Syphilis

CHAPTER CONTENT

1. CASE DEFINITION

- **Confirmed Case - Syphilitic Stillbirth**
  - A fetal death that occurs after 20 weeks gestation or in which the fetal weight is greater than 500 g with laboratory confirmation of infection i.e. identification of *Treponema pallidum* by nucleic acid detection (PCR or equivalent), fluorescent antibody or equivalent examination of material in an appropriate clinical specimen (see laboratory comments)

- **Probable case – Syphilitic stillbirth**
  - A fetal death that occurs after 20 weeks gestation or in which the fetal weight is greater than 500 g where the mother/birthing parent had:
    - untreated or inadequately treated** infectious syphilis prior to delivery

      or

    - evidence of reinfection during the pregnancy (i.e. non-treponemal titres increasing at least four-fold)

Laboratory comments

In addition to serological samples, appropriate clinical specimens for the diagnosis of congenital syphilis include nasal secretions, skin lesions, fluid from blisters or exudative skin rashes, placenta, umbilical cord, or autopsy clinical material.

Syphilis serological results can be affected by the timing of maternal/birthing parent infection. If syphilis is acquired close to delivery, maternal/birthing parent and newborn serological tests may initially be negative. Reactive syphilis serological tests in an infant can represent infant

infection or trans-placental passage of antibodies. In the absence of congenital infection, antibodies are expected to decline and clear by 18 months of age. Infant non-treponemal titres fourfold or greater than maternal/ birthing parent titres (using the same non-treponemal test) at birth supports a diagnosis of congenital syphilis. A fourfold or greater rise in infant non-treponemal titre supports a diagnosis of congenital syphilis.

- **Confirmed Case - Early Congenital Syphilis**
  - Laboratory confirmation of infection in a live birth:
    - identification of *Treponema pallidum* by nucleic acid detection (PCR or equivalent), fluorescent antibody or equivalent examination of material in an appropriate clinical specimen (see laboratory comments)
      OR
    - reactive serology (non-treponemal **and** treponemal) from venous blood (not cord blood) in an infant or in a child **with** clinical, radiographic or other laboratory evidence of congenital syphilis*
      OR
    - infant's RPR titre at least 4-fold or greater than the mother/birthing parent's RPR titre in samples collected during the immediate postnatal period
      OR
    - persistent positive treponemal serology in a child older than 18 months of age **without** clinical, laboratory or radiographic evidence of congenital syphilis*
      AND
    - younger than two years of age at the time of meeting the case definition **and** no other suspected source of exposure

- **Confirmed Case – Late Congenital Syphilis**
  - Laboratory confirmation of infection:
    - identification of Treponema pallidum by nucleic acid detection (PCR or equivalent), fluorescent antibody or equivalent examination of material in an appropriate clinical specimen (see laboratory comments)
      OR
    - reactive serology (non-treponemal and treponemal) from venous blood in a child **with** clinical, radiographic or other laboratory evidence of congenital syphilis*
      AND
    - two or more years of age at the time of meeting the case definition **and** no other suspected source of exposure

- **Probable Case – Congenital Syphilis**
  - Reactive serology (non-treponemal **and/or** treponemal) from venous blood (not umbilical cord blood) in an infant or in a child **without** clinical, radiographic or other laboratory evidence of congenital syphilis* whose mother/birthing parent had:
    - untreated or inadequately treated** syphilis prior to delivery

OR

- evidence of reinfection during the pregnancy (i.e. non-treponemal titres increasing at least four-fold)

AND

- younger than two years of age at the time of meeting the case definition **and** no other suspected source of exposure

Footnotes

* Includes any evidence of congenital syphilis such as any features suggestive of congenital syphilis on radiographs of long bones; an elevated CSF cell count or protein (without other cause); anaemia; osteochondritis; hepatosplenomegaly; skin rash; condylomata lata; rhinitis (snuffles); pseudoparalysis; meningitis; ascites; intrauterine growth retardation; prematurity, or any other abnormality not better explained by an alternative diagnosis.

