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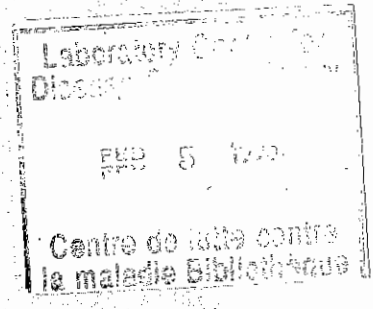
Supplement

1995 Update

CANADIAN STD GUIDELINES



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1995 Update

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

Laboratory Centre for Disease Control
Health Protection Branch
Health Canada
Ottawa

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PREFACE

This update has been produced to reflect changes in information in nine chapters (identified overleaf) of the 1992 Canadian Guidelines for Prevention, Diagnosis, Management and Treatment of Sexually Transmitted Diseases in Neonates, Children, Adolescents and Adults.

The STD guidelines were established after careful deliberations by a group of acknowledged authorities made up of the individuals and representatives of Canadian specialist societies, provincial and territorial control jurisdictions and the Laboratory Centre for Disease Control (LCDC) of Health Canada listed below. They should be construed not as rules but rather as recommendations based on available information placed into a Canadian context.

Previous guidelines and this update are dedicated to the children of Canada who are sexually abused or assaulted and whose dignity and worth must be preserved.

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The assistance and interest of the Canadian Infectious Disease Society, the Canadian Paediatric Society, the College of Family Physicians of Canada (Dr Carol Herbert) and the Provincial and Territorial Directors of STD Control have been invaluable in the production of these guidelines. The collaboration of the Canadian Medical Association, the Canadian Public Health Association, the Canadian Nurses Association, the US Centers for Disease Control and Prevention (Dr George Schmidt), the Fédération des médecins omnipraticiens du Québec, the Quebec Association of Medical Microbiology and Infectious Disease Physicians and the Society of Obstetricians and Gynaecologists of Canada should also be recognized.

1995 Update: Information for Readers

The 1995 Update of the 1992 Canadian Guidelines for the Prevention, Diagnosis, Management and Treatment of Sexually Transmitted Diseases in Neonates, Children, Adolescents and Adults has addressed changes in information in the following chapters:

Vulvo-vaginitis in adolescents and adults
Viral hepatitis
Gonococcal infections
Chlamydial infections
Syphilis
Human immunodeficiency virus infection and AIDS in adolescents and adults
Human immunodeficiency virus infection in children
Screening for sexually transmitted disease
Laboratory diagnosis of chlamydial infections

The changes have been endorsed by the Canadian Infectious Disease Society's Sub-Committee on Sexually Transmitted Diseases and the Canadian Paediatric Society's Committee on Infectious Diseases and Immunization.

Information in all other chapters has not changed.

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Key-word Index

Key-word Index (cont'd).....

Symptoms Suggesting Specific STD Syndromes

Symptoms	See section on	Page
Prepubertal boys:		
Urethral discharge, burning on urination, urethral or meatal itch, enuresis	• urethritis	13
Painful genital ulcers or lesions, painful inguinal lymphadenopathy	• genital ulcer disease	69
Painless genital lesions with or without inguinal lymphadenopathy	• genital ulcer disease genital and anal warts	69 113
Adolescent and adult males:		
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Painful genital ulcers or lesions, painful inguinal lymphadenopathy	• genital ulcer disease	69
Painless genital lesions with or without inguinal lymphadenopathy	• genital ulcer disease genital and anal warts	69 113
Prepubertal girls:		
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Painful genital ulcers or lesions, painful inguinal lymphadenopathy	• genital ulcer disease	69
Painless genital lesions with or without inguinal lymphadenopathy	• genital ulcer disease genital and anal warts	69 113
Adolescent and adult females:		
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Recent onset of abdominal pain, unusual vaginal bleeding, deep dyspareunia, with or without vaginal discharge	• cervicitis pelvic inflammatory disease (PID)	19 25
Painful genital ulcers or lesions, painful inguinal lymphadenopathy	• genital ulcer disease	69
Painless genital lesions with or without inguinal lymphadenopathy	• genital ulcer disease genital and anal warts	69 113
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NOTE: if a sexually transmitted disease (STD) or syndrome is suspected in a prepubertal child or an adolescent who is not sexually active, an evaluation for sexual abuse or sexual assault is required

Treatment of Specific Diseases and Syndromes

Investigation of Specific Syndromes and Where to Find More Information

NOTE: Patients may have more than one STD; this is only an outline of investigations. In many cases screening for other STD should be carried out (see section on Screening, page 157).

Syndrome (page)	**Specimen type site (page)**	**Laboratory test (page)**	**Most frequent etiology (page)**
urethritis (13)	urethral or meatal smear/swab (179)	Gram stain (184-6) specific culture or non-culture test	*Neisseria gonorrhoeae* (81) *Chlamydia trachomatis* (91)
cervicitis (19)	endocervical smear/swab (181)	Gram stain (184-6) specific culture or non-culture test	*N. gonorrhoeae* (81) *C. trachomatis* (91)
pelvic inflammatory disease (25)	endocervical smear/swab (181)	Gram stain (184-6) specific culture or non-culture test	*N. gonorrhoeae* (81) *C. trachomatis* (91)
epididymitis (49)	urethral or meatal smear swab (179)	Gram stain (184-6) specific culture or non-culture test	*N. gonorrhoeae* (81) *C. trachomatis* (91)
prepubertal vaginitis (35)	vaginal secretions (181)	Gram stain (184-6) specific culture, saline wet mount for KOH test, pH, microscopy (181)	*N. gonorrhoeae* (81) *C. trachomatis* (91) *Trichomonas vaginalis* yeasts bacterial vaginosis (39)
vulvovaginitis in adults and adolescents (39)	vaginal secretions (181)	saline wet mount for KOH test, pH, microscopy (181)	*T. vaginalis* yeasts bacterial vaginosis (39)

Investigation of Specific Syndromes and Where to Find More Information (cont'd).....

NOTE: Patients may have more than one STD; this is only an outline of investigations. In many cases screening for other STD should be carried out (see section on Screening, page 157).

Syndrome (page)	**Specimen type site (page)**	**Laboratory test (page)**	**Most frequent etiology (page)**
genital ulcer disease (69)	swab from ulcer vesicle (183) blood	microscopy (dark-field for syphilis, 183-91) (electron microscopy for herpes simplex virus infection, 183) specific culture, serology (for syphilis, 191)	*Treponema pallidum* (syphilis)(99) herpes simplex virus (107) *Haemophilus ducreyi* (chancroid)(69)
genital and anal warts (113)	(colposcopy and biopsy are specialist procedures) Pap smear (184)	microscopy (Pap smear, 184) (biopsy material)	human papillomavirus
proctitis proctocolitis enteritis (57)	rectal swab stool specimen (183)	specific culture serology (syphilis, 191) microscopy (ova and parasites, 184)	*N. gonorrhoeae* (81) *C. trachomatis* (91) *T. pallidum* (syphilis)(99) herpes simplex virus (107) ova parasites and enteric pathogens (57)
AIDS (119, 127)	blood	serology (197)	HIV infection (119, 127)

INTRODUCTION

These guidelines have been written for primary health care workers, both physicians and nurses. They are intended to assist in the prevention and appropriate management of sexually transmitted disease (STD) in Canada.
It is hoped that the format of this document will enable busy professionals rapid access to the information that they need. Please take the time initially to find your way around. The tables on the previous pages are designed to act as a map to guide you to the information that you might want. You will notice that certain advice and guidance is repeated. This is intentional. Where you do need to refer elsewhere, the appropriate page number should be close by.
When updates on treatment and management are necessary, we intend that they will be produced in a size and format compatible with the present document.
Comments on the accuracy and utility of the guidelines would be welcome.

Laboratory support
This document provides Canadian recommendations for the prevention, diagnosis, management and treatment of STD when a person first presents to the health care system. All health care providers should have access to diagnostic tests for *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Treponema pallidum* and HIV (human immunodeficiency virus). Facilities to obtain a Gram stain would be the minimum level of support required.

Sexually transmitted syndromes
Traditionally, the management of STD has been based on cases with a specific microbiological diagnosis, such as *N. gonorrhoeae* or *T. pallidum*. However, people usually present to health care providers with a number of symptoms and physical findings, i.e., a syndrome, such as urethritis or pelvic inflammatory disease (PID). Diagnosis of a syndrome according to standard criteria predicts the likelihood that a specific pathogen(s) is present and thus facilitates initiation of appropriate empiric treatment at the first visit rather than deferring treatment until there is microbiological confirmation. The table on page v listed symptoms that should suggest the presence of a particular syndrome.
Management by syndrome alone, however, is inadequate because infections with important pathogens such as *C. trachomatis* and *N. gonorrhoeae* may be present without any symptoms or findings. Although infection may be suspected because of disease in a partner or the presence of another STD, the infection may be diagnosed only with a specific laboratory test. Thus, in managing STD, diagnosis by syndrome and laboratory diagnosis by testing for specific organisms, are both important and complementary.

Diagnosis and management of STD syndromes

The diagnosis and management of STD syndromes require the following measures:

- optimal history taking
- genital examination
- targeted extragenital examination
- appropriate specimen collection and transportation
- interpretation of initial laboratory results
- initiation of treatment, when indicated
- contact tracing
- reporting
- follow-up

Details of these measures for various age groups are presented in this document. Appendix I provides guidelines for optimal evaluation in suspected cases of STD. In evaluating and interacting with patients, it is vitally important that the health care provider be supportive and non-judgemental, that there be clear communication in terms the patient understands, and that confidentiality be maintained.

Use of appropriate universal precautions when carrying out an examination should never be overlooked.

Sexual abuse and assault

When an STD or sexually transmitted syndrome is detected in a prepubertal child or an adolescent who is not sexually active, evaluation for sexual abuse is required (see section on Child Sexual Abuse, page 133). Refer to page 141, if there is any suggestion of sexual assault. Appendix IV, page 203, provides some guidance and a list of contacts for the most current information on collecting optimal specimens for forensic evaluation in cases of sexual abuse or sexual assault.

Importance of laboratory diagnosis

Basic laboratory support, particularly the availability of interpretation of a stained smear at the time a patient is evaluated, is necessary to reduce over-treatment in some cases and under-diagnosis of infection in others. Stained smears of secretions (e.g., Gram stain) are simple, rapid, inexpensive tests that allow detection of a polymorphonuclear leucocyte (PMN) response and may indicate the types of bacteria present in a secretion (e.g., *N. gonorrhoeae*). Guidelines for specimen collection and transport are given in Appendix II.

The degree of importance of obtaining specific microbiologic tests can vary, depending on the clinical circumstances. Specific microbiologic testing, preferably by means of culture for potential pathogens rather than a non-culture method, is strongly recommended wherever possible in the following cases:

- evaluation of suspected sexual abuse of a child
- evaluation of sexual assault.

Specific microbiologic testing by means of culture or non-culture method is highly desirable in the following situations:

- for screening to detect asymptomatic infection
- for evaluation for cervicitis, PID or vulvovaginitis
- when the diagnosis is uncertain
- when antimicrobial resistance is a possibility
- when treatment has failed in a microbiologically proven infection
- for management of asymptomatic sexual contacts of a person with a sexually transmitted syndrome.

There are other circumstances in which extensive microbiologic testing is desirable but may not be the most cost-effective approach (e.g., diagnostic testing for *C. trachomatis* in a male with classic urethritis).

Regardless of whether or not laboratory testing is performed for a patient with a sexually transmitted syndrome, the health care provider must ensure that contact tracing is done.

Recommendations for initial management

Since health care providers do not have equal access to laboratory facilities, suggested management of syndromes is given for three situations: the ideal situation, in which Gram-stain results are available during the initial evaluation, cases in which Gram-stain results are not available at the initial evaluation, and cases in which diagnosis or suspicion of a syndrome is a strong enough indication to begin empiric therapy, irrespective of the availability of Gram stain results.

Primary Prevention of Sexually Transmitted Disease

Primary Prevention of Sexually Transmitted Disease

It is vastly more effective to prevent than to treat STD and their sequelae.

- physicians have a central role in the prevention of STD and they should:
  - routinely discuss this issue with their patients using language that is age appropriate and understandable
  - provide patients with accurate information about risk and prevention
  - help motivate patients to act preventively
  - assure patients of complete confidentiality

Practice points for primary care providers

- actions promoting prevention take very little time compared to time spent on the diagnosis and management of STD and their sequelae. These actions can be interspersed at convenient times during the course of routine patient care.

Indications to patients that you are interested in STD and sexual health concerns

non-verbal messages:

- STD/AIDS posters, pamphlets and cartoons in the office

verbal messages:

- discussion of STD and related issues with each patient as appropriate
- for **adolescent and adult patients** you may indicate that "part of my work deals with patients' sexual concerns". This should be followed by inquiries such as, "Are you sexually active?", "How many partners have you had during the past couple of years?", "Have your partners been men, or women, or both?", "What have you been doing to avoid pregnancy?", "What have you been doing to avoid STD?" and questions on type of sexual activity.
- for **prepubescent patients including relatively young children and their parents** indicate that "part of my job is answering children's questions about sex. Do you have any? If you ever do, you can ask me".

Primary prevention (cont'd).....

Help in dealing with STD and sexual health issues that require specialist attention

- compile a list of "user friendly" infectious disease specialists, gynecologists, pediatricians, psychiatrists, psychologists and other relevant professionals

Judging your actions

- consider how successful you are in discussing sexual health concerns with your patients
- look out for practices that unintentionally *promote* STD. For example, the prescription of oral contraception can be the "cause" of patients ceasing condom use and increasing their risk of acquiring STD.

Guidance for patients

Acceptance of sexuality

- individuals must come to terms with the fact that they are sexually active before they can plan for STD prevention. Primary care providers, by their actions, can show an understanding of a patient's sexual activity and can stress the corresponding need for STD prevention

Easy to use advice

- **relatively simple advice to always use condoms, or to always be abstinent, together with discussion of ways of reaching these goals, may well be the safest information that can be provided**
- the primary care provider must challenge patients to plan how they will discuss with their partner, and consistently practice, STD prevention. This includes how to set limits on sexual activity, condom use and how they will deal with possible partner resistance.
- the primary care provider must also find out if their patients know where they can comfortably obtain condoms in their community, if they know how to use condoms correctly, if they are aware of the signs of STD and if they know how to seek testing and treatment, if needed
- public health messages that exhort individuals to "get to know your partner better" can induce a false sense of security that may work against the use of more effective preventive strategies such as abstinence or condom use. It must be stressed that it is difficult for an individual to assess the chances of their partner having an STD.
- advice to be monogamous may also convey a false sense of security that works against use of more effective preventive strategies. Adolescents and young adults may interpret monogamy as having one relationship at a time. This can lead to "serial monogamy" and multiple sexual partners over a period of time. Because of "serial monogamy", condom use is always "a must" in many relationships.

Primary prevention (cont'd).....

Planning for prevention

- primary care providers can underscore the need for before-the-fact decision making by citing facts about STD prevalence ("15% of my single patients end up getting chlamydia") and intractability ("Unfortunately, many STD are incurable") coupled with reassuring facts about prevention ("If you decide on condom use or on setting limits before you begin a relationship, you can really reduce your risk")

Public STD prevention acts

- individuals who try and put into practice STD prevention messages may have to undertake potentially embarrassing public or semi-public acts, such as buying condoms, seeking STD, including HIV, testing and talking with health care providers
- primary care providers can discuss this with their patients and can try to identify the most "user-friendly" resources available so as to minimize the emotional cost involved

The importance of consistency

- it is helpful for primary care providers to stress consistency ("*Always* set limits or *always* use condoms..."), to let patients know that they should feel good about their preventive behaviour ("You can more or less relax when you consistently set limits or consistently use condoms...") and to let patients know that they should reward their partner for supporting their prevention activities ("Let them know you appreciate their cooperation...")

Only abstinence or a truly monogamous relationship between two uninfected partners can assure the avoidance of STD.

