

Gonorrhoea



Public Health Branch

1. Etiology

Gonorrhoea is caused by *Neisseria gonorrhoeae* (*N. gonorrhoeae*), a gram-negative diplococcal bacterium.

2. Case Definition

Each case classification is mutually exclusive. Individuals with more than one site of infection 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).

2.1 Confirmed Case – Genital Infections:

Laboratory confirmation of infection in genitourinary specimens (e.g., urine, endocervical, male urethral):

- Detection of *Neisseria gonorrhoeae* by culture;

OR

- Detection of *N. gonorrhoeae* nucleic acid (1).

NOTE: A positive test for Gram-negative intracellular diplococci in symptomatic postpubertal males with urethral discharge provides a presumptive diagnosis for gonorrhoea (1).

2.2 Confirmed Case - Extra-genital Infections:

Laboratory confirmation of infection from pharynx, rectum, joint, conjunctiva, blood and other extra-genital sites:

- Detection of *N. gonorrhoeae* by culture;

OR

- Detection of *N. gonorrhoeae* nucleic acid (1).

2.3 Confirmed Case – Perinatally Acquired Infections:

Laboratory confirmation of infection from a neonate in the first four weeks of life leading to the diagnosis

of gonococcal conjunctivitis, scalp abscess, vaginitis, bacteremia, arthritis, meningitis or endocarditis:

- Detection of *N. gonorrhoeae* by culture;

OR

- Detection of *N. gonorrhoeae* nucleic acid (1).

3. Reporting and Other Requirements

Laboratory:

- All confirmed cases are reportable by laboratory to the Public Health Surveillance Unit (204-948-3044 secure fax).
- Operators of Manitoba clinical laboratories are required to submit clinical isolate sub-cultures of *N.gonorrhoeae* or specimens (in the absence of positive cultures) known to contain *N. gonorrhoeae* nucleic acid, to Cadham Provincial Laboratory (CPL) within seven days of report.

Health Care Professional:

- For Public Health investigation and to meet the requirement for contact notification under the Reporting of Diseases and Conditions Regulation in the *Public Health Act*, the *Notification of Sexually Transmitted Disease* (NSTD) form available at: http://www.gov.mb.ca/health/publichealth/cdc/protocol/form_3.pdf must be completed for all laboratory-confirmed cases of gonorrhoea.
- Please check with the public health office in your region, with respect to procedures for return of NSTD forms for case and contact investigation.
- Cooperation with public health investigation is greatly appreciated.

NOTE: Please see the Manitoba Health, Healthy Living and Seniors document “*The Public Health Act – Reporting Requirements and Powers*” for information on reporting requirements when a patient refuses treatment for a reportable

communicable disease or fails to comply with an order from the Medical Officer of Health
<http://www.gov.mb.ca/health/publichealth/cdc/protocol/pharrp.pdf>.

Regional Public Health/First Nations Inuit Health Branch:

- Return completed NSTD forms to the Public Health Surveillance Unit by mail (address on form) or secure fax (204-948-3044).

4. Epidemiology

4.1 Reservoir and Source:

Humans (3). The source of the organism is exudate and secretions from infected mucosal surfaces in humans (2).

4.2 Transmission:

Transmission occurs through direct contact with exudates from mucous membranes of infected people, almost always as a result of sexual activity (3). Perinatal transmission may also occur (2, 4). Transmission occurs rarely through household exposure in prepubertal children (2). Sexual abuse should be considered strongly when genital, rectal, or pharyngeal colonization or infection is diagnosed in prepubertal children beyond the newborn period (2).

4.3 Occurrence:

General: In 2008, the World Health Organization estimated that there were 106 million new cases of gonorrhea among adults globally (5). The disease affects both men and women, especially sexually active adolescents and younger adults (3). Prevalence is highest in communities of lower socioeconomic status (3). Reported incidence of infection in the United States of America is highest in females 15 through 24 years of age and in males 20 through 24 years of age (2). Data from

genitourinary medicine clinics in England show that 42% of diagnosed gonorrhea is in men who have sex with men (MSM) (6).

Canada: Between 2003 and 2012, the rate of reported cases of gonorrhea increased by 38.9%, from 26.0 to 36.2 per 100,000 (7). Between 2001 and 2010, the overall reported rates of gonorrhea were consistently higher in males than in females (7). In 2010, people under 30 years of age accounted for the majority (70.5 %) of reported gonorrhea cases (8). The highest rate in females was 15 to 19 years of age (147.0 per 100,000) (8), and in males 20 to 24 years of age (134.5 per 100,000) (8). The increase in rates of reported cases is likely due in part to improved diagnosis through nucleic acid amplification testing (NAAT) (7). Increasing gonococcal resistance to many available treatments may also contribute to increasing rates (7).

Manitoba: In 2011, the rate of reported gonorrhea cases in Manitoba was over two times the national average. In 2013, 1,220 cases (rate of 96.3 per 100,000) were reported to the Public Health Surveillance System, Manitoba Health, Healthy Living and Seniors. This is a decrease from the rate reported in 2006 (132.7 per 100,000), corresponding to 1,564 cases. In 2013, the overall rate of infection in females (105 per 100,000) was higher than in males (84 per 100,000). The 15 to 24-year-old age group had the highest rates of infection for both males (335 per 100,000) and females (471 per 100,000).

4.4 Incubation Period:

Usually two to seven days (2, 9).

4.5 Host Susceptibility and Resistance:

Humans are considered universally susceptible. Individuals deficient in complement components are uniquely susceptible to bacteremia (3). Young sexually active females are at higher risk for gonococcal pelvic inflammatory disease than older

women owing to biological factors (cervical ectopy) that may facilitate ascending infection, as well as sexual behavioural factors that are more common in younger age brackets (4). Infection with HIV increases the risk of acquisition of gonorrhoea (10). Gonococcal strains are antigenically heterogeneous and reinfection is common (3).

