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## 5.3 CHLAMYDIA TRACHOMATIS

## REPORTABLE

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### ETIOLOGY

*Chlamydia trachomatis* is a bacterial agent. Serotypes D through K are responsible for sexually transmitted infections in the adult and perinatally transmitted infections in the neonate and infant.

### CASE DEFINITIONS

#### Genital Infections: Confirmed Case:

Laboratory evidence of infection in genitourinary specimens:

- detection of *C. trachomatis* by culture
- OR-
- detection of *C. trachomatis* nucleic acid
- OR-
- detection of *C. trachomatis* antigen)

#### Extra-genital infections: Confirmed Case:

Laboratory evidence of infection in rectum, conjunctiva, pharynx and other extra-genital sites:

- detection of *C. trachomatis* by culture
- OR-
- detection of *C. trachomatis* nucleic acid
- OR-
- detection of *C. trachomatis* antigen

#### Perinatally Acquired Infections: Confirmed Case:

Laboratory evidence of infection:

- detection and confirmation of *C. trachomatis* in nasopharyngeal or other respiratory tract specimens from an infant who developed pneumonia in the first 6 months of life:
  - isolation of *C. trachomatis* by culture
  - OR-
  - demonstration of *C. trachomatis* nucleic acid
  - OR-
  - demonstration of *C. trachomatis* antigen
- OR-
- detection and confirmation of *C. trachomatis* in conjunctival specimens from an infant who developed conjunctivitis in the first month of life:
  - isolation of *C. trachomatis* by culture
  - OR-
  - demonstration of *C. trachomatis* nucleic acid
  - OR-
  - demonstration of *C. trachomatis* antigen

## CLINICAL FEATURES

### Genital Infections

Most genital chlamydial infections are asymptomatic and can persist for months. When symptoms occur, the spectrum of clinical manifestations is varied.

#### Males:

Symptomatic infection is generally characterized by urethritis including urethral discharge, dysuria and frequency, and non-specific symptoms such as redness, pruritus and swelling of the urethra. These symptoms, if untreated, can lead to complications including epididymitis, Reiter's Syndrome (reactive arthritis) and occasionally infertility.

#### Females:

Symptomatic females may experience cervical or vaginal discharge, dysuria and urinary frequency, dyspareunia, lower abdominal pain, abnormal vaginal bleeding, or vaginal symptoms (redness, pruritus and swelling). If untreated, complications such as ectopic pregnancy, infertility, pelvic inflammatory disease (oophoritis, endometritis, salpingitis), and, rarely, Reiter's syndrome may occur. Up to 2/3 of cases of tubal-factor infertility and 1/3 of cases of ectopic pregnancy may be attributed to *C. trachomatis* infection.

### Extra-Genital Infections

Pharyngeal and rectal infections are often asymptomatic. Rectal symptoms can include rectal pain (proctitis or proctocolitis), mucoid discharge, blood in the stool, and tenesmus.

Conjunctivitis in adults manifests with pre-auricular lymphadenopathy, hyperemia, infiltration, and mucopurulent discharge. There may also be a chronic phase with discharge and symptoms which may last for a year or longer if untreated.

### Perinately Acquired Infections

Most infants remain asymptomatic after exposure in the birth canal but conjunctivitis and pneumonia occur in about 15% and 7% of exposed infants, respectively.

Conjunctivitis symptoms usually appear between 7 and 21 days postnatally. Typically, a mucoid discharge progresses to a more purulent discharge with conjunctivitis and edematous eyelids.

Symptoms of infant pneumonia usually appear between 10 days and five months of age and include staccato cough, dyspnea, and a low-grade fever.

