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1988 Canadian Guidelines for the Treatment of Sexually Transmitted Diseases in Neonates, Children, Adolescents and Adults

Health and Welfare Canada

Santé et Bien-être social Canada

Canada

Minister of National Health
and Welfare

CANADA

Ministre de la Santé nationale
et du Bien-être social

OTTAWA, K1A 0K9

Because of our common commitment to attaining equality in health care, I am sending you a copy of the 1988 **"Canadian Guidelines for the Treatment of Sexually Transmitted Diseases in Neonates, Children, Adolescents and Adults".**

These Guidelines arose from a recommendation of my **Expert Interdisciplinary Advisory Committee on STDs in Children and Youths**. Considerable collaborative effort on the part of representatives of specialist medical societies, the Provincial and Territorial Directors of STD control and Departmental officers has contributed to the preparation of these Guidelines.

The publication is unique in that, for the first time in Canada, the management of disease syndromes as well as specific infections is addressed. The problem of STDs in prepubertal children as possible indicators of sexual abuse is considered. The treatment regimens of choice are based on efficacy data from recently reported studies.

I trust you will find these Guidelines informative and helpful in our efforts to control the spread of sexually transmitted diseases in Canada.

Jake Epp

1988

Canadian Guidelines for the Treatment of Sexually Transmitted Diseases in Neonates, Children, Adolescents and Adults

Bureau of Communicable Disease Epidemiology, Laboratory Centre for Disease Control,
Health Protection Branch, Department of National Health and Welfare, Ottawa, in collaboration with
the Canadian Paediatric Society, the Canadian Infectious Disease Society,
the Canadian Public Health Association and the provincial and territorial directors of STD control

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PREFACE

These guidelines were developed on the advice of the Expert Interdisciplinary Advisory Committee on Sexually Transmitted Diseases in Children and Youths.

The establishment of this committee arose from a recommendation of the report of the Committee on Sexual Offences Against Children and Youths (*Sexual Offences Against Children* [cat no J 2-50/1984E], Dept of Supply and Services, Ottawa, 1984). This committee was appointed by the Minister of Justice and Attorney-General of Canada and the Minister of National Health and Welfare in December 1980 and was charged with "inquiring into the incidence and prevalence in Canada of sexual offences against children and youths and recommending improvements in laws for the protection of young persons from sexual abuse and exploitation".

Accordingly, these guidelines are dedicated to the children of Canada who are victims of sexual offences and whose dignity and worth must be preserved.

The guidelines for the treatment of sexually transmitted diseases were established after careful deliberation by a group of acknowledged authorities from Canadian specialist societies and provincial control jurisdictions. They should be construed not as rules, but rather as a source of guidance for physicians in Canada. This is particularly true for items that may be controversial or are based on limited data.

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Acknowledgement: *The assistance and cooperation of Louise Painchaud of the Canadian Paediatric Society in preparing this document are greatly appreciated.*

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INTRODUCTION

The purpose of this manual is to provide Canadian guidelines for the treatment of sexually transmitted diseases (STDs) in neonates, children, adolescents and adults. The recommendations for adolescents are essentially the same as those for adults, but there are some special considerations for the former group. Good efficacy data are available for some of the STDs in adults (Appendix A); however, some treatment recommendations are based on incomplete data. Suggested treatments are listed in order of preference. Appendix B lists appropriate antimicrobial doses according to weight.

In children and neonates there are very few useful studies on which to base recommendations. Because of this, it must be stressed that careful clinical assessment and follow-up are especially important.

Multiple STD infections

The presence of a sexually transmitted infection should alert the clinician to the likelihood of infection with other sexually transmitted organisms, including the AIDS (acquired immune deficiency syndrome) virus (human immunodeficiency virus [HIV]). Attention should be focussed on management of disease syndromes, not just on infection by a single organism. A careful and thorough search with examination, serologic tests, smears and cultures is essential to determine appropriate treatment programs.

Sexual abuse

STDs are transmitted primarily by sexual contact. These infections *do* occur in children and adolescents. The presence of any of the following in *any prepubertal child* (female: no breast budding; male: no penile or testicular enlargement) *should make consideration of sexual abuse mandatory:* gonorrhea, chlamydial infection (except that acquired perinatally), syphilis (except congenital), genital warts, trichomoniasis, genital herpes infection and bacterial vaginosis.

Hospitalization may be indicated until such time as the situation can be clarified. Adequate microbiologic documentation must be obtained by taking appropriate slides and cultures and performing other tests. This information can be obtained from a specialist (Appendix C) or an authoritative manual.

Confidentiality

Confidentiality of records and medical services must be assured in both inpatient and outpatient settings.

Sexual history

A careful sexual history should include details of the specific types of sexual activity, sites of sexual contact, sexual orientation, use of condoms, use of birth control, number of partners, previous STDs and STD symptoms in the patient and partner(s). Terminology that is understood by the patient must be used. This is particularly important for the prepubescent child and young adolescent.

Contacts

The source of the STD must be found and treated. This includes sexual contacts and parent(s) of infected neonates, as well as sexual abuse perpetrators.

Sexual activity must not be resumed until the patient and partner(s) are adequately treated and have returned for a test of cure.

Compliance

Compliance with treatment protocols may be a significant problem for many individuals. Therefore, treatment for outpatients should be as simple as possible without compromising therapeutic principles. Access to facilities, cost of medication, dosage schedule and perception of the severity of illness all affect compliance.

Education and counselling

Individuals are often not adequately educated in methods of protecting themselves from infection with an STD or pregnancy. Appropriate education and counselling must be provided and must include information on STDs, including AIDS, and how to have safer sex. Education and counselling should be adjusted to the cognitive and emotional development of the individual patient.

Follow-up

Rigorous follow-up is necessary for all STDs to determine whether there has been an appropriate clinical and microbiologic response to therapy and whether there is now evidence of infection with a second organism.