** Inadequate treatment is any treatment without penicillin or penicillin given less than 30 days before delivery or insufficient reduction in non-treponemal titers despite receiving treatment (according to guidelines). A lack of verbal or written confirmation of treatment should be considered "inadequate treatment".

- **Primary Syphilis**
  - Laboratory Confirmation
    - Identification of *T. pallidum* by dark-field microscopy, fluorescent antibody, nucleic acid testing, or equivalent examination of material from a chancre or a regional lymph node ***OR***
    - Molecular detection of T. pallidum nucleic acid [e.g., nucleic acid amplification test (NAAT)] in an appropriate clinical specimen; ***OR***
    - Presence of one or more typical lesions (chancres) and reactive treponemal serology, regardless of non-treponemal test reactivity, in individuals with no previous history of syphilis ***OR***
    - Presence of one or more typical lesions (chancres) and a fourfold or greater increase in the titre over the last known non-treponemal test in individuals with a past history of syphilis treatment
- **Secondary Syphilis**
  - Laboratory Confirmation
    - Identification of *T. pallidum* by dark-field microscopy, fluorescent antibody, nucleic acid testing or equivalent examination of mucocutaneous lesions, condylomata and reactive serology (non-treponemal and treponemal) ***OR***
    - Molecular detection of T. pallidum nucleic acid (e.g., NAAT) in an appropriate clinical specimen
    - Presence of typical signs or symptoms of secondary syphilis (e.g., skin rash, low-grade fever, malaise, pharyngitis, alopecia, weight loss, arthralgias and painless lymphadenopathy) **AND** either:
      - A reactive serology (non-treponemal and treponemal) ***OR***
      - A fourfold or greater increase in titre of the last known non-treponemal test

- **Early Latent Syphilis (< 1 year after infection)**
  - Laboratory confirmation
    - An asymptomatic patient with reactive serology (treponemal and/or non-treponemal) who, within the previous 12 months, had one or more of the following:
      - Non-reactive serology
      - Symptoms suggestive of primary or secondary syphilis
      - Exposure to a sexual partner with primary, secondary or early latent syphilis
- **Late Latent Syphilis (> 1 year after infection or of unknown duration)**
  - Laboratory confirmation
    - An asymptomatic patient with persistently reactive treponemal serology (regardless of non-treponemal serology reactivity) who does not meet the criteria for early latent disease and who has not been previously treated for syphilis.
- **Neurosyphilis**
  - Early (< 1 year after infection)
    - Laboratory confirmation
      - Fits the criteria in confirmed case of primary syphilis, secondary syphilis or early latent syphilis above ***AND***
      - One or more of the following:
        - Reactive CSF-VDRL in non-bloody cerebrospinal fluid (CSF)
        - Molecular detection of T. pallidum nucleic acid (e.g., NAAT) in CSF or vitreous humor, ***OR***
        - Clinical evidence of neurosyphilis ***AND***
        - either elevated CSF leukocytes ***OR***
        - Elevated CSF protein in the absence of other known causes
  - Late (> 1 year after infection)
    - Laboratory confirmation
      - Reactive treponemal serology (regardless of non-treponemal serology reactivity) but not fitting the criteria of a confirmed case of primary, secondary or early latent syphilis ***AND***
      - One or more of the following:
        - Reactive CSF-VDRL in non-bloody CSF
        - Clinical evidence of neurosyphilis ***AND***
        - Either elevated CSF leukocytes ***OR***
        - Elevated CSF protein in the absence of other known causes
- **Tertiary Syphilis Other than Neurosyphilis**
  - Laboratory confirmation
    - Reactive treponemal serology (regardless of non-treponemal test reactivity) together with characteristic late abnormalities of the cardiovascular system, bone, skin or other

structures in the absence of other known causes of these abnormalities (*T. pallidum* is rarely seen in these lesions although, when present, it is diagnostic) ***AND***
    - No clinical or laboratory evidence of neurosyphilis

Note: Each category is mutually exclusive. The possibility of a prozone reaction should be considered in individuals who are suspected of having secondary syphilis but whose non-treponemal test is non-reactive.

