Human Immunodeficiency Virus (HIV)

CHAPTER CONTENT

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Information for this chapter was adapted with permission from Alberta Health. For more information about Human Immunodeficiency Virus see: Alberta Public Health Disease Management Guidelines: Human Immunodeficiency Virus (HIV).

1. CASE DEFINITION

Confirmed Case

- **Adults, Adolescents, and Children ≥ 18 months**
  - Detection of HIV antibody with confirmation (e.g., EIA screening with confirmation by Geenius™ HIV-1/2 Antibody Differentiation or another confirmatory test) ***OR***
  - Detection of HIV nucleic acid (e.g. DNA polymerase chain reaction [PCR] or plasma RNA) ***OR***
  - HIV p24 antigen with confirmation by neutralization assay ***OR***
  - Isolation of HIV in culture
- **Children < 18 months (on two separate samples collected at different times) ***
  - Detection of HIV nucleic acid (e.g. DNA PCR or plasma RNA) ***OR***
  - HIV p24 antigen with confirmation by neutralization assay ***OR***
  - Isolation of HIV in culture

*In children < 18 months of age born to HIV-positive women, nucleic acid testing should be done within 2 weeks after birth and, if negative, repeated at 1 to 2 months and at 3 to 4 months of age. Any positive results should be repeated with a second specimen for confirmation.

For children of HIV-positive women and who have negative nucleic acid results, antibody testing should be done at 12 and 18 months of age to ensure that they have lost maternally derived antibodies. This is not used to determine uninfected status but rather to eliminate the possibility of a positive antibody result being misinterpreted. These children should continue to be monitored until they have a negative HIV antibody test.

Probable Case

- Children < 18 months (on a single sample)
  - Detection of HIV nucleic acid by quantitative or qualitative NAT

2. DIAGNOSIS

- All diagnostic decision making should happen in conjunction with clinical assessment
- Clinical diagnosis of HIV requires a confirmatory test following a positive screening test result. The confirmation of a new diagnosis, informing the patient and appropriate clinical, public health and pharmacological management follow-up, usually require the involvement of a team of practitioners, including an Infectious Disease Specialist physician
- Enzyme immunoassay (EIA) is the first screening test for HIV infection
- All positive EIA test results are confirmed by a Geenius™ HIV-1/2 Antibody Differentiation Assay, a specific test
- A positive Geenius™ HIV-1/2 Antibody Differentiation test supports the initial reactive (positive) EIA and is reported as positive
- **An indeterminate or not detected Geenius™ HIV-1/2 Antibody Differentiation result, requires follow-up serology for qualitative HIV NAT testing (i.e., an HIVQUAL)**
  - The ordering provider will be prompted to order HIVQUAL
- If HIVQUAL is negative and indeterminant AND patient has shown high risk behaviour in the last 4 weeks repeat HIV Testing in 3 months
- When to consult a laboratory or infectious disease specialist
  - An individual may be in the window period of HIV infection with a negative EIA, or a negative/indeterminate Geenius™ HIV-1/2 Antibody Differentiation
  - Rarely, infection with HIV-2 may explain a positive EIA and negative/indeterminate Geenius™ HIV-1/2 Antibody Differentiation
- The “window period” for HIV antibody development in non-immunocompromised hosts is usually less than a month with the current generation of screening tests
- Antibody development may be delayed if the subject is immunocompromised, or is coinfected with hepatitis C
- Genotyping, phenotyping, and serum levels of antiretrovirals are used to detect drug resistance, enabling appropriate antiretroviral drug combinations, and adjustment of dosage if required
- For more information see Annex A

Infant Testing

- **Consultation with a pediatric Infection Disease Specialist is required whenever HIV is suspected or diagnosed in infants and children**
- All diagnostic decision making should happen in conjunction with clinical assessment