Other STDs

This manual does not include information on all of the possible STDs. It has focussed on the most common diseases in our population and their associated syndromes. This does not imply that other diseases are not serious or important. Information on these diseases is available from other sources.

Isolation of hospitalized patients with STDs

Most hospitalized patients who have an STD are not infectious to their health care providers or other patients. Good handwashing technique on the part of older patients and health care providers must be stressed. Neonates and infants with gonococcal ophthalmia, disseminated gonococcal disease, disseminated or mucocu-

taneous herpes simplex or congenital syphilis must be isolated according to accepted infection control protocols.

Reporting of STDs

Many STDs are reportable by law to the local medical officer of health. Local regulations should be consulted regarding the reportability of specific STDs (Appendix D). Reporting of STDs is an important facet of STD control. Reporting not only results in statistical information and disease trends but also provides a method of ensuring that both the patient and his or her sexual contacts have been adequately treated. If there are further specific questions regarding diagnosis and treatment or response to treatment a specialist in the field should be consulted.

Special considerations for adolescents

As many sexually active adolescents use no birth control and are at risk of *becoming pregnant*, treatment regimens for STD in pregnancy must be considered.

Street youths and others whose compliance with medical follow-up is in doubt should have appropriate laboratory investigations done and receive treatment for gonorrhea and chlamydial infection independent of clinical findings and before culture results are available.

Contact tracing can be more difficult in the adolescent group, and compliance with treatment and follow-up is often poor.

Compliance can be a significant problem in the adolescent. Therefore, treatment for outpatients should be as simple as possible without compromising therapeutic principles. Access to facilities, cost of medication, dosage schedule and perception of the severity of illness all affect compliance.

Hospitalization is strongly recommended for all adolescents with pelvic inflammatory disease (PID). As compliance with either medical regimens or appointments may be a problem for many teenagers, optimal treatment cannot be guaranteed on an outpatient basis. Since the sequelae of poorly treated PID are so profound, particularly in terms of increasing risks of infertility, ectopic pregnancies and chronic pelvic pain, aggressive inpatient therapy should always be favoured over outpatient management. If hospitalization is not possible, close outpatient follow-up is mandatory. Hospitalization may also be indicated if sexual abuse is suspected.

Educational counselling regarding STD prevention, as well as *birth control counselling*, should accompany medical treatment of STD in all adolescents, both male and female. It should be adapted to the cognitive and emotional development of the adolescent.

Neonates, children and adolescents at high risk of STD

Neonates

- One or both parents known to be infected.
- Mother from a high-risk group (e.g., prostitutes).
- STD status of mother unknown (i.e., no prenatal care, lack of screening tests).

Children who have been sexually abused

Individuals with signs or symptoms of infection

- Adolescents with urethritis, cervicitis, epididymitis or genital warts.
- Male adolescents with pyuria.
- Prepubescent children with urethritis, vaginitis, genital warts or genital herpes.
- Sexually active females with lower abdominal pain.

Individuals who are sexual contacts of proven or suspected STD cases

Individuals with possible exposure

- Adolescent prostitutes, both male and female.
- Sexually active adolescents.
- Pregnant adolescents.
- Adolescents undergoing therapeutic abortion.
- Siblings of sexual abuse cases.
- Drug abusers.

STD cannot be dismissed as a minor problem in the pediatric age group. There were 566 cases of gonorrhea per 100 000 female adolescents aged 15 to 19 years in Canada in 1985. Furthermore, in 1985 there were 8502 (224.5 per 100 000) reported cases of gonorrhea in males and females aged 10 to 19 years, far more than the total incidence of all other reported diseases for this age group. Even more alarming, there were more than 23 cases per 100 000 girls between the ages of 10 and 14 years and 67 cases in children under 10 years of age.

Gonococcal infections

Gonococcal infections occur most frequently in the genital tract and present as urethritis and vaginitis in prepubertal girls and as cervicitis, urethritis, endometritis/salpingitis (PID) and bartholinitis in postpubertal females. In males, both prepubescent and adolescent, urethritis is the most common presentation. Gonorrhea may also cause epididymitis. Infection may occur at other mucous membrane sites, producing neonatal ophthalmia, conjunctivitis, pharyngitis or proctitis. Bacteremic spread can involve skin and joints, and can, on rare occasions, cause meningitis or endocarditis.

Asymptomatic infection occurs in both males and females and may involve the urethra, cervix, pharynx or rectum. All females, including children, should have rectal cultures if gonorrhea is suspected, even if there is *no* history of anal intercourse. Homosexual males who have had anal intercourse should also have rectal cultures.

Transmission of gonorrhea results from intimate sexual contact, particularly sexual intercourse, and also occurs at parturition.

All sexual contacts must be traced and clinically evaluated; appropriate cultures should be taken and treatment instituted without waiting for laboratory results.

Sexual abuse must be considered when genital, rectal or oral gonorrhea is found in children beyond the neonatal period.

Since the incubation period for gonorrhea is usually 2 to 7 days, cultures taken immediately after exposure may yield *false-negative* results.

Follow-up cultures are necessary to ensure effective treatment (Tables I to VI). These should be obtained 4 to 7 days after completion of therapy.

Since 20% to 30% of symptomatic cases of gonorrhea in heterosexual men and 40% to 50% of cases in women have documented coexisting chlamydial infection, all patients with gonococcal infection should also receive appropriate therapy for chlamydial infection (see section on chlamydial infections, page 6). Since homosexual men are less likely than heterosexual men to have coexistent chlamydial infections, routine additional tetracycline or doxycycline treatment is not recommended for homosexual men.

Types of antibiotic-resistant Neisseria gonorrhoeae

Penicillinase-producing* N. gonorrhoeae *(PPNG):

- Plasmid directed penicillinase production.
- Organism highly resistant to penicillins, including ampicillin and amoxicillin.
- Increasing problem in Canada.
- Prevalence varies in different parts of the country.

