Chlamydia trachomatis Infections

Case Definition

Confirmed case

Genital Infections
Laboratory evidence of infection in genitourinary specimens (e.g., endocervical, urethral or vaginal swab; urine)\(^1\):
- Isolation of *Chlamydia trachomatis* by culture
- Detection of *C. trachomatis* nucleic acid (e.g., PCR)
- Detection of *C. trachomatis* antigen.

Extra-genital Infections
Laboratory evidence of infection in rectum, conjunctiva, pharynx or other extra-genital sites from appropriate specimen (e.g., rectal, conjunctiva, throat or skin swab)\(^1\):
- Isolation of *C. trachomatis* by culture
- Detection of *C. trachomatis* nucleic acid (e.g., PCR)
- Detection of *C. trachomatis* antigen.

Perinatally Acquired Infections
Laboratory evidence of *C. trachomatis* infection in nasopharyngeal or other respiratory tract specimens (e.g., nasopharyngeal swab auger suction, throat swab)\(^1\) or in urine from an infant who developed pneumonia in the first six months of life:
- Isolation of *C. trachomatis* by culture
- Detection of *C. trachomatis* nucleic acid (e.g., PCR)
- Detection of *C. trachomatis* antigen

Laboratory evidence of *C. trachomatis* in conjunctival specimens\(^1\) from an infant who developed conjunctivitis in the first month of life:
- Isolation of *C. trachomatis* by culture
- Detection of *C. trachomatis* nucleic acid (e.g., PCR)
- Detection of *C. trachomatis* antigen.
Note: Each case classification is mutually exclusive. Individuals with more than one site of infection concurrently may fall under more than one case classification but will be counted as one case with multiple sites of infection identified to avoid duplicate counting of cases.

[1] Refer to the Provincial Laboratory for Public Health (ProvLab) Guide to Services for current specimen collection and submission information.
Reporting Requirements

1. Physicians, Health Practitioners and others
   - Physicians, nurses, nurse practitioners, midwives, persons in charge of an institution, or operators of a supportive living accommodation as listed in Section 22(3) and 22(4) of the Public Health Act, shall notify the Chief Medical Officer of Health (CMOH) (or designate) of all confirmed cases in the prescribed form by mail, fax or electronic transfer within 48 hours (two days). The completed Notification of Sexually Transmitted Infection (STI) form shall be forwarded to the CMOH (or designate) within two weeks of notification. The Notification of STI Form will include:
     - index patient information,
     - laboratory/clinical findings,
     - treatment details and
     - contact information and their treatment.
   - For out-of-zone, out-of-province and out-of-country reports, the following information should be forwarded to the CMOH (or designate) by phone, fax or electronic transfer within 48 hours (two days) including:
     - name,
     - date of birth,
     - current health care number,
     - current address of residence and phone number,
     - attending physician (locally and out-of-province),
     - positive laboratory report (faxed) and
     - date of exposure.

2. Laboratories
   - Section 23(b) of the Public Health Act (1) requires that all laboratories, including the Provincial Laboratory for Public Health (ProvLab), shall report all positive laboratory results by mail, fax or electronic transfer within 48 hours (two days) to the:
     - CMOH (or designate), and
     - Attending/ordering physician or health practitioner.

3. Alberta Health Services
   - The Medical Officer of Health (MOH) (or designate) is responsible for ensuring investigation, treatment and follow-up of all reported confirmed cases.

4. Additional Reporting Requirements for Physicians, Health Practitioners and Others
   - In all cases, where a person under 18 is suspected or confirmed to have an STI, an assessment should be carried out by the clinician to determine if additional reporting is required;
     - To Child and Family Services
       The clinician should determine whether there are reasonable and probable grounds to believe that they are in contact with “a child in need of intervention” [as per Section 1(2) of the Child, Youth and Family Enhancement Act (CYFEA)(2)] and shall report to a director pursuant to Section 4 of the CYFEA (2).

   Reporting is done by contacting the local Child and Family Services office or calling the CHILD ABUSE HOTLINE: 1-800-387-5437 (KIDS). For local office contact information see: www.child.alberta.ca/home/782.cfm
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 identifies the exception for minors under age 16 years as having the ability to consent, in “close in age” or “peer group” situations. The law recognizes that the age of consent for sexual activity is 16.