- Detection of HIV nucleic acid (e.g., DNA PCR or Plasma RNA) is helpful for the diagnosis of HIV in infants
  - Qualitative NAAT is used to detect small amounts of nucleic acid in babies born to HIV-infected mothers, for individuals who may still be in the window period, and for those with advanced disease or marked compromised immunity
  - Quantitative NAAT (viral load testing) is used to monitor HIV-positive patients prior to and during antiretroviral therapy
- In infants < 18 months of age born to HIV-infected mothers, testing should be done within two weeks after birth and, if negative, repeated at 1- 2 months and at 3 - 4 months of age
- All positive results should be repeated with a second specimen for confirmation
- For children with negative nucleic acid results, antibody testing should be done at 12 and 18 months to ensure they have lost maternally derived antibodies
  - This is not used to determine uninfected status but rather to eliminate the possibility of a positive antibody result being misinterpreted
- These children should continue to be monitored until they have a negative HIV antibody test
- For more information, please refer to:
  - Guiding Principles for Planning and Undertaking Voluntary HIV Testing
  - Alberta Provincial Lab Guide to Services
  - Alberta Provincial Lab HIV Diagnostic Algorithm
  - Canadian Guidelines on Sexually Transmitted Infections

3. REPORTING

Health Care Professionals

- Confirmed cases are to be reported by telephone (867) 920-8646, fax (867) 873-0442, or email to the Office of the Chief Public Health Officer (OCPHO) **within 24 hours** of diagnosis or formed opinion ***AND***
- **Within 24 hours** of diagnosis or formed opinion complete and fax (867) 873-0442 the following forms to the OCPHO:
  - NWT HIV Case Investigation Form
  - Communicable Disease Report Form

As set out in the *Child and Family Services Act Section 8*, health care professionals have a legal duty to report suspected cases of child abuse, as it relates to reportable sexually transmitted infections (STIs), to the appropriate authority.

- The *Public Health Act* and *Child and Family Services Act* supersede physician/patient confidentiality concerns and require notification to the appropriate authority without patient consent for all reportable STIs and in cases where child abuse is suspected
- The age of consent is the age at which a young person can legally agree to sexual activity
- For more information go to the Government of Canada Age of Consent to Sexual Activity

Laboratories

- Report all positive results to the OCPHO by fax (867) 873-0442 within **24 hours**

4. OVERVIEW

Causative Agent

- HIV is a retrovirus of which two types have been identified: type 1 (HIV-1) and type 2 (HIV-2).
  - HIV-1 is most common in Canada, accounting for 89.9% of analyzed samples
- These viruses are serologically, geographically, and epidemiologically distinct
- HIV is a fragile virus and is susceptible to many disinfectants and drying causing the reduction (90–99%) in HIV concentration within several hours

Clinical Presentation and Major Complications

For information regarding HIV clinical presentation and complications see Alberta Public Health Notifiable Disease Management Guidelines: Human Immunodeficiency Virus (HIV)

Transmission

- Transmission of HIV is from person to person
  - Common modes include sexual contact, sharing of HIV-contaminated needles, syringes, and other equipment for drug injection
  - Rare modes of transmission include the transfusion of blood or blood products and through organ or tissue transplants
- The HIV virus is most commonly found in and transmitted through blood, body fluids containing blood and other body fluids (i.e., semen) with a high viral titre
- It has been isolated from urine, saliva, tears, and bronchial secretions, however, transmission from these fluids has not been reported
- Concurrent sexually transmitted infection (STI), especially ulcerative STI, greatly facilitates the transmission of HIV
- Infection may be transmitted vertically from mother to child during pregnancy, delivery, or through breastfeeding
- Occupational exposures in healthcare or high-risk settings also represent possible transmission settings
- The risk of transmission from oral sex is not easily quantifiable but is presumed to be low

Incubation Period

- Variable – the time frame from infection to detectable antibodies is generally less than 1 month but can range from 2 - 3 weeks to 6 months
  - For more information see: Saskatchewan Communicable Disease Control Manual Section 6-40

- Infectiousness is highest during the initial infection and rises with increasing immune deficiency.