Chromosomally mediated resistant* N. gonorrhoeae *(CMRNG):

- Resistance due to changes in gonococcal cell wall.
- Organisms resistant to penicillins and often to tetracycline and erythromycin.
- Prevalence varies in different parts of the country.

Resistance to other recommended antibiotics may occasionally be encountered (e.g., high level of tetracycline resistance [TRNG]).

Treatment of antibiotic-resistant N. gonorrhoeae

Patients infected with PPNG, CMRNG or TRNG should be treated with spectinomycin or ceftriaxone and receive concurrent therapy for chlamydial infection where indicated. *Exception:* Oropharyngeal gonorrhea — use only ceftriaxone or trimethoprim/sulfamethoxazole (co-trimoxazole); spectinomycin is NOT adequate.

Penicillin-allergic patients

The treatments of choice for patients allergic to penicillin include the following:

- Ceftriaxone (NOT for cephalosporin-allergic patients or those with accelerated reactions to penicillins).
- Spectinomycin (NOT for oropharyngeal infection).
- Tetracycline (NOT for patients under 9 years of age, NOT for rectal infection and NOT for penicillin- or tetracycline-resistant gonorrhea).

If the above regimens are not suitable, a specialist should be consulted.

Table I — Treatment of gonococcal cervicitis, urethritis and prepubertal vaginitis*†‡

Children under 9 years of age	Adults, adolescents and children over 9 years of age
Penicillin-sensitive gonorrhea	
Amoxicillin or ampicillin, 50 mg/kg (maximum 3.0 g) po, *plus* probenecid, 25 mg/kg (maximum 1.0 g) po in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or** Ceftriaxone, 125 mg IM in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days	Amoxicillin, 3.0 g, or ampicillin, 3.5 g, po, *plus* probenecid, 1.0 g po in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or** Ceftriaxone, 250 mg IM in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days
Penicillin-resistant gonorrhea or penicillin-allergic patients	
Spectinomycin, 40 mg/kg (maximum 2.0 g) IM in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or** Ceftriaxone, 125 mg IM in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days	Spectinomycin, 2.0 g IM in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or** Ceftriaxone, 250 mg IM in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days

**Sexual abuse must be ruled out.*

†Follow-up cultures are necessary to ensure effective treatment. These regimens include appropriate therapy for concurrent chlamydial infections (tetracyclines‡). Contact tracing and treatment of contacts are important.

‡Tetracyclines should NOT be given to pregnant or lactating women or to children under 9 years of age. (See section on chlamydial infections, page 6.) Homosexual males are NOT frequently coinfected with *Chlamydia,* and, therefore, tetracyclines should only be given if concurrent chlamydial infection is found.

Table II — Treatment of pharyngeal gonococcal infection*†‡§

Children under 9 years of age¶	Adults, adolescents and children over 9 years of age
Penicillin-sensitive gonorrhea	
Aqueous procaine penicillin G, 100 000 U/kg (60 mg/kg; maximum 4.8×10^6 U) in single dose IM, *plus* probenecid, 25 mg/kg (maximum 1.0 g) po in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or** Ceftriaxone, 125 mg IM in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days	Aqueous procaine penicillin G, 4.8×10^6 U IM *plus* probenecid, 1.0 g po in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or** Ceftriaxone, 250 mg IM in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or** Tetracycline, 500 mg alone *qid* for 7 days
Penicillin-resistant gonorrhea	
Ceftriaxone, 125 mg IM in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days	Ceftriaxone, 250 mg IM in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or** Trimethoprim/sulfamethoxazole (co-trimoxazole), nine single-strength tablets daily for 5 days, taken as a single daily dose
Penicillin-allergic patients	
Ceftriaxone, 125 mg IM in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or** Erythromycin base, 40 mg/kg per day alone po in four divided doses for 7 days; follow-up cultures are particularly important since efficacy data for erythromycin for gonorrhea are limited	Ceftriaxone, 250 mg IM in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or** Tetracycline, 500 mg alone *qid* for 7 days

**Sexual abuse must be ruled out.*

†Ampicillin, amoxicillin and spectinomycin are not effective treatment for pharyngeal gonococcal infection.

‡Follow-up cultures are necessary to ensure effective treatment. These regimens include appropriate therapy for concurrent chlamydial infections (tetracyclines§). Contact tracing and treatment of contacts are important.

§Tetracyclines should NOT be given to pregnant or lactating women or to children under 9 years of age. (See section on chlamydial infections, page 6.) Homosexual males are NOT frequently coinfected with *Chlamydia,* and, therefore, tetracyclines should only be given if concurrent chlamydial infection is found.

¶Efficacy data in this setting are very limited.

Table III — Treatment of anorectal gonorrhea*†‡

Children under 9 years of age	Adults, adolescents and children over 9 years of age
Penicillin-sensitive gonorrhea	
Amoxicillin, 50 mg/kg (maximum 3.0 g) po, *plus* probenecid, 25 mg/kg (maximum 1.0 g) po in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or**	Aqueous procaine penicillin G, 4.8×10^6 U IM, *plus* probenecid, 1.0 g po in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or**
Ceftriaxone, 125 mg IM in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or**	Ceftriaxone, 250 mg IM in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or**
Spectinomycin, 40 mg/kg per day IM in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days	Spectinomycin, 2.0 g IM in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or**
	Amoxicillin, 3.0 g, or ampicillin, 3.5 g, po, *plus* probenecid, 1.0 g po in single dose for *females* and in single dose daily for 2 days for *males, plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days
Penicillin-resistant gonorrhea or penicillin-allergic patients	
Spectinomycin, 40 mg/kg per day (maximum 2.0 g) IM in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or**	Spectinomycin, 2.0 g IM in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or**
Ceftriaxone, 125 mg IM in single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days	Ceftriaxone, 250 mg IM in single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days

**Sexual abuse must be ruled out.*

†Follow-up cultures are necessary to ensure effective treatment. These regimens include appropriate therapy for concurrent chlamydial infections (tetracyclines‡). Contact tracing and treatment of contacts are important.