Table 1: Symptoms and Signs of Chlamydial Infection

Females	Males	Neonates and Infants
Most often asymptomatic	Often asymptomatic	Conjunctivitis in neonates
Cervicitis	Urethral discharge	Pneumonia in infants <6 months of age
Vaginal discharge	Urethritis	
Dysuria	Urethral itch	
Lower abdominal pain	Dysuria	
Abnormal vaginal bleeding	Testicular pain	
Dyspareunia	Conjunctivitis	
Conjunctivitis	Proctitis (commonly asymptomatic)	
Proctitis (commonly asymptomatic)		

Source: Canadian Guidelines on Sexually Transmitted Infections, 2013

## DIAGNOSIS

### Laboratory Tests

Refer to: <http://publichealthlab.ca/service/chlamydia-trachomatis-neisseria-gonorrhoeae-ctng-dna/>.

The diagnosis of *C. trachomatis* is based on the history, physical examination and the laboratory test performed. There are several types of tests used to diagnose chlamydia. Most use a sample of urine or a swab from the cervix, vagina or urethra. The type of diagnostic test used may depend on the symptoms or the type of laboratory tests available in the regional health authority. The Public Health Laboratory in NL will automatically test for *N. gonorrhoeae* when *C. trachomatis* testing is ordered.

The *C. trachomatis* & *N. gonorrhoeae* multiplex PCR assay detects these infections from endocervical swab or first void urine specimens from symptomatic or asymptomatic individuals.

For confirmation on laboratory specimens go to the NL Public Health Laboratory web site [www.publichealthlab.ca](http://www.publichealthlab.ca) or call (709)777-6583.

## **Specimen Collection:**

### **Female: Endocervical swab and vaginal swab**

Container/Tube: Cobas® PCR Female Swab Collection Kit

Collection Instructions:

1. Remove excess mucus from exocervix with medium cleaning swab provided in Cobas PCR collection kit and discard. This step is important in removing mucus which may prohibit nucleic acid extraction.
2. Insert second medium swab into endocervix, rotate swab for 15 to 30 seconds to ensure adequate sampling.
3. Withdraw swab.
4. Holding tube upright, verify that all Cobas PCR collection medium is at bottom of transport tube. Unscrew cap of transport tube, fully insert swab into tube, and break swab at score line. Screw cap on securely.

Note: 1. Specimen source is required.

2. Spermicidal agents and feminine powder sprays interfere with the assay and should not be used prior to collection.

### **Male and Female: First Void Urine**

Container/Tube: Cobas® PCR Urine Sample Kit

Specimen Volume: 10 mL urine

Collection Instructions:

1. Patient should not have urinated for at least 1 hour prior to specimen collection.
2. Patient/ health care provider should collect first portion of a voided urine (first part of stream) into a sterile, plastic, preservative-free specimen collection container.

Note: Specimen source is required.

### Other specimen sources

Nasopharyngeal, rectal and conjunctival specimens collected in Cobas® PCR Female Swab Collection Kit have not been validated at the Newfoundland & Labrador Public Health Laboratory.

### **Interpretation of Results**

CT DETECTED: indicates the presence of *Chlamydia trachomatis* DNA. This assay is not intended as a test of cure as non-viable CT may be detected when performed < 3 weeks after completion of therapy. In cases of treatment failure isolation/culture should be attempted.

CT NOT DETECTED: absence of *Chlamydia trachomatis* DNA.

INDETERMINATE: the specimen submitted contained substances inhibitory to the assay. Please recollect a specimen to complete follow up.

## **EPIDEMIOLGY**

### **Occurrence**

- In Canada chlamydia is the most commonly diagnosed and reported bacterial STI.
- Chlamydia is underdiagnosed because the majority of infected individuals are asymptomatic
- Chlamydia is also often a co-infection for those diagnosed with *N. gonorrhea*.
- Chlamydia is more common among youth between the ages of 15-24 years.
- Risk factors:
  - Sexual contact with a chlamydia-infected person.
  - A new sexual partner or more than two sexual partners in the past year.
  - Previous sexually transmitted infections (STIs).
  - Vulnerable populations (e.g., injection drug users, incarcerated individuals, sex trade workers, street youth etc.)