Clinical Guidance

- For patient specific clinical management consult your local healthcare professional, paediatrician, infectious disease specialist or NWT Clinical Practice Guidelines
- Treatment should be made in collaboration with a physician experienced in HIV/AIDS care and treatment

5. PUBLIC HEALTH MEASURES

Key Investigations

- Complete the HIV Case Investigation Form, ensuring to capture details around patient risk factors and membership to high-risk groups such as: injection drug users, workplace or non-occupational exposures, persons with a history of medical or dental procedures in an HIV endemic country
- Ascertain status of co-infection with other sexually transmitted infections (STIs) and bloodborne infections (BBIs)
- If female, determine pregnancy status
- Determine donation of blood, tissue, or organs

Case Management

- Refer to HIV Specialist
- Determine and follow up with contacts
- Provide resources for case
- Assess the risk of associated STIs such as Hepatitis B and Hepatitis C
- Educate the case about the modes of transmission and reducing the risk of transmission to others, including informing the case about the duty to disclose status to sexual and/or drug partners (IDU and non-IDU partners)
- Initiate immediate follow-up of all pregnant women
- Screen for Tuberculosis
- Offer immunizations

Contact Management

- Tracing of partners should be based on the estimated duration of infection
  - If the date of seroconversion is known, all partners in the 6 months prior to the positive testing should be identified

  - If the seroconversion date is unknown, all partners, as far back as practical, should be identified
- Partners should be traced based on estimated duration of infection in index case. Contacts include:
  - Needle-sharing partners
  - Persons who share sharps and other items potentially contaminated with blood e.g., razors, toothbrushes
  - Other persons with an identified exposure to blood or other body fluids capable of producing HIV infection
  - Long-term and short-term sexual partners
  - Survivors of sexual assault
  - Children born to HIV-positive mothers
- It is recommended to meet with the contacts in person
- Collaboration between the primary care physician, public health personnel, social services (if relevant), and infectious disease physicians is essential
- Public health personnel should be available to assist physicians with partner notification and help with appropriate referral for clinical evaluation, testing, treatment, and health education
- Both the physician and public health personnel conducting contact tracing, should provide partners with information that includes:
  - Modes of transmission
  - Disease process
  - How to modify risk behaviors
- All partners should be tested for HIV and given specific details on where to be tested, and how it will be reported if positive
- Post Exposure Prophylaxis should be considered for significant exposures (See Annex C: Post Exposure Prophylaxis Risk Assessment and Annex D: Post Exposure Prophylaxis Protocol)
- One negative HIV antibody test may be inadequate due to the possibility of being in the "window period" or having ongoing risk behaviour
- If the contact is found to be HIV positive, immediate referral should be made to a HIV specialist
- The Office of the Chief Public Health Officer (OCPHO) will assist with contacting partners living out of the territory
- Individuals exposed to blood and other body fluids capable of producing HIV infection:
  - Should be notified of potential HIV exposure
  - Should be assessed by an infectious disease physician for chemoprophylaxis

Pregnant Contacts

- Pregnant female contacts should be given priority for follow-up
- Based on continued risk behaviour, it is recommended that additional testing be performed during pregnancy and/or prior to delivery

- If the woman does not return for retesting, public health personnel and/or the primary care physician should make attempts to contact her and provide additional information and/or support
- In addition to standard HIV testing, a HIV specialist should be consulted regarding additional tests (e.g., HIV RNA) and/or further HIV antibody testing

Infant Contacts

- It is essential that children born to HIV-positive women should be referred to a specialist in pediatric infectious diseases for as soon as possible after delivery
- For infants of HIV-positive mothers who have not taken antiretroviral prophylaxis, perinatal transmission can still be significantly reduced
- In consultation with a pediatric infectious disease specialist, consider starting antiretroviral therapy as soon as possible after birth, preferably within 1 - 4 hours
- HIV-positive mothers should not breastfeed