‡Tetracyclines should NOT be given to pregnant or nursing women or to children under 9 years of age. (See section on chlamydial infections, page 6.) Homosexual males are NOT frequently coinfected with *Chlamydia,* and, therefore, tetracyclines should only be given if concurrent chlamydial infection is found.

Table IV — Treatment of gonococcal infection in pregnancy*

Neonates†‡	Adults and adolescents§
Penicillin-sensitive gonorrhea	
Aqueous crystalline penicillin G IV or IM: term infant, 50 000 U (30 mg) in single dose; low-birth-weight infant, 20 000 U (12 mg) in single dose, **or**	Ampicillin, 3.5 g po, or amoxicillin, 3.0 g po, with probenecid, 1.0 g po in single dose, *plus* erythromycin, 500 mg *qid* for 7 days (if erythromycin is not tolerated, erythromycin, 250 mg *qid* for 14 days), **or**
Ceftriaxone, 125 mg IM in single dose	Ceftriaxone, 250 mg IM in single dose, *plus* erythromycin, 500 mg *qid* for 7 days (if erythromycin is not tolerated, erythromycin, 250 mg *qid* for 14 days)
Penicillin-resistant gonorrhea or penicillin-allergic patients	
Ceftriaxone, 125 mg IM in single dose, **or**	Spectinomycin, 2.0 g IM in single dose, *plus* erythromycin, 500 mg *qid* for 7 days (if erythromycin is not tolerated, erythromycin, 250 mg *qid* for 14 days), **or**
Spectinomycin, 40 mg/kg (maximum 2.0 g) IM in single dose	Ceftriaxone, 250 mg IM in single dose, *plus* erythromycin, 500 mg *qid* for 7 days (if erythromycin is not tolerated, erythromycin, 250 mg *qid* for 14 days)

*Follow-up cultures are necessary to ensure effective treatment. The regimens for gonococcal infections in pregnant women include appropriate therapy for concurrent chlamydial infections. Contact tracing and treatment of contacts, including the mother of the infected neonate, are important.

†In neonates born to women with untreated gonococcal infection, topical prophylaxis for neonatal ophthalmia is NOT adequate. (See section on neonatal ophthalmia, page 14.)

‡Neonates with chlamydial infection should receive appropriate therapy.

§Tetracyclines should NOT be given to pregnant women. (See section on chlamydial infections, page 6.)

Table V — Treatment of gonococcal epididymitis and epididymo-orchitis*†‡

Children under 9 years of age§	Adults, adolescents and children over 9 years of age
Penicillin-sensitive gonorrhea	
Single-dose regimen as for urethritis (Table I), followed by erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 10 days	Single-dose regimen as for urethritis (Table I), followed by tetracycline, 500 mg *qid* for 10 days, or doxycycline, 100 mg *bid* for 10 days
Penicillin-resistant gonorrhea or penicillin-allergic patients	
Single-dose regimen as for urethritis (Table I), followed by erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 10 days	Single-dose regimen as for urethritis (Table I), followed by tetracycline, 500 mg *qid* for 10 days, or doxycycline, 100 mg *bid* for 10 days

**Sexual abuse must be ruled out.*

†Follow-up cultures are necessary to ensure effective treatment. These regimens include treatment for concurrent chlamydial infections (tetracyclines‡). Contact tracing and treatment of contacts are important.

‡Tetracyclines should NOT be given to children under 9 years of age. (See section on chlamydial infections, page 6.) Homosexual males are NOT frequently coinfected with *Chlamydia,* and, therefore, tetracyclines should only be given if concurrent chlamydial infection is found.

§Efficacy data for erythromycin in this setting are limited; follow-up cultures are therefore particularly important.

Table VI — Treatment of other gonococcal infections

Pelvic inflammatory disease	
See section on pelvic inflammatory disease, page 11	
Disseminated gonococcal infection	
Arthritis or bacteremia: Hospitalization and treatment with a minimum of 3 days' appropriate IV antibiotic followed by oral therapy to complete at least a 7-day course; consultation with a specialist	
Meningitis or endocarditis: Hospitalization and consultation with a specialist	
Ophthalmia	
Neonates	Adults, adolescents and children
See section on neonatal ophthalmia, page 14	Hospitalization Accepted infection control procedures for isolation Consultation with a specialist for appropriate treatment

Chlamydial infections

The manifestations of infection with *Chlamydia trachomatis* vary greatly with age. In newborns and infants the syndromes include asymptomatic nasopharyngeal or rectal carriage, conjunctivitis and pneumonia. Parents of infected newborns should be examined and treated, because infection is the result of peripartum transmission. In children the presentations include asymptomatic genital tract carriage, urethritis in boys and vaginitis in girls. Sexual abuse should always be considered in children past the neonatal period who have a *C. trachomatis* genital tract infection. In adolescents the syndromes are similar to those of adults and include the following: asymptomatic carrier state; conjunctivitis; urethritis, epididymitis and proctitis in males; and cervicitis, endometritis, salpingitis, urethritis and proctitis in females. Sexual partners should always be examined, tested and treated for *C. trachomatis* without waiting for diagnostic test results.

Treatment should be initiated because of either a positive diagnostic test or a high index of suspicion of a chlamydial syndrome or infection in contacts. Tetracyclines and, to a lesser extent, erythromycin are preferred over sulfonamides because of efficacy against *N. gonorrhoeae* and genital mycoplasmas. Tetracyclines are contraindicated in children under 9 years of age. Cephalosporins, aminoglycosides and metronidazole are totally ineffective against *C. trachomatis.* Multiple-dose regimens of penicillins may eradicate *C. trachomatis,* but results are not reliable.

Treatment

Newborns and infants (conjunctivitis and pneumonia)

- Oral erythromycin, 40 mg/kg per day in four divided doses for at least 14 days.
- Topical therapy alone for conjunctivitis is NOT adequate.