4.6 Period of Communicability:

Communicability is for as long as the person harbours the organism (2). Communicability may extend for months if untreated (3). Effective treatment ends communicability within hours (3).

5. Clinical Presentation/Natural History

Gonorrhoea is a common bacterial infection that is transmitted almost exclusively by sexual contact or perinatally and primarily affects the mucous membranes of the urethra and cervix and, less frequently, those of the rectum, oropharynx, and conjunctivae (4). Ascending genital infection in women leads to endometritis and salpingitis—called pelvic inflammatory disease (PID). This is the most common complication, and a frequent cause of female infertility (4).

5.1 Uncomplicated Infection in Adults:

Acute urethritis is the main manifestation in men (4). The major symptoms in men are urethral discharge and dysuria usually without urinary frequency (4). Urethral itch may also occur (9). A small proportion of men with urethral gonorrhoea remain asymptomatic (3, 4).

Infection in women is often asymptomatic but symptoms may include lower abdominal pain, increased vaginal discharge, deep dyspareunia, abnormal vaginal bleeding and dysuria (often without urgency or frequency) (4, 9). If initial infection is asymptomatic, gonococcal infection in

women may not be identified until complications (e.g., PID) have occurred (11).

Pharyngeal gonococcal infection is acquired by receptive oral sex (4). Most pharyngeal infections are asymptomatic (4).

N. gonorrhoeae has been isolated from the rectum in up to 40% of women with gonorrhoea (sometimes when there is no history of rectal penetration) and in a similar proportion of MSM (men who have sex with men) with uncomplicated gonorrhoea (4). Rectal gonococcal infection is usually asymptomatic, but some patients have acute proctitis manifested by anal pruritis, tenesmus, purulent discharge, or rectal bleeding (4).

Gonococcal conjunctivitis in adults is usually seen in persons with genital gonorrhoea, likely a result of autoinoculation (4). Gonococcal conjunctivitis is usually painful, with prominent photophobia and copious, purulent exudate; corneal ulceration can supervene rapidly in the absence of prompt antibiotic therapy (4).

Infection in Pregnancy:

Gonorrhoea in pregnancy is associated with spontaneous abortion, premature labour, early rupture of fetal membranes, chorioamnionitis and perinatal infant mortality (4).

Interrelationship between Gonorrhoea and HIV:

HIV transmission and acquisition are enhanced in people with gonococcal infections (3, 9). As HIV weakens the immune system, it is easier for someone who is HIV-positive to become infected with gonorrhoea (10).

5.2 Complications:

Local extension from the genital tract can result in epididymitis and chronic prostatitis in men and Bartholinitis, perihepatitis, pelvic inflammatory disease (PID), ectopic pregnancy and infertility in women (2, 9). Even asymptomatic infection in females can progress to PID, with tubal scarring that

can result in ectopic pregnancy or infertility (2, 11). Eye infections in adults may progress to corneal involvement, perforation and blindness if not treated promptly.

5.3 Infection in Children:

In children beyond the newborn period, including prepubertal children, gonococcal infection may occur in the genital tract and almost always is transmitted sexually (2). Vaginitis is the most common presentation in prepubertal females (2). Gonococcal urethritis is an uncommon presentation in the prepubertal male (2). Among sexually abused children, anorectal and pharyngeal infections with *N. gonorrhoeae* are common and frequently asymptomatic (11).

Neonatal Infection: Gonococcal infection among neonates results from perinatal exposure to the mother's infected cervix (11). Infection in the newborn infant usually involves the eyes (2). It is usually an acute illness that manifests two to five days after birth (11). Other manifestations include rhinitis, vaginitis, urethritis, and infection at sites of fetal monitoring (e.g., scalp) (11). The most severe manifestations of *N. gonorrhoeae* infection in newborns are ophthalmia neonatorum and sepsis, which can include arthritis and meningitis (11). Ophthalmia neonatorum can result in perforation of the globe of the eye and blindness (11).

5.4 Disseminated Gonococcal Infections (DGI):

Septic arthritis and a characteristic syndrome of polyarthritis, dermatitis and tenosynovitis are predominant manifestations (4, 11). Rare manifestations include meningitis, osteomyelitis, septic shock and acute respiratory distress syndrome (4).

6. Laboratory Diagnosis

Diagnosis is based on a combination of history, physical examination and laboratory investigation. A diagnosis of gonorrhea should be considered in

anyone with signs or symptoms compatible with gonorrhea.

There should also be a high index of suspicion in the following individuals, for whom testing/screening is recommended:

- Individuals who have had sexual contact with a person with a confirmed or suspected gonococcal infection;
- Individuals who have had unprotected sex with a resident of an area with high gonorrhea burden and/or high risk of antimicrobial resistance;
- Individuals with a history of previous gonococcal infection;
- Individuals with a history of other sexually transmitted infections (e.g., chlamydia, HIV);
- Sex workers and their sexual partners;
- Sexually active youth < 25 years of age;
- Street-involved youth and other homeless populations;
- Men who have unprotected sex with men;
- Individuals who have sex with multiple and/or casual/anonymous partners; and
- Individuals requesting sexually transmitted/blood-borne infections (STBBI) screening.

In postpubertal males, the presence of gram-negative intracellular diplococci on a stained smear of urethral exudate is generally diagnostic of gonorrhea (9). Staining is unreliable in females due to the presence of other microbial species that may mimic *Neisseria*.

Depending on the clinical situation, consideration should be given for collection of samples using both culture and nucleic acid amplification testing (NAAT), especially in symptomatic patients (9).