Reporting is done by contacting your local City Police Detachment or RCMP Detachment [http://www.rcmp-grc.gc.ca/ab/det-eng.htm](http://www.rcmp-grc.gc.ca/ab/det-eng.htm).

For additional information see: Frequently Asked Questions:
- Age of Consent to Sexual Activity [www.justice.gc.ca/eng/dept-min/clp/faq.html](http://www.justice.gc.ca/eng/dept-min/clp/faq.html) (3)
Etiology

*Chlamydia trachomatis* is a bacterial agent (obligate intracellular parasite) with approximately select serologic variants (serovars) causing oculogenital infections (serovars A – K) and LGV (serovars L₁, L₂, and L₃). Genital and perinatal infections are generally caused by serotypes B, and D through K (5-7).

Clinical Presentation

Genital Infections

Symptomatic and asymptomatic genital chlamydial infections occur, but as many as 85–90% of infections in men and women are asymptomatic. Asymptomatic infections can persist for months. When symptoms occur, the spectrum of clinical manifestations is varied.

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

Symptomatic females will most often experience cervical or vaginal discharge, dysuria and frequency, painful intercourse, lower abdominal pain, abnormal bleeding between periods, and vaginal symptoms including redness, itch and swelling. If untreated, complications such as ectopic pregnancy, infertility, PID (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 (6-8).

Extra-Genital Infections

Pharyngeal and rectal infections are often asymptomatic. Rectal symptoms when present, include rectal pain (proctitis or proctocolitis), mucoid discharge, blood in the stool, and tenesmus. Conjunctivitis in adults manifests with preauricular 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.

Perinatally 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 (9). Conjunctivitis symptoms usually appear between 7 and 21 days post-natally, often starting as a mucoid discharge and progressing to a more purulent discharge. The eyelids become edematous and the conjunctiva becomes erythematous and thick. Symptoms of infant pneumonia include staccato cough, dyspnea, and a low-grade fever. Infants usually become symptomatic between 10 days and 5 months of age (10).

Diagnosis

Diagnosis is made based on history, physical examination, and laboratory investigation. The diagnosis is confirmed by examination of genitourinary, rectal or conjunctival samples by culture, molecular diagnostic tests, antigen detection, or fluorescent antibody tests (11).

In infants under six months of age, the specimen is generally taken from the nasopharynx or the respiratory tract. The organisms are less easily recovered from discharge. Nucleic acid amplification testing (NAAT) can be used with urine specimens.
Epidemiology

Reservoir
Humans are the only known reservoir (6).

Transmission
Transmission of *Chlamydia trachomatis* is person to person via sexual contact (oral, vaginal, cervical, urethral 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 uterus, fallopian tubes, ovaries, abdominal cavity, glands of the vulva area in females 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 (5;6).

Incubation Period
The incubation period is variable depending upon the type/site of infection. It is commonly 7 – 14 days, but can be as long as six weeks (6).

Period of Communicability
*Chlamydia trachomatis* is communicable for as long as the person harbours the organism. This may be for many months in untreated individuals. Effective therapy ends communicability in hours (8;11).

Host Susceptibility
All persons are susceptible to this disease if exposed. No acquired immunity has been demonstrated and, in fact, it has been demonstrated that the recurrent infection rate among young sexually active individuals is quite high.

Occurrence

General
This sexually transmitted infection is one of the most frequently reported worldwide. The World Health Organization estimates that there are 4 – 5 million new cases every year in the USA alone. Globally they estimate there are over 140 million persons infected (12). This infection is the most common cause of urethritis and cervicitis in North America.

Chlamydia infections have been found in all population groups but they are predominantly characterized by young age and high-risk behaviours. It affects both males and females in all age groups, however, females are affected more often than males. Sporadic cases of chlamydial conjunctivitis are reported throughout the world in sexually active adults. Approximately one in 300 adults with genital chlamydia infection develops conjunctivitis (13).