Efficacy

- **condoms can be effective in preventing the majority of STD**
- the prevention of one case of an STD generally leads to the prevention of several others
- the latex in condoms is impermeable to the human immunodeficiency virus (HIV), hepatitis B virus and herpes simplex virus (HSV), *Chlamydia trachomatis* and *Neisseria gonorrhoeae*
- natural skin condoms may not be impermeable to the hepatitis B virus and HIV

Reasons for failure

- many reasons for failure can be overcome (see Recommendations for proper use, below)
- not all STD are preventable by using condoms. Lesions not physically covered by the condom pose a risk, e.g., HSV lesions or genital warts (caused by the human papillomavirus [HPV]) at the root of the penis or in the pubic hair. Contact with fluid from weeping lesions (HSV) or shedding epithelial cells (HPV) may be difficult to avoid.
- transmission of pubic lice, scabies or molluscum contagiosum is not prevented

Anal Sex

- anal sex continues to be a high-risk activity for the acquisition of STD. Condoms used during anal intercourse are under increased stress (risking breakage) and most condom packages contain a disclaimer that they are for vaginal intercourse only. Specially designed condoms are available for anal intercourse; using two condoms is an alternative but may not be reliable. Condoms with spermicide are not recommended for anal intercourse due to risk of irritation.

NOTE

- family physicians may advocate the use of condoms with spermicides as safe, effective and acceptable preventive measures. However, spermicide use increases risk of urinary tract infections in young women and may lead to modifications of the bacterial flora leading, e.g., to bacterial vaginosis.

Condoms (cont'd).....

- for increased protection against pregnancy, other methods of contraception should be used in addition to condoms, such as oral contraceptives or an intrauterine device (IUD)
- allergy to latex has been reported, likely as a result of the increasing numbers of condom users. Primary care providers should be vigilant for this possibility and question patients about reactions to latex (e.g., surgical or household rubber gloves) – the incidence of serious anaphylaxis is extremely rare – if in doubt, consult a specialist. Natural skin condoms are an alternative but may not be impermeable to the hepatitis B virus and HIV. However, a natural skin condom can be used together with a latex condom to protect the male or female from contact with latex.
- other barriers, e.g., dental dams, have been advocated for use during certain forms of non-penetrative sexual activity

The future

- research to develop other barrier methods such as the "female condom" or "vaginal pouch" may lead to greater choice in sexually transmitted disease prevention

Barriers to condom use and ways to overcome them

Perceived Barrier	Intervention Strategy
decreases sexual pleasure (sensation)	1. often perceived by those who have never used a condom. Encourage patient to try. 2. try a thinner latex condom
decreases spontaneity of sexual activity	1. encourage incorporation of use of condom during time before actual intercourse. Peace of mind may actually enhance pleasure. 2. demonstrates responsibility and respect
embarrassing, juvenile, "unmanly"	this feeling is not shared by many in the population, especially now
poor fit, either too small or too big, slips off. uncomfortable (actually due to constriction of the urethra with subsequent painful ejaculation)	1. smaller and larger condoms are available 2. natural skin condoms are another alternative for "large" patients but are less reliable for prevention of STD (see above)
requires prompt withdrawal after ejaculation	reinforce the protective nature
fear of breakage may lead to less vigorous sexual activity	with prolonged intercourse, lubricant wears off and the condom begins to rub. Have a water-soluble lubricant available to reapply.

NOTE

- only "spontaneity" and, for males only, "reduced sensation" were complaints of a majority of surveyed persons. Other barriers were felt by < 40% of those surveyed, often < 20%.

Condoms (cont'd).....

Recommendations for the proper use of condoms to reduce the transmission of STD(a)

1. latex condoms should be used because they offer greater protection against viral STD than natural skin condoms
2. condoms should be stored in a cool, dry place out of direct sunlight
3. condoms in damaged packages or those that show obvious signs of age, e.g., those that are brittle, sticky or discoloured, should not be used because they cannot be relied upon to prevent infection
4. condoms should be handled with care to prevent puncture
5. condoms should be put on before any genital contact to prevent exposure to body fluids that may contain infectious agents. Hold the tip of the condom and unroll it onto the erect penis, leaving space at the tip of the condom to collect semen, yet assuring that no air is trapped in the tip.
6. adequate lubrication should be used. If exogenous lubrication is needed, only water-based lubricants should he used. Petroleum or oil-based lubricants (such as petroleum jelly, cooking oils, shortening, and lotions) should not be used since they weaken the latex.
7. use of condoms with spermicides may provide some additional protection against STD; however, vaginal use of spermicides along with condoms is likely to provide greater protection
8. if a condom breaks, it should be replaced immediately. If ejaculation occurs after condom breakage, the immediate use of spermicide has been suggested. However, the protective value of post-ejaculation application of spermicide in reducing the risk of STD transmission is unknown.
9. after ejaculation, care should be taken so that the condom does not slip off the penis before withdrawal; the base of the condom should be held while withdrawing. The penis should be withdrawn while still erect.
10. condoms should never be reused

(a) After: Division of Sexually Transmitted Diseases, Center for Prevention Services, CDC. Condoms for prevention of sexually transmitted diseases. MMWR 1989; 37:133-7.

Safer sex guidelines

- there are many publications available from a variety of sources giving advice on the use on condoms and other safer sexual practices
- if you are not aware of a local source of health promotion material, contact your local public health authority or provincial/territorial director of STD control (see section on Directors of STD Control, page 211)

Diagnosis, Management and Treatment of Specific Syndromes

Definition

- inflammation of the urethra with a mucoid, mucopurulent, or purulent urethral discharge **OR** an increased number of polymorphonuclear leucocytes (PMNs) in urethral secretions (a mean of 4 or more PMNs per oil immersion field [x 1000] in 5 fields on a smear)

Special considerations in children

- if there are symptoms or signs of urethritis or unexplained pyuria in a boy who is prepubertal or an adolescent who is not sexually active, sexual abuse must be considered
- the examination must include a search for other physical evidence of abuse
- if the health care provider is not comfortable with performing an evaluation for child sexual abuse, the child should be evaluated by, or the case discussed with, a referral centre (see Appendix V, page 207)
- try to obtain all relevant tests at the initial evaluation to avoid repeating the examination (see section on Laboratory Diagnosis, page 187)

Etiology

Important causes

- *Chlamydia trachomatis*
- *Neisseria gonorrhoeae*

NOTE

- infections may be present without symptoms/signs or PMN response and, if present, require treatment

Other causes

- *Ureaplasma urealyticum* – frequently present but its detection is not by itself an indication for treatment (see CAUTIONS, page 16)
- *Trichomonas vaginalis* – infrequent
- herpes simplex virus infection – rare without genital lesions

Clinical clues

Any of the following should prompt evaluation for urethritis:

	Children	Adolescents and adults
Symptoms	• urethral discharge • burning on urination • irritation in the distal urethra or meatus • unwillingness to void • enuresis • vague lower abdominal pain	• urethral discharge • burning on urination • irritation in the distal urethra or meatus
Signs	• urethral discharge (frequent) • meatal inflammation (infrequent) • unexplained pyuria in an adolescent or adult	

Specimen collection and laboratory diagnosis – adolescents and adults (for prepubertal children see section on Specimen Collection, page 179)

- perform a genital examination, particularly to detect urethral discharge. This may require stripping the urethra (milking the penis 3 or 4 times from the base to the glans), or re-evaluation after the patient has not voided for at least 4 hours.
- if a meatal discharge is present:
  - swab the discharge to prepare a slide for a stained smear (usually Gram stain) and other diagnostic tests for *N. gonorrhoeae*
  - obtain an endourethral swab (inserted 3 to 4 cm) for a diagnostic test for *C. trachomatis*
- if no meatal discharge is present:
  - obtain endourethral swab for a slide for a stained smear (usually Gram stain) and other diagnostic tests for *N. gonorrhoeae*
  - obtain endourethral swab for a diagnostic test for *C. trachomatis*
- consider obtaining a blood sample for serologic testing for **syphilis** (see section on Screening, page 157)
- consider **HIV screening**
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176)
    (see section on Screening, page 157)
- immunization against hepatitis B should be considered
  - screening for hepatitis B markers (surface antigen [HBsAg] and surface antibody [HBsAb]) should be considered pre-immunization
    (see section on Hepatitis B, page 63)

Urethritis (cont'd).....

Prevention

- **Primary prevention of infection is a critical part of management**
- **Patients presenting with concerns about STD provide an important opportunity for instruction and encouragement for the consistent practice of safer sex**

Reporting, contact tracing and follow-up

- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority
- when treatment is indicated for the index case, all partners who have had sexual contact with the index case (within the 30 days prior to onset of symptoms if *N. gonorrhoeae* is detected, longer if the case is asymptomatic or the history warrants, and within at least 6 weeks if *C. trachomatis* is detected) should be located, clinically evaluated and treated appropriately. Persons treated for gonococcal infections should also be treated for chlamydia.
- testing of partners for causes of urethritis may assist in the diagnosis of the index case
- local public health authorities should be available to help with contact tracing, clinical evaluation, testing, treatment and health education
- repeat diagnostic testing for *N. gonorrhoeae* and *C. trachomatis* is not routinely recommended if a recommended treatment is given and taken, symptoms and signs disappear and there is no re-exposure to an untreated partner
- children should be retested
- in patients with clinically or microbiologically documented treatment failure, possibilities include:
  - a false-positive test result
  - failure to take medication correctly
  - re-exposure to an untreated partner
  - infection acquired from a new partner
  - infection with other pathogens
  - a non-infective etiology

Urethritis (cont'd).....

CAUTIONS

- detection of *U. urealyticum* is not by itself an indication for treatment
  - routine culture for *U. urealyticum* is not indicated since isolation in culture is not proof that it is the etiology of the urethritis
- Group B streptococci and *Gardnerella vaginalis* virtually never cause urethritis and routine urethral culture for these bacteria should not be done
- the following symptoms and signs are not typical of urethritis and suggest an alternative diagnosis:
  - hematuria, chills, fever, frequency, nocturia, urgency, perineal pain, scrotal masses, a problem with initiation of the urinary stream or the strength of the stream and tender inguinal lymphadenopathy (see section on Epididymitis, page 49 and Prostatitis, page 53)
- in the absence of external lesions, a yeast infection is not a cause of urethritis

Management and treatment

Depends on the availability of results of the stained smears

Results available	
Smear shows increased numbers of PMNs(a) and gram-negative intracellular diplococci	• treat for urethritis due to *N. gonorrhoeae* and *C. trachomatis* *9 years or older:* • **ceftriaxone 250 mg IM** in a single dose **PLUS** • **doxycycline 100 mg orally** x 2/day for 7 days **OR tetracycline 500 mg orally** x 4/day for 7 days(b) *Under 9 years:* • **cefixime 16 mg/kg orally** in a single dose (max 800 mg) **PLUS** • **erythromycin 40 mg/kg/day** in divided doses (max 500 mg x 4/day orally) for 7 days **OR** • **ceftriaxone 125 mg IM** in a single dose **PLUS** • **erythromycin 40 mg/kg/day** in divided doses (max 500 mg x 4/day orally) for 7 days • for alternative regimens for children, adolescents and adults see section on Gonococcal Infections, page 81
Smear shows increased number of PMNs(a) but no intracellular diplococci	• treat for non-gonoccocal urethritis *9 years or older:* • **doxycycline 100 mg orally** x 2/day for 7 days **OR tetracycline 500 mg orally** x 4/day for 7 days(b) *Under 9 years:* • **erythromycin 40 mg/kg/day orally** in divided doses (max 500mg x 4/day) for 7 days • for alternative regimens for children, adolescents and adults see section on Chlamydial Infections, page 91
Smear shows a mean of < 4 PMNs in 5 fields (x 1000)	• defer antimicrobial treatment until the microbiologic results are available – if the results are positive: treat according to the results (see section on specific disease) **OR** • if the history suggests a high risk of infection: consider treating for urethritis due to *N. gonorrhoeae* and *C. trachomatis* if appropriate follow-up cannot be assured

(a) a mean of ≥ 4 PMNs per field (x 1000) in 5 fields
(b) tetracycline is less expensive but compliance is better with doxycycline

Management and treatment (cont'd).....

Results not available	
Urethral discharge detected	• treat for urethritis due to *N. gonorrhoeae* and *C. trachomatis*
No urethral discharge detected	• defer antimicrobial treatment until the microbiological results are available – if the results are positive: treat according to the results (see section on speeific disease) • if the history suggests a high risk of infection, consider treating for urethritis due to *N. gonorrhoeae* and *C. trachomatis* if appropriate follow-up cannot be assured

NOTE: erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations may be substituted.

Cervicitis in Adolescents and Adults

Definition

- inflammation of the cervix with:
  - a mucopurulent or purulent cervical discharge and with an increased number of polymorphonuclear leucocytes (PMNs) in endocervical secretions (a mean of 10 or more PMNs per oil immersion field [x 1000] in 5 fields on a smear)

NOTE

- the criteria for defining cervicitis, especially when signs are minimal, are not yet well standardized. An increased number of PMNs in the absence of other markers is not specific for the diagnosis of cervicitis
- evaluation of smear for PMNs is not valid during menstruation

Special considerations in children

- cervicitis does not occur in prepubertal girls. The counterpart is prepubertal vaginitis (see section on Prepubertal Vaginitis, page 35)

Etiology

- most important causes of cervicitis are:
  Chlamydia trachomatis
  Neisseria gonorrhoeae
- *C. trachomatis* and *N. gonorrhoeae* infections are frequently present without signs, symptoms or a PMN response but still require treatment
- cervicitis may also be due to the herpes simplex virus (HSV) (typically with erosive lesions and involvement of the exocervix plus external genital lesions)

Cervicitis in Adolescents and Adults (cont'd).....

Clinical clues

Any of the following should prompt evaluation for cervicitis in adolescents and adults:

Symptoms	• vaginal discharge • lower abdominal pain of recent onset • intermenstrual, postcoital or prolonged abnormal vaginal bleeding • deep dyspareunia
Signs	• purulent or mucopurulent cervical discharge • induced mucosal bleeding on taking the first endocervical swab • if ectopy is present, edema and erythema in the area of ectopy **NOTE:** these signs are best detected during a non-menstrual phase

Specimen collection and laboratory diagnosis

- since cervicitis and vaginitis frequently coexist, patients should be evaluated for both

Genital examination

- perform a genital examination, ensuring adequate visualization of the cervix (including the os). Secretions on the cervix may need to be removed with a swab.

Endocervical specimens

- obtain endocervical swabs for a slide for a stained smear (usually Gram stain) and for diagnostic tests for *N. gonorrhoeae* and *C. trachomatis*
- evaluation of smear for PMNs not valid during menstruation
- swab cervical lesions for a diagnostic test for HSV if infection suspected

Pap smear

- take a Papanicolaou smear if one has not been performed in the preceding 12 months (see page 184)

Vaginal specimens

- obtain vaginal swabs for:
  - stained smear (usually Gram stain)
  - a saline wet mount for a diagnostic test for *Trichomonas vaginalis* and for diagnosis of bacterial vaginosis with identification of clue cells (epithelial cells with granular appearance caused by adherent bacteria)
  - a potassium hydroxide (using 10% KOH) preparation, including an amine odour test (whiff test)
  - pH test (normal pH < 4.5)

Bimanual examination

- perform a bimanual examination to detect signs of pelvic inflammatory disease

Cervicitis in Adolescents and Adults (cont'd).....

Tests for other STD

- consider obtaining a blood sample for serologic testing for **syphilis** (see section on Screening, page 157)
- consider **HIV screening**
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 177) (see section on Screening, page 157)
- immunization against hepatitis B should be considered
  - screening for hepatitis B markers (surface antigen [HBsAg] and surface antibody [HBsAb]) should be considered pre-immunization (see section on Hepatitis B, page 63)

NOTE

- detection of *C. trachomatis* may be enhanced by using a cytobrush for endocervical specimens (not approved for use in pregnancy)
- detection of *C. trachomatis* and *N. gonorrhoeae* may be enhanced by taking a urethral swab for a diagnostic test for *C. trachomatis* and a rectal swab for a diagnostic test for *N. gonorrhoeae*
- *Ureaplasma urealyticum* and *Mycoplasma hominis* are not proven causes of cervicitis and should not be looked for by culture

Prevention

- **Primary prevention of infection is a critical part of management**
- **Patients presenting with concerns about STD provide an important opportunity for instruction and encouragement for the consistent practice of safer sex**

Reporting, contact tracing and follow-up

- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority
- when treatment is indicated for the index case, all partners who have had sexual contact with the index case (within the 30 days prior to onset of symptoms if *N. gonorrhoeae* is detected, longer if the case is asymptomatic or the history warrants, and within at least 6 weeks if *C. trachomatis* is detected) should be located, clinically evaluated and treated appropriately. Persons treated for gonococcal infections should also be treated for chlamydia
- testing of partners for causes of cervicitis may assist in the diagnosis of the index case
- local public health authorities should be available to help with contact tracing, clinical evaluation, testing, treatment and health education

Cervicitis in Adolescents and Adults (cont'd).....