6.1 Nucleic Acid Amplification Testing (NAAT):

Cadham Provincial Laboratory (CPL) performs assays for both gonorrhea and chlamydia on all urine and swab specimens submitted for NAAT. CPL is

currently the sole laboratory provider of NAAT diagnostic and screening services in Manitoba for gonorrhea and chlamydia. For the most current information regarding specimen collection, refer to the specimen collection instructions provided by CPL in the online CPL Guide to Services <http://www.gov.mb.ca/health/publichealth/cpl/docs/guide.pdf> . If CPL specimen collection requirements change, the changes will be reflected in the online CPL *Guide to Services* and will also be communicated to practitioners by letter from CPL.

- **Adult Male/Female Urine:** Urine is the preferred specimen for males and it is the only recommended specimen for females without a cervix (e.g., due to hysterectomy) or those refusing a complete genital examination. The patient should not have voided for at least one hour prior to specimen collection. The first 20-30 mL (not midstream) of urine should be collected in a sterile plastic preservative-free container. Transfer the urine as soon as possible (within 24 hours of collection) to the urine specimen transport tube provided in the CPL-provided urine specimen collection kit. Store at 2° - 30° C until transportation to CPL is available.
- **Adult Male Urethral and Female Endocervical Swab Specimens:** The CPL-provided unisex swab specimen collection kit is used for female endocervical and male urethral swab specimens. In Manitoba, vaginal swab testing using an Aptima Unisex swab, may be considered for prepubertal girls, not women. At this time, vaginal swabs submitted on females over the age of 12 will not be processed. Males should **NOT** have urinated one hour prior to specimen collection. Only the swab in the NAAT kit should be used. After collection of the endocervical/urethral specimen, place the collection swab into the swab specimen transport tube.

NOTE: The Aptima Combo 2® test performed at CPL has not been approved for conjunctival specimens. Laboratory results obtained for conjunctival specimens will be reported as “for investigational purposes only”. The Aptima Combo 2® test has not been validated for rectal and pharyngeal specimens and if received, such specimens would be rejected. Refer to “Adult Male/Female Non-genital Specimens” below.

6.2 Culture:

Cultures obtained less than 48 hours after exposure may give false negative results (9). Culture is more likely to be successful when the specimen can be processed in the laboratory within 24 hours from specimen collection. All suspected treatment failures should be investigated using culture, which allows for antimicrobial susceptibility testing (9). Culture, in addition to applicable NAAT, is also strongly recommended in the following situations:

- To determine antibiotic susceptibilities prior to treatment, when possible;
- As a **test of cure** for suspected treatment failure or in situations where there is an increased probability of treatment failure;
- For symptomatic MSM;
- In the case of sexual abuse/sexual assault (rectal, pharyngeal, vaginal);
- For specimens taken from children under 12 years of age (see Prepubertal Children below)
- To evaluate pelvic inflammatory disease (PID) or any other suspected extra-genital non-gonococcal infection; and
- If the infection was acquired in countries or areas with high rates of antimicrobial resistance (9).

See section below “Adult Male/Female Non-genital Specimens” for how to obtain specimens for culture.

Adult Male/Female Non-genital Specimens:

Culture is necessary for specimens obtained from all non-genital sites (i.e., throat, rectum, eye). Oropharyngeal specimens are indicated in females and males (e.g., MSM) with a history of performing

oral sex (9). Rectal specimens are indicated in females with anogenital symptoms, females with a history of receptive anal intercourse (whether or not condoms were used), and in MSM who practice receptive anal intercourse (whether or not condoms were used) (9).

When culture is indicated, use the swab in Amies Charcoal Transport medium (or equivalent) tube to obtain the specimen. Amies Charcoal Transport media is available through the Materials Distribution Agency (MDA).

Alternatively, a swab inoculated to a modified Thayer Martin plate (or equivalent) can be sent if it can be delivered immediately to the laboratory. Culture of gonorrhea is compromised if the specimen is frozen, thawed or heated before arrival at the laboratory.

6.3 Testing in Children:

Prepubertal Children: Although non-culture techniques are considered diagnostic, culture is always strongly recommended for specimens from children. Specimens for culture from children should follow the same collection procedure as described above for adults although sites sampled may differ (i.e., vagina from girls).

NOTE: Children aged 12 or under, presenting with vaginal, urethral or rectal discharge (or older children with any suggestion of sexual abuse) require diagnostic testing from the pharynx and rectum as well as from the vagina (girls) or urethra (boys). See the Manitoba Health, Healthy Living and Seniors protocol *Children with Sexually Transmitted Diseases*.

Newborn: Although the non-culture techniques are considered diagnostic, culture is always strongly recommended for all specimens from newborns for potential medicolegal purposes, antimicrobial sensitivity testing and/or testing for other organisms. Use the specimen collection procedure for culture as described above under “Adult Male/Female Non-genital Specimens” for both genital and non-genital sites in newborns.

7. Key Investigations for Public Health Response

- Interview case for history of exposure, risk assessment, contacts, adequacy of treatment and promotion of safer sex practices.
- Interview contacts and offer epidemiological treatment, with risk assessment and promotion of safer sex practices.

