Syphilis

CHAPTER CONTENT

1. CASE DEFINITION

Confirmed Case

- **Early Congenital Syphilis (within 2 years of birth)**
  - Laboratory confirmation
    - Identification of *Treponema pallidum* (*T. pallidum)* by dark-field microscopy, fluorescent antibody or equivalent examination of material from nasal discharges, skin lesions, placenta, umbilical cord or autopsy material of a neonate (up to 4 weeks of age) ***OR***
    - Reactive serology (non-treponemal and treponemal) from venous blood (not cord blood) in an infant/ child with clinical, laboratory or radiographic evidence of congenital syphilis whose mother is without documented evidence of adequate treatment ***OR***
    - Detection of *T. pallidum* DNA in an appropriate clinical specimen

- **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***
    - 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 lata and reactive serology (non-treponemal and treponemal) ***OR***
    - Presence of typical signs or symptoms of secondary syphilis (e.g. mucocutaneous lesions, alopecia, loss of eyelashes and lateral third of eyebrows, iritis, generalized lymphadenopathy, fever, malaise or splenomegaly) ***AND*** *either:*
      - A reactive serology (non-treponemal and treponemal) ***OR***
      - A fourfold or greater increase in titre over the previous 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 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**
  - Infectious (< 1 year after infection)
    - Laboratory confirmation
      - Fits the criteria in confirmed case of primary syphilis, secondary syphilis or early latent syphilis above ***AND***

- One of the following:
  - Reactive CSF-VDRL in non-bloody cerebrospinal fluid (CSF)
  - Clinical evidence of neurosyphilis ***AND***
  - either elevated CSF leukocytes ***OR***
  - Elevated CSF protein in the absence of other known causes

- Non-infectious (> 1 year after infection)
  - Laboratory confirmation
    - Reactive treponemal serology (regardless of non-treponemal serology reactivity) ***AND***
    - One 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 a colleague experienced in this area.

- **Screening test**
  - Syphilis enzyme immunoassay (EIA)

- Measures IgM and IgG antibody specific for *T. pallidum*
- Estimated turnaround time for test result is 48 hours
- 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.

- **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

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

Health Care Professionals

- 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 telephone (867) 920-8646, fax (867)873- 0442, or email
- Complete and fax (867) 873-0442 the NWT STI Case Investigation Report Form AND NWT STI Contact Tracing Form within **24 hours**
- **Immediately** report all outbreaks or suspect outbreaks by telephone (867) 920-8646 to the OCPHO

Laboratories

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

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, condylomalata lata, alopecia, meningitis, headaches, uveitis, retinitis	2 – 12 weeks (2 weeks – 6 months)
3. Latent	Asymptomatic	Early: < 1 year Late: ≥ 1 year
4. Tertiary:		
Cardiovascular syphilis	Aortic aneurysm, aortic regurgitation, coronary artery ostial stenosis	10 – 30 years
Neurosyphilis	Ranges from asymptomatic to symptomatic with headaches, vertigo, personality changes,	<2 – 20 years

	dementia, ataxia, presence of Argyll Robertson pupil	
Gumma	Tissue destruction of any organ; manifestations depend on site involved	1 – 46 years (most cases 15 years)
5. 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, treatment, and follow-up of infectious syphilis.
- Management and treatment of syphilis infections Canadian Guidelines on Sexually Transmitted Infections.
    - **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

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, 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.
- **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 non-infectious syphilis during pregnancy Born with congenital syphilis	Follow-up with paediatrician 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.

- The OCPHO will assist with contacting partners living out of the territory.

Prevention

- Appropriate treatment and follow-up
- Safer sex education
- Comprehensive screening
- 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

7. EPIDEMIOLOGY

- Between 2014 and 2018, NWT reported a 550% increase in rates of syphilis.
- 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 as of July 2021.
- 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
7. Government of Canada website for Syphilis: https://www.canada.ca/en/public-health/services/diseases/syphilis.html
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