Follow-up.....

- follow-up should be arranged, but if a recommended treatment is given and taken, symptoms and signs disappear and there is no re-exposure to an untreated partner, repeat diagnostic testing for *N. gonorrhoeae* and *C. trachomatis* is not routinely recommended. However, women with PID and those treated in pregnancy and their newborns should be retested.
- in patients with clinically or microbiologically documented treatment failure, possibilities include:
  - a false-positive test result
  - failure to take medication correctly
  - re-exposure to an untreated partner
  - infection acquired from a new partner
  - infection with other pathogens
  - a non-infective etiology

CAUTIONS

- signs of uterine or adnexal tenderness on examination, or of fever or an adnexal mass in women in whom cervicitis is being considered should be evaluated for PID (see page 25)
- evaluation of cervical smear for PMNs is not valid during menstruation
- patients who have had a complete hysterectomy may still be infected with *C. trachomatis* or *N. gonorrhoeae*, or both, in the urethra or rectum
- detection of *Ureaplasma urealyticum* or *Mycoplasma hominis* is not by itself an indication for treatment. Routine culture for genital mycoplasmas is not indicated.
- human papillomavirus (HPV) infection of the cervix does not cause clinically evident cervical inflammation

Management and treatment

Initial management varies depending on the clinical findings and the availability of results of a stained smear of endocervical secretions at the initial visit.

Results available	
Mucopurulent or purulent endocervical discharge present and smear shows increased number of PMNs (a mean of ≥ 10 PMNs per field [x 1000] in 5 fields) in endocervical secretions	• treat for *N. gonorrhoeae* and *C. trachomatis* • **ceftriaxone 250 mg IM** in a single dose **PLUS doxycycline 100 mg orally** x 2/day for 7 days **OR tetracycline 500 mg orally** x 4/day for 7 days(a) • for alternative regimens see section on Gonococcal Infections, page 81
Mucopurulent or purulent endocervical discharge present and smear shows mean of < 10 PMNs/field (x 1000)	• defer antimicrobial treatment until the microbiologic results are available (unless gram-negative intracellular diplococci seen on smear) • if the results are positive, treat according to the results (see section on specific disease) **OR** • if the history suggests a high risk of infection, consider treating for mucopurulent cervicitis due to *N. gonorrhoeae* and *C. trachomatis* if appropriate follow-up cannot be assured (see above)
No mucopurulent or purulent endocervical discharge but gram-negative intracellular diplococci present in endocervical secretions	• treat for mucopurulent cervicitis due to *N. gonorrhoeae* and *C. trachomatis* (see above)
No mucopurulent or purulent endocervical discharge and no gram-negative intracellular diplococci	• defer antimicrobial treatment until the microbiologic results are available • if the results are positive, treat according to the results (see section on specific disease) **OR** • if the history suggests a high risk of infection, consider treating for mucopurulent cervicitis due to *N. gonorrhoeae* and *C. trachomatis* if appropriate follow-up cannot be assured (see above)
Clinical presentation compatible with cervical herpes simplex virus infection	• consider treatment for HSV infection (see section on Genital HSV Infection, page 107)

Treatment (cont'd).....

Results not available	
Endocervical discharge detected **AND** at least one of the following factors present: • edema or erythema in an area of ectopy • induced mucosal bleeding (signs of uterine or adnexal tenderness are an indication for treatment for pelvic inflammatory disease, see section on PID, page 25) **OR** • the patient is from a high-risk group (see section on Screening, page 157)	• treat for mucopurulent cervicitis due to *N. gonorrhoeae* and *C. trachomatis* (see above)
No endocervical discharge detected	• proceed as when there is a mean < 10 PMNs/field (x 1000) **OR** • if the history suggests a high risk of infection consider treating for mucopurulent cervicitis due to *N. gonorrhoeae* and *C. trachomatis* if adequate follow-up cannot be assured (see above)
Clinical presentation is compatible with cervical herpes simplex virus infection	• consider treatment for HSV infection (see section of Genital HSV Infection, page 107)

(a) tetracycline is less expensive but compliance is better with doxycycline

Pelvic Inflammatory Disease

Definition

- pelvic inflammatory disease (PID) is inflammation of the endometrium, fallopian tubes, pelvic peritoneum and/or contiguous structures

NOTE

- **laparoscopic evidence of salpingitis or pelvic peritonitis or histologic evidence of endometritis may be present with few or no symptoms of acute PID**

Epidemiology

- estimates of the size of the problem of PID are difficult to obtain. However, there were almost 16,000 hospital admissions for suspected PID in Canada in 1987/88 alone. Females 15-29 yrs have the highest rates of hospitalization. Major sequelae of PID are ectopic pregnancies and infertility. In 1987/88, 1 in every 63 pregnancies was ectopic.

Etiology

- STD pathogens – up to 80%:
  - *Neisseria gonorrhoeae* 25-50%
  - *Chlamydia trachomatis* 30-60%
  - *Mycoplasma hominis*

- Other organisms – 20-40%:
  - anaerobes including *Bacteroides* sp. and *Peptostreptococcus* sp.
  - coliforms, such as *Escherichia coli*
  - these organisms are also found in 5-30% of gonococcal/chlamydial salpingitis

Special considerations in children

- sexually transmitted PID is not known to occur in prepubertal girls

PID (cont'd).....

Clinical clues

- presence of an intrauterine device (IUD)
- previous episode of PID
- any of the following should prompt evaluation for PID in sexually active adolescents and adults:

Symptoms	• low abdominal **pain** of recent onset • metrorrhagia, intermenstrual or postcoital vaginal **bleeding** • deep **dyspareunia** • vaginal **discharge** that is not readily explained
Signs	• cervical motion tenderness • adnexal tenderness on bimanual examination, with or without a mass (when the findings are unilateral or predominantly unilateral, ectopic pregnancy must be ruled out) • **cervicitis** (purulent cervical exudate is present in 30% of PID cases) • **fever** (in < 40% of cases)

Laboratory clues

- detection of gram-negative intracellular diplococci on a stained smear of endocervical secretions **OR**
  positive results of a diagnostic test for *C. trachomatis* or *N. gonorrhoeae* **OR** both

Major sequelae

- infertility
- ectopic pregnancy
- chronic pelvic pain

NOTE

- **women who have had an episode of PID have a 10-fold increased risk of subsequent PID, an 8-fold increased risk of ectopic pregnancy, and a 10-fold increased risk of infertility**

Specimen collection and laboratory diagnosis

Genital examination

- perform a genital examination, ensuring adequate visualization of the cervix (including the os). Secretions on the cervix may need to be removed with a swab.

Endocervical specimens

- obtain endocervical swabs for a slide for a stained smear (usually Gram stain) and for diagnostic tests for *N. gonorrhoeae* and *C. trachomatis*
- evaluation of smear for PMNs not valid during menstruation
- swab cervical lesions for a diagnostic test for HSV if infection suspected

PID (cont'd).....

Pap smear

- take a Papanicolaou smear if one has not been performed in the preceding 12 months (see page 184)

Vaginal specimens

- obtain vaginal swabs for:
  - stained smear (usually Gram stain)
  - a saline wet mount for a diagnostic test for *Trichomonas vaginalis* and for diagnosis of bacterial vaginosis with identification of clue cells (epithelial cells with granular appearance caused by adherent bacteria)
  - a potassium hydroxide (using 10 % KOH) preparation, including an amine odour test (whiff test)
  - pH test (normal pH < 4.5)

Bimanual examination

- perform a bimanual examination to detect signs of pelvic inflammatory disease

Tests for other STD

- consider obtaining a blood sample for serological testing for **syphilis** (see section on Screening, page 157)
- consider **HIV screening**
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176)
    (see section on Screening, page 157)
- immunization against hepatitis B should be considered
  - screening for hepatitis B markers (surface antigen [HBsAg] and surface antibody [HBsAb]) should be considered pre-immunization
    (see section on Hepatitis B, page 63)

NOTES

- detection of *C. trachomatis* and *N. gonorrhoeae* may be enhanced by using a cytobrush (not approved for use in pregnancy) to obtain an endocervical specimen for a diagnostic test for *C. trachomatis* and a rectal swab for a diagnostic test for *N. gonorrhoeae*
- consider obtaining a complete blood count, differential count and erythrocyte sedimentation rate or C-reactive protein level at the initial evaluation for ancillary support of the diagnosis of acute PID and to aid in evaluating the response to treatment. In many cases PID may be present when these tests are normal.
- the serum level of ß-human chorionic gonadotropin (HCG) should be determined to exclude ectopic pregnancy unless pregnancy is unlikely (if this test is not available, a urine pregnancy test may be obtained, but the result is negative in up to 50% of women with ectopic pregnancy because of variable amounts of HCG in the urine)
- ultrasound may be normal and does not rule out PID

PID (cont'd).....

Management

- **it is essential to differentiate PID from other diseases but appropriate therapy should not be withheld from patients when the diagnosis is equivocal**
- **early treatment is essential and should NOT be delayed while the patient is waiting to be hospitalized or advice is being sought**

Refer for hospital admission and evaluation by a specialist when:
- atypical findings are present **OR**
- an adnexal mass or tubo-ovarian abscess is present **OR**
- moderate to severe illness **OR**
- patient is unable to tolerate oral medication **OR**
- patient is immunocompromised (including HIV infection) **OR**
- patient is pregnant **OR**
- surgical emergency such as ectopic pregnancy and acute appendicitis cannot be excluded

Outpatient management is acceptable when:
- *typical findings* are present **AND**
- mild to moderate illness **AND**
- if patient can tolerate oral medications **AND**
- patient is judged likely to be compliant

BUT
- ALL PATIENTS TREATED AS OUTPATIENTS SHOULD BE RE-EVALUATED 48 TO 72 HOURS AFTER THE INITIAL ASSESSMENT AND
- THOSE WHOSE CONDITION HAS NOT IMPROVED SHOULD BE ADMITTED TO HOSPITAL AND EVALUATED BY A SPECIALIST

Special considerations

Adolescents with PID:
- hospitalization is strongly recommended for all adolescents with PID as they are at increased risk for sequelae, as compliance with both medical regimens and appointments may be a problem and optimal treatment cannot be guaranteed on an outpatient basis
- if an adolescent is treated as an outpatient, then to aid compliance treatment regimens should be as simple as possible
- confidentiality of medical services must be assured in a hospital setting for all adolescent patients; otherwise, they may not seek appropriate treatment for STD

Patients with an IUD:
- IUD should not be removed until after therapy is initiated and patient is responding
- in mild or moderate cases the IUD should be removed at first follow-up
- consider leaving IUD in place only if risk of pregnancy is high
- contraceptive counselling will be necessary when IUD is removed

Pregnant women:
- require hospitalization because of the need to very carefully consider other diagnoses as PID is rare after the first trimester

Immunocompromised women:
- women with HIV infection may be at increased risk of developing PID after infection with *N. gonorrhoeae* and may have a delayed response to treatment
- women with HIV and PID should be hospitalized and treated expeditiously

Prevention

- **Primary prevention of infection is a critical part of management**
- **Patients presenting with concerns about STD provide an important opportunity for instruction and encouragement for the consistent practice of safer sex**
- **All patients with PID should be counselled regarding their future risk of PID and infertility**

Reporting, contact tracing and follow-up

- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority
- when treatment is indicated for the index case, all partners who have had sexual contact with the index case (within the 30 days prior to onset of symptoms if *N. gonorrhoeae* is detected, longer if the case is asymptomatic or the history warrants, and within at least 6 weeks if *C. trachomatis* is detected) should be located, clinically evaluated and treated appropriately. Persons treated for gonococcal infections should also be treated for chlamydia.
- a high proportion of infected male partners may be asymptomatic

- local public health authorities should be available to help with contact tracing, clinical evaluation, testing, treatment and health education
- a Papanicolaou smear should be obtained, if appropriate, when the PID has resolved (see page 184)

Treatment

- therapy must be directed against major pathogens with a combination of antimicrobial agents. Single antimicrobial regimens are NOT adequate. This is especially true for single-agent penicillins or single-agent cephalosporins
- all therapeutic regimens should be highly effective against *N. gonorrhoeae* and *C. trachomatis*
- treatment is complex and in some situations controversial
- the sequelae of PID are serious and, therefore, strong consideration should be given to using a comprehensive regime on discharge from hospital or for outpatient treatment
- a regimen with broader antimicrobial activity should be considered when concomitant infection with anaerobes and coliforms (see Etiology above) is likely, i.e., with:
  - adnexal mass formation
  - severe PID
  - chronic PID
  - PID in a female > 25 years of age
  - IUD
  - previous history of PID

PID (cont'd).....

Treatment (cont'd).....

Hospitalized patients (for pregnant women see below)

In-patient therapy

Preferred:

- **cefoxitin(a) 2 g IV** 8 hourly
  PLUS
  doxycycline 100 mg IV or **orally** x 2/day for at least 4 days and at least 48 hrs after improvement

Alternative:

In women with adnexal mass formation consider using

- **clindamycin 900 mg IV** 8 hourly
  PLUS
  gentamicin 1.5 mg/kg IV 8 hourly for at least 4 days and at least 48 hrs after improvement (serum gentamicin concentrations should be monitored)

Therapy after discharge

- **doxycycline 100 mg orally** x 2/day to complete at least 14 days of treatment
  PLUS
  one of the following regimens if appropriate:

If gonococcal infection is diagnosed by Gram stain or culture **OR**
where there is an increased risk of gonococcal infection(b)
ADD

- **cefixime 400 mg orally** x 2/day to complete at least 14 days of treatment
  OR
- **ciprofloxacin 500 mg orally** x 2/day to complete at least 14 days of treatment
  OR
- **ofloxacin 400 mg orally** x 2/day to complete at least 14 days of treatment

For women with adnexal mass formation, tubo-ovarian abscess or peritonitis
ADD

- **cefixime 400 mg orally** x 2/day to complete at least 14 days of treatment
  OR
- **amoxicillin-clavulanate 500 mg orally** x 3/day to complete at least 14 days of treatment
  OR
- **metronidazole 500 mg orally** x 3/day to complete at least 14 days of treatment(c)
  OR
- **clindamycin 300 mg orally** x 3/day to complete at least 14 days of treatment

For women at higher risk of anaerobic infections, i.e., > 25 years of age, presence of IUD, previous history of PID
STRONGLY CONSIDER ADDING

- **metronidazole 500 mg** orally x 2/day to complete at least 14 days of treatment(c)

(a) other cephalosporins (such as ceftizoxime and cefotetan), which provide adequate coverage against gonococci and other facultative gram-negative aerobes and anaerobic bacteria, may be utilized in appropriate doses

(b) street youth, previous STD, sexual contact with person with proven infection or compatible syndrome

(c) advise patients taking metronidazole **NOT** to take any alcoholic beverages during therapy and for 48 hrs post-treatment to prevent "Antabuse"-like reaction. Metronidazole is not recommended during the first trimester of pregnancy.

PID (cont'd).....

Treatment (cont'd).....

Pregnant Women(a)
• the treatment regimen above should be followed, but doxycycline should be replaced by **erythromycin 2 g/day orally** in divided doses for at least 10-14 days – if not tolerated, **erythromycin 1 g/day orally** in divided doses for 14 days, may be substituted (erythromycin estolate is contraindicated in pregnancy)(b)

(a) PID is rare after the first trimester

(b) erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations (except estolate) may be substituted.

PID (cont'd).....

Treatment (cont'd).....