8. Management

8.1 Management of Cases:

- Appropriate specimens for testing should be obtained prior to initiating treatment as detailed in section 6.
- **All laboratory-confirmed gonorrhea cases should be treated.**
- Treatment should be offered to the following while awaiting culture or NAAT results:
 - Mothers of infected neonates.
 - When Gram-negative diplococci are observed in urethral exudates in postpubertal males.
 - There is urethral/cervical mucopurulent discharge.
 - For contacts of partners infected with gonorrhea.
 - Individuals at high risk of infection AND follow-up is not assured.
 - Sexual assault victims.
- Patients who have gonococcal infection and are also infected with HIV should receive the same treatment regimens as those who are HIV negative (11).
- All patients treated for gonorrhea should also be treated for chlamydia due to the high rates of concomitant infection (9). All of the treatment recommendations for adults and children in this protocol (refer to Tables 1-3) include azithromycin which is effective treatment for chlamydia (9).
- Testing for other infections:

- HIV counselling and testing are recommended (3, 9).
- Testing for chlamydia, syphilis and hepatitis B is recommended (9).
- Serologic testing for hepatitis C is recommended for high risk individuals (e.g., injection drug users, individuals with a history of incarceration).
- Immunization:
 - Hepatitis B immunization is recommended if not already immune (9).
 - Hepatitis A immunization is recommended for high risk individuals (e.g., MSM, injection drug users) (6). Refer to the current *Canadian Immunization Guide* at: <http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-eng.php>.
 - The human papillomavirus (HPV) vaccine should be discussed with male and female patients as per the recommendations in the current *Canadian Immunization Guide* at: <http://www.phac-aspc.gc.ca/publicat/cig-gci/p04-eng.php>.
- Patient education on prevention should be provided including:
 - The risk of reinfection;
 - The need for the index case and his/her sex partner(s) to abstain from unprotected sex until at least 3 days after completion of treatment and the case/contact(s) are asymptomatic (i.e., signs and symptoms have resolved) (9);
 - Barrier methods of contraception (12); and
 - Risks associated with various sex activities and ways to reduce the risk of acquiring sexually transmitted infections (STIs) (12).
- Cases should be interviewed to obtain information on contacts so that contact

notification can be initiated. Refer to *Management of Contacts* below.

- Patients diagnosed with gonorrhoea should be educated about antibiotic resistance and instructed to return to care if symptoms do not resolve in 3-5 days or if test of cure is recommended (13).

Special Considerations for the Pregnant Woman:

- See Tables 1-3 for treatment regimens.
- Always consult with an appropriate specialist if you are unclear about a medication risk in pregnancy (14).
- A test of cure is recommended for all pregnant women and their sex partners (14).
- Neonates born to infected mothers must be tested and treated for gonorrhoea (9). Refer to “Neonatal Infection” below.

Children:

See Tables 1-3 for treatment. Sexual abuse must be considered when genital, rectal or pharyngeal gonorrhoea is diagnosed in any child beyond the neonatal period (2, 9). Consultation with a colleague experienced in such cases should be sought (9). Siblings and other children at risk should also be evaluated (9). Refer to the Manitoba Health, Healthy Living and Seniors protocol *Children with Sexually Transmitted Diseases* for management and additional mandatory reporting requirements. Consultation with experts for the reporting, referral and management of such cases should be sought. Refer to *Reporting of Child Protection and Child Abuse: Handbook and Protocols for Manitoba Service Providers* available at: http://www.pacca.mb.ca/ESW/Files/Handbook_Child_Protection_and_Child_Abuse_Web_Links.pdf.

Neonatal Infection:

- Treatment should be initiated without waiting for test results (9). Consultation with an expert in infectious diseases should be initiated as soon as possible. Refer to Tables 2 and 4 for initial treatment recommendations.

- When a neonate is confirmed to have gonorrhea, the mother and her most recent sex partner plus any other partners within 60 days of delivery should be located, clinically evaluated and empirically treated, regardless of clinical findings and without waiting for test results (9).

Disseminated Gonococcal Infections (DGI):

- Refer to Tables 3 and 4 below for recommended treatment.

Infection Prevention and Control Measures:

Routine Practices. Refer to page 96 of the Manitoba Health, Healthy Living and Seniors document *Routine Practices and Additional Precautions: Preventing the Transmission of Infection in Health Care* available at:

<http://www.gov.mb.ca/health/publichealth/cdc/docs/ipc/rpap.pdf>.

Treatment:

Treatment recommendations for gonorrhea are based on the *Canadian Guidelines on Sexually Transmitted Infections Gonococcal Infections Chapter* (July 2013) available at: <http://www.phac-aspc.gc.ca/std-mts/sti-its/cgsti-ldcits/assets/pdf/section-5-6-eng.pdf>.

Due to the increase in quinolone-resistant *N. gonorrhoeae*, fluoroquinolones such as ciprofloxacin, levofloxacin and ofloxacin are no longer recommended for treating gonococcal infections in Manitoba.

Penicillin and tetracyclines should not be used for the treatment of gonorrhea as resistance is high (9).

Refer to Tables 1-4 below for specific gonorrhea treatment recommendations. Combination therapy is recommended in response to increasing antimicrobial resistance (9). Manitoba Health, Healthy Living and Seniors provides drugs for treatment of bacterial STIs to practitioners in the provincial jurisdiction at no charge; however, not all of the recommended regimens listed in this protocol are publicly-funded. To order the publicly-funded STI drugs, refer to the *Manitoba Health STI*

Medication Order Form:

<http://www.gov.mb.ca/health/publichealth/cdc/protocol/form11.pdf>.

Refer to Appendix A for management of acute pelvic inflammatory disease (PID).

Medication-specific Considerations:

- Where possible, directly observed therapy with single-dose regimens is recommended (9).
- Clinicians should base their treatment choices and tailor recommendations on local epidemiologic data where available (9).
- Cefixime and ceftriaxone should not be given to patients who are allergic to cephalosporins (9). An appropriate specialist should be consulted for patients who are allergic to cephalosporins.
- Azithromycin should not be used as monotherapy unless cephalosporins are contraindicated as resistance has been reported (9).

