%) infected with hepatitis C develop chronic infection. Chronic infections are often asymptomatic but may present with disease flares years after initial infection. About 5 to 20 percent of chronically infected people will develop cirrhosis. Hepatocellular carcinoma can also be a consequence of chronic infections (1% to 5% of individuals).

Diagnostic testing

HCV **antibody tests (anti-HCV)** are performed at regional laboratories in Nova Scotia.

All positive anti-HCV tests are sent to the QEII Health Sciences Centre virology laboratory for reflex **HCV-RNA testing**.

Antigen testing for **HCV (HCV-Ag)** may be performed in other provinces or territories but is not currently available in Nova Scotia.

A second anti-HCV test, the Recombinant ImmunoBlot Assay (RIBA) will also be performed if anti-HCV is positive, and HCV-RNA is negative.

- If RIBA is positive, this indicates past infection with resolution OR current infection with viral RNA that is below the limit of detection. If clinically warranted, a repeat specimen for HCV-RNA testing in three months is recommended.
- If RIBA is negative, this indicates possible window period during seroconversion OR a false positive initial test. Repeat testing in 3 months is recommended.

In some circumstances Dried Blood Spot (DBS) testing may also be used as an alternative to phlebotomy for diagnostic testing. DBS is a method of blood collection that uses a single drop of blood on filter paper. The blood samples are tested for antibodies and if positive, then tested for HCV-RNA. With an adequate sample, the reliability and accuracy approaches that of standard testing. DBS has advantages in its ability to reduce barriers to testing given that collection can occur at community sites (see HCV Surveillance Guidelines laboratory comments).

There are two options for laboratory-based HCV testing in Nova Scotia:

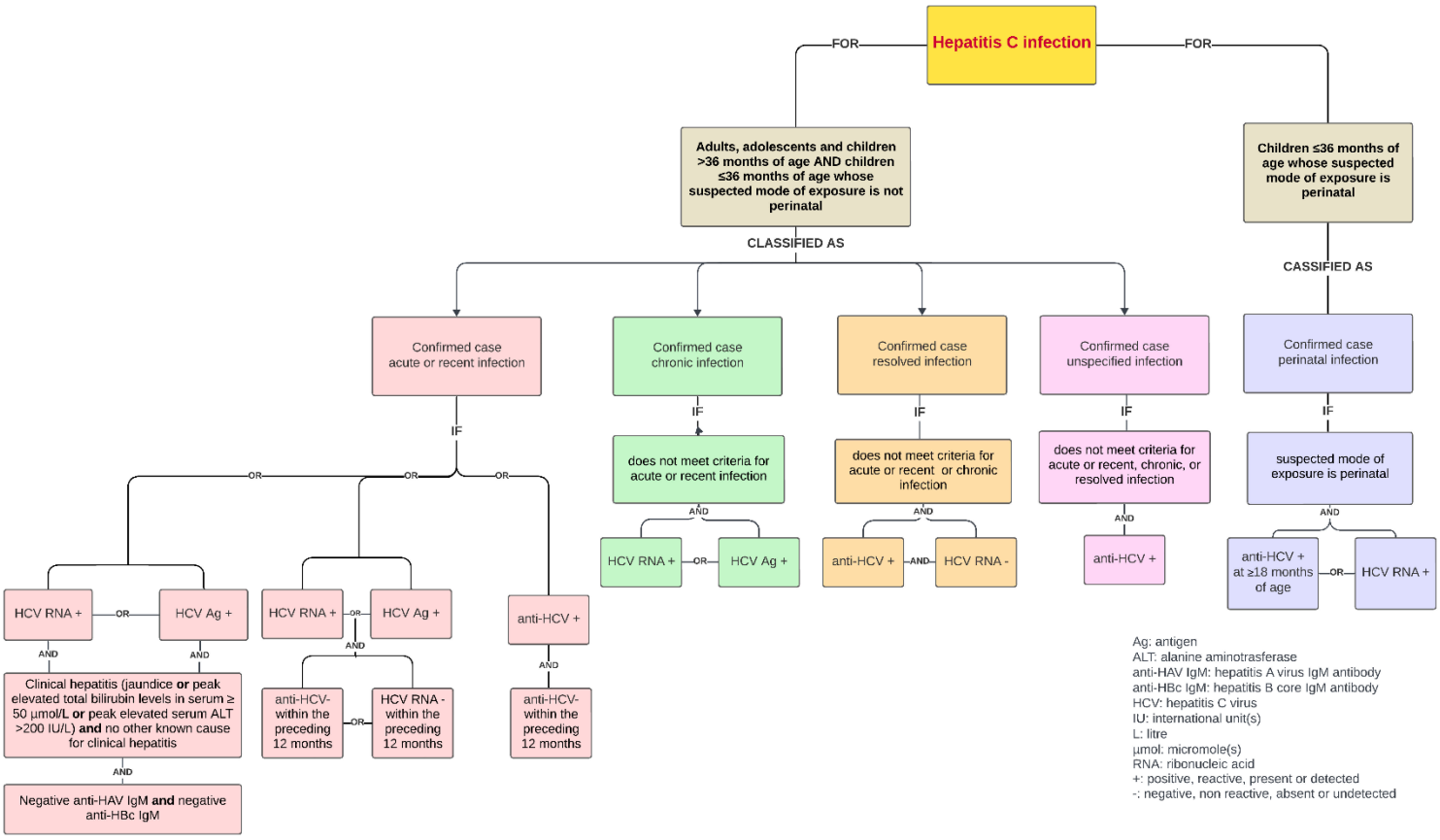
1. Nominal testing

The individual'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 laboratory sends it back to the physician. If the result is positive, the laboratory and the physician report the test result and name to local Public Health.

2. Non-nominal testing

Instead of using the individual's name, 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 laboratory sends it back to the physician. If the result is positive, the laboratory and the physician report the test result and code to local Public Health. Public Health must call the reporting physician with the code to obtain the case's name and contact information.

Figure 1: HEPATITIS C Laboratory Result Interpretation Flow Chart*
For Adults and Children >36 months AND Children ≤36 months of age whose suspected mode of exposure is perinatal



*Refer to Surveillance Guidelines for case definitions, classifications, and laboratory comments for interpreting results.

Point of Care Tests

Rapid Anti-HCV point of care tests (POCT) may also be available for use in community settings. Accuracy varies based on population and the test available, however, research shows nearly 98 percent sensitivity and 99 percent specificity in those without HIV infection. In those with HIV infection specificity remains high, but sensitivity may be lower. Anti-HCV POCTs are considered screening tests and confirmation through

laboratory testing is indicated. Screening tests reduce barriers to testing, however linkage to confirmation testing and, if indicated, care and treatment is paramount.

Treatment

HCV is a curable infection. The goal of treatment is an undetectable viral load following treatment. This is called sustained virologic response (SVR).

In recent years treatment has evolved to include a combination of medications called Direct Acting Anti-virals (DAAs). These medications are more effective and better tolerated than previous treatment options. Once SVR is achieved, individuals can become re-infected if they have ongoing exposures. Treatment is under the direction of the attending health care provider and is out of scope for Public Health.

PUBLIC HEALTH MANAGEMENT & RESPONSE

Case management

- Determine if the case is already known to be HCV positive (HCV-RNA or Anti-HCV or HCV Ag). See Figure 1: Hepatitis C Laboratory Result Interpretation Flow Chart above for interpretation.
    - If no, continue with the investigation.
    - If yes, determine if the case is a re-infection, and initiate a new investigation if indicated (refer to the Nova Scotia Surveillance Guidelines for Notifiable Diseases and Conditions at ***novascotia.ca/dhw/populationhealth/surveillanceguidelines***).
- Contact the health-care provider named on the laboratory report and inform them of the role of Public Health in HCV case follow-up.
- Obtain preliminary information from the reporting health-care provider. Such information may include:
    - Reason for testing (e.g. known exposures).
    - Clinical symptoms such as jaundice.
    - Relevant bloodwork, including bilirubin and serum alanine aminotransferase (ALT) levels, if available.
    - Relevant clinical history including previous HCV tests, infections and/or treatment.
    - Confirmation case is aware of diagnosis.

Determine the case definition (acute, chronic, resolved, unspecified, or perinatal). If acute, also determine if the case is considered infectious (RNA or antigen positive). Refer to Figure 1: Hepatitis C Laboratory Result Interpretation Flow Chart above.

Public Health Follow up – Acute and Chronic

Further public health follow-up should be completed on all acute and chronic cases.

- Note that all chronic cases are, by definition, infectious, whereas acute cases may or may not be infectious. Given that all acute cases are recently acquired, there is still benefit in public health follow up for those who are non-infectious (RNA negative) to provide education on reducing risk of re-infection and to identify possible contacts from when they were infectious
- Cases that meet the resolved case definition are a lower priority for public health follow-up; however, if contact with the individual is initiated then linkage to supports as indicated, and education on reducing risk of re-infection, should be provided.

Once preliminary information is obtained, **interview the case.** Building trust, rapport, and addressing barriers to care is crucial. Public Health is in a position to provide respectful and supportive preventive education, and linkage to wrap around supports, which may help to positively impact adherence to treatment and preventing risk of re-infection.

- Obtain any additional details about current and past symptoms, as well as prior history of infection and treatment information, if applicable.
- Determine risk factors, and receipt and/or donation of blood products, cells, tissues, or organs.
    - If receipt and/or donation of blood products, cells, tissues or organs are identified, collect as much additional information as possible, including the dates, institution, and address at the time and **consider the need for initiating a Look-back or Trace-back by Canadian Blood Services (CBS).**
- Discuss whether exposure to the virus may have occurred in a facility offering personal services such as manicure/pedicure, tattoo, piercing, dentistry or medical procedure.
    - If yes, consult with Regional Medical Officer of Health (RMOH) to determine whether a follow-up investigation at the facility is indicated. RMOH will lead any referral to Department of Environment and Climate Change (ECC) for Public Health inspection, if indicated. If the most likely exposure occurred during a medical procedure, refer to NSH or IWK IPAC, as appropriate.
- Discuss contacts with the case, and determine next steps for contact tracing (see *Contact tracing* section below).