Non-hospitalized patients

Preferred:

- **ceftriaxone 250 mg IM** in a single dose
  PLUS
  doxycycline 100 mg orally x 2/day x 14 days

Alternatives (in alphabetical order):

- **cefixime 800 mg orally** in a single dose
  PLUS
  doxycycline 100 mg orally x 2/day x 14 days
  OR
- **ciprofloxacin 500 mg orally** in a single dose
  PLUS
  doxycycline 100 mg orally x 2/day x 14 days
  OR
- **ofloxacin 400 mg orally** in a single dose
  PLUS
  doxycycline 100 mg orally x 2/day x 14 days

If gonococcal infection is diagnosed by Gram stain or culture **OR** where there is an increased risk of gonococcal infection(b)
USE

- **cefixime 400 mg orally** x 2/day x 14 days
  PLUS
  doxycycline 100 mg orally x 2/day x 14 days
  OR
- **ciprofloxacin 500 mg orally** x 2/day x 14 days
  PLUS
  doxycycline 100 mg orally x 2/day x 14 days
  OR
- **ofloxacin 400 mg orally** x 2/day x 14 days
  PLUS
  doxycycline 100 mg orally x 2/day x 14 days

(b) street youth, previous STD, sexual contact with person with proven infection or compatible syndrome

Prepubertal Vaginitis and Vulvitis

Definition

- inflammation of the vagina with a mucopurulent or purulent vaginal discharge in a prepubertal girl
- prepubertal vaginitis should not be confused with prepubertal vulvitis, in which there may be irritation but no discharge

Etiology

- the most important infectious causes of prepubertal vaginitis are:
  - group A streptococci (not an STD)
  - *Neisseria gonorrhoeae*
  - *Chlamydia trachomatis*
- other causes include:
  - herpes simplex virus (HSV)
  - *Trichomonas vaginalis*
  - *Shigella* sp. (not an STD)
  - foreign body, with or without overgrowth of normal flora (the commonest cause)
  - trauma
- identification of *N. gonorrhoeae*, *C. trachomatis*, HSV or *T. vaginalis* should prompt evaluation for possible sexual abuse. The role of other causes of prepubertal vaginitis including bacterial vaginosis as markers for sexual abuse is less clear and if diagnosed other symptoms or signs of abuse should be sought carefully and depending upon results, cases should be referred for evaluation
- the normal vaginal flora in prepubertal girls may include *Escherichia coli*, *Staphylococcus aureus*, *Haemophilus influenzae*, *Proteus* spp., *Neisseria meningitidis*, *Klebsiella* spp., *Pseudomonas aeruginosa* and non-group A streptococci

Clinical clues

- the normal non-estrogen stimulated vaginal squamous epithelium is susceptible to infection with chlamydia and gonorrhea, therefore, *vaginal **NOT** endocervical specimens should be collected*
- speculum examination is **NOT** indicated in prepubertal girls unless there is unexplained bleeding

Prepubertal Vaginitis (cont'd).....

Clinical clues (cont'd).....

- symptoms and signs:
  any of the following should prompt evaluation for pre-pubertal vaginitis:
  - vaginal **discharge**
  - perineal **irritation**
- indications to refer prepubertal girls with vulvovaginitis to a specialist:
  - bloody vaginal discharge
  - foul vaginal discharge
  - physician inexperienced in vaginal examination of this age group
  - persistent discharge after appropriate therapy
  - persistent vulvitis after one month of good hygiene measures

Specimen collection and laboratory diagnosis

- **genital specimens should be taken from prepubertal girls only when it is necessary. It is vital to ensure that the child is not traumatized by the taking of specimens.**
- if the presence of a foreign body has been excluded, vaginal swabs (not cervical) could be obtained:
  - one swab can be used for a stained smear (usually Gram stain) and for culture of *N. gonorrhoeae*, group A streptococci, *Shigella* sp., and *T. vaginalis* (if available)
  - a second swab can be used for cultures of *C. trachomatis*
  - a further swab is necessary for HSV, if genital herpes is suspected
  - where possible, and if necessary, a swab could be taken for a saline wet mount for a diagnostic test for *Trichomonas vaginalis* and for diagnosis of bacterial vaginosis with identification of clue cells (epithelial cells with granular appearance caused by adherent bacteria)
- in addition, pharyngeal and rectal swabs can be obtained for culture of *N. gonorrhoeae* and *C. trachomatis*

NOTES

- if culture is not available for *N. gonorrhoeae*, or HSV, a non-culture, organism-specific test may have to be substituted but is less than ideal. In the case of C. trachomatis, molecular amplification techniques (eg, PCR, LCR, page 189) are under evaluation but are less than ideal, particularly for *C. trachomatis*. False positivity of non-culture tests may be as high as 50% in this low prevalence age group. This adds to the difficulty in assessment for possible child abuse. Non-culture test results are not usually acceptable for medico-legal purposes.
- alert the laboratory to take special care with the specimens, to document the results as thoroughly as possible, e.g., degree of test positivity if a non-culture test is used, and to save any pathogenic isolates for submission to reference laboratory
- if sexual abuse is suspected, the suspected abuser(s) should also be evaluated with the most specific tests. The laboratory should be notified about the importance of the specimens and should be asked to save any pathogenic isolates.
- see section on Forensic Evidence, page 203

Prepubertal Vaginitis (cont'd).....

Reporting, contact tracing and follow-up

- reporting sexual abuse:
  - sexual abuse of children must be reported to the local child protection agency
- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority
- the duration of time that a perinatally transmitted STD can persist varies with different pathogens. It is not definitely known for any pathogen.
- the likelihood that a specific STD diagnosed in a child was sexually transmitted by oral-genital, genital-genital or ano-genital contact varies with different pathogens
- the likelihood of child sexual abuse, rather than persistent perinatal transmission, has caused an infection should be strongly considered with:
  - *Neisseria gonorrhoeae* infection in a child > 1 month of age and particularly > 6 months of age
  - genital or rectal chlamydial infection > 6 months of age, although perinatally acquired chlamydial infection may colonize an infant for possibly up to 3 years
  - genital or perianal herpes simplex virus infection > 3 months of age, although alternative routes of transmission should be considered
  - genital *Trichomonas vaginalis* infection > 6 months of age, although there may be non-sexual means of transmission
- expert advice should be sought in such cases
- the sexual contact of the index case should be located, clinically evaluated and treated appropriately
- local public health authorities should be available to help with contact tracing, clinical evaluation, testing and treatment
- follow-up must be arranged and repeat diagnostic testing for *N. gonorrhoeae* and *C. trachomatis* should be carried out
- follow-up is to ensure that the STD has been treated adequately so that, if there is a recurrence, it is diagnosed as a reinfection not a "relapse". The conduct of the re-examination must take into account the psychologic state of the child.

Prepubertal Vaginitis (cont'd).....

Management and treatment

- contact known to be positive for *N. gonorrhoeae* or *C. trachomatis*, or both:
  - treat the child according to the organism(s) detected or syndrome diagnosed in the contact
- contact not known to be positive for *N. gonorrhoeae* or *C. trachomatis*
  results of Gram stain available:
  - gram-negative intracellular diplococci presents: treat for prepubertal vaginitis due to *N. gonorrhoeae* and *C. trachomatis*
  - gram-negative intracellular diplococci not detected: defer antimicrobial treatment until the microbiologic results are available. If the results are positive, treat according to the results.

  results of Gram stain not available:
  - defer antimicrobial treatment until the microbiologic results are available. If the results are positive, treat according to results.

N. gonorrhoeae	*Preferred*(a): • **cefixime 16 mg/kg/day orally** in a single dose (max 800 mg) **PLUS erythromycin 40 mg/kg/day orally** (max 2 g/day) in divided doses for 7 days(b) **OR** if isolate known to be susceptible **amoxicillin** or **ampicillin 50 mg/kg orally** (max 3 g) **PLUS probenecid 25 mg/kg orally** (max 1 g) in a single dose **PLUS erythromycin 40 mg/kg/day orally** (max 2 g/day) in divided doses for 7 days(b) **OR** • **ceftriaxone 125 mg IM** in a single dose **PLUS erythromycin 40 mg/kg/day orally** (max 2 g/day) in divided doses for 7 days(b) *Alternative:* • **spectinomycin 40 mg/kg IM** (max 2 g) as a single dose **PLUS** **erythromycin 40 mg/kg/day orally** (max 2 g/day) in divided doses for 7 days(b)
C. trachomatis	• **erythromycin(b) 40-50 mg/kg/day orally** (max 2 g/day) in divided doses for 7 days(b)
T. vaginalis	• **metronidazole 15-20 mg/kg/day orally** in 3 divided doses (max 250 mg x 3/day) for 7 days **OR** **metronidazole 40 mg/kg orally** (max 2 g) in single dose
Bacterial vaginosis	• **metronidazole 15-20 mg/kg/day orally** in 3 divided doses (max 250 mg x 3/day) for 7 days
Herpes simplex virus	primary infection: (see section on HSV infection, page 107) recurrences: (see section on HSV infection, page 107)

(a) oral therapies are preferred in 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*. As there is limited experience with the use of cefixime in children with gonococcal infections, antimicrobial susceptibility *must* be ascertained and follow-up cultures for test-of-cure obtained.

(b) may use **doxycycline 100 mg orally** x 2/day or **tetracycline 500 mg orally** x 4/day for 7 days if > 9 years of age. Erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations may be substituted.

Vulvo-Vaginitis in Adolescents and Adults

Definition

- inflammation of the vulva, vagina, or both, and/or excessive vaginal discharge not due to cervicitis

Epidemiology/Etiology

- among the most common problems in clinical medicine
- other than trichomoniasis, the number of cases due to identified causes has increased in the last 20 years

Infectious Causes:
vaginitis/vaginosis:
- *Candida* sp. and other yeasts
- *Trichomonas vaginalis*
- bacterial vaginosis:
  mixed infection with anaerobes and aerobes associated with an increased risk of puerperal and postsurgical pelvic infections, and PID
- infection during pregnancy may be associated with prematurity in newborns

vulvitis:
- *Candida* sp. and other yeasts
- Herpes simplex virus (HSV)

Non-infectious causes should also be considered:
- a common cause of perceived vaginal discharge is excessive physiologic secretions
- foreign body, trauma
- hypersensitivity, e.g., latex condoms, spermicides, vaginal douches, etc.

NOTES
- ***T. vaginalis* and HSV are most often sexually transmitted**
- bacterial vaginosis and yeast vaginitis are rarely sexually transmitted; however, bacterial vaginosis is more common in those who are sexually active
- the cause of vaginal discharge cannot be identified in up to 50% of patients
- *Gardnerella vaginalis*, Group B streptococci and the genital mycoplasmas by themselves do **NOT** cause vaginitis; these pathogens should not be searched for in patients with vaginitis or treated if present

Vulvovaginitis in Adolescents and Adults (cont'd).....

Clinical clues

	Predisposing Factors	Symptoms	Signs
Candidiasis	• often absent • current or recent use of antibiotics • corticosteroids • diabetes mellitus • HIV infection • pregnancy	• itch • external dysuria • vaginal discharge • dyspareunia	• erythema and edema of vulva, vagina and/or introitus • white, clumpy adherent vaginal discharge
Trichomoniasis	• sexual activity	• vaginal discharge • itch • introital dyspareunia	• frothy, offwhite-yellow vaginal discharge
Bacterial vaginosis	• often absent • more common if sexually active	• vaginal discharge • fishy odour • may increase after intercourse	• grey to white thin vaginal discharge, often copious

Specimen collection and laboratory diagnosis

Genital and speculum examination
– **rule out cervicitis (see page 19)**
Vaginal specimens
- obtain vaginal swabs and:
  - if office microscopy is not available
    - send two air-dried slides to the laboratory: one for a Gram stain and one for a stain for *T. vaginalis*
  - if office microscopy is available
    - slide for a stained smear (usually Gram stain)
    - a wet mount (saline preparation) for the diagnosis of *T. vaginalis* and bacterial vaginosis
    - a 10% potassium hydroxide preparation for detection of yeast
- an amine odour whiff test with 10% KOH
- pH test (normal pH < 4.5): unreliable in the presence of blood

NOTE
- vaginal cultures for *Gardnerella vaginalis* and genital mycoplasmas are NOT indicated
- vaginal cultures for yeast are not routinely indicated and a positive culture *by itself* does not mean the woman has candidiasis
- when vulvitis is present without vaginitis, consider vulvar culture for yeast

Vulvovaginitis in Adolescents and Adults (cont'd).....

Tests for other STD

- consider obtaining a blood sample for serologic testing for **syphilis** (see section on Screening, page 157)
- HIV testing is strongly recommended
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176; see section on Screening, page 157)
- immunization against hepatitis B is recommended (see page 161)

Pitfalls in Diagnosis and Management of Vaginitis

- Misdiagnosis of cervicitis
- Inadequate history
- Patient not examined; no speculum examination
- Vaginal specimen not taken
- Reinfection (trichomoniasis):
  - partner not treated
  - new sexual contact
- Poor patient compliance
- Chemical or hypersensitivity vaginitis associated with topical treatment
- Patient may have self-treated with over-the-counter antifungal preparations; a history for medication should be taken for all patients.

Reporting, contact tracing and follow-up

- causes of vaginitis are not notifiable by physicians or laboratories to local public health authorities
- contact tracing for partners of patients with vaginitis is not routine except that regular male sexual partners of cases of trichomoniasis should be assessed, examined for other STD and treated with metronidazole 2 g orally in a single dose
- follow-up is not necessary unless signs and symptoms persist or reappear
- exception: follow-up of bacterial vaginosis in late pregnancy may be indicated to detect clinical relapses which require retreatment

Vulvovaginitis in Adolescents and Adults (cont'd).....

Management

Laboratory	
Methods	Interpretation

• Vaginal *smears/swabs* for
  • microscopy
  • Gram stain of air-dried slide for yeast and bacterial vaginosis (see page 186); stain for *T. vaginalis*
  • wet mount preparation for *T. vaginalis* and bacterial vaginosis (see page 183)
  • 10% KOH preparation for budding yeasts (see page 183)
• *pH*: wet pH paper with vaginal discharge
• *whiff test*: add a few drops of 10% KOH to vaginal discharge on speculum or smear to detect characteristic 'fishy odour'
	Bacterial Vaginosis
	• vaginal pH > 4.5
	• positive whiff test
	• wet mount preparation reveals presence of clue cells
	• Gram stain reveals a shift in vaginal flora with a decrease in large gram-positive rods and a marked increase in smaller gram-variable coccobacilli. Clue cells (epithelial cells with granular appearance caused by adherent bacteria) may also be present. For laboratories, Gram-stain diagnosis must be standardized using an accepted scoring system.
	
	Candidiasis
	• pH normal
	• negative whiff test
	• wet mount preparation with 10% KOH shows budding yeast and/or pseudohyphae
	• Gram-stain smear reveals PMNs, budding yeast and/or branching pseudohypbae
	
	Trichomonas vaginalis
	• vaginal pH > 4.5
	• negative whiff test
	• wet mount preparation reveals motile flagellates with PMNs
	• stain smear may reveal *T. vaginalis* and/or PMNs

Vulvovaginitis in Adolescents and Adults (cont'd).....

Treatment

Bacterial vaginosis

if asymptomatic, treatment is unnecessary unless pregnant, pre IUD insertion, pre-gynecologic surgery, pre-induced abortion

if symptomatic, treat

Preferred:

- **metronidazole 500 mg orally** x 2/day x 7 days(a)
  - avoid in first trimester of pregnancy
  - some experts recommend interrupting breast feeding until 24 hours after completing therapy

Alternatives:

- **clindamycin 300 mg orally** x 2/day x 7 days (can be used in pregnancy)
  OR
- **clindamycin cream 2%, 5 g intravaginally** daily for 7 days
  (can be used in pregnancy)
  OR
- **metronidazole gel 0.75%**, x 2/day x 5 days intravaginally
  OR
- **metronidazole 2 g orally** in a single dose

NOTES: (a) advise patients **NOT** to take any alcoholic beverages during metronidazole therapy and for 48-hr post-treatment to prevent disulfuram reaction
Male sexual partner: treatment not recommended.