Prevention

- Prevention and public health programs should be offered to reduce HIV transmission through Injection Drug Use (IDU) (e.g., needle exchange programs and harm reduction strategies)
- Confidential HIV testing should be made available where possible and where HIV transmission is high (i.e., correctional facilities, tuberculosis clinics, drug treatment centers, family planning and prenatal clinics, establishments that offer services to Men who have sex with Men, homelessness shelters, and group homes)
- Healthcare practitioners should recommend to all STI cases and contacts that they be tested for HIV
- HIV testing is recommended in all pregnant women
  - All pregnant women should be counseled regarding HIV testing and prenatal blood work should include HIV screening unless the woman opts out
    - For more information see: NWT Prenatal Record.
  - Those found to be positive should be advised of the recommendation for prophylactic antiretroviral medications for herself and the baby
- Screen all donations of blood, blood products, tissues, organs, and semen for HIV
- Provide public education about the safe handling of blood, body fluids, and sharps disposal
- Focus on methods to reduce high risk sexual behaviors that may lead to HIV or STIs (e.g., safer sex education)
- Pre-exposure prophylaxis (PrEP)
  - PrEP involves the use of antiretroviral medications by confirmed HIV **negative** individuals with ongoing risk of HIV acquisition
  - PrEP is covered by some, but not all insurance plans in the NWT
  - Guidance for PrEP eligibility, risk assessment and procedures is available at: Alberta HIV Pre-Exposure Prophylaxis Guidelines

- School health programs should focus on basic and accurate information about STIs, safer sex, HIV, and unplanned pregnancies
- Provide hepatitis B vaccine for those at increased risk of infection due to risk factors common to HIV infection
- Anyone considering tattooing, body piercing, or acupuncture should be counselled to ensure that these practices are carried out with sterile equipment, preferably single-use equipment
- Recalcitrant individuals
  - Educate the individual about the modes of transmission and reducing the risk of transmission to others, and their public health and legal responsibility (duty to disclose to sexual and/or IDU partners)
  - People who are unwilling or unable to take appropriate precautions to prevent the spread of HIV should be reported to the OCPHO
    - ➢ See Annex B for more information

6. PUBLIC & HEALTH PROFESSIONAL EDUCATION

- NWT Health and Social Services: HIV and AIDS
- Government of Canada: HIV resources and professional development
- Government of Canada: HIV and AIDS Symptoms and Treatment
- Public Health Agency of Canada: Sexual Health and Sexually Transmitted Infections
- Centers for Disease Control and Prevention: CDC/HIV
- World Health Organization: WHO/HIV

7. EPIDEMIOLOGY

For more information on the epidemiology of HIV in the Northwest Territories (NWT) see: Epidemiological Summary of Communicable Diseases HSS Professionals.

8. REFERENCES

Information for this chapter was adapted with permission from Alberta Health's Public Health Notifiable Disease Management Guidelines: Human Immunodeficiency Virus (HIV).