Children

Under 9 years of age

- Erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or**
- Sulfamethoxazole, 75 mg/kg per day po in two divided doses (maximum 1.0 g *bid*) for 10 days.

Over 9 years of age

Preferred:

- Tetracycline, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or**
- Doxycycline, 5 mg/kg per day po in two divided doses (maximum 100 mg *bid*) for 7 days.

Alternative:

- Erythromycin, 500 mg po *qid* for 7 days, **or**
- Sulfamethoxazole, 1.0 g *bid* for 10 days.

Adolescents and adults

Uncomplicated urethral, endocervical or rectal infection

Preferred:

- Tetracycline, 500 mg *qid* for 7 days, **or**
- Doxycycline, 100 mg *bid* for 7 days.

Alternative (for patients for whom tetracyclines are contraindicated or not tolerated):

- Erythromycin, 500 mg *qid* for 7 days, **or**
- Sulfamethoxazole, 1.0 g *bid* for 10 days.

Complicated infection (in conjunction with other antimicrobial treatments appropriate for epididymitis and PID, pages 6 and 11)

Preferred:

- Doxycycline, 100 mg *bid* for at least 10 days.

Alternative:

- Tetracycline, 500 mg *qid* for at least 10 days, **or**
- Erythromycin, 500 mg po *qid* for at least 10 days.

Pregnant women and nursing mothers

- Erythromycin, 500 mg po *qid* for 7 days, or 250 mg po *qid* for 14 days if the larger dose is not tolerated.

Sexual partners, parents of infected neonates, and infants of infected parents

- Examine and test if facilities are available and then treat all patients immediately with one of the regimens appropriate for age.

Syphilis

The following treatment guidelines are not based on comparative studies, as they are not available.

Acquired syphilis

Acquired syphilis is divided, for treatment purposes, into early (primary, secondary or latent of less than 1 year's duration), late (greater than 1 year's duration) and neurosyphilis. The recommended regimen varies for each category (Table VII). All patients with neurologic symptoms or signs must have their cerebrospinal fluid (CSF) examined. Controversy exists over whether other patients with late latent syphilis should have a lumbar puncture to rule out neurosyphilis. It is suggested that these cases be discussed with local specialists and decisions made on a case-by-case basis.

Syphilis in pregnancy

All pregnant women should be routinely tested for syphilis early in pregnancy, and those in high-risk groups should be tested again in the third trimester. Pregnant women with syphilis, who have not previously been treated, should receive penicillin in doses appropriate to the stage of disease. Retreatment during pregnancy is unnecessary unless there is clinical or serologic evidence of new infection: dark field positive lesion, a fourfold rise in the titre of a quantitative nontreponemal test (Rapid Plasma Reagin [RPR], Venereal Disease Research Laboratory [VDRL]) or history of recent sexual contact with a person with early syphilis.

For penicillin-allergic pregnant women, desensitization and treatment with penicillin are recommended. If

Table VII — Treatment of syphilis

Type of syphilis	Treatment	
	Preferred	Alternative*
Primary, secondary or latent of less than 1 year's duration	Benzathine penicillin G, 50 000 U/kg (maximum 2.4 million U) IM in single session	Tetracycline hydrochloride, 500 mg po *qid* for 15 days; in children under 9 years of age desensitization and use of penicillin are preferred; **or** erythromycin, 40 mg/kg per day (maximum 500 mg) po *qid* for 15 days
Latent of more than 1 year's duration, including cardiovascular	Benzathine penicillin G, 50 000 U/kg (maximum 2.4 million U) IM weekly for 3 successive weeks	Tetracycline hydrochloride, 500 mg po *qid* for 30 days; in children under 9 years of age desensitization and use of penicillin are preferred; **or** erythromycin, 40 mg/kg per day (maximum 500 mg) po *qid* for 30 days
Neurosyphilis	Crystalline penicillin G, 2 to 4 million U IV *q4h* (12 to 24 million U per day) for at least 10 days	
Congenital syphilis	Crystalline penicillin G, 50 000 U/kg per day IV divided *q8–12h* for at least 10 days	
During pregnancy		
Primary, secondary or latent of less than 1 year's duration	Benzathine penicillin G, 50 000 U/kg (maximum 2.4 million U) IM in single session	Desensitization and use of penicillin are preferred; erythromycin,† 500 mg po *qid* for 15 days
Latent of more than 1 year's duration	Benzathine penicillin G, 50 000 U/kg (maximum 2.4 million U) IM weekly for 3 successive weeks	Desensitization and use of penicillin are preferred; erythromycin,† 500 mg po *qid* for 30 days

*For penicillin-allergic patients only.

†Since the efficacy of erythromycin for syphilis in pregnant women has not been adequately documented, infants should be treated with penicillin early in the neonatal period.

this is not possible, erythromycin may be used. However, since the efficacy of erythromycin in this setting has not been adequately documented, the infant should be treated with penicillin after delivery.

Congenital syphilis

Congenital syphilis may occur if a woman has untreated syphilis during pregnancy. Infected infants are frequently asymptomatic at birth and may be seronegative if the maternal infection occurred late in gestation. Infants should be treated at birth if maternal treatment was inadequate or unknown, or did not include penicillin, or if adequate follow-up of the infant cannot be ensured.

Infants with congenital syphilis should have a CSF examination before treatment to provide a baseline for follow-up. Appropriate neurologic follow-up is necessary if the central nervous system (CNS) is involved. Since interpretation of CSF abnormalities in neonates is not simple, it is recommended that all neonates be treated as if they had CNS involvement. They should receive aqueous crystalline penicillin G for at least 10 days, because benzathine penicillin cannot reliably achieve optimal CSF levels. Infants in whom congenital syphilis is diagnosed after 1 month of age should also be treated with crystalline penicillin G for a minimum of 10 days.