Vulvovaginal candidiasis (VVC)

if asymptomatic, treatment is unnecessary

if symptomatic:

- **miconazole** or **clotrimazole 100 mg** (ovule) **intravaginally** daily for 7 days
  OR
- **miconazole cream 2%** or **clotrimazole cream 1%, 5 g intravaginally** daily for 7 days
  OR
- **miconazole** or **clotrimazole 200 mg intravaginally** daily for 3 days
  OR
- **clotrimazole 500 mg** tablet **intravaginally** in a single dose
  OR
- **fluconazole 150 mg orally** in a single dose (contraindicated in pregnancy)
  OR
- **terconazole 0.8% cream, 5 g intravaginally** for 3 days
  OR
- **terconazole 80 mg suppository, 1 suppository intravaginally** for 3 days
  OR
- **tioconazole 6.5% ointment, 5 g intravaginally** in a single application

NOTES: Recurrent VVC requires investigation for underlying causes and different therapeutic strategies. Specialist advice may need to be sought.
Male sexual partner should only be treated if *Candida* balanitis is present – use miconazole or clotrimazole cream applied x 2/day for 7 days.

Vulvovaginitis in Adolescents and Adults (cont'd).....

Treatment (cont'd.....)

Vaginitis caused by *T. vaginalis*

treat all cases and their sexual partners regardless of symptoms

- **metronidazole 2 g orally** in a single dose(a)

pregnant women:
avoid metronidazole during the first trimester
- **clotrimazole 100 mg intravaginally** (ovule) **or clotrimazole cream 1%, 5 g intravaginally** daily for 6 days may suppress symptoms

lactating women:
- **metronidazole 2 g orally** single dose(a)
  - some experts suggest interrupting breast feeding until 24 hrs after completing therapy

NOTE: (a) advise patients **NOT** to take any alcoholic beverages during metronidazole therapy and for 48-hr post-treatment to prevent disulfiram reaction

Epidemiology/Etiology

- purulent conjunctivitis occurs in < 1% of neonates in Canada
- maternal STD related causes: *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, herpes simplex virus (HSV)
- STD-related cases more common with
  - prolonged rupture of membranes
  - prematurity
  - maternal history of STD
  - no prenatal care
  - adolescent mother
- decreased prevalence of gonococcal neonatal ophthalmia with routine eye prophylaxis
- may occur despite eye prophylaxis
- most common non-STD causes: *Staphylococcus aureus*, chemical conjunctivitis

	% neonatal conjunctivitis	Incubation period	Severity of conjunctivitis	Associated problems
Chlamydia trachomatis	10-20%	5-14 days	++	pneumonitis 3 wks – 3 months
Neisseria gonorrhoeae	< 1%	2-5 days	+++	disseminated infection
Herpes simplex virus	< 1%	7-14 days	+	disseminated infection

Specimen collection and laboratory diagnosis

- *C. trachomatis*: scraping from lower palpebral conjunctiva and nasopharynx aspirate for culture and/or non-culture diagnostic test
- *N. gonorrhoeae*: Gram stain and bacterial culture of purulent discharge
- HSV: viral cultures of conjunctiva, mouth secretions and fluid and scrapings from any skin lesions. Electron microscopy for rapid diagnosis if scrapings from skin vesicles are available.
- serology in mother and infant to rule out possibility of co-infection with syphilis or HIV. If HIV antibody test is positive in a neonate, this does not necessarily mean infection of the infant (see section on HIV infection in children, page 127).

Ophthalmia neonatorum (cont'd).....

Prevention

- chemoprophylaxis or antimicrobial prophylaxis should be administered as soon as possible after delivery and preferably within one hour after birth. Tubes and ampules should NOT be used for more than one patient.
- Options:
  erythromycin 0.5% ophthalmic ointment
  OR
  tetracycline 1% ophthalmic ointment
  OR
  silver nitrate 1% ophthalmic ointment
- **NONE** of these measures will prevent all cases of gonococcal or chlamydial eye infection
- if prophylaxis is not given, adequate infant follow-up should be ensured

NOTE

- if routine prophylaxis against ophthalmia neonatorum is not used, then screening for *C. trachomatis* and *N. gonorrhoeae* should be carried out during pregnancy and appropriate treatment given

Reporting, contact tracing and follow-up

- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority
- the mother and her sexual partners should be located, clinically evaluated and treated appropriately
- local public health authorities should be available to help with contact tracing, clinical evaluation, testing, treatment and health education

Ophthalmia neonatorum (cont'd).....

Management and treatment

Infection with *C. trachomatis*

During first week of life:
infants < 2000 g
- **erythromycin 20 mg/kg/day orally** in divided doses

infants > 2000 g
- **erythromycin 30 mg/kg/day orally** in divided doses

> 1 week to 1 month
- **erythromycin 40 mg/kg/day orally** in divided doses

> 1 month
- **erythromycin 40 mg/kg/day orally** in divided doses (max 500 mg x 4/day)

the above regimens should be given for at least 14 days

Note: topical therapy alone for conjunctivitis is NOT adequate

Infection with *N. gonorrhoeae*

hospitalize and institute appropriate infection control precautions until 24 hrs of effective therapy completed
- culture eye discharge, blood (CSF only if evidence of systemic disease)
- irrigate eyes immediately with sterile normal saline and at least hourly as long as necessary to eliminate discharge
- consult with a specialist as soon as possible

Preferred initial therapy
- **ceftriaxone 25-50 mg/kg/day IV or IM** for 7 days
  PLUS
- **erythromycin at age–appropriate doses (see above)** for 14 days

Note: topical therapy alone for conjunctivitis is NOT adequate
additional topical antibiotics are not necessary for the treatment of gonococcal conjunctivitis

Infection with herpes simplex virus (see also section on HSV infection page 107)

- hospitalize and isolate
- consultation with pediatric and ophthalmologic specialists is suggested
- **acyclovir 30 mg/kg/day IV** 1-2 hour infusion x 3/day for 14 days
  PLUS
- **trifluridine** or **acyclovir** or other anti-herpes ophthalmic solution x 2/day for 14 days

NOTE: erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations may be substituted.

Epididymitis in Adolescents and Adults

Definition

- inflammation of the epididymis manifested by acute onset of unilateral testicular pain and swelling, often with tenderness of the epididymis and vas deferens with erythema and edema of the overlying skin

NOTE

- when epididymitis is accompanied by urethritis, it is presumed to be a sexually acquired infection; however, the urethritis may be asymptomatic and, therefore, overlooked

CAUTION

- **It is important to consider non-infectious causes of scrotal swelling, such as trauma, torsion of the testicle, and tumour. Torsion of the testicle is a surgical emergency.**

Epidemiology

- it is uncommon for males to present with epididymitis to STD clinics in Canada
- complicates < 1% of identified sexually transmitted urethritis
- US data suggest that it is a frequent problem in young males

Etiology

Sexually active men < 35 yrs	Sexually active men > 35 yrs
• *Chlamydia trachomatis* • *Neisseria gonorrhoeae* • With structural abnormalities of the urinary tract: – facultative gram-negative aerobes – other classical urinary tract pathogens	• gram-negative aerobes • other classical urinary tract pathogens • less frequent – *C. trachomatis* – *N. gonorrhoeae*

Special considerations in children

- sexually transmitted epididymitis is not known to occur in prepubertal boys. If symptoms and signs consistent with epididymitis occur in a prepubertal boy, torsion of the testicle must be excluded. This is a surgical emergency.

Epididymitis (cont'd).....

Clinical clues

Any of the following should prompt evaluation for epididymitis:

- painful unilateral scrotal swelling
- unilateral scrotal swelling or tenderness, or both, possibly with erythema and edema of the overlying skin

- obtain history (see section on Optimal History and Examination, page 173) with special attention to eliciting information on:
  - sexual activity
  - recent history of trauma
  - known or suspected structural or functional abnormalities of the urinary tract

CAUTION

- **If torsion of the testicle is a possibility, the patient should immediately be referred to a specialist in urology.**

Specimen collection and laboratory diagnosis

Genital examination

- perform a genital examination, with careful examination for urethral discharge and careful palpation of the scrotal contents

Meatal and urethral specimens

- if patient is sexually active or has been sexually active in the previous 6 months

  WITH meatal discharge take:
  - meatal swab for a slide for a stained smear (usually Gram stain) and for a diagnostic test for *N. gonorrhoeae*
  - endourethral swab for a diagnostic test for *C. trachomatis*

  WITHOUT meatal discharge take:
  - endourethral swab for a slide for a stained smear (usually Gram stain) and for diagnostic tests for *C. trachomatis* and *N. gonorrhoeae*

Urine culture

- for all patients (whether or not they are or have been sexually active) obtain a mid-stream urine specimen for Gram stain of unspun urine and for routine culture for aerobic urinary tract pathogens

Epididymitis (cont'd).....

Specimen collection and laboratory diagnosis (cont'd).....

Tests for other STD

- consider obtaining a blood sample for serologic testing for **syphilis** (see section on Screening, page 157)
- consider **HIV screening**
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176) (see section on Screening, page 157)
- immunization against hepatitis B should be considered
  - screening for hepatitis B markers (surface antigen [HBsAg] and surface antibody [HBsAb]) should be considered pre-immunization (see section on Hepatitis B, page 63)

NOTE

- when technical expertise is available, in some cases an aspirate may be obtained directly from the inflamed epididymal region for a smear and for diagnostic tests for *C. trachomatis*, *N. gonorrhoeae* and aerobic organisms

Reporting, contact tracing and follow-up

- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority
- when treatment is indicated for the index case, all sexual partners of patients with presumed sexually acquired epididymitis should be clinically evaluated and treated with a similar regimen, except that the duration of treatment is as for uncomplicated infection, i.e., total of 7 days
- local public health authorities should be available to help with contact tracing, clinical evaluation, testing, treatment and health education
- follow-up should be arranged, but if a recommended treatment is given and taken, symptoms and signs disappear and there is no re-exposure to an untreated partner, repeat diagnostic testing for *N. gonorrhoeae* and *C. trachomatis* is not routinely recommended

Prevention

- **Primary prevention of infection is a critical part of management**
- **Patients presenting with concerns about STD provide an important opportunity for instruction and encouragement for the consistent practice of safer sex**

Management and treatment

Depends on availability of results of the stained smears of urethral secretions and urine

Results available	
Smear of urethral secretions shows a mean of ≥ 4 polymorphonuclear leucocytes (PMNs)/field (x 1000) in 5 fields and gram-negative intracellular diplococci	• treat for epididymitis due to *N. gonorrhoeae* and *C. trachomatis:* • **ceftriaxone 250 mg IM** in a single dose(a) **PLUS** **doxycycline 100 mg orally** x 2/day for at least 10 days **OR tetracycline 500 mg orally** x 4/day for at least 10 days
Smear of urethral secretions shows a mean of ≥ 4 PMNs/field (x 1000) but no gram-negative intracellular diplococci	• treat for *C. trachomatis* epididymitis alone *Preferred:* • **doxycycline 100 mg orally** x 2/day for at least 10 days **OR tetracycline 500 mg orally** x 4/day for at least 10 days • for alternative drugs see page 96. Treat for at least 10 days.
Smear of urethral secretions shows a mean of < 4 PMNs/field (x 1000) but the stain of unspun urine shows PMNs and one or more bacteria/field (x 1000)	• treat as for a urinary tract infection
Neither smear nor urine shows PMNs	• **defer antimicrobial treatment and immediately re-evaluate for torsion of the testicle**

Results not available	
Urethral discharge detected	• treat for epididymitis due to *N. gonorrhoeae* and *C. trachomatis* and await results: • **ceftriaxone 250 mg IM** in a single dose(a) **PLUS** **doxycycline 100 mg orally** x 2/day for at least 10 days **OR tetracycline 500 mg orally** x 4/day for at least 10 days
No urethral discharge detected	• **immediate referral for microbiologic evaluation and additional tests, as needed, if torsion of the testicle is a possibility**

(a) ceftriaxone may be substituted by the preferred oral regimens for the treatment of gonococcal infections, see page 88

Prostatitis in Adolescents and Adults

Definition

- inflammation of the prostate with an increased number of polymorphonuclear leucocytes (PMNs) in prostatic fluid AND in bacterial prostatitis, an increased number of bacteria in prostatic fluid or urine (obtained after prostatic massage) compared with the first-void and mid-stream urine

Epidemiology

- before the introduction of antimicrobials, gonococcal infection was an important cause of prostatitis
- now microbiologically documented prostatitis caused by recognized sexually transmitted pathogens is exceedingly rare
- prostatitis is included here to assist health care providers in management of males who present with genital symptoms

Special considerations in children

- prostatitis does not occur in prepubertal boys

Etiology

Usual causes	Potential or rare causes
• facultative gram-negative urinary pathogens e.g., *Escherichia coli* and *Proteus* spp	• gram-positive urethral organisms e.g., coagulase-negative staphylococci and diphtheroids • *Trichomonas vaginalis* • genital mycoplasmas

Clinical clues

Any of the following should prompt evaluation for prostatitis:

Symptoms	acute bacterial	• sudden onset of chills, fever and malaise with frequency, difficulty voiding and, occasionally, acute retention
	other	• frequency, urgency or nocturia • dysuria • difficulty starting the urinary stream, poor flow of urine and/or post-void dribbling • sensation of fullness in the rectum • pain in the perineum, suprapubic region, or rectum • ejaculate of abnormal colour or consistency • post-ejaculation pain or hemospermia • rarely, a urethral discharge, sometimes only noted with bowel movements
Signs		• perineal tenderness • unusual prostatic tenderness • "bogginess" of the prostate **Note:** tenderness and "bogginess" of the prostate are not necessarily present with proven bacterial prostatitis and its presence does not establish a diagnosis of prostatitis

Specimen collection and laboratory diagnosis

- perform a genital examination, particularly to detect any urethral discharge, to evaluate the scrotal contents and to elicit perineal tenderness
- if suggested by the history **OR** if a urethral discharge **OR** epididymal inflammation is detected:
  - evaluate for urethritis or epididymitis (see sections on Urethritis, page 13 and Epididymitis, page 49)
- if practical, collect the following specimens sequentially in sterile containers:
  - the first 10 to 15 mL of urine for culture including 7 to 8 mL of urine for centrifugation to examine the sediment for pyuria
  - a mid-stream urine for culture, including 7 to 8 mL for centrifugation to examine the sediment for pyuria
- **EXCEPT** when acute bacterial prostatitis is strongly considered:
  - perform a rectal examination to evaluate the prostate and massage it to attempt to express prostatic secretions for direct microscopy to evaluate for number of PMNs, for motile trichomonads and for culture
  - collect the next 10 to 15 mL of urine for culture, including 7 to 8 mL for centrifugation to examine the sediment for pyuria

NOTES

- for culture of fluids, the laboratory should be requested (telephoned or arranged in advance) to inoculate media that will grow classic urinary tract pathogens and to use a 0.1 mL inoculum as well as the standard 0.001 mL of inoculum

NOTES (cont'd).....

- if acute bacterial prostatitis is a possibility, blood cultures should be obtained and prostate examination deferred

Interpretation of laboratory results

- a positive culture is one in which there is a significant (usually 10-fold or greater) increase in the number of one or more types of bacteria in the prostatic fluid or the urine obtained after prostatic massage compared to the first void and mid-stream urines. The results of culture of the prostatic fluid alone are difficult to interpret without the other information.

CAUTION

- **This interpretation is accepted for facultative gram-negative organisms but is more controversial for gram-positive organisms.**

Reporting, contact tracing and follow-up

- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority
- sexual partners of patients with prostatitis do not usually require evaluation or treatment because prostatitis is not typically caused by a sexually transmitted pathogen
- appropriate follow-up should be arranged depending on the proven or presumed diagnosis

NOTES

- although prostatitis is defined as inflammation of the prostate, in practical terms defining prostatitis is often difficult and there is considerable confusion in categorizing it. This problem is accentuated because there is increasing histopathologic inflammation with age in asymptomatic men.
- the ultimate diagnostic category is usually determined on the basis of the acuteness of the presentation, examination of the prostatic fluid, and culture results
- the current nomenclature is as follows:
  - in *acute and chronic bacterial prostatitis* the results of culture are positive and there is a significant PMN response in the prostatic fluid
  - in *non-bacterial prostatitis* the culture results are negative but there is a significant PMN response in the prostatic fluid
  - in *prostadynia* the results of culture are negative and there is minimal or no PMN response in the prostatic fluid

CAUTION

- **Since prostatic fluid contains antibacterial substances, which will inhibit growth of certain organisms, specimens must be processed as soon as possible.**

Management and treatment

The initial management varies depending on whether urethritis or epididymitis is present and, if both are absent, on the acuteness of the other symptoms.