Antibiotic Resistance:

Local Public Health should be promptly notified of cefixime, ceftriaxone or azithromycin treatment failures (9).

Gonococcal resistance to common antimicrobials may be plasmid or chromosomally mediated.

Once regional resistance to an antibiotic reaches three to five per cent, empiric therapy using that antimicrobial regimen is no longer recommended. Antibiotic resistance can only be confirmed through laboratory testing using culture and antimicrobial susceptibility testing of the organism.

In 2009 in Manitoba, of 34 *N. gonorrhoeae* isolates submitted to CPL for antimicrobial susceptibility testing, 5.9% were resistant to ciprofloxacin. In 2010, of 24 isolates submitted, 29.2% were resistant to ciprofloxacin. All gonococcal isolates submitted in 2010 for susceptibility testing were sensitive to azithromycin, cefixime and ceftriaxone. This information should be interpreted carefully as the

number of isolates is so low that it is impossible to draw any concrete conclusions. The number of isolates submitted for antimicrobial susceptibility testing at CPL continues to decline, presumably due to the predominant use of molecular testing. The higher percentage of isolates resistant to ciprofloxacin in 2010 may be partially due to selective culturing as a result of treatment failure. As of January 19, 2012 in Manitoba, all submitted isolates were susceptible to ceftriaxone and cefixime but the minimum inhibitory concentrations (MICs) (i.e., amount of antibiotic required to kill the bacteria) are slowly increasing over time, consistent with Public Health Agency of Canada findings.

Case Follow-up:

- Test of cure for *N. gonorrhoeae* from all initial positive sites is important in the following situations/individuals:
 - All pharyngeal infections;
 - Persistent symptoms or signs post-therapy;
 - Case treated with a regimen other than the preferred regimen;
 - Case is linked to another case with documented antimicrobial resistance to the treatment given;
 - Antimicrobial resistance to the administered therapy is documented;
 - Case is linked to a treatment failure case that was treated with the same antibiotic;
 - Treatment failure for gonorrhea has occurred previously for current infection in the individual;
 - There is re-exposure to an untreated partner;
 - Infection occurs during pregnancy;
 - Disseminated gonococcal infection is diagnosed;
 - Case is a child;
 - Follow-up testing should be considered for PID if *N. gonorrhoeae* was initially isolated;
 - Women undergoing therapeutic abortion (TA) who have a positive test result for gonococcal infection, as they are at increased risk of developing pelvic inflammatory disease (9).
 - When indicated, test of cure should be performed from all positive sites:
 - By culture 3 -7 days after completion of therapy (9).
 - By NAAT (if culture is not available) at least 2-3 weeks after completion of treatment to avoid false positive results due to the presence of non-viable organisms (9). Note that NAAT is only useful as a test of cure for genital infections. Refer to the online CPL *Guide to Services* for more information:
<http://www.gov.mb.ca/health/publichealth/cpl/docs/guide.pdf>.
 - Treatment failures* should be investigated using culture to allow for antimicrobial susceptibility testing (9).
 - Cases of gonorrhea should be retested six months post-treatment (9) or whenever the patient seeks medical care within the following 12 months (11) as reinfection is common.
- * Defined as no reported sexual contact during the post-treatment period AND one of the following:
- Presence of intracellular Gram-negative diplococci on microscopy taken at least 72 hours after completion of treatment.
 - Positive *N. gonorrhoeae* on culture taken at least 72 hours after completion of treatment.
 - Positive NAAT taken at least 2-3 weeks after completion of treatment (9).

Table 1. Recommended Treatment Regimens for Uncomplicated Gonorrhoea

Indication	Preferred Treatment ¹	Alternate Treatment ¹
Anogenital infection (urethral, endocervical, vaginal, rectal) in adults and youth ≥ 9 years of age	Ceftriaxone 250 mg IM in a single dose PLUS azithromycin 1 g PO in a single dose ² OR Cefixime 800 mg PO in a single dose ³ PLUS azithromycin 1 g PO in a single dose ²	Spectinomycin 2 g IM in a single dose ⁴ PLUS azithromycin 1 g PO in a single dose ² OR Azithromycin 2 g PO in a single dose ⁵
Pharyngeal infection in adults and youth ≥ 9 years of age	Ceftriaxone 250 mg IM in a single dose PLUS azithromycin 1 g PO in a single dose ²	Cefixime 800 mg PO in a single dose ³ PLUS azithromycin 1 g PO in a single dose ² OR Azithromycin 2 g PO in a single dose ⁵
Anogenital infection (urethral, rectal) in men who have sex with men (MSM)	Ceftriaxone 250 mg IM in a single dose PLUS azithromycin 1 g PO in a single dose ²	Cefixime 800 mg PO in a single dose ³ PLUS azithromycin 1 g PO in a single dose ² OR Spectinomycin 2 g IM in a single dose ⁴ PLUS azithromycin 1 g PO in a single dose ² OR Azithromycin 2 g PO in a single dose ⁵
Pharyngeal infection in MSM	Ceftriaxone 250 mg IM in a single dose PLUS azithromycin 1 g PO in a single dose ²	Cefixime 800 mg PO in a single dose ³ PLUS azithromycin 1 g PO in a single dose ² OR Azithromycin 2 g PO in a single dose ⁵

¹ General consensus of the Expert Working Group for the *Canadian Guidelines on Sexually Transmitted Infections*.

² **Alternate combination therapy:** Azithromycin 1 g PO is preferred over the alternative of doxycycline 100 mg PO bid x 7 days due to significant rates of tetracycline-resistant gonorrhoea and concerns regarding compliance with a 7 day treatment regimen. **Doxycycline is contraindicated in pregnant and breastfeeding women.**

³ There is scientific evidence that cefixime 800 mg is safe and effective in treating gonococcal infections. Pharmacodynamic studies have shown that 800 mg of cefixime compared to 400 mg, increases the period when the free drug concentration exceeds the MIC. Therefore, a dosage of 800 mg may be more effective than the previously recommended 400 mg at reducing risk of gonococcal treatment failure in settings of reduced cephalosporin susceptibility.