Referrals and Recommendations

- Although hepatitis C is not vaccine-preventable, persons with hepatitis C are eligible for other vaccines. Advise health-care provider and case about the recommended vaccines under the Vaccine-Eligibility-for-High-Risk-Conditions.pdf (novascotia.ca) , as well as other publicly funded vaccines for adults.
- Hepatitis C is curable with treatment. As needed, facilitate referral to appropriate health care provider for additional testing, investigation, and 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, opioid agonist treatment, and other harm reduction strategies, with the goal of reducing the

risk of acquiring and transmitting blood-borne infection(s) and supporting successful treatment and SVR.

- Pregnancy and breastfeeding:
    - Efforts should be made to refer people who could become pregnant, who are RNA-HCV positive, to treatment *prior* to becoming pregnant.
    - Refer to culturally appropriate prenatal/postpartum resources and supports, if indicated. Consult and refer to Early Years, Public Health if not already connected. Fear of child apprehension can be a major barrier to accessing care among pregnant people who use drugs. Linkage to wrap around supports may help to positively impact early childhood development.

Exclusion

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

Education

Inform the case that HCV is considered to be curable since the introduction of DAA's. If RNA positive, encourage the case to discuss treatment options further with their health care provider.

Advise on how to prevent transmission:

- 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.
- Practice 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 practice safe sex (e.g., use condoms) due to the low but possible risk of sexual transmission to partners.
- If pregnant, advise that vertical transmission of HCV occurs in about 5 per cent of RNA-HCV positive pregnant people. At this time, there are no known interventions that decrease vertical transmission.
- If considering pregnancy, encourage case to discuss the risk of vertical transmission and treatment implications with a health-care provider.
- If breastfeeding, advise that transmission of HCV via breastmilk has not been documented. However, if at any time nipples are cracked and bleeding, consider abstaining from breastfeeding until they are healed. To maintain milk supply, encourage expressing breastmilk and refer to health care provider for further advice.
- 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).
- Harm-reduction messages and other resources can be found at CATIE - Canada's source for HIV and hepatitis C information

Contact tracing

Contacts are defined as: Any individual who has had an exposure (see Table 1) to the blood or blood products of an individual who was infectious with HCV at the time of the exposure.

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

- Those with whom injection, intranasal or inhalation drug equipment (needles, pipes, cookers, etc.) has been shared. These contacts should be prioritized.
- Sexual contacts, with risk increasing if blood may have been present or HIV co-infection.

- Household and other intimate contacts who are likely to have blood-to-blood exposure to the case, including sharing of razors and toothbrushes or other potential exposure to the cases blood.
- Recipients of organ, tissue, and cell donations*
- Infants exposed in utero (i.e. vertical transmission)**

Timeframe: From earliest risk factors or most recent negative anti-HCV test (whichever is more recent) until present. Or, if re-infected, then from known date of SVR or earliest risk factors (whichever is more recent). If duration of infection is greater than 24 months focus on more recent contacts.

Contact notification: May be completed by Public Health or primary care provider depending on resources and capacity. If the case is comfortable doing so, they can notify contacts themselves. The responsibility for completing contact tracing and notification should be clear and when needed, Public Health can offer support and assistance.

Contacts should be informed of the following:

- Potential exposure
- General information on HCV (e.g., provide education on hepatitis C disease, symptoms, prevention, and transmission risks, and treatment opportunities)
- Recommendation for testing, providing resources and facilitating where feasible
- Potential further information as required

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

Currently in Canada, all donor blood is screened for HCV. Contacts who have been identified as having received blood, organs, tissue, or cells from HCV-positive donors (prior to introduction of screening processes in 1992) should be recommended to be tested for HCV.

**Infants exposed in utero:

Infants of a HCV-positive birth parent should be followed by Public Health and a pediatric specialist, as appropriate. Coordinated efforts among the health care team may be needed to ensure testing and follow up is completed.

- **Anti-HCV** testing should be deferred until children are 18 months of age because positive anti-HCV results in infants younger than 18 months may represent a false-positive result due to placental transfer of antibodies.
- HCV RNA testing of infants should be delayed until at least 8 weeks of age to avoid false negative results.
- Between 20% and 30% of infants with perinatally-acquired hepatitis C infections experience spontaneous clearance by 2-3 years of age.
- Umbilical cord blood should not be used for infant testing.

All infants should receive childhood vaccines as per the Routine Immunization

Schedules for Children, Youth and Adults.

Prophylaxis for contact(s)

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

Exclusion of contact(s)

No exclusion is required.

General Information Sheet

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