Urethritis detected	• manage as for urethritis (see the section on Urethritis, page 13)
Epididymitis strongly suspected	• manage as for epididymitis (see the section on Epididymitis, page 49)
Neither urethritis nor epididymitis appear to explain the findings	patient acutely ill: • marked prostatic tenderness or the expressed prostatic secretions show a significant inflammatory response: – admit to hospital and initially treat with a combination of a ß-lactam antimicrobial, e.g., ampicillin and an aminoglycoside, e.g., gentamicin, or a similar regimen • minimal or no prostatic tenderness, no significant polymorphonuclear leucocyte (PMN) response in the expressed prostatic secretions or no increase in the number of PMNs in the sediment of the urine obtained after prostatic massage compared with the first-void and mid-stream urine: – admit to hospital and assess for other potential diagnoses, including pyelonephritis
	patient not acutely ill: • significant PMN response in the expressed prostatic secretions or an increase in the number of PMNs in the sediment of the urine obtained after prostatic massage compared to the first-void and mid-stream urine: – consider starting treatment with an oral antimicrobial such as trimethoprim-sulpbamethoxazole or a quinolone, but reassess the diagnosis and treatment when the microbiologic results become available • minimal or no PMN response in the expressed prostatic secretions and no increase in the number of PMNs in the sediment of the urine obtained after prostatic massage compared with the sediment of the first-void and mid-stream urine: – wait for microbiologic results

Proctitis, Proctocolitis and Enteritis Caused by Sexually Transmitted Pathogens

Definition

Proctitis

- inflammation of the rectal mucosa not extending more than 15 cm into the rectum, associated with
  - anorectal pain, tenesmus, constipation
    AND mucopurulent rectal discharge
    OR
    erythema, friability, or ulcerations of the rectal mucosa
    OR BOTH

Proctocolitis

- typically caused by classic causes of colitis, in which the inflammation extends higher than 15 cm into the rectum, may sometimes present with a similar clinical picture to proctitis plus diarrhea and/or abdominal cramps

Enteritis

- causes more proximal infection associated with diarrhea without rectal manifestations of proctitis or proctocolitis

NOTE

- several pathogens are often present concurrently so that mixed presentations are frequent

CAUTIONS

- **Infection is often more severe in those with human immunodeficiency virus infection and the list of potential causes is greater.**
- **Infection must always be considered, but trauma and foreign bodies may result in findings suggestive of proctitis or proctocolitis.**

Special considerations in children

- proctitis or proctocolitis caused by a sexually transmitted pathogen is rare in children, but if diagnosed, sexual abuse must be strongly considered and the physical examination must include a careful search for other evidence of abuse

Proctitis (cont'd).....

Etiology of sexually transmitted infections

- in males and in some females, agents causing proctitis are usually transmitted directly by rectal intercourse
- agents causing proctocolitis are usually transmitted by fecal-oral route
- rectal human papillomavirus infection (genital warts) is often present in males with proctitis but does NOT cause symptoms of proctitis

Syndrome	Most important causes
Proctitis	• *Neisseria gonorrhoeae* • herpes simplex virus (HSV) • *Chlamydia trachomatis* • *Treponema pallidum* (syphilis)
Proctocolitis	• *Entamoeba histolytica* • *Campylobacter* species • *Shigella* species • toxin-producing *Clostridium difficile* • *Escherichia coli* O157:H7
Enteritis	• *Giardia duodenalis* • *E. coli* O157:H7

Additional special etiological considerations in HIV infection

- Cytomegalovirus
- *Mycobacterium avium-intracellulare*
- *Cryptosporidium*
- *Salmonella* species
- *Isospora*

Clinical clues

- Any of the following should prompt evaluation

Proctitis	Proctocolitis and Enteritis	Rectal and perianal signs of proctitis OR proctocolitis
• rectal discharge • anorectal pain • tenesmus (ineffectual straining to defecate) • constipation in conjunction with other symptoms • bloody stools • perianal lesions	• diarrhea • abdominal bloating • abdominal pain • nausea • fever • in proctocolitis BUT NOT enteritis, one or more of those listed for proctitis	• mucopurulent, purulent, or bloody rectal discharge • perianal lesions

Proctitis (cont'd).....

Specimen collection and laboratory diagnosis

Ano-genital examination

- perform a genital examination, including speculum examination in adolescent and adult females
- perform examination of the perianal region, rectal examination and anoscopy or proctoscopy in adolescents and adults to assess the appearance and friability of the mucosa and to detect lesions or ulcers

Specimen collection depends on presenting syndrome

- evaluate adolescent and adult males for urethritis (see the section on Urethritis, page 13)
- evaluate adolescent and adult females for cervicitis (see the section on Cervicitis, page 19)
- evaluate prepubertal girls for vaginitis (see section on Prepubertal Vaginitis, page 35)
- evaluate prepubertal males for urethritis (see section on Specimen Collection, page 179)
- if perianal or other genital lesions are detected, perform a dark-field examination or a direct fluorescent antibody test for *T. pallidum* (if available) and syphilis serology (see section on syphilis, page 99) and a diagnostic test for HSV
- obtain a biopsy of the lesions if the diagnosis is uncertain

Rectal specimens

- obtain rectal swabs, preferably under direct vision through an anoscope or a proctoscope, for a slide for a stained smear and for diagnostic tests for *N. gonorrhoeae*, *C. trachomatis* and HSV

Stool specimens

- collect a stool specimen for
  - culture for enteric pathogens
  - testing for *C. difficile* cytotoxin and ova and parasites
- when infection with HIV is possible, IN ADDITION, collect stool specimens for *Cryptosporidium* and *M. avium-intracellulare*

Blood cultures

- if febrile and systemically ill, obtain blood cultures

Tests for other STD

- consider obtaining a blood sample for serologic testing for **syphilis** (if not already performed) (see section on Screening, page 157)
- consider **HIV screening**
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176)
    (see section on Screening, page 157)
- immunization against **hepatitis B** should be considered
  - screening for hepatitis B markers (surface antigen [HBsAg] and surface antibody [HBsAb]) should be considered pre-immunization
    (see section on Hepatitis B, page 63)

Proctitis (cont'd).....

Prevention

- **Primary prevention of infection is a critical part of management**
- **Anal intercourse or oral-anal sex are the main modes of sexually transmitted infections that cause proctitis, proctocolitis and enteritis**
- **Patients presenting with concerns about STD provide an important opportunity for instruction and encouragement for the consistent practice of safer sex**

Reporting, contact tracing and follow-up

- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority
- when treatment is indicated for the index case, all partners who have had sexual contact with the index case (within the 30 days prior to onset of symptoms if *N. gonorrhoeae* is detected, longer if the case is asymptomatic or the history warrants, and at least within 6 weeks if *C. trachomatis* is detected), should be located, clinically evaluated and treated appropriately. Persons treated for gonococcal infections should also be treated for chlamydia.
- local public health authorities should be available to help with contact tracing, clinical evaluation, testing, treatment and health education
- follow-up should be arranged, but if a recommended treatment is given and taken, symptoms and signs disappear and there is no re-exposure to an untreated partner, further testing is not routine EXCEPT for gonococcal infections or EXCEPT for syphilis where serological follow-up is necessary (see section on Syphilis, page 99)

Management and treatment of proctitis

- the initial management varies depending on the availability of results of the stained smear at the initial visit and on evidence of disease at other sites. Since several pathogens are often present concurrently, initial management may have to be modified when the results of all the diagnostic tests become available.

Results available	
Rectal smear shows increased number of polymorphonuclear leucocytes (PMNs) with or without gram-negative intracellular diplococci	• treat for proctitis due to *N. gonorrhoeae* and *C. trachomatis* > 9 years of age: • **ceftriaxone 250 mg IM** in a single dose **PLUS doxycycline 100 mg orally** x 2/day **OR tetracycline 500 mg orally** x 4/day for 7 days (a) 9 years of age and younger: • **cefixime 16 mg/kg/day orally** in a single dose **PLUS erythromycin 40 mg/kg/day orally** in divided doses (max 500 mg x 4/day) for 7 days(b) • for alternative regimens see section on Gonococcal Infections, page 81
Presence of external lesions typical of herpes simplex virus infection	• consider treating for HSV (see section on Genital HSV Infections, page 107)
Dark-field microscopy positive lesion	• treat for syphilis (see section on Syphilis, page 99)
Evidence for infection at other sites	• manage for the appropriate syndrome (if an STD, see section on specific disease)
Epidemiologic reason to suspect the presence of a certain STD, e.g., contact with *N. gonorrhoeae* or syphilis	• manage for the STD (see section on specific disease)
Other cases	• if rectal smear shows no increase in the number of PMNs – defer treatment until the results of diagnostic tests are available – if the results are positive, treat according to the results (if an STD, see section on specific disease) – if the results are negative, reassess

(a) tetracycline is less expensive but compliance is better with doxycycline

(b) erythromycin dosage refers to the use of erythromycin base. Equivalent dosages of other formulations may be substituted.

Proctitis (cont'd).....

Management and treatment (cont'd).....

Results not available	
Presence of a purulent or mucopurulent rectal discharge	• treat for proctitis due to *N. gonorrhoeae* and *C. trachomatis* (see section on Gonococcal Infections, page 81)
Presence of external lesions typical of herpes simplex virus infection	• consider treating for HSV (see section on Genital HSV Infections, page 107)
Evidence of infection at other sites	• manage for the appropriate syndrome (if an STD, see section on specific disease)
Epidemiologic reason to suspect the presence of a certain STD, e.g., contact with *N. gonorrhoeae* or syphilis	• manage for the STD (see section on specific disease)
Other cases	• defer treatment until the results of diagnostic tests are available – if the results are positive, treat according to the results (if an STD, see section on specific disease) – if the results are negative, reassess

Viral Hepatitis

Definition

- a viral infection of the liver

Epidemiology/Etiology

- diseases of major concern which can be associated with sexual transmission are hepatitis B, hepatitis A, hepatitis C, cytomegalovirus (CMV) and Epstein-Barr virus (EBV) infection
- acute infection with hepatitis A, B, and C is often asymptomatic
- hepatitis B and C can cause chronic infection and chronic liver disease

Hepatitis B

- most common STD causing hepatitis
- sexual transmission accounts for 45% of cases
- other modes of transmission include:
  - parenteral exposure to contaminated blood
  - perinatal transmission (mother to child)
  - person-to-person transmission among family contacts through contact with blood/secretions
- prior to donor screening, blood and blood products were major sources of infection
- persons at high risk:
  - infants born to HBsAg-positive women
  - injection drug users who share needles and/or equipment
  - persons with multiple sexual partners
  - persons born, who lived or whose parents lived, in areas of high endemicity
  - household contacts of an acute case
  - exposure to blood (e.g., health care workers)
  - chronically institutionalized persons

Hepatitis A

- transmitted most commonly by fecal-oral contamination (e.g., household contact)
- can be transmitted through oral and anal sexual activity

Hepatitis C

- highest rate of transmission in injection drug users who share needles and/or equipment
- sexual transmission also occurs but much less efficiently than hepatitis B

Viral hepatitis (cont'd).....

Special considerations for children

- universal prenatal screening for HBsAg
- for all children born to HBsAg-positive mothers:
  - HBIG 0.5 mL at birth plus hepatitis B immunization beginning in the newborn period
- hepatitis B immunization must be given to all children with household contact with HBsAg-positive parent or caregiver
- universal hepatitis B immunization programs for all infants and/or pre-adolescents are recommended
- see page 66

Clinical clues

- if symptomatic:
  - malaise, anorexia with or without jaundice
  - arthralgia, urticaria, fever
  - liver enzymes elevated
- if asymptomatic:
  - search for epidemiologic clues (see page 63)
  - liver enzymes elevated

Manifestations of disease

Disease	Incubation period	Acute Infectious (% symptomatic)	Outcome
hepatitis B	45-180 days	• < 10% of childhood infections • 50% of adult infections	• 1% develop fulminant hepatitis • overall 1-10% of adults become chronic carriers • acquired perinatally or as a young child, the carrier rate exceeds 90%
hepatitis A	15-45 days	• < 10% childhood infections • 50% of adult infections	• no chronic carriers
hepatitis C	14-168 days	• more often asymptomatic	• chronic carriage occurs in > 50% of infections

Laboratory diagnosis: interpretation of hepatitis serology

- suspect acute viral hepatitis: obtain serum for IgM-HAV, HBsAg
  - if both negative: IgM anti-HBc; consider test for hepatitis C
  - in certain high-risk groups, consider testing for all three viruses
  - see table of Management, page 68
- interpretation of hepatitis serology(a):

	IgM-HAV	HBs Ag	Anti-HBc	IgM anti-HBc	Anti-HBs	Anti-HCV
acute hep A	+	–	–	–	–	–
acute hep B	–	+	+	+	–	–
acute hep B (late incubation period)	–	+	–	–	–	–
acute hep B (window phase)	–	–	+	+	–	–
acute hep B (convalescence) or previous hep B	–	–	+	–	+	–
chronic hep B carrier	–	+	+	–	–	–
post hep B immunization	–	–	–	–	+	–
acute hep C	–	–	–	–	–	+/–(b)
chronic hep C carrier	–	–	–	–	–	+/–(c)

(a) IgM-HAV: antibody to hepatitis A, IgM class
HBsAg: HBV surface antigen
Anti-HBc: antibody to HBV core antigen, all classes
IgM anti-HBc: antibody to HBV core antigen, IgM class
Anti-HBs: antibody to HBV surface antigen
Anti-HCV: antibody to hepatitis C virus

(b) +/– acute hep C: majority of cases will have seroconverted by 6 months

(c) +/– chronic hep C: in some immunocompromised patients, hep C antibodies may disappear

Tests for other STD when hepatitis is suspected to be sexually transmitted

- consider obtaining a blood sample for serologic testing for **syphilis** (see section on Screening, page 157)
- HIV testing is strongly recommended
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176)
    (see section on Screening, page 157)

Prevention of sexually transmitted viral hepatitis

General

- **primary prevention of infection is a critical part of management**
- **patients presenting with concerns about STD and/or prevention of pregnancy provide an important opportunity for instruction and encouragement about the consistent practice of safer sex**
- **provide counselling about safer needle use to injection drug users and information concerning drug rehabilitation**

Specific

Immunization against hepatitis B virus is highly effective in preventing infection and disease

- all pregnant women should be screened for hepatitis B (HBsAg)
- for all children born to HBsAg-positive mothers
  - HBIG 0.5 mL at birth + hepatitis B immunization beginning in the newborn period
- hepatitis B immunization for all children with household contact with HBsAg-positive parent or caregiver
- other target groups at risk for sexually transmitted hepatitis B include:
  - persons whose regular sexual partner is HBsAG-positive
  - injection drug users
  - persons with multiple sexual partners
  - persons who have recently acquired an STD
  - sex trade workers (prostitutes)
  - sexual partners of any of the above
  - adolescents
- *universal hepatitis B immunization programs for pre-adolescents are recommended*

Hepatitis A: universal vaccination is not recommended

- *may be considered for those practising oral/anal sex*

Hepatitis C: no vaccine is available

Pre-immunization screening (see page 161)

Reporting, contact tracing and follow-up

- hepatitis B and hepatitis A are reportable in all provinces and territories; hepatitis C is reportable in some jurisdictions
- report whether a case is acute or chronic (hepatitis B or C) AND the likely mode of transmission, if possible

Viral hepatitis (cont'd).....

Management of sexual contacts

Hepatitis B

- if possible, identify sexual or needle-sharing partners for 6 months prior to the onset of symptoms or longer if the case is asymptomatic or if the history warrants
- counsel about informing susceptible partners about the risk of infection and risk-reduction methods
- contacts
  - give HBIG preferably within 48 hours of exposure; efficacy decreased if given after 7 days. Start a course of hepatitis B vaccine for those with exposure within previous 2 weeks
  - for on-going regular sexual partners, test and immunize susceptibles
  - counsel about risk reduction until primary course of vaccine has been completed

Hepatitis C

- passive immunization with immune globulin is not helpful
- sexual transmission is not the major source of infection but counselling about risk-reduction methods is appropriate

Hepatitis A

- passive immunization with immune globulin (0.2 mL/kg; maximum 20 mL) within 14 days of contact

Management of clinical case of hepatitis

(a) Test newborns at 9 months for HBsAg and anti-HBs to verify efficacy of prophylaxis.