Jarisch–Herxheimer reaction

A febrile reaction may occur 8 to 12 hours after treatment of syphilis — most commonly early syphilis. The reaction is often accompanied by malaise and is not related to drug allergy. It usually lasts a few hours and can be treated by antipyretics.

Penicillin-allergic patients

Drugs other than penicillin and tetracycline do NOT have proven efficacy in the treatment of syphilis. For the penicillin-allergic patient, consideration must be given to hospitalization and desensitization followed by administration of penicillin.

Tetracyclines may be used in patients over 9 years of age. In children under 9 years of age, penicillin desensitization in hospital followed by penicillin treatment is preferred. Alternatively, erythromycin may be given, but close follow-up is required as its efficacy is not well documented.

Contact tracing

All patients must be interviewed for contacts according to the stage of disease. All contacts that the patient had for 3 months before the development of symptoms of primary syphilis should be traced. Patients with secondary syphilis should have contacts traced for 6 months; this period should be 1 year for cases of early latent disease. Contact tracing is not practical in cases of late latent disease; however, the marital or long-term sexual partner should be screened.

Every effort should be made to establish a diagnosis in the contact before treatment.

Follow-up

- *Congenital and early syphilis:* repeat serologic testing at 1, 3, 6, 12 and 24 months.
- *Late syphilis:* repeat serologic testing at 1 and 12 months.
- *Neurosyphilis:* repeat serologic testing at 6, 12 and 24 months and CSF examination at 6 months; further follow-up will depend on the results.

Patients with congenital or early syphilis whose initial quantitative nontreponemal test result (e.g., RPR or VDRL) was greater than 1:8 dilutions should demonstrate a fourfold decrease in titre over a 12- to 24-month period. Patients treated for late syphilis may have a slower decline in titre or may remain serofast.

The results of treponemal-specific tests, such as the microhemagglutination antibody assay for *Treponema pallidum* (MHA-TP), the *T. pallidum* hemagglutination assay (TPHA) and the fluorescent treponemal antibody absorbed test (FTA-abs), will probably not revert to negative with treatment.

Retreatment should be considered if (a) clinical signs or symptoms of syphilis persist or reappear, (b) there is a fourfold increase in titre of a nontreponemal syphilis test or (c) an initial titre corresponding to 1:8 fails to decrease fourfold within 2 years.

Consideration should be given to performing a lumbar puncture on all patients in whom treatment has failed. Patients should be retreated with the schedules recommended for syphilis of more than 1 year's duration.

Herpes simplex virus infections

Genital herpes

Genital herpes virus infection is an STD causing lesions on the genitalia and perineum. Both herpes simplex virus type 1 (HSV-1) and type 2 (HSV-2) can cause these lesions, but type 2 is more common. The first episode of infection may be the most severe. Reactivations of latent infection are common.

Early treatment with oral or intravenous acyclovir can accelerate healing and decrease symptoms in initial genital herpes. Early patient-initiated oral acyclovir treatment provides limited symptomatic relief with recurrent clinical episodes and probably should be reserved for patients who tend to have severe recurrences. Patients with frequent or severe recurrences may be candidates for daily oral acyclovir, which can repress recurrent clinical genital herpes. Topical acyclovir ointment is only of marginal benefit in the treatment of primary disease and has no role in the prophylaxis of genital herpes.

Neonatal herpes

Neonatal herpes may present as (a) generalized systemic infection involving the liver, other organs and frequently the CNS with or without skin involvement, (b) localized CNS disease without skin involvement, or (c) localized infection that may involve the skin, eyes or mouth or all three.

Treatment

Initial genital herpes

Children, prepubertal:

- Acyclovir, 5 mg/kg *q8h* IV for 7 days (initiation of treatment 6 days or more after onset of symptoms is unlikely to be of benefit).
- Sexual abuse must be considered.
- No data are available to support the use of oral acyclovir.

Adults and adolescents:

- Acyclovir, 200 mg po five times a day for 7 to 10 days (initiation of treatment 6 days or more after onset of symptoms is unlikely to be of benefit), **or**
- Acyclovir, 5 mg/kg *q8h* IV for 7 days for patients requiring hospitalization for severe symptoms or who are unable to take oral acyclovir.

Recurrence of genital herpes

Children:

- No data are available to support the use of acyclovir.

Adults and adolescents:

- Acyclovir, 200 mg po five times a day for 5 days, patient-initiated within 2 days of onset of symptoms.

Prophylaxis of recurrences

- Patient initiation of acyclovir treatment with each possible recurrence described above, **or**
- Continuous daily prophylaxis.

Children:

- No data are available to support the use of acyclovir.

Adults and adolescents:

- Acyclovir, 200 mg po two to five times a day (most commonly *tid*) can decrease recurrences. Information on the safety of extended use and the possibility of viral resistance is not yet available. Since experience with this drug is limited owing to its recent availability, further data will be available in the future.

Pregnancy

The use of acyclovir in the treatment or prophylaxis of genital herpes during pregnancy or for the prevention of neonatal infection is currently not recommended. In severe cases or disseminated disease, a specialist should be consulted.

Neonatal herpes

Most commonly, herpes simplex virus is transmitted to the neonate during the birth process. Intrauterine infections are rare but may cause congenital malformations. Postnatal transmission of the infection is also rare.

Neonatal herpetic infections frequently are severe, with high morbidity and mortality rates. *Early* diagnosis and treatment with appropriate antiviral agents can improve outcome.

Neonatal herpes is relatively uncommon in Canada. Consultation with a specialist is suggested if this diagnosis is suspected.

Urethritis

In adolescents and adults, typical symptoms of urethritis include urethral discharge, burning with urination, and itch or discomfort in the urethra at times other than urination. In children, abdominal pain and the avoidance of urination may be symptoms. However, in all age groups many infections are asymptomatic. The major etiologic agents are *C. trachomatis, N. gonorrhoeae* and *Ureaplasma urealyticum*. The specific treatment regimens are based on the following factors:

- The presence or absence of *N. gonorrhoeae*.
- The penicillin susceptibility of *N. gonorrhoeae*.
- Previous treatment, if any.
- Interim sexual activity.
- Treatment status of the partner.