⁴ Available only through Health Canada's Special Access Program (SAP) <http://www.hc-sc.gc.ca/dhp-mps/acces/drugs-drogués/index-eng.php>

⁵ Azithromycin 2 g PO in a single dose should only be considered as an alternate treatment option if there is a history of severe allergy to cephalosporins. It is important to recognize the risk of treatment failure when using azithromycin monotherapy for the treatment of gonorrhoea in settings of emerging azithromycin resistance. There are also significant gastrointestinal side effects associated with high dose azithromycin. A test of cure is recommended when monotherapy with azithromycin is used.

Table 2. Recommended Treatment Regimens for Uncomplicated Gonorrhoea in Children < 9 Years of age

Indication	Preferred Treatment ⁶	Alternate Treatment ⁶
Anogenital infection (urethral, vaginal, rectal)	Cefixime 8 mg/kg PO BID x 2 doses ⁷ (maximum 400 mg per dose) PLUS azithromycin 20 mg/kg (maximum dose of 1 g) PO in a single dose OR Ceftriaxone 50 mg/kg IM up to 250 mg in a single dose PLUS azithromycin 20 mg/kg (maximum dose of 1 g) PO in a single dose	Spectinomycin 40 mg/kg IM in a single dose (maximum dose of 2 g) ⁸ PLUS azithromycin 20 mg/kg (maximum dose of 1 g) PO in a single dose
Pharyngeal infection	Ceftriaxone 50 mg/kg IM up to 250 mg in a single dose PLUS azithromycin 20 mg/kg (maximum dose of 1 g) PO in a single dose	Cefixime 8 mg/kg PO BID x 2 doses ⁷ (maximum 400 mg per dose) PLUS azithromycin 20 mg/kg (maximum dose of 1g) PO in a single dose
<p>Important notes related to neonates (birth to one month of age):</p> <ul style="list-style-type: none"> • In neonates the recommended dosage for ceftriaxone is 25-50 mg/kg (maximum 125 mg). • Routine combination therapy with a macrolide is not recommended due to the association with pyloric stenosis. Testing should be done for chlamydia and if results are positive, treatment should be provided as per the Chlamydia protocol http://www.gov.mb.ca/health/publichealth/cdc/protocol/chlamydia.pdf. 		

⁶ General consensus of the Expert Working Group for the *Canadian Guidelines on Sexually Transmitted Infections*.

⁷ Wherever possible, oral therapies are recommended for children. Recommendations for the use of cefixime are based on data showing efficacy in the treatment of infections caused by organisms similar to *N. gonorrhoeae*. Because there is limited experience with the use of cefixime in children with gonococcal infections, antimicrobial susceptibility should be ascertained and a follow-up culture ensured. If follow-up cannot be ensured, ceftriaxone should be used in place of cefixime.

⁸ Available only through Health Canada's Special Access Program (SAP) <http://www.hc-sc.gc.ca/dhp-mps/acces/drugs-drogués/index-eng.php>

Table 3. Recommended treatment for gonococcal ophthalmia and disseminated infections in adults and youth > 1 month old

Infection	Preferred initial treatment for adults and youth ≥ 9 years of age (while awaiting consultation with an experienced colleague) ⁹	Preferred initial treatment for children > 1 month to < 9 years of age (while awaiting consultation with an infectious diseases expert) ⁹
Arthritis	Ceftriaxone 2 g IV/IM daily for 7 days ⁹ PLUS azithromycin 1 g PO in a single dose ¹⁰	Ceftriaxone 50 mg/kg IV/IM ¹¹ daily for 7 days (maximum dose of 1 g/day) ⁹ PLUS azithromycin 20 mg/kg (maximum dose of 1 g) PO in a single dose
Meningitis	Ceftriaxone 2 g IV/IM ¹¹ daily for 10 - 14 days ⁹ PLUS azithromycin 1 g PO in a single dose ¹⁰	Ceftriaxone 50 mg/kg IV/IM ¹¹ q12h for 10-14 days (maximum of 1 g/dose and 2 g/day) ⁹ PLUS azithromycin 20 mg/kg (maximum dose of 1 g) PO in a single dose
Endocarditis	Ceftriaxone 2 g IV/IM ¹¹ daily for 28 days ⁹ PLUS azithromycin 1 g PO in a single dose ¹⁰	Ceftriaxone 50 mg/kg IV/IM ¹¹ q12h for 28 days (maximum of 1 g/dose and 2 g/day) ⁹ PLUS azithromycin 20 mg/kg (maximum dose of 1 g) PO in a single dose
Ophthalmia	Ceftriaxone 2 g IV/IM in a single dose ⁹ PLUS azithromycin 1 g PO in a single dose ¹⁰	Ceftriaxone 50 mg/kg IV/IM in a single dose (maximum dose of 2 g) PLUS azithromycin 20 mg/kg (maximum dose of 1 g) PO in a single dose ⁹
Note: Hospitalization is indicated for meningitis and may also be indicated for other disseminated infections in adults and youth ≥ 9 years of age. Hospitalization is indicated for all disseminated infections in youth < 9 years.		

These guidelines are based on the general consensus of the Expert Working Group for the *Canadian Guidelines on Sexually Transmitted Infections*.

⁹ This is the usual duration of therapy but all cases should be discussed with an infectious diseases expert.