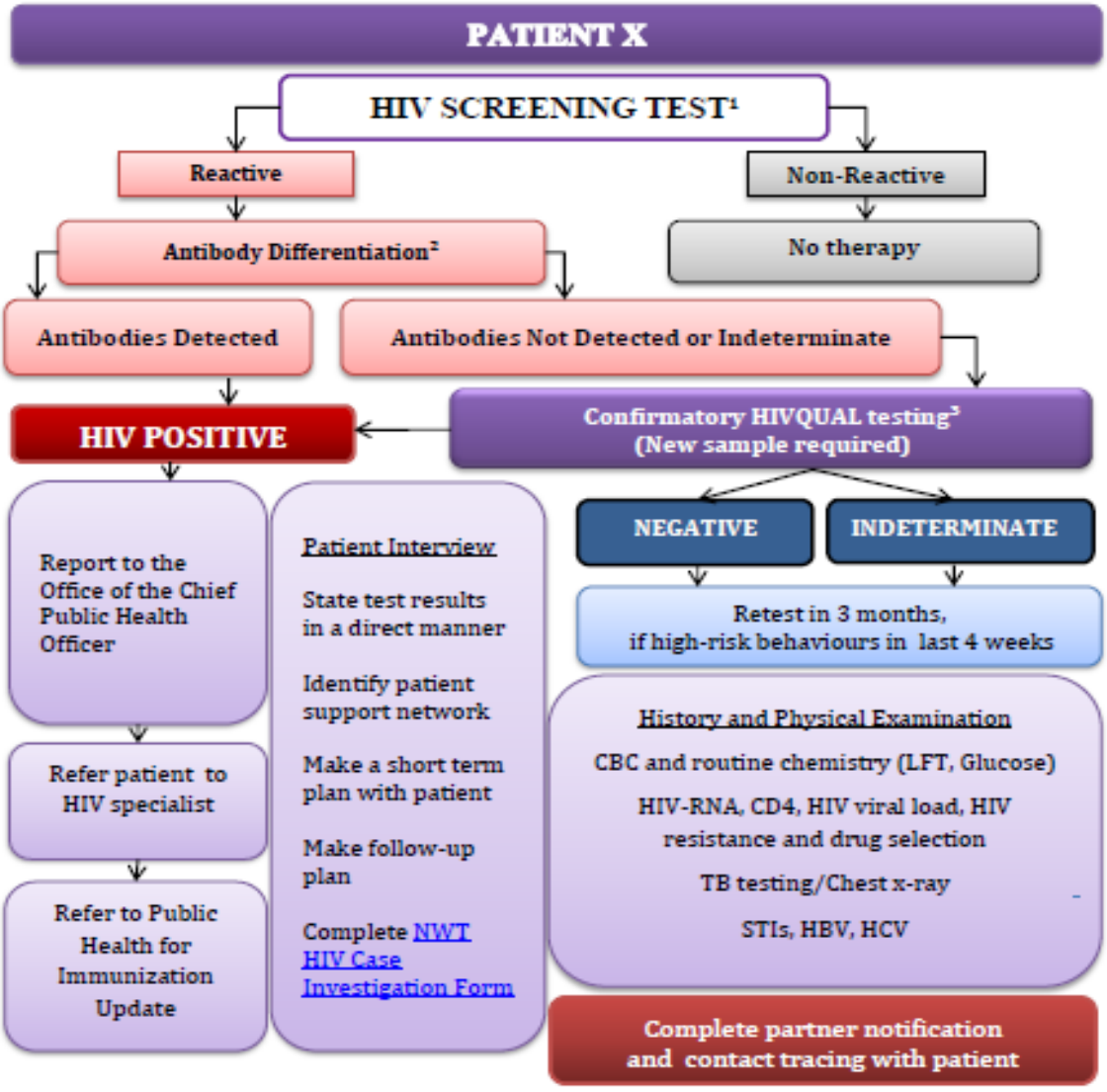
Additional resources used in this chapter include:

1. Alberta Health, Alberta guidelines for post-exposure management and prophylaxis HIV: Hepatitis B, Hepatitis C, and sexually transmitted infection: https://open.alberta.ca/publications/9781460143360
2. Alberta HIV Pre-Exposure Prophylaxis (PrEP) Guidelines: https://www.albertahealthservices.ca/assets/info/hp/srh/if-hp-srh-hiv-prep-guidelines.pdf

3. Saskatchewan Ministry of Health Communicable Disease Control Manual: Section 6-40 Human Immunodeficiency Virus (HIV): https://www.ehealthsask.ca/services/Manuals/Pages/CDCManual.aspx
4. Saskatchewan Ministry of Health Guidelines for the Management of Exposures to Blood and Body Fluids: https://www.ehealthsask.ca/services/Manuals/Pages/hiv-guidelines.aspx
5. The NWT Infection Prevention and Control Manual: https://www.hss.gov.nt.ca/professionals/en/services/communicable-disease-manual/infection-prevention-and-control