A **prozone reaction** refers to a false-negative response resulting from overwhelming antibody titres that interfere with the proper formation of the antigen-antibody lattice network that is necessary to visualize a positive flocculation test.

2. DIAGNOSIS

- Diagnosis is made on a combination of history, epidemiologic risk factors or exposure, physical examination, and laboratory tests.
- Laboratory diagnosis is established by the detection of *Treponema pallidum ssp. pallidum* from fluid taken from ulcers in primary and secondary syphilis and/or by serologic testing.
- Interpretation of syphilis serology should be made in conjunction with an infectious disease specialist experienced in this area.
- **Point of Care Tests (POCTs)**
    - In situations where a person is known to have a previously negative syphilis screen OR has never been screened for syphilis a POCT can be a useful tool for initial screening
    - Ideally, all positive POCT should be followed up with syphilis confirmatory serology
    - In the context of an outbreak and in situations where serology testing may be a barrier (ie high risk outreach populations and situations) a POCT may also be used but with cautionary interpretation of results if patient's history is unknown
- **Screening Test**
    - Syphilis enzyme immunoassay (EIA)
        - Measures IgM and IgG antibody specific for *T. pallidum*
        - Estimated turnaround time for test result is 48 hours depending on location.
        - Persists in most cases for the life of the patient
- **Congenital Syphilis Screening**
    - The Northwest Territories (NWT) Chief Public Health Officer endorses the Public Health Agency of Canada (PHAC) Canadian Guidelines on Sexually Transmitted Infections and the adoption of the World Health Organization's guidelines for congenital syphilis screening. The Chief Public Health Officer strongly recommends that all pregnant persons in the NWT be offered syphilis screening:
        - at time of pregnancy confirmation or at first prenatal visit
        - around 28-32 weeks; ***AND***
        - in the immediate post-partum period.
    - Any syphilitic stillbirth should have the appropriate testing for syphilis. In order to improve capture of congenital syphilis stillbirths, it is critical that stillbirth investigations include a swab (e.g., nasopharyngeal, placenta, oral, umbilical cord) for syphilis PCR testing

- **Staging Test**
  - Rapid plasma reagin (RPR)
    - Useful indicator of response to therapy by: Observing a fall in titres over time,
    - Detecting re-infection in seropositive persons ***OR***
    - Treatment failure
  - Estimated turnaround time for test result is 48 hours
- **Confirmatory test**
  - *Treponema pallidum* particle agglutination test (TPPA)
    - Results are reported as reactive, indeterminate or non-reactive
    - If TPPA results are indeterminate:
      - Repeat test in 2-3 weeks if early syphilis infection is clinically suspected
      - If the second TPPA result is indeterminate, it likely represents a biological false-positive
    - Consult with a colleague experienced in this area
      - Estimated turnaround time for test result is 72 hours from receipt of specimen
- For more information, please refer to: Interpretation of syphilis serology:
  - Alberta Provincial Lab for Public Health|Tools
  - Canadian Guidelines on Sexually Transmitted Infections

3. REPORTING

All HCPs must follow the NWT *Public Health Act*. Measures for contact tracing and legislative requirements are laid out within the *Reportable Disease Control Regulations* and reporting timelines are found in the *Disease Surveillance Regulations*.

The *NWT Public Health Act 2009* and *NWT Child and Family Services Act* supersede constraints normally associated with physician/patient confidentiality concerns and require notification to the appropriate authority without patient consent for all reportable STIs and in any cases where child abuse is suspected. See the Government of Canada Age of Consent website.

Note the only acceptable methods of reporting to the OCPHO are outlined below. Information provided outside of these methods will not be considered reported unless otherwise stated by a CPHO delegate.