The etiologic agents of urethritis in children are very poorly defined, but it is presumed that they are the same as those in adults.

Ideally, treatment regimens for urethritis should be specific for the etiologic agents. However, because patients with urethritis are often infected concurrently with more than one pathogen, broad-spectrum coverage is usually indicated.

Nongonococcal urethritis will recur in 30% to 35% of males, often without a history of noncompliance with treatment or re-exposure. *C. trachomatis* is rarely isolated from this group.

Treatment

Nongonococcal urethritis or postgonococcal urethritis (N. gonorrhoeae excluded)

Patients should be treated with a regimen effective against both *C. trachomatis* and *U. urealyticum*.

Initial, under 9 years of age:

- Erythromycin, 40 mg/kg per day in four divided doses (maximum 500 mg *qid*) for 7 days.

Initial, over 9 years of age:

- *Preferred:* tetracycline hydrochloride, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or** doxycycline, 5 mg/kg per day po in two divided doses (maximum 100 mg *bid*) for 7 days.
- *Alternative:* erythromycin, 40 mg/kg per day in four divided doses (maximum 500 mg *qid*) for 7 days.

Recurrence or persistence of urethritis after initial treatment:

- Erythromycin for 14 days if tetracycline was previously given, **or** tetracycline or doxycycline for 14 days if erythromycin was previously given (unless child is under 9 years of age).

Urethritis when N. gonorrhoeae infection is present or has not been excluded

Patients should be treated with a regimen effective against both uncomplicated *N. gonorrhoeae* and *C. trachomatis*.

Children under 9 years of age

Penicillin-sensitive gonorrhea:

- Amoxicillin or ampicillin, 50 mg/kg (maximim 3.0 g) po, *plus* probenecid, 25 mg/kg (maximum 1.0 g) po in a single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or**
- Ceftriaxone, 125 mg IM in a single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days.

Note: Tetracyclines should NOT be given.

Penicillin-resistant gonorrhea or penicillin-allergic patients:

- Spectinomycin, 40 mg/kg (maximum 2.0 g) IM in a single dose, *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days, **or**
- Ceftriaxone, 125 mg IM in a single dose (NOT for patients with anaphylactic or accelerated reactions to penicillins), *plus* erythromycin, 40 mg/kg per day po in four divided doses (maximum 500 mg *qid*) for 7 days.

Note: Tetracyclines should NOT be given.

Adults, adolescents and children over 9 years of age

Penicillin-sensitive gonorrhea:

- Amoxicillin, 3.0 g, or ampicillin, 3.5 g, po, either with probenecid, 1.0 g po in a single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or**
- Ceftriaxone, 250 mg IM in a single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days.

Note: Tetracyclines should NOT be given to pregnant or lactating women. Homosexual males are NOT frequently coinfected with *Chlamydia*, and, therefore, tetracyclines should only be given if concurrent chlamydial infection is found.

Penicillin-resistant gonorrhea or penicillin-allergic patients:

- Spectinomycin, 2.0 g IM in a single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or**
- Ceftriaxone, 250 mg IM in a single dose (NOT for patients with anaphylactic or accelerated reactions to penicillins), *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days.

Note: Tetracyclines should NOT be given to pregnant or lactating women. Homosexual males are NOT frequently coinfected with *Chlamydia*, and, therefore, tetracyclines should only be given if concurrent chlamydial infection is found.

Pregnant women and nursing mothers

A single-dose regimen should be used (as for recurrence or persistence of nongonococcal urethritis, or for gonococcal urethritis in adults, adolescents and children over 9 years of age, followed by erythromycin, 500 mg *qid* for 7 days or 250 mg *qid* for 14 days, instead of tetracycline or doxycycline).

Sexual partners

Sexual contacts should be examined, tested and treated immediately with one of the above regimens appropriate for age of the patient and the diagnosis in the index case.

Follow-up

Follow-up cultures for *N. gonorrhoeae* or *C. trachomatis* should be performed after completion of therapy if these organisms were identified before treatment.

Mucopurulent cervicitis in adolescents and adults

The three major causes of cervicitis are *C. trachomatis,*

N. gonorrhoeae and herpes simplex virus. Cervicitis does not occur in prepubertal girls. Herpes simplex virus usually causes clinically evident cervicitis only in the initial episode. Many women with cervicitis are asymptomatic, and in many with cervical inflammation a specific etiologic agent cannot be identified. The criteria for a clinical diagnosis of cervicitis remain controversial. Currently, mucopurulent cervicitis is felt to be associated with an increased likelihood of *C. trachomatis* and possibly *N. gonorrhoeae* infections. It is defined as follows:

- Mucopurulent secretion from the endocervix that appears yellow or green when viewed on a white cotton-tipped swab (positive swab test result).
- Greater than 10 polymorphonuclear leukocytes per microscopic oil immersion field (×1000) in a Gram-stained smear of endocervical secretions.
- Cervical inflammation, determined by cervical friability (bleeding when the first swab is introduced) or by erythema or edema within a zone of cervical ectopy.

Treatment

Mucopurulent cervicitis

If there is any suspicion of endometritis or salpingitis, the section on treatment of PID (page 11) should be consulted.

Mucopurulent cervicitis should be treated with a regimen effective against both uncomplicated *N. gonorrhoeae* and *C. trachomatis.*

Adults, adolescents and children over 9 years of age

Penicillin-sensitive gonorrhea:

- Amoxicillin, 3.0 g, or ampicillin, 3.5 g, po, either with probenecid, 1.0 g po in a single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or**
- Ceftriaxone, 250 mg IM in a single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days.

Note: Tetracyclines should NOT be given to pregnant or lactating women.