9. Annex A-Diagnostic Protocol for HIV Testing in the NWT

Protocol for HIV Testing and Case Management
NWT Clinician's Desk Reference



[1]Adapted in part from the 2016 Alberta Provincial Lab HIV Diagnostic Algorithm

[2]Western blot confirmation has been replaced by the Geenius™ HIV-1/2 Antibody Differentiation Assay.
[3]Prov Lab has implemented an active reminder to physicians that will be triggered when a request for HIVQUAL samples exceeds 10 days.
For more information on HIV/AIDS Counseling, Testing and Management consult the NWT HIV/AIDS Manual.

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10. Annex B- Management of Recalcitrant People

Report to the Chief Public Health Officer (CPHO) or designate concerning a patient who is potentially unwilling or unable to prevent HIV transmission

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Counsel and support the patient to encourage disclosure and cessation of risk behaviour.

- Assess the patient's knowledge and capacity to comply
- Refer to treatment of services as necessary
- Report assessment to CPHO

↓

CPHO (or designate) confirms details of report and HIV status of the patient and issues a written report containing:

- Conditions of HIV disclosure
- Protection of partners
- No sharing of needles or donation of blood/tissue
- Regular meetings scheduled with Health Professionals
- Compliance with medical treatment and counseling

↓

When Risk Behaviour Persists, CPHO (or designate) imposes a public health order which places limitations on the patient, relevant to transmission. Limits may include

- Movement within the community
- Participation in activities or events
- Interaction with certain individuals

↓

When risk behaviour persists, CPHO (or designate) initiates an Apprehension Order

↓

In the event of extreme risk to others, the patient may be charged under the Public Health Act and/or the Criminal Code

11. Annex C- Post Exposure Prophylaxis Risk Assessment

Choose the most appropriate option from Table 1, 2, 3 and 4. Complete the appropriate calculations for adjusted risk at Table 5. Then interpret the numerical risk using Table 6.

Table 1: Identify Source			
Source types		**Associated Scores**	**Final Value A**
Known HIV Carrier	**Acute AIDS illness**	1	
	Asymptomatic	10	
Unknown HIV Status	**High risk situation**	100	
	Low risk situation	1000	

Table 2: Identify Inoculum type		
Inoculum types	**Associated Score**	**Final Value B**
Fresh Blood	1	
Body fluids at risk (e.g., semen)	10	
Dried old blood	100	
Low risk secretions (tears, saliva, urine)	1000	

Table 3: Identify mode of Transmission		
Transmission types	**Associated score**	**Final Value C**
Intravenous	1	
Deep intravenous	10	
Deep transcutaneous with visible bleeding at site	100	
Superficial transcutaneous with no visible bleeding	200	
Mucosal contact only	500	
Intact Skin	1000	