Abbreviations:
IgM-HAV: antibody against hepatitis A virus, IgM class
HBsAg: hepatitis B surface antigen
IgM anti-HBc: antibody to hepatitis B core antigen, IgM class
HBIG: hepatitis B immune globulin (to be given as soon as possible after contact, not effective after 14 days)
Ig: human gamma-globulin (to be given as soon as possible after contact, not effective after 14 days)

NOTE : Condoms should be used by sexual contacts at risk of aquiring hepatitis B while primary immunization is in progress.

*Every opportunity should be used to immunize all patients at high risk of hepatitis B.

Definition

- ulcerative or vesicular genital lesion(s) caused by a number of STD, with or without lymphadenopathy

Epidemiology/Etiology

- 2-5% of visits to physicians for possible STD, 70-80% are due to herpes simplex virus (HSV), *Treponema pallidum* or *Haemophilus ducreyi*(a)
- 3-5% of ulcers have 2 or more pathogens
- women and men with genital ulcer disease are at increased risk of acquiring and transmitting HIV
- genital ulcer disease is likely to be accompanied by other STD which cause, for example, urethritis or cervicitis
- lymphogranuloma venereum (LGV) is a rare cause of genital ulcer disease in Canada
- *H. ducreyi* is causing focal urban epidemics in North America, particularly among cocaine users. Sex trade workers (prostitutes) are the usual reservoir. These outbreaks are also associated with HIV infection.
- the ratio of men to women with chancroid is at least 5:1
- uncircumcised men are twice as susceptible to developing chancroid after contact with *H. ducreyi*

Disease	% of genital ulcer disease(a)	Incubation period
genital HSV infection	20-60%	2-21 days
primary syphilis	5-10%	9-90 days, mean 21 days
chancroid	0-10%	4-14 days

(a) remainder due to trauma, non-specific erosive balanitis or vulvitis, candidiasis, malignancy, scabies or idiopathic causes

Special considerations for children (see section on Child Sexual Abuse, page 133)

- sexual abuse must be considered when genital ulcer disease is found in children beyond the neonatal period. Expert advice should be sought in such cases either through referral or case discussion.
- reporting sexual assault
  - sexual abuse of children must be reported to the local child protection agency
  - local public health authorities may be helpful in evaluating the source of infection and spread to others
- physical examination must include search for other evidence of abuse and other STD
- whenever possible the child should be evaluated at a referral centre. Try to obtain all relevant tests at the initial evaluation.

Clinical Clues

- previous genital lesion or STD
- contact with sex trade workers (prostitutes)
- chancroid: travel to endemic areas
- HSV/syphilis/chancroid: sexual activity with a new partner
- contact with person with genital ulcer disease

Genital Ulcer Disease (cont'd).....

Manifestations – ULCERS and VESICLES

NOTE

- concurrent infection with HIV changes the clinical features of genital ulcers due to these 3 diseases

Disease	Site	Appearance	Other symptoms/signs
genital herpes simplex virus infection	• male: glans/prepuce anus/rectum in homosexuals • female: primary-cervix (not prepubertal ♀)/vulva recurrence-vulva perineum/legs buttocks	• grouped multiple vesicles → superficial circular ulcers • smooth margin and base • shallow	• ulcers usually painful • genital pain, • inguinal lymph nodes enlarged, non-fluctuant and tender • fever and malaise (especially in primary infection)
primary syphilis	• at site of inoculation	• papule → chancre • indurated with serous exudate • single in 70% of cases • smooth margin and base	• ulcers painless • firm, enlarged non-fluctuant non-tender lymphadenopathy common
chancroid	• at site of inoculation	• single or multiple necrotising ulcers • 2 or more in 50% of cases • non-indurated • ragged undermined margin • irregular base	• ulcers painful • often painful swelling and suppuration of regional lymph nodes with erythema and edema of overlying skin

Specimen collection and laboratory diagnosis

T. pallidum

- dark-field examination or direct fluorescent antibody test on serous fluid from ulcers. Syphilis serology to include a non-treponemal test (RPR or VDRL) and at least one treponemal test (MHA-TP or FTA-ABS).

Herpes simplex virus

- culture should be carried out on all ulcers **unless** infection has been confirmed previously with same presentation (see section on Specimen Collection, page 179)

Specimen collection (cont'd).....

H. ducreyi

- culture, but inform laboratory in advance as special procedures need to be followed – a smear for Gram stain may also be useful, see section on Laboratory Diagnosis, page 184

Tests for other STD

- consider **HIV screening**
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176)
    (see section on Screening, page 157)
- immunization against hepatitis B should be considered
  - screening for hepatitis B markers (surface antigen [HBsAg] and surface antibody [HBsAb]) should be considered pre-immunization
    (see section on Hepatitis B, page 63)

Prevention

- **Primary prevention of infection is a critical part of management**
- **Patients presenting with concerns about STD provide an important opportunity for instruction and encouragement for the consistent practice of safer sex**

Reporting, contact tracing and follow-up

- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority
- when treatment is indicated for the diagnosis of chancroid, all partners who have had sexual contact with the index case (at least within the previous 2 weeks) should be located, clinically evaluated and treated appropriately
- when treatment is indicated for the diagnosis of primary syphilis, all partners who have had sexual contact with the index case in the previous 3 months before the development of symptoms must be located and appropriate testing done
- local public health authorities should be available to help with contact tracing, clinical evaluation, testing, treatment and health education
- follow-up should be arranged for chancroid and genital HSV infection but, if a recommended treatment is given and taken, symptoms and signs disappear and there is no re-exposure to an untreated partner (chancroid), repeat diagnostic testing is not routinely recommended
- for follow-up of syphilis patients see section on Syphilis, page 99

Genital Ulcer Disease (cont'd).....

Management

Results available	
dark-field examination/fluorescent antibody test POSITIVE (motile corkscrew spirochetes present)	• treat as syphilis (see page 99)
dark-field examinations, fluorescent antibody tests (see page 101) *and* tests for herpes simplex virus infection and *H. ducreyi* are NEGATIVE OR NOT PERFORMED	• treat as syphilis if there is a recent history of contact with infectious syphilis or if clinical suspicion is strong and follow-up cannot be ensured **OTHERWISE** • if laboratory tests are negative and presentation typical of herpes simplex virus infection, consider therapy for HSV **OR** • if presentation suggests chancroid, treat for chancroid (see page 74)

Results unavailable
Options: • refer for dark-field examination, fluorescent antibody testing and appropriate culture/ serology and defer antimicrobial therapy until laboratory results are obtained **OR** • if clinical suspicion for HSV infection or chancroid is strong, treat for specific disease and see for follow-up **OR** • if clinical suspicion of syphilis is strong or further follow-up not possible, treat as syphilis (see page 99)

Genital Ulcer Disease (cont'd).....

Treatment

	Preferred treatment	Alternative treatment for penicillin allergic patients(a)
syphilis – primary (see also page 99)	*for adults:* • **benzathine penicillin G 2.4 million U IM** in single session *for children (not congenital syphilis):* • **benzathine penicillin G 50,000 U/kg IM** (up to maximum of 2.4 million U) in a single session	*for adults and adolescents:* • **tetracycline 500 mg orally** x 4/day for 14 days **OR** • **doxycycline 100 mg orally** x 2/day for 14 days *for children < 9 years and pregnant women and nursing mothers:* *Preferred:* • **desensitization and use of penicillin** *Alternative:* • **erythromycin 40 mg/kg/day orally** in divided doses (max 500 mg per dose) for 14 days

	Initial infection	Recurrences	
		treatment	prophylaxis
genital HSV infection (see also page 107)	*children, prepubertal:* • oral acyclovir probably effective but there are no data yet to support its use • **acyclovir 5 mg/kg IV** x 3/day for 7 days *adults and adolescents:* • **acyclovir 200 mg orally** x 5/day for ≥ 10 days or until healing complete **OR** • **acyclovir 5 mg/kg IV** x 3/day for patients requiring hospitalization, switch to oral therapy when possible to complete 10 days therapy or until healing complete (initiation of treatment 6 days or more after onset of symptoms is unlikely to be of benefit)	*children:* • (see pages 111, 112) *adults and adolescents:* intermittent (early, preferably with prodrome, patient-initiated) treatment of active recurrences • **acyclovir 200 mg orally** x 5/day for 5 days – of limited clinical benefit; useful in a minority of patients	*children:* • (see pages 111, 112) *adults and adolescents:* • (see pages 111, 112)

	Preferred	Alternatives
chancroid	*adults:* • **erythromycin 2 g/day orally** in divided doses for 7 days *children:* • **erythromycin 50 mg/kg/day orally** in divided doses for 7 days (max 500 mg x 4/day)	• **ciprofloxacin 500 mg orally** x 1/day for 3 days (not recommended for prepubertal children, pregnant women or nursing mothers) **OR** • **ceftriaxone 250 mg IM** as a single dose

(a) penicillin-allergic patients administered tetracycline/doxycycline/erythromycin must be followed carefully to ensure therapeutic success

NOTE

- erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations (estolate contraindicated in pregnancy) may be substituted.

Pubic Lice

Epidemiology/Etiology

- caused by *Phthirus pubis* (crab louse)
- humans are the only reservoir
- shorter life span off host (24 hrs) than head lice (several days)
- highest prevalence in single persons 15-25 yrs, rare > 35 yrs
- transmission:
  - intimate contact, person-to-person
  - shared personal articles (clothes, bedding)

Manifestations

- itching, scratching, erythema, skin irritation and inflammation all as a reaction to the louse bite
- small blue spots can appear where the louse has bitten
- extensive infestation can be associated with mild fever and malaise
- scratching can lead to secondary skin infection

Specimen collection and laboratory diagnosis

- based on history and index of suspicion
- careful examination for adult lice and eggs (nits), look for an area of scabs with nits in the hair, scabs may be adult louse
- examine nits or scabs by light microscopy

Management and treatment

- pediculocide should remain in contact with the eggs for at least 1 hr
- 5% permethrin or 1% gamma benzene hexachloride/lindane are agents of choice
- gamma benzene hexachloride/lindane has been extensively utilized. There are concerns about possible neurotoxicity, which limits its use in young children. It is also contraindicated in pregnancy and lactating women. Health care workers should carefully follow the instructions for use.

Ectoparasites (cont'd).....

***Pubic Lice* (cont'd).....**

- 5% permethrin cream has similar efficacy with less toxicity
- wash the affected area, apply formulation (cream or lotion) for 10 minutes then wash
  repeat if necessary in 7-10 days
- washing clothes and fomites in hot water (50° C) or dry cleaning kills all stages of lice, *alternatively* place in plastic bags for 2 weeks
- vacuum mattresses
- examine and treat sexual partner(s) if appropriate

Scabies

Epidemiology/Etiology

- caused by *Sarcoptes scabiei*

Transmission

- often non-sexual, through close person-to-person contact, e.g., in families
- shared personal articles (clothes, bedding) may be fomites
- sexual transmission does occur: usually need more than brief contact
- most affected are those sexually active between 15-40 yrs

Manifestations

- nocturnal itching
- burrows under the skin
- lesions roughly symmetrical – especially hands (finger webs, sides of digits) and wrists – may involve abdomen, buttocks and upper thighs and female breast
- pyoderma of the penis
- in HIV-infected patients may present atypically (crusted or "exaggerated")

Specimen collection and laboratory diagnosis

- skin scraping of a burrow to remove the mite
- burrow ink test
  - apply fountain pen ink to outside of the burrow, wipe skin, the burrow track may be visualized

Ectoparasites (cont'd).....

Scabies (cont'd).....

Management and treatment

- gamma benzene hexachloride/lindane
  - 1% cream or lotion
  - apply to all areas of the body from the neck down
  - leave for 8-12 hrs
  - shower and apply clean clothes
  - not recommended for young children because of possible neurotoxicity
- permethrin 5% cream or pyrethroid spray has similar efficacy to lindane but with less toxicity
- crotamiton 10% cream or 5% sulfur in petroleum are less effective
  - crotamiton: apply nightly x 2 and wash off thoroughly 24 hrs after last application
  - sulfur apply nightly x 3 and wash off thoroughly 24 hrs after last application

- wash clothes and bedding
- examine and treat sexual partners if appropriate
- pruritis may persist for several weeks. May retreat after 1 week if no clinical improvement. Thereafter, only retreat if live mites can be demonstrated.

Reporting, contact tracing and follow-up

- pubic lice and scabies infestations are not generally reportable to local public health authorities
- follow-up only if clinically necessary
- contact tracing of ectoparasitic infections not required

Diagnosis, Management and Treatment of Specific Diseases

Epidemiology/Etiology

- caused by *Neisseria gonorrhoeae*
- 6,814 reported cases in Canada – 1993
- highest incidence groups: females 15-19 yrs and males 20-24 yrs
- proportion of penicillin-resistant organisms > 1% in most areas of Canada and may reach 15% or higher in certain urban and some rural areas
- numbers of isolates resistant to tetracyclines, or a combination of penicillin and tetracyclines, are increasing
- quinolone resistance has been increasing and in some areas is > 1%
- usual incubation period, 2-7 days
- > 50% of males and females may have asymptomatic infections, which are more common at certain body sites, e.g., rectum and pharynx
- contacts are also more likely to be asymptomatic
- long-term carriage occurs
- *Chlamydia trachomatis* and other STD pathogens often present

Clinical clues

- behaviourial factors:
  - contact with a person with proven infection or a compatible syndrome
  - unprotected sex outside a mutually monogamous relationship
  - previous STD
  - sexually active adolescents and young adults < 25 yrs
  - street youth
- symptoms of genital tract infection with *N. gonorrhoeae*:

males
  - urethral discharge
  - dysuria
  - urethral itch

females
  - vaginal discharge
  - lower abdominal pain
  - abnormal vaginal bleeding
  - deep dyspareunia

neonates
  - conjunctivitis, sepsis

Manifestations of disease

Neonates and infants	Children	Adults
• OPHTHALMIA NEONATORUM • neonatal amniotic infection syndrome • disseminated gonococcal infection	• URETHRITIS • VAGINITIS • conjunctivitis • pharyngitis • proctitis • disseminated gonococcal infection	females: • CERVICITIS • PELVIC INFLAMMATORY DISEASE: salpingitis, endometritis • urethritis • perihepatitis • bartholinitis
		males: • URETHRITIS • epididymitis
		males and females: • pharyngitis • conjunctivitis • proctitis • disseminated gonococcal infection: arthritis, dermatitis, endocarditis, meningitis

Major sequelae

Females	• infertility • ectopic pregnancy • chronic pelvic pain

Specimen collection

- specimens should be taken for diagnosis of gonococcal infection (see below) and chlamydial infection (see page 92 for swab type for chlamydia)
- specimens for gonococci:
  males – calcium alginate or Dacron(a) swabs are recommended
  females – calcium alginate or Dacron(a) swabs are preferred but sterile cotton swabs may be used

Routine specimen sites

- urethra in adolescent and adult males (detection of discharge may require stripping the urethra [squeezing the penis 3 or 4 times from the base to the glans], or re-evaluation after the patient has not voided for at least 4 hrs)
  – if a meatal discharge is present, insert swab 1-2 cm into the meatus
  – if there is no meatal discharge, use thin flexible wire endourethral swab inserted 3-4 cm into the urethra

(a) ® E.I. DuPont de Nemours and Co.

Gonococcal Infections (cont'd).....

Routine specimen sites (cont'd).....