### **Reservoir**

Individuals who are asymptomatic, particularly untreated infected males continue to serve as a large reservoir capable of transmitting *C. trachomatis* to sexual partners. *C. trachomatis* grows in the vagina and/or urethra of infected persons. It may be found in the rectum and/or throat as well. The bacteria may spread to other parts of the reproductive tract causing major sequelae.

### **Incubation**

The usual incubation period from time of exposure to onset of symptoms is 2 to 3 weeks, but can be as long as 6 weeks.

## **Transmission**

Transmission of *Chlamydia trachomatis* is person to person via sexual contact (oral, vaginal, or rectal routes), or through the birth process (vertical transmission). The transmission is more efficient male to female than female to male.

The bacteria may also spread from the primary site of the case to other sites causing infection of the cervix, uterus, fallopian tubes, ovaries, abdominal cavity, glands of the vulva area in females and urethra and testes in males. The eyes of adults may become infected through the transmission of the infected genital secretions to the eye, typically by the fingers.

Newborns become infected by direct contact with an infected birth canal.

## **Communicability**

Individuals and contacts are advised to abstain from unprotected intercourse until treatment is complete- 7 days after single dose therapy, or until a full course of multi-day therapy.

## **CONTROL MEASURES**

### **Management of Cases**

Evaluation should be appropriate for the presenting symptoms, signs and sexual history.

Test symptomatic or asymptomatic clients who identify risk behavior through unprotected sexual intercourse and/or known contacts of chlamydia, gonorrhea, epididymitis/orchitis or PID.

Testing for chlamydia should not occur in isolation, offer other additional STI screening. PHAC suggests:

- Obtain specimen(s) for the diagnosis of *N. gonorrhoeae*.
- Obtain a blood sample for serologic testing for syphilis
- HIV testing and counselling are recommended
- Immunization against hepatitis B is recommended in non-immune individuals
- Discuss HPV vaccine with women and men

In February 2015, the National Advisory Committee on Immunization (NACI) published an update on the recommended Human Papillomavirus (HPV) vaccine immunization schedule:

[http://www.phac-aspc.gc.ca/naci-ccni/acs-dcc/2015/hpv-vph\\_0215-eng.php](http://www.phac-aspc.gc.ca/naci-ccni/acs-dcc/2015/hpv-vph_0215-eng.php)

Cooperation of the index case is essential to successful contact tracing; enhance cooperation of the index case by obtaining trust and providing an explanation of the reasons for contact tracing.

Counsel and identify partners, obtain contact information.

### **Treatment for chlamydia is indicated for the following:**

- A positive chlamydia test.
- Diagnosis of a syndrome compatible with a chlamydial infection, without waiting for the test results of *C. trachomatis*.
- Diagnosis of chlamydial infection in a sexual partner.
- Empirical co-treatment when a diagnosis of *N. gonorrhoeae* is made without waiting for test results of *C. trachomatis* due to the significant probability of co-infection (20–42%) and the possibility of false-negative results, especially with non-NAAT methods.

### **Treatment of Choice**

#### **Adult Cases**

Efficacy and use-effectiveness studies evaluating single-dose azithromycin and a 7-day course of doxycycline have demonstrated similarly high cure rates; azithromycin is much more expensive.

Ofloxacin has an efficacy similar to doxycycline and azithromycin, but it is more expensive and needs to be taken as a multiple-dose course.

Erythromycin is associated with significantly higher gastrointestinal side effects than other regimens.

Drug resistance is rare but may become an emerging issue.

In the absence of a contraindication, the following treatment options are recommended:

**Table 2. Adults (non-pregnant and non-lactating): urethral, endocervical, rectal, conjunctival infection**

Preferred	Alternative
Doxycycline 100 mg PO bid for 7 days	Ofloxacin 300 mg PO bid for 7 days
OR	OR
Azithromycin 1 g PO in a single dose if poor compliance is expected*	Erythromycin 2 g/day PO in divided doses for 7 days†
	OR
	Erythromycin 1g/day PO in divided doses for 14 days†

\* If vomiting occurs more than 1 hour post-administration, a repeat dose is not required.