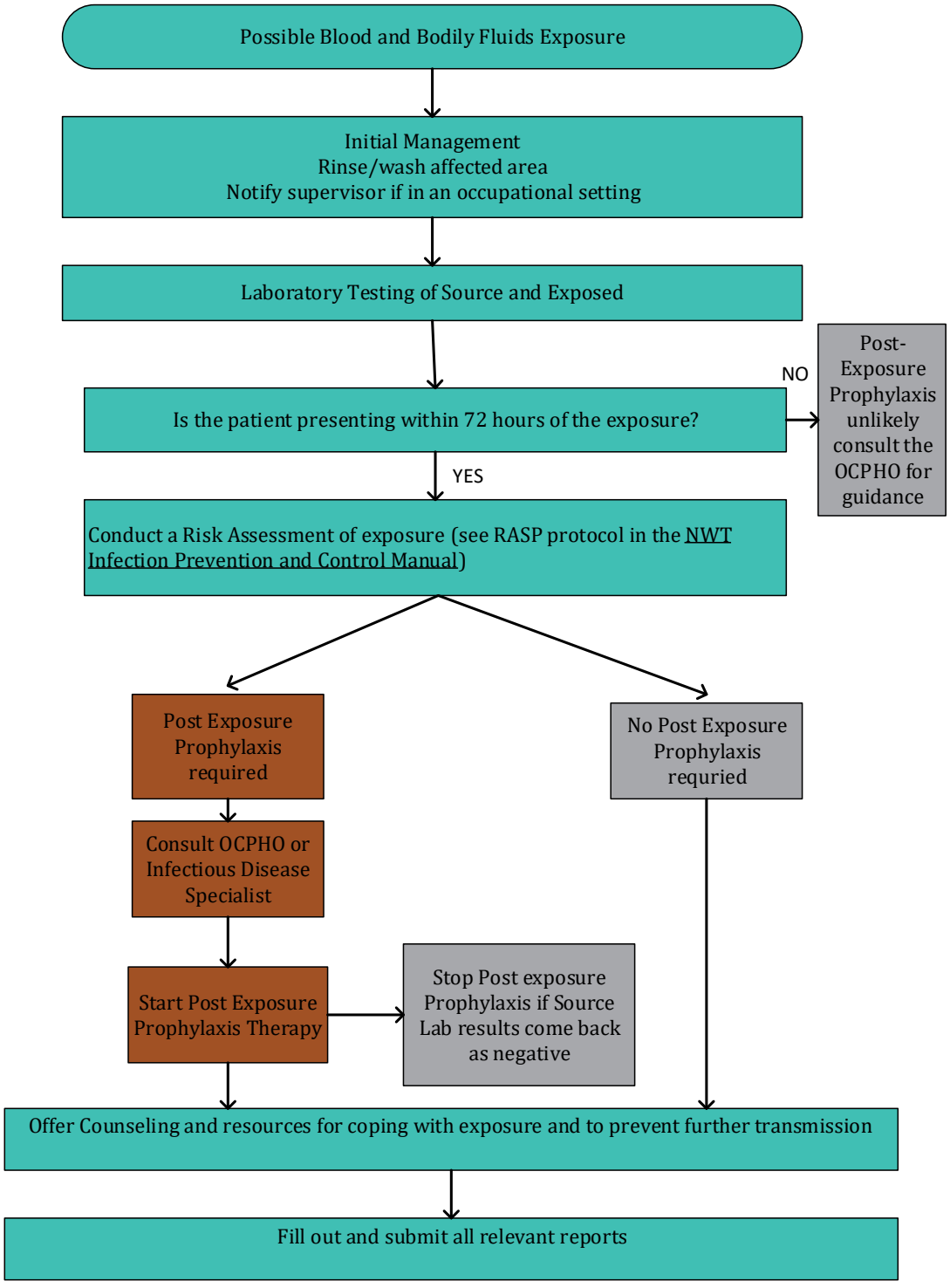
Table 4: Estimated Volume of Inoculum		
Volumes	**Associated score**	**Final Value D**
Massive (e.g., transfusion)	100	
Measurable (>1mL)	10	
Moderate (large-bore hollow needle >22g)	5	
Small (small-bore hollow needle <22g)	3	
Trace surface only (e.g., suture needle)	1	

Table 5: Calculate Total Risk	
Formula	**Adjusted Risk Value (R)**
D/(AxBxC)	

Table 6: Risk Value Interpretation	
R value	**Associated recommendation**
>1/1000	PEP is recommended
1/1000 to 1/10,000	Consider PEP on a case-by-case basis
<1/10,000	PEP is not recommended

NOTE: The above risk stratification is adapted from the NWT Infection Prevention and Control Manual P. 194 with some updates from Alberta guidelines for post-exposure management and prophylaxis: HIV, Hepatitis B, Hepatitis C, and sexually transmitted infections.

12. Annex D- Post Exposure Prophylaxis Procedure



NOTE: Adapted with permission from the NWT Infection Prevention and Control Manual. For more details on post exposure prophylaxis in HIV exposures see: NWT Infection Prevention and Control Manual.