Health Care Professionals

For **Part 2** written report within 24 hours

- In response to the elevated rates of syphilis in the NWT and subsequent risk of congenital syphilis, the Chief Public Health Officer requires **ALL** syphilis screening tests be reportable to the Office of the Chief Public Health Officer, regardless of the result, within 24 hours by fax (867)873-0442, or SFT CDCU@gov.nt.ca.
  - All POCT are to be reported immediately in the EMR using the manual test entry. For those who do not have access to the EMR, POCT are to be reported using the NWT Biolytical Insti HIV/Syphilis Multiplex POCT Reporting Form via SFT dropbox (instructions are attached to the form)

- To report a case and contacts complete and fax (867) 873-0442 the NWT STI Case Investigation Report Form AND NWT STI Contact Tracing Form within **24 hours** after diagnosis is made or opinion is formed
  - Any case not staged, or not indicated as staged as per the STI Case Investigation Form reporting requirements will be flagged in the EMR to the MRP. The expectation is that the MRP will stage the case and complete the appropriate reporting requirement by sending the form back to the OCPHO via fax of SFT. **DO NOT** send staging information via the EMR this will not be considered reporting to the OCPHO.
- If there are any updates regarding the case or contacts the appropriate form will need to be resent with the additional information
- To remove a case or contact from the public health follow-up list complete the Syphilis Lost-to-Follow-up Report Form and submit using fax (867) 873-0442 or SFT CDCU@gov.nt.ca. **DO NOT** remove anyone from the list prior to completing reporting.
- **Immediately** report all outbreaks or suspect outbreaks by telephone (867) 920-8646 to the OCPHO

Laboratories

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

Additional Reporting Requirements

- The clinician should determine whether there are reasonable and probably grounds to believe that they are in contact with a "child who needs protection" as per *Section 7(3)* of the *NWT Child and Family Services Act* and shall report to a Child Protection Worker, or peace officer/authorized person if a Child Protection Worker is not available, pursuant to *Section 8* of the *NWT CFSA Act*.

To Law Enforcement Agency

- Consent is a key factor in determining whether any form of sexual activity is a criminal offence. Children under 12 do not have the legal capacity to consent to any form of sexual activity.
- The law recognizes that the age of consent for sexual activity is 16. The law does also identify close in age exceptions for minors between 12 and 15 years. Please refer to: Age of Consent to Sexual Activity.
- Reporting is done by contacting your local RCMP Detachment.
- For additional information see:
  - Age of Consent to Sexual Activity at: https://www.justice.gc.ca/eng/rp-pr/other-autre/clp/faq.html
  - Criminal Code of Canada at: The Criminal Code of Canada (justice.gc.ca)
  - The *Northwest Territories Child and Family Services Act*.

4. OVERVIEW

For more information about syphilis:

- Syphilis: Canadian Guidelines on Sexually Transmitted Infections
- Health Canada: Syphilis-Canada.ca
- Centres for Disease Control and Prevention: Syphilis

Causative Agent

- *Treponema pallidum ssp. pallidum*

Clinical Presentation and Major Complications

CLINICAL PRESENTATION		
Stage	**Clinical Manifestation**	**Incubation Period**
1. Primary	Chancre, regional lymphadenopathy	3 weeks (3 – 90 days)
2. Secondary	Rash, fever, malaise, lymphadenopathy, mucus lesions, condyloma, ta alopecia, meningitis, headaches, uveitis, retinitis	2 – 12 weeks (2 weeks – 6 months)
3. Latent	Asymptomatic	Early: < 1 year Late: ≥ 1 year
4. Neurosyphilis	Ranges from asymptomatic to symptomatic with headaches, vertigo, personality changes, dementia, ataxia, presence of Argyll Robertson pupil Can include visual or hearing changes which are irreversible even when treated	Can occur at any stage
5. Tertiary:		
Cardiovascular syphilis	Aortic aneurysm, aortic regurgitation, coronary artery ostial stenosis	10 – 30 years
Gumma	Tissue destruction of any organ; manifestations depend on site involved	1 – 46 years (most cases 15 years)
6. Congenital:		
Early	2/3 may be asymptomatic Fulminant disseminated infection, mucocutaneous lesions, osteochondritis, anemia, hepatosplenomegaly, neurosyphilis	Onset <2 years
Late	Interstitial keratitis, lymphadenopathy, hepatosplenomegaly, bone involvement, anemia, Hutchinson's teeth, neurosyphilis	Persistence >2 years after birth