Penicillin-resistant gonorrhea or penicillin-allergic patients:

- Spectinomycin, 2.0 g IM in a single dose, *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days, **or**
- Ceftriaxone, 250 mg IM in a single dose (NOT for patients with anaphylactic or accelerated reactions to penicillins), *plus* tetracycline, 500 mg po *qid* for 7 days, **or** doxycycline, 100 mg po *bid* for 7 days.

Note: Tetracyclines should NOT be given to pregnant or lactating women.

Cervicitis in pregnancy

A single-dose regimen should be used, as above, *plus* erythromycin, 500 mg *qid* for 7 days or 250 mg *qid* for 14 days, instead of tetracycline or doxycycline.

Sexual partners

Sexual partners should be examined, tested and treated immediately with a regimen appropriate for the site of contact and the diagnosis in the index case.

Follow-up

Follow-up cultures for *N. gonorrhoeae* or *C. trachomatis* should be performed after completion of therapy if these organisms were identified before treatment.

Pelvic inflammatory disease

PID (salpingitis and endometritis) can be defined as ascending infection of the uterus and adnexa caused by pathogenic microorganisms originating in the cervix or vagina. The etiology of PID is often polymicrobial, including infection with *N. gonorrhoeae, C. trachomatis,* anaerobes (bacteroides and streptococci) and aerobes (*Escherichia coli* and group B streptococci). The role of *Mycoplasma hominis* in PID is controversial.

The diagnosis of PID can be extremely difficult. A careful pelvic examination is mandatory. Lower abdominal pain and tenderness, deep pain with intercourse, abnormal vaginal bleeding, and cervical or adnexal tenderness may be present. These cardinal signs may be accompanied by low-grade fever and leukocytosis, but the clinical diagnosis of PID may have an accuracy of less than 70%. Gram stain from the endocervix revealing gram-negative intracellular diplococci or positive results of culture for *N. gonorrhoeae* or of testing for *C. trachomatis* may be helpful in establishing a clinical diagnosis of sexually transmitted PID.

Treatment

Early treatment is essential and should NOT be delayed while the patient is waiting to be hospitalized.

Single antimicrobial regimens are NOT adequate. This is especially true for single-agent penicillins (e.g., piperacillin) or single-agent cephalosporins (e.g., cefoxitin, cefamandole and cefotaxime).

Therapy must be directed against major pathogens with a combination of antimicrobial agents.

Hospitalization is preferred in any of the following circumstances:

- The patient is an adolescent.
- The diagnosis is uncertain.
- Surgical emergency, such as appendicitis and ectopic pregnancy, cannot be excluded.
- A pelvic abscess is suspected.
- The patient is pregnant.
- Severe illness precludes outpatient management.
- The patient is unable to follow or tolerate an outpatient regimen.
- The patient has failed to respond to outpatient therapy.
- Follow-up within 72 hours of starting antibiotic treatment cannot be arranged.

Hospitalized patients

Preferred:

- Cefoxitin, 2 g IV *q6h,* and doxycycline, 100 mg IV or po *bid,* for at least 4 days and at least 48 hours after improvement, *followed by*
- Doxycycline, 100 mg po *bid* to complete at least 10 days of treatment.

Alternative:

- Clindamycin, 600 mg IV *q6h,* and gentamicin, 2 mg/kg IV *q8h,* for 4 days and at least 48 hours after improvement (gentamicin serum concentrations should be monitored), *followed by*
- Clindamycin, 450 mg po *qid,* to complete at least 10 days of treatment.

Note: Clindamycin plus gentamicin has not been extensively evaluated for sexually acquired PID. It may not provide *adequate treatment* for *C. trachomatis* and *N. gonorrhoeae.* The addition of doxycycline, 100 mg po *bid,* should be considered to improve treatment of infections caused by *C. trachomatis* and *N. gonorrhoeae.*

Appendix D — Provincial and territorial offices of STD control

For expert consultation on a specific case of STD, the local medical officer of health can be contacted for the telephone number and name of the nearest specialist.

Director
STD Control Province of Alberta
Alberta Community and
Occupational Health
Executive Building
10105–109th St., 4th Floor
Edmonton, Alta.
T5J 1M8
(403) 427-2830

Director
Venereal Disease Control
Ministry of Health
828 W 10th Ave.
Vancouver, BC
V5Z 1L8
(604) 660-6172

Program coordinator
Venereal Disease Control
Department of Health
831 Portage Ave.
Winnipeg, Man.
R3G 0N6
(204) 945-6843

Provincial epidemiologist
Public Health Services
Department of Health
PO Box 5100, Carleton Place
Fredericton, NB
E3B 5G8
(506) 453-2216

Chief medical health officer
Medical Services Division
Department of Health
PO Box 4750
St. John's, Nfld.
A1C 5T7
(709) 576-3430

Infectious disease control officer
Department of National
Health and Welfare
Medical Services Branch
Northwest Territories Region
Bag Service 7777
Yellowknife, NWT
X1A 2R3
(403) 920-8646

Provincial epidemiologist
Community Health Services
Department of Health
PO Box 488
Halifax, NS
B3J 2R8
(902) 424-5547

Senior medical consultant
Communicable Diseases
Disease Control and
Epidemiology Service
Ontario Ministry of Health
15 Overlea Blvd., 5th Floor
Toronto, Ont.
M4H 1A9
(416) 963-2238

Provincial epidemiologist
Department of Health
65 McGill Ave.
Charlottetown, PEI
C1A 2K1
(902) 894-7331

Directeur
Planification et Promotion
de la Santé
Ministère de la Santé et
des Services sociaux
1075, ch. Ste-Foy
Québec, PQ
G1S 2M1
(418) 643-7656

Director
Microbiology and Communicable
Diseases
Saskatchewan Health
3211 Albert St.
Regina, Sask.
S4S 5W6
(306) 787-8316

Infectious disease control officer
Yukon Region
Whitehorse General Hospital
5 Hospital Rd.
Whitehorse, Yukon Territory
Y1A 3H7
(403) 668-9444