† Erythromycin dosages refer to erythromycin base. Equivalent dosages of other formulations may be substituted (**with the exception of the estolate formulation, which is contraindicated in pregnancy**). If erythromycin has been used for treatment, test of cure should be performed 3-4 weeks after completion of therapy.

For treatment of pregnant or lactating women, consult the Public Health Agency of Canada *Guidelines on Sexually Transmitted Infections* or the Regional Medical Officer of Health.

[Chlamydial Infections - Section 5 - Management and Treatment of Specific Infections - Canadian Guidelines on Sexually Transmitted Infections - Public Health Agency of Canada](#)

## Pediatric Cases

Neonates born to untreated, infected mothers must be tested for *C. trachomatis*.

Neonates should be treated if their test results are positive. Neonates should be closely monitored for signs of chlamydial infection (e.g., conjunctivitis, pneumonitis). Prophylaxis is not recommended unless follow-up cannot be guaranteed.

When a case is diagnosed in an infant, the mother and her sexual partner(s) should be located, clinically evaluated and treated regardless of clinical findings and without waiting for test results.

If the case is <14 years of age sexual abuse must be considered and reported to CYFS as per the Children and Youth Care and Protection Act.

## Management of Contacts

### Definition of a Contact

All partners who have had sexual contact with the index case within 60 days prior to symptom onset or date of specimen collection (if asymptomatic) should be tested and empirically treated regardless of clinical findings and without waiting for test results.

The length of time for the trace-back period should be extended:

- to include additional time up to the date of treatment
- if the index case states that there were no partners during the recommended trace-back period, then the last partner should be notified
- if all partners traced (according to recommended trace-back period) test negative, then the partner prior to the trace-back period should be notified

### Notification

Partner notification will identify those at risk, reduce disease transmission/reinfection and ultimately prevent disease sequelae.

Notification of contacts is done in a confidential manner that protects the identity of the index case.

- All contacts should be screened for HIV and other STI.
- All contacts should be instructed about infection transmission.
- All contacts should be provided with individualized STI prevention education.

Follow-up on all out of province/country referrals of cases and contacts is done in collaboration with provincial [office Department of Health and Community Services, Disease Control Division](#).

## Management of Outbreaks

An outbreak management team should be established to address infection prevention and control measures.

The provincial *Outbreak Management Protocol* is Section 10 of the DCM and can be accessed at

[http://www.health.gov.nl.ca/health/publications/diseasecontrol/S10\\_Outbreak\\_Protocol.pdf](http://www.health.gov.nl.ca/health/publications/diseasecontrol/S10_Outbreak_Protocol.pdf)

## PREVENTION

Ensure appropriate treatment of *C. trachomatis* for cases.

Every newborn born in a hospital in Newfoundland and Labrador receives preventive treatment for ophthalmia neonatorum with erythromycin ophthalmic prophylaxis or another appropriate therapeutic agent.

Interview case, identify and ensure appropriate treatment and follow-up of C. trachomatis for sexual partner(s).

Educate the case, sexual partners, and the public about symptoms, transmission and prevention of infections including:

- personal protective measures, particularly the correct and consistent use of condoms
- delaying onset of sexual activity
- developing mutually monogamous relationships
- reducing the numbers of sexual partners
- minimize anonymous or casual sexual activity
- culturally appropriate, accessible and acceptable STI services
- providing information about risk for STI when travelling.

## **Screening**

Individuals with risk factors for chlamydia infections:

- sexual contact with chlamydia-infected person(s)
- new sexual partner or more than 2 sexual partners in preceding year
- previous STI
- vulnerable populations (e.g., IDU, incarcerated individuals, sex workers, street involved youth)

## **Follow-up Testing**

Repeat testing for all individuals with chlamydia infections is recommended 6 months post-treatment.

## **DOCUMENTS**