- urethra in prepubertal boys
  - collecting an intraurethral specimen in prepubertal boys is difficult because of pain and the small diameter of the urethra
  - for practical rather than scientific reasons, a meatal rather than an intraurethral specimen should be obtained, using a thin swab on a flexible wire shaft
  - the swab should be rotated in the meatal opening rather than introduced further into the urethra
- cervix in adolescent and adult females
  - cervical mucus need not be removed: for this reason specimens for *N. gonorrhoeae* are taken before those for *C. trachomatis* where removal of cervical mucus is recommended
  - insert sterile swab 1-2 cm into the endocervical canal and rotate
- rectum in females (colonization can occur without anal intercourse) and in men who have sex with men
- urethra – prepubertal girls
  - vagina and rectum in prepubertal girls – NOT cervix
  - in a prepubertal girl only a meatal specimen should be obtained, using a thin swab on a flexible wire shaft
- pharynx with history of oral-genital contact
  - in prepubertal girls suspected of having been sexually abused, a pharyngeal culture is recommended

Other sites

- examination of first void urine (FVU) for a non-culture test for *N. gonorrhoeae* is currently under evaluation. There are insufficient data at the present time to recommend these tests. Not recommended for screening asymptomatic men (see section on Specimen Collection, page 179)
- rectum and urethra if the cervix has been surgically removed
- women undergoing laparoscopy for investigation of pelvic inflammatory disease should have specimens taken for culture
- urethra in women with urethral syndrome
- blood and joint fluid in disseminated disease
- epididymal aspirate in men with epididymitis
- conjunctiva for ocular infection

Transport

- the local public health authority/laboratory should be contacted for the preferred method of transport of specimens to ensure pathogen survival for purposes of culture (see section on Laboratory Diagnosis of Gonococcal Infections, page 187)
- transport of gonococcal specimens should be at ambient temperature in CO_2 enriched atmosphere – NOT 4° C as recommended for other organisms

Gonococcal Infections (cont'd).....

Tests for other STD

- consider obtaining a blood sample for serologic testing for **syphilis** (see section on Screening, page 157)
- **HIV testing** is strongly recommended
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176)
    (see section on Screening, page 157)
- immunization against hepatitis B is recommended (see page 161)

Laboratory diagnosis

- cultures obtained less than 48 hrs after exposure may be negative
- culture is recommended in cases of:
  - sexual abuse of children
  - sexual assault
  - treatment failure
  - evaluation of cervicitis and PID
- susceptibility testing for all isolates is suggested and is **required** for all isolates from positive ("test-of-cure") follow-up cultures and treatment failures
- non-culture tests should be used only when culture is not practical

Gonococcal Infections (cont'd).....

Laboratory diagnosis (cont'd).....

Site	Test	Comments
urethra: adolescent and adult males	• Gram stain – (for intracellular diplococci)	• generally diagnostic of gonorrhea
	• culture	• confirmation and antibiotic susceptibility
	• non-culture test	• only in cases where culture not practical (does not provide antibiotic susceptibility)
meatus: prepubertal males	• culture	• confirmation and antibiotic susceptibility • NON-CULTURE TESTS ARE NOT SATISFACTORY FOR MEDICO-LEGAL REASONS IN CASES OF CHILD SEXUAL ABUSE OR SEXUAL ASSAULT
endocervix: adolescent and adult females	• Gram stain for intracellular diplococci	• sensitivity lower than in urethral specimens in males but may be diagnostic of gonorrhea
	• culture	• confirmation and antibiotic susceptibility
	• non-culture tests	• only in cases where culture not practical (does not provide antibiotic susceptibility)
vagina: prepubertal girls	• culture	• confirmation and antibiotic susceptibility • NON-CULTURE TESTS ARE NOT SATISFACTORY FOR MEDICO-LEGAL REASONS IN CASES OF CHILD SEXUAL ABUSE OR SEXUAL ASSAULT
pharynx conjunctiva rectum	• culture (Gram stain and non-culture tests not suitable for these sites)	• confirmation and antibiotic susceptibility

Gonococcal Infections (cont'd).....

Prevention

- **Primary prevention of infection is a critical part of management**
- **Patients presenting with concerns about STD and/or prevention of pregnancy provide an important opportunity for instruction and encouragement for the consistent practice of safer sex**

Reporting, contact tracing and follow-up

- gonococcal infections are reportable in all provinces and territories
- positive culture and non-culture tests must be reported to the local public health authorities
- all partners who have had sexual contact with symptomatic index cases and within the 30 days prior to onset of symptoms (longer if the case is asymptomatic or the history warrants); parents of infected neonates; and persons implicated in sexual abuse cases must be located, clinically evaluated and treated appropriately. Persons treated for gonococcal infections should also be treated for *C. trachomatis* since co-infections are so common.
- local public health authorities should be available to help with contact tracing, clinical evaluation, testing, treatment and health education
- follow-up should be arranged for all patients 4-7 days after completion of treatment
- repeat diagnostic testing for *N. gonorrhoeae* is not routine if a recommended treatment is given and taken AND symptoms and signs disappear AND there is no re-exposure to an untreated partner
- follow-up testing by culture **must be completed if any of the following exist:**
  - treatment failure has occurred previously
  - antimicrobial resistance to therapy used is documented
  - patient is an adolescent
  - compliance is questionable
  - pharyngeal or rectal gonorrhea diagnosed
  - re-exposure to an untreated partner
  - infection occurs during pregnancy
  - PID or disseminated gonococcal infection (DGI) diagnosed
  - patient is a child and there is concern with ongoing exposure

Special considerations for children

- infants born to infected women must be tested and treated
- sexual abuse must be considered when genital, rectal or pharyngeal gonorrhea is diagnosed in any child after the neonatal period. Expert advice should be sought in such cases. Siblings and other children possibly at risk must be evaluated.
- sexual abuse of children must be reported to the local child protection agency
- local public health authorities may be helpful in evaluating the source of infection and spread to others
- **SEE SECTION ON CHILD SEXUAL ABUSE, PAGE 133**

Management

- based on site of infection and laboratory results
- the diagnosis of gonorrhea can only be confirmed by the identification of *N. gonorrhoeae* by culture. All confirmed cases must be treated.

Results available	
Gram stain	• treat for gonococcal infection if gram-negative intracellular diplococci observed • the presence of gram-negative diplococci outside polymorphonuclear leucocytes (PMNs) is an equivocal finding which must be confirmed by culture. If positive, treat. • the presence of PMNs without diplococci does not indicate or exclude gonococcal infection
culture tests	• treat all positives
non-culture tests	• a positive non-culture test is suggestive of gonorrhea and should be confirmed if possible BUT treat for gonorrhea
Results of smear/culture/non-culture test unavailable	
urethral/cervical discharge observed	• treat for gonorrhea
no urethral/cervical discharge	• defer therapy until smear/culture/non-culture test results available **OR** if follow-up uncertain and history and symptoms suggestive treat for gonorrhea • treat for gonorrhea if partner positive

Gonococcal Infections (cont'd).....

Treatment

- **ALL PATIENTS TREATED FOR GONORRHEA SHOULD ALSO BE TREATED FOR CHLAMYDIAL INFECTION**

ADOLESCENTS AND ADULTS (except pregnant women and nursing mothers)(a)

Urethral, endocervical, rectal, pharyngeal infection
(pelvic inflammatory disease: see page 25)
(epididymitis: see page 49)

*All regimens followed by doxycycline/tetracycline/azithromycin**

Preferred (IM):
- **ceftriaxone 125 mg IM** in a single dose

Preferred (oral) (alphabetical order):
- **cefixime 400 mg orally** in a single dose
  or
- **ciprofloxacin** 500 mg orally** in a single dose
  or
- **ofloxacin** 400 mg orally** in a single dose

Alternative (IM): except pharyngeal
- **spectinomycin 2 g IM** in a single dose
  PLUS
  doxycycline/tetracycline/azithromycin

NOTE: all patients should also receive empiric treatment for chlamydial and non-gonococcal infections with doxycycline 100 mg orally x 2/day for 7 days or tetracycline 500 mg orally x 4/day for 7 days.

* Azithromycin 1 g orally in a single dose is an alternative for the empiric treatment of chlamydia. There are only limited data, as yet, to support the use of azithromycin in non-gonococcal/non-chlamydial urethritis or cervicitis; more studies are currently being carried out.

** Ciprofloxacin and ofloxacin should not be used if there is a possibility that the infection was acquired in Southeast Asia. If either ciprofloxacin or ofloxacin is used in such a case, a test-of-cure is recommended.

PREGNANT WOMEN AND NURSING MOTHERS

Urethral, endocervical, rectal or pharyngeal infection

- the treatment regimens for adults and adolescents should be followed except that ofloxacin and ciprofloxacin are contraindicated and doxycycline/tetracycline should be replaced by **erythromycin 2 g/day** in divided doses for at least 7 days **OR** if not tolerated **erythromycin 1 g/day** in divided doses for 14 days may be substituted (erythromycin estolate is contraindicated in pregnancy). Amoxicillin 3 g orally or ampicillin 3.5 g orally with probenicid 1 g orally can be considered if isolate is known to be sensitive.

FOR NOTES SEE PAGE 90

Gonococcal Infections (cont'd).....

Treatment (cont'd).....

Gonococcal ophthalmia (adolescent and adult) **Disseminated infection: arthritis, meningitis**
consultation with a specialist is essential hospitalization is necessary for meningitis and may be necessary for other disseminated infection *Preferred initial therapy:* • **ceftriaxone 2 g/day IM** **PLUS doxycycline/tetracycline/azithromycin** while awaiting consultation

CHILDREN UNDER 9 YEARS(a,b)

Urethral, vaginal, rectal, pharyngeal infection	
Preferred: • **cefixime 16 mg/kg orally** in a single dose (max 400 mg)(b) **PLUS erythromycin** OR • **ceftriaxone 125 mg IM** in a single dose **PLUS erythromycin**	*Alternative: except pharyngeal* • **spectinomycin 40 mg/kg IM** (max 2 g) in a single dose **PLUS erythromycin**
NOTE: erythromycin 40 mg/kg/day orally in divided doses (max 500 mg x 4/day) for 7 days as treatment for chlamydial infection, which should always be included	

Disseminated infection: arthritis, meningitis, gonococcal opbthalmia beyond neonatal period
hospitalization and consultation with a specialist is essential *Preferred initial therapy:* • **ceftriaxone 50-100 mg/kg/day IM or IV** **PLUS erythromycin** while awaiting consultation

FOR NOTES SEE PAGE 90

Gonococcal Infections (cont'd).....

Treatment (cont'd).....

NEONATAL INFECTION(b)

Ophthalmia neonatorum

hospitalize and institute appropriate infection control precautions until 24 hrs of effective therapy completed

- culture eye discharge, blood (CSF only if evidence of systemic disease)
- irrigate eyes immediately with sterile normal saline and at least hourly as long as necessary to eliminate discharge
- start ceftriaxone 50-100 mg/kg/day IV or IM (single dose therapy may be adequate if blood culture is negative)
- consult with a specialist as soon as possible

Newborns born to women infected with gonorrhea

Recommended therapy (must also include therapy for chlamydia for 14 days):

- **ceftriaxone 125 mg IM in a single dose PLUS erythromycin in the following dosage schedule**

if < 7days of age and < 2000 g

- **erythromycin 20 mg/kg/day orally** in divided doses

if < 7 days of age and > 2000 g

- **erythromycin 30 mg/kg/day orally** in divided doses

if > 7 days of age

- **erythromycin 40 mg/kg/day orally** in divided doses

NOTES

(a) ceftriaxone and cefixime should not be given to persons with cephalosporin allergy or a history of immediate and/or anaphylactic reactions to penicillins

(b) oral therapies are preferred in children. Recommendations for the use of cefixime are based on data showing efficacy in the treatment of infections caused by organisms similar to *Neisseria gonorrhoeae*. Because there is limited experience with the use of cefixime in children with gonococcal infections, antimicrobial susceptibility *must* be ascertained AND follow-up culture assured. If follow-up cannot be assured, use ceftriaxone 125 mg IM in place of cefixime.

Other points

- the preferred diluent for IM ceftriaxone is 1% lidocaine without epinephrine (0.9 mL/250 mg, 0.45 mL/125 mg) to reduce discomfort
- in adults, if tetracyclines are contraindicated or not tolerated, use **erythromycin 2 g/day orally** in divided doses for 7 days (**1 g/day** in divided doses for 14 days if higher dose not tolerated). Other formulations of erythromycin can be substituted in appropriate doses except that erythromycin estolate is contraindicated during pregnancy.
- erythromycin dosages refer to erythromycin base. Equivalent dosages of other formulations may be substituted.

Epidemiology/Etiology

- caused by *Chlamydia trachomatis*
- more frequent than infection due to *Neisseria gonorrhoeae* – more than 44,282 cases reported in Canada in 1993
- particularly frequent in sexually active adolescents
- under diagnosed in males because of low index of suspicion and reluctance to take urethral swabs from men; recent evidence indicates that the rate of infection is likely the same for females and males
- usual incubation period is 2-6 weeks but can be much longer
- > 50% of males and 70% of females can be asymptomatic
- *N. gonorrhoeae* often present with *C. trachomatis*
- long-term carriage occurs

Clinical Clues

- contact with person with a proven infection or a compatible syndrome
- previous STD
- sexually active adolescent
- males
  - urethral discharge
  - dysuria
  - urethral itch
- females
  - vaginal discharge
  - lower abdominal pain
  - abnormal vaginal bleeding
  - deep dyspareunia
  - dysuria (when urinary tract infection ruled out)
- conjunctivitis in neonates and pneumonia in infants < 6 months of age

Chlamydial Infections (cont'd).....

Manifestations of disease

Neonates and infants	Children	Adults
• CONJUNCTIVITIS in neonates • PNEUMONIA in infants < 6 months of age	• URETHRITIS • VAGINITIS • Proctitis • conjunctivitis • lymphogranuloma venereum	females: • CERVICITIS • PELVIC INFLAMMATORY DISEASE • urethritis • perihepatitis
		males: • URETHRITIS • EPIDIDYMITIS
		males and females: • proctitis • conjunctivitis • Reiter's syndrome • lymphogranuloma venereum

Major sequelae

Females	• chronic pelvic pain • infertility • ectopic pregnancy

Specimen collection

- unless the diagnosis has been ruled out, specimens should be taken for the diagnosis of gonococcal infection (see page 82) as well as for chlamydial infection (see below)
- the sample MUST include epithelial cells as *C. trachomatis* is an obligate intracellular parasite. Pus may not contain many such cells.

Routine specimen sites

- urethra in adolescent and adult males (preferably after not voiding for 2 hours if discharge is not clinically evident)
  - thin flexible wire sterile cotton tipped endourethral swab inserted 3-4 cm into the urethra
- urethra in prepubertal boys
  - collecting an intraurethral specimen in prepubertal boys is difficult because of pain and the small diameter of the urethra
  - for practical rather than scientific reasons, a meatal rather than an intraurethral specimen should be obtained, using a thin swab on a flexible wire shaft
  - the swab should be rotated in the meatal opening rather than introduced further into the urethra

Chlamydial Infections (cont'd).....

Routine specimen sites (cont'd).....

- cervix in adolescent and adult females
  - see page 182
  - before endocervical specimens are collected, overlying vaginal secretions should be removed by swabbing, and endocervical mucus should be removed. Specimens for detection of *N. gonorrhoeae* should be collected before those for *C. trachomatis.*
  - insert a sterile cotton tipped swab 1-2 cm into the endocervical canal and rotate. Detection may be enhanced by using a cytobrush (cytobrush not approved for use in pregnant women).
  - in addition, a urethral/meatal specimen should be obtained when urethral discharge is present
- vagina, rectum – prepubertal girls
  - see page 182-83
  - in addition, a urethral/meatal specimen should be obtained when urethral discharge is present
  - cervical specimens should NOT be collected
- urine - males and females
  - first 10 mL of urine after at least 2 hours of not voiding. Collect in sterile urine containers. Urine suitable for molecular amplification technique (e.g., PCR, LCR, see page 189) but not for EIA or culture

Other sites

- women undergoing laparoscopy for investigation of pelvic inflammatory disease should have endometrial or fimbrial biopsy specimens taken for culture, PCR or LCR
- rectal and urethral swabs if the cervix has been surgically removed
- rectal swab if proctitis is considered or if rectal penetration has occurred
- conjunctival scraping for ocular infection
- nasopharyngeal aspirate in infants < 6 months of age
- bubo aspirate in lymphogranuloma venereum

Tests for other STD

- consider obtaining a blood sample for serologic testing for **syphilis** (see section on Screening, page 157)
- **HIV** testing is strongly recommended
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176)
    (see section on Screening, page 157)
- immunization against **hepatitis B** is recommended (see page 161)

Chlamydial Infections (cont'd).....

Laboratory diagnosis (see page 189)

- results are highly dependent upon adequacy of specimen, laboratory expertise and type of test available
- culture has traditionally been considered to