¹⁰ **Alternate combination therapy:** Azithromycin 1 g PO is preferred over the alternative of doxycycline 100 mg PO bid x 7 days due to significant rates of tetracycline-resistant gonorrhoea and concerns regarding compliance with a 7 day treatment regimen. **Doxycycline is contraindicated in pregnant and breastfeeding women.**

¹¹ IM administration should only be considered if an IV line is not available.

Table 4. Recommended treatment for ophthalmia neonatorum and disseminated infection in neonates

Note: Refer to “Neonatal Contacts” below for prophylaxis of neonates born to women with untreated gonorrhoea.

Indication	Preferred Treatment ¹²	Important Notes
Ophthalmia neonatorum	Ceftriaxone 25-50 mg/kg IM in a single dose (maximum dose of 125 mg) ¹³	<ul style="list-style-type: none"> Irrigate eyes immediately with sterile normal saline and at least hourly as long as necessary to eliminate discharge. Prophylactic treatment for possible chlamydial co-infection is not recommended unless follow-up cannot be assured. Testing should be done for Chlamydia and if results are positive, treatment should be provided as per the Chlamydia protocol http://www.gov.mb.ca/health/publichealth/cdc/protocol/chlamydia.pdf. Hospitalization and consultation with an expert in infectious diseases should be initiated as soon as possible. Appropriate infection prevention and control precautions are necessary for all cases.
Neonates with disseminated gonococcal arthritis, meningitis or endocarditis	Cefotaxime 50 mg/kg IV/IM ¹⁴ q6h for 10-14 days ^{13, 15}	<ul style="list-style-type: none"> Hospitalization and consultation with an expert in infectious diseases should be initiated as soon as possible. Prophylactic treatment for possible chlamydial co-infection is not recommended unless follow-up cannot be assured. Testing should be done for chlamydia and if results are positive, treatment should be provided as per the Chlamydia protocol http://www.gov.mb.ca/health/publichealth/cdc/protocol/chlamydia.pdf.

¹² General consensus of the Expert Working Group for the *Canadian Guidelines on Sexually Transmitted Infections*.

¹³ Routine gonococcal combination therapy with a macrolide is not recommended due to the association with pyloric stenosis.

¹⁴ IM administration should only be considered if an IV line is not available.

¹⁵ This is the usual duration of therapy but all cases should be discussed with an infectious diseases expert.

8.2 Management of Contacts:

- Regulations under the *Public Health Act* require health care professionals to report all sex contacts of gonorrhea cases to Manitoba Health, Healthy Living and Seniors. Please use the *Notification of Sexually Transmitted Disease (NSTD)* form available at: <http://www.gov.mb.ca/health/publichealth/cdc/protocol/form3.pdf> to report cases and contacts.
- Patients should be referred to a physician, public health nurse or other health care professional for support with partner notification. Public Health will be notified of all cases in order to coordinate contact notification and management and ensure that it is completed to the extent possible.
- All partners who have had sexual contact with the index case within 60 days prior to symptom onset or date of specimen collection (if the index case is symptomatic) should be notified and tested for gonorrhea (9). Treatment should be offered, regardless of clinical findings and without waiting for test results (9).
- The length of time for the trace-back period should be extended if possible in the following circumstances:
 - To include additional time between the date of testing and date of treatment;
 - If the index case states that there were no partners during the recommended trace-back period, the most recent partner should be notified; and
 - If all partners traced (according to recommended trace-back period) test negative, the last partner prior to the trace-back period should be notified (9).
- Parents of infected neonates (i.e., mother and her sexual partner) and individuals implicated in sexual abuse/assault cases,

must be located, clinically evaluated and treated (9).

- Contacts should also be counseled and screened for other STIs, especially chlamydia, as there is a high rate of concomitant infection.

NOTE: When resources are limited, priority for partner notification should be directed toward youth/young adults < 25 years of age and partners who may be pregnant.

Neonatal Contacts:

- Neonates born to infected untreated mothers should be tested for gonorrhea (9). Conjunctivae should be cultured prior to administering antibiotics (9). If the infant is unwell in any way, blood and cerebrospinal fluid should also be cultured to rule out disseminated infection (9).
- Neonates born to women with untreated gonorrhea should be treated with ceftriaxone 25-50 mg/kg IM in a single dose (maximum dose of 125 mg) (9).
- Prophylactic treatment for possible chlamydial co-infection is not recommended unless follow-up cannot be assured (9).
- Testing should be done for chlamydia and if results are positive, treatment should be provided as per the Chlamydia protocol <http://www.gov.mb.ca/health/publichealth/cdc/protocol/chlamydia.pdf>.

8.3 Preventive Measures:

- Case and contact management as per sections 8.1 and 8.2.
- Educate the public and counsel individuals in an effort to promote safer sexual practices and the use of barrier contraceptives (4, 15).
- Promptly test individuals with compatible clinical syndromes (4).
- Test individuals with newly acquired STIs for other common infections (4).

- Test all pregnant women at least once during pregnancy. A repeat test in the third trimester is recommended for women at high risk of gonococcal infection (2, 16). Pregnant women who were not screened during pregnancy should be screened for *N. gonorrhoeae* at delivery (16).
- Undertake case-finding in individuals who are at higher risk of infection with gonorrhea (9). Frequency of testing will depend upon individual risk circumstances:
 - Individuals who have had sexual contact with a person with a confirmed or suspected gonococcal infection;
 - Individuals who have had unprotected sex with a resident of an area with high gonorrhea burden and/or high risk of antimicrobial resistance;
 - Individuals with a history of previous gonococcal infection;
 - Individuals with a history of other sexually transmitted infections (e.g., chlamydia, HIV);
 - Sex workers and their sex partners;
 - Sexually active youth < 25 years of age;
 - Street-involved youth and other homeless populations;
 - Men who have unprotected sex with men;
 - Individuals who have sex with multiple and/or casual/anonymous partners.
 - Individuals requesting STBBI screening (5).
- Implement ocular prophylaxis of all infants immediately after birth to prevent ophthalmia neonatorum (4). Prophylaxis may be delayed for as long as one hour after birth to facilitate parent-infant bonding (4). Please note that these recommendations are subject to change while the recently released Canadian Paediatric Society Position

Statement on Preventing ophthalmia neonatorum

(<http://www.cps.ca/en/documents/position/ophthalmia-neonatorum>) is being reviewed.