Canada
Chlamydia infections are the most commonly reported STI in Canada accounting for more than 3/4 of all reported STI. In Canada genital chlamydia became a reportable disease in 1990. In 2000, the national number of cases was 46,439 (rate of 150.9/100,000). By 2009, the national number of cases had almost doubled, climbing to 87,210 (rate 258.5/100,000) (13;14).
Alberta
Genital chlamydia became reportable in Alberta in 1989. Chlamydia is the most common reportable sexually transmitted infection in Alberta. From 2000 to 2009, the number of cases has continued to increase. In 2010, a decrease in provincial cases was reported, however in 2011 that case number again increased. The provincial rate of chlamydial infections has remained above the national average since 1990. Since 1998, females aged 20 – 24 years have had the highest rates of infection followed by women 15 – 19 years of age. In 2010, 82% of cases occurred in people between the ages of 15 – 29 years of age. The highest rates of Chlamydia occurred in young adults aged 20 – 24 years. Females have higher reported rates than males, having almost twice the rate of males (13;15;16).

Chlamydia Case and Rates in Alberta and Canada, 2000-2011

Key Investigation
Single Case
The diagnosis and treatment is performed by community physicians and STI Clinics (Edmonton, Calgary and Fort McMurray).
- Determine the presence or absence of symptoms.
- Determine if risk factors for chlamydia are present;
  - sexual contact with chlamydia infected person(s),
  - new sexual partner or more than two sexual partners in preceding year,
  - previous STI,
  - vulnerable populations (e.g., Injection drug use, incarcerated individuals, sex workers, street involved youth, etc.).
- Offer testing for HIV and other STI.
- Counsel and identify partners, including locating information.
Control

Management of a Case

- Test of cure for *C. trachomatis* is not routinely recommended when appropriate treatment is taken, signs and symptoms disappear and there is no re-exposure to an untreated partner.
- Test of cure is recommended when:
  - compliance is sub-optimal,(11)
  - an alternative treatment regimen has been used,(11)
  - the patient is a child (<14 years of age),(11)
  - the patient is a pregnant woman,(11)
  - non-genital site involved (e.g., eye, rectum, pharynx) or in cases of complicated infection (PID or epididymitis).

- A nucleic acid amplification test (NAAT) is performed (3 – 4 weeks after completion of treatment), or
- A specimen culture is performed (5 – 7 days after completion of treatment).
- Empirical co-treatment for gonorrhea is recommended in areas of high gonococcal disease prevalence, prior to test results becoming available.
- All cases should be instructed about infection transmission. Patients should be counseled about the importance of abstaining from unprotected intercourse until 7 days after completion of treatment of both case and partner(s) (11).
- All cases should be provided with individualized STI prevention education, targeted at developing knowledge, skills, attitudes and behaviors to reduce the risk and prevent recurrences of STI.
- Sexual assault in adults should be managed in conjunction with local Sexual Assault services and other appropriate community support services.
- Immunization against hepatitis A may be recommended. Refer to *Alberta Immunization Policy* manual for immunization eligibility (17).
- Immunization against hepatitis B is recommended if not already given. Refer to *Alberta Immunization Policy* manual for immunization eligibility (17).
- All patients with a notifiable STI qualify for provincially funded medications.
  - STI services will send replacement medication upon receipt of a Notification of STI Form when the physician mailing address is indicated on the form.
  - Physicians and STI clinics may order additional quantities of medication by contacting STI Services.
- Recalcitrant Patients
  - The *Public Health Act* (sections 39 through 52) (1) authorizes detention of recalcitrant patients for medical examination, treatment and/or counselling.
  - The CMOH [or designate (section 13(3) of the *Public Health Act*)] or MOH may issue a certificate to detain an individual who is believed to be infected and refuses or neglects to comply with treatment.
  - There must be proof of infection or contact with an infected person and documentation of failure to comply with prescribed treatment and medical examination or non compliance for testing and/or treatment.

Treatment of a Case

Indications for Treatment: (18)

- positive diagnostic test result,
- diagnosis of a syndrome compatible with a chlamydial infection, without waiting for test result,
- diagnosis of a syndrome compatible with a chlamydial infection in a partner without waiting for test results,
• co-treatment for gonorrhea, with cefixime 800mg po in a single dose, is recommended when case occurs in an area of high prevalence.