Major Complications: Destruction of soft tissue and bone, heart failure, dementia, and blindness

Transmission

- Direct contact with infectious exudates from early moist lesions of the skin and mucous membranes of the infected person.

- Primary mode of transmission is by vaginal, anal, and oral sexual contact with an infected person.
- Infection is communicable during the primary, secondary, and early latent stages.
- Late latent and tertiary syphilis are not infectious.

Incubation Period

- Symptoms may appear in 10 - 90 days, but typically within 3 weeks, after the person becomes infected.

Clinical Guidance

- For patient-specific clinical management consult your local healthcare professional, paediatrician, infectious disease specialist.
- Consultation with an infectious disease specialist or colleague experienced in this area is recommended to assist with the diagnosis, staging, treatment, and follow-up of syphilis.
- For syphilis staging and treatment: follow Canadian Guidelines on Sexually Transmitted Infections (GSTI) and Public Health Agency of Canada (PHAC)
  - Staging references in GSTI: Appendix A: Clinical algorithm for syphilis staging and treatment and 1.2 Infectious syphilis staging and clinical manifestations
- If a client refuses treatment contact the OCPHO by phone (867_ 920-8646 or SFT CDCU@gov.nt.ca for further direction.
- If the MRP is unsure of the stage of syphilis in any case, timely consultation to an ID specialist should occur (within 7 days of diagnosis). If assessment and consultation provide no further clarification, the case should be considered unknown latent and treated as late latent and contacts collected and followed up (in event case is still in early latent stage)
- Be cognizant that neurosyphilis can occur at any stage
- Syphilis requires both clinical and public health management for the first 12 months or while the client is infectious. Beyond the infectious stage, it is the MRP's clinical responsibility to ensure client's receive appropriate follow up and review of treatment for adequacy based on stage
- Treatment of unknown stage of syphilis:
  - The clinical treatment standard between doses is 7 days (up to a maximum of 10 days). If the case does not receive a second or third dose within 10 days, **the regimen must be repeated** with the appropriate dosing interval.
- **Treatment of Pregnant Individuals Diagnosed with Syphilis**
  - The Chief Public Health Officer endorses the adoption of Canadian Guidelines on Sexually Transmitted Infections recommended treatment for infectious syphilis in pregnancy. The Chief Public Health Officer strongly recommends that all pregnant persons who test positive for infectious syphilis while pregnant be treated with 2 separate doses (one week apart) of Benzathine penicillin G-LA 2.4 million units IM

- For those clients who are diagnosed during pregnancy, the clinical treatment standard between doses is 7 days (up to a maximum of 10 days). If the case does not receive a second or third dose within 10 days, **the regimen must be repeated** with the appropriate dosing interval.