Additional Resources for Health Care Professionals

Canadian Guidelines on Sexually Transmitted Infections. Available at: <http://www.phac-aspc.gc.ca/std-mts/sti-its/index-eng.php>

Sexual Health Information Line (Nine Circles Community Health Centre), Winnipeg, 204-945-2437, Outside Winnipeg, 1-800-782-2437.

Sexuality Education Resource Centre, Manitoba, 204-982-7800.

APPENDIX A: Management of Acute Pelvic Inflammatory Disease (PID)

Early diagnosis and treatment are crucial to the maintenance of fertility (17).

- Acute pelvic inflammatory disease results from the ascending spread of microorganisms from the vagina and endocervix to the upper female genital tract including the endometrium, fallopian tubes, pelvic peritoneum and contiguous structures (17).
- This syndrome includes any combination of endometritis, salpingitis, tubo-ovarian abscess and pelvic peritonitis (11).
- Etiologic agents include *N. gonorrhoeae*, *C. trachomatis* and other organisms such as anaerobes, enteric gram negative rods, streptococci and some mycoplasma.
- Acute PID may be difficult to diagnose because of the wide variation in presenting symptoms and signs. Many women with PID have subtle or mild symptoms.

- There is no single historical, physical or laboratory finding that is both sensitive and specific for the diagnosis of PID (11, 17).
- The minimum diagnostic criteria for PID includes the following:
 - Lower abdominal tenderness and
 - Uterine/adnexal tenderness or
 - Cervical motion tenderness (11, 17).
- Additional criteria that support a diagnosis of PID and enhance the specificity of the diagnosis, in addition to the minimum criteria include:
 - Oral temp > 38.3°C
 - Presence of white blood cells (WBC) on saline microscopy of vaginal secretions/wet mount
 - Elevated erythrocyte sedimentation rate
 - Elevated C - reactive protein
 - Abnormal cervical or vaginal mucopurulent discharge
 - Laboratory documentation of cervical infection with *N. gonorrhoeae* or *C. trachomatis* (11, 17).
- Definitive diagnostic criteria include:
 - Endometrial biopsy with histopathologic evidence of endometritis (at least 1 plasma cell per x 120 field and at least 5 neutrophils per x 400 field);
 - Transvaginal sonography or other imaging techniques showing thickened fluid-filled tubes, with or without free pelvic fluid or tubo-ovarian complex; or
 - Gold standard: Laparoscopy demonstrating abnormalities consistent with PID, such as fallopian tube erythema and/or mucopurulent exudates (17).

Treatment:

- Goals of treatment are to control acute infection and to prevent long-term sequelae such as infertility, ectopic pregnancy and chronic pelvic pain (17).
- Empiric treatment for PID should be initiated in women at risk for STIs if the minimum criteria are present and no other causes for the illness can be identified.
- The management of women with PID is considered inadequate unless their sexual partners are also clinically evaluated (18).
- Treatment regimens should provide coverage for *N. gonorrhoeae*, *C. trachomatis*, Gram-negative facultative bacteria and streptococci. Anaerobic coverage (metronidazole) should be considered, but whether elimination of anaerobes from the upper tract is necessary remains to be answered even though anaerobes are detected in the majority of PID cases (17).

The recommended combination treatment below is covered by Manitoba Health, Healthy Living and Seniors. There are other effective treatment regimens for PID that health care providers may wish to prescribe; however, only the regimens described below are publicly-funded in Manitoba. To order the publicly-funded STI drugs, refer to the *Manitoba Health STI Medication Order Form*: <http://www.gov.mb.ca/health/publichealth/cdc/protocol/form11.pdf>.

Ceftriaxone 250 mg IM in a single dose followed by

Doxycycline 100 mg orally twice a day for 14 days with or without

Metronidazole 500 mg orally twice a day for 14 days.

Precautions: Ceftriaxone should not be given to persons with a cephalosporin allergy or a history of immediate and/or anaphylactic reactions to penicillins (17). Doxycycline is contraindicated in pregnancy, lactation and children under nine years of age. Patients should not drink alcohol during and for 24 hours after oral therapy with metronidazole because of a possible disulfiram (antabuse) reaction (17).

For patients with contraindications to treatment with cephalosporins, recent evidence suggests that short course **azithromycin** at a dose of either 250 mg PO daily for one week or 1 gram PO weekly for

two weeks **combined with oral metronidazole** is effective in producing a clinical cure for acute PID (17).

- Some patients will require hospitalization. The decision of whether hospitalization is necessary should be based on the discretion of the health care provider.
- Individuals treated as outpatients need careful follow-up and should be re-evaluated 2 to 3 days after therapy is initiated (17). If no clinical improvement has occurred, hospital admission for parenteral therapy, observation and consideration for laparoscopy is required; consultation with colleagues experienced in the care of these patients should be considered (17).
- Some specialists also recommend rescreening for *N. gonorrhoeae* and *C. trachomatis* four to six weeks after therapy is completed in women with documented infection.
- Pregnant patients with suspected PID should be hospitalized for evaluation and treatment with parenteral therapy; consultation with an expert should be sought.

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