**Non-Pregnant/Non-Lactating Adults** (Urethral, cervical, rectal infection)

**Preferred**
- azithromycin 1 gm po as a single dose PLUS co-treatment for gonorrhea with cefixime 800mg po in a single dose, if in area of high prevalence

**Alternate**
- doxycycline 100 mg po BID for 7 days

**Pregnant/Breastfeeding Mothers** (Urethral, cervical, rectal infection)

**Preferred**
- amoxicillin 500 mg po TID for 7 days PLUS co-treatment for gonorrhea with cefixime 800mg po in a single dose, if in area of high prevalence

**Alternate**
- azithromycin 1 gm po as a single dose* or
- erythromycin 1 gm/day po in divided doses for 14 days

*Limited data is available on the long-term safety of azithromycin in pregnancy but the benefits of single dose treatment for selected patients (e.g., if poor compliance is expected) may outweigh this risk.

**Considerations**
- If vomiting occurs > 1 hour post administration of azithromycin, a repeat dose is not required.
- Doxycycline is contraindicated in pregnant women.
- Erythromycin dosage refers to the use of erythromycin base. Equivalent dosages of other formulations may be substituted (with the exception of the Estolate formulation being contraindicated in pregnancy).

**Chlamydia Infection of the Eye**

**Preferred:**
- Adult and Children ≥ 9 years of age: doxycycline 100 mg po BID for 14 days.

**Alternate:**
- azithromycin 1 gm po as a single dose, with appropriate test of cure follow-up.

**Considerations**
- Children < 9 years of age - consult pediatric Infectious Disease physician.
- All patients should also have genitourinary specimens submitted for C. trachomatis.
- All patients should be followed to ensure resolution of infection.

Refer to the [Alberta Treatment Guidelines for Sexually Transmitted Infections in Adolescents and Adults 2008](#).

**Pediatric Cases**
- If the case is <14 years of age, referral to a pediatrician should be made.
- 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 examined and tested.

• Because of the high risk of sexual abuse, it is recommended that all children <14 years of age (except for those < 1 month of age with a conjunctivitis or < 6 months of age with pneumonia) be managed in consultation with a referral centre in either:
  ○ Edmonton:
    Child and Adolescent Protection Centre,
    Stollery Children’s Hospital, 1C4.24
    Walter Mackenzie Health Sciences Centre
    8440-112 Street
    Edmonton, AB T6G 2B7
    Tel: 780-407-1240
  ○ OR
  ○ Calgary:
    Child Abuse Service
    Child Development Centre
    Suite 200, 3820-24 Ave NW
    Calgary, Alberta, T2N 1N4
    Tel: 403-955-5959

Management of Contacts
Partner Notification
• Partner notification will identify those at risk, reduce disease transmission/re-infection and ultimately prevent disease sequelae.

• It is mandated under the Public Health Act that every attempt is made to identify, locate, examine and treat partners/contacts of all cases. (1)

• Physician/case manager are required to provide partner names and locating information on the Notification of STI Form and forward to STI Services.

• If testing and/or treatment of partner(s) are not confirmed on the Notification of STI Form, STI Services will initiate follow up by a Partner Notification Nurse.
  ○ Partner Notification Nurse (PNN) is specially trained to conduct notification of partners and contacts in a confidential manner that protects the identity of the index case.
  ○ The phone number for your designated PNN is available by calling STI Services at 780-735-1466 or toll free 1-888-535-1466.

• 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, targeted at developing knowledge, skills, attitudes and behaviors to reduce the risk and prevent recurrences of STI.

• STI Services initiates follow-up on all out of province/country referrals of cases and partner(s).

Preventive Measures
• Ensure appropriate treatment of C. trachomatis for cases.

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

• Include information about risk for STI during pre-travel health counseling.

• Ensure STI services are culturally appropriate, and readily accessible and acceptable.
• Educate the case, sexual partners, and the public on methods of personal protective measures, in particular the correct and consistent use of condoms and discuss safer sex options including:
  ○ abstinence,
  ○ delaying onset of sexual activity,
  ○ developing mutually monogamous relationships,
  ○ reducing the numbers of sexual partners,
  ○ discouraging anonymous or casual sexual activity,
  ○ sound decision making,
  ○ transmission and prevention of infection (11;18).

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, etc.).
• All sexually active persons under 25 years of age, at least annually.
• All pregnant women (at first prenatal visit; re-screen all who are positive at first screen and those at high risk in third trimester).
• Women should be tested for gonococcal infection prior to insertion of an IUD, a therapeutic abortion, or a D & C.
• Victims of sexual assault.

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