5. PUBLIC HEALTH MEASURES

Rapid clinical and public health responses are required to control syphilis

Management of Cases

- Interview case for history of exposure, risk assessment (pregnant, multiple sex partners, high risk sexual activities, sex workers, etc.), and contact tracing.
- Provide STI prevention education.
- Screen for other sexually transmitted infections and blood-borne infections (STBBIs) such as human immunodeficiency virus (HIV), chlamydia, gonorrhea, human papillomavirus (HPV), hepatitis B (HBV), and hepatitis C (HCV).
  - Presence of genital and oral lesions increases the risk of HIV transmission and/ or acquisition.
- Update immunizations for HPV, HBV, hepatitis A, and Tetanus (Tdap) as per the NWT Immunization Schedule | HSS Professionals.
- Universal screening of all pregnant women (remains the standard of care in the NWT).
- Treatment considerations
  - Index and contacts to abstain from unprotected sex while clinical disease is present and until adequate treatment has been given.
- Syphilis is primarily infectious for the first 12 months after infection. Rarely, some people may have relapse of symptoms in late latent phase and would be infectious. Those who are pregnant with untreated late latent syphilis may still be able to pass on the infection to their child. Public health follow-up during the infectious stage is important to identify new cases and monitor contacts. Once a client has minimal infectious potential, public health follow up is no longer necessary however, the client will still be at risk for potentially severe consequences due to the complications of latent syphilis and will require further clinical case management.
- Syphilis cases and contacts will no longer be considered lost to follow-up until after 12 months have passed from the diagnoses date for cases or the last known exposure for contacts. HCPs are required to send a Syphilis Lost-to-Follow-up Report Form before removing any case or contact from a public health follow-up list
- **Monitoring of Serologic Tests and Other Follow-up***

Primary, secondary, early latent	1, 3, 6, and 12 months after treatment
Late latent/tertiary	12 and 24 months after treatment
Neurosyphilis	6, 12 and 24 months after treatment

HIV-infected (any stage)	1, 3, 6, and 12 months after treatment and yearly thereafter
Pregnant women	Monthly until delivery
Babies Born to mothers treated for infectious syphilis during pregnancy Born to mothers treated for late latent syphilis during pregnancy Born with congenital syphilis	Follow-up with pediatrician or infectious disease specialist

*Consultation with a colleague experienced in this area is recommended to assist with follow-up.

- For more information please refer to: Canadian Guidelines on Sexually Transmitted Infections.

Management of Contacts

- **Partner Notification***

Syphilis Infection	Trace Back	Who
Primary	3 months	• Sexual partners • Newborns of infected mothers
Secondary	6months	• Sexual partners • Newborns of infected mothers
Early Latent	1 year	• Sexual partners • Newborns of infected mothers
Late Latent/stage undetermined	Variable**	• Sexual partners • Newborns of infected mothers • Children of Maternal Case

*Consultation with a colleague experienced in this area is recommended to assist with management of contacts.

**If there were no partners during the traceback period, then the last partner should be tested and treated.

- It is the public health unit/community health center responsibility to notify other communities within the NWT of contacts that may be living/staying in those communities
- The OCPHO will assist with contacting partners living out of the territory
- High risk contacts (i.e., pregnant, sex worker) may need additional actions for follow-up. Please consult with OCPHO if barriers to finding high risk contacts persist

Prevention

- Appropriate treatment and follow-up
- Safer sex education

- Screening (e.g. pop-up clinics, POCT)
- Re-screening

6. PUBLIC & HEALTH PROFESSIONAL EDUCATION

For more information about Syphilis:

- Government of Canada website for Syphilis
- Public Health Agency of Canada Sexual Health and Sexually Transmitted Infections
- The public can be advised to use 8-1-1 for nonurgent sexual health questions and advice

7. EPIDEMIOLOGY

- Between Jan 2019 and June 2023 NWT has reported a 370% increase in rates of syphilis, with 7 congenital syphilis cases since Jan 2019. See public infographic for more detials. An outbreak was declared on August 22, 2019, after 28 cases of syphilis were reported.
  - 70% of these cases were reported in Yellowknife.
  - This outbreak is ongoing.
- For more information on the epidemiology of Syphilis in the Northwest Territories (NWT) see: Epidemiological Summary of Communicable Diseases HSS Professionals.

8. REFERENCES

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4. Alberta Health Services The Provincial Laboratory For Public Health (ProvLab) Syphilis testing interpretation and education: https://www.albertahealthservices.ca/lab/Page14607.aspx
5. Centres for Disease Control and Prevention syphilis information: https://www.cdc.gov/std/syphilis/default.htm
6. Government of Canada Department of Justice: https://www.justice.gc.ca/eng/rp-pr/other-autre/clp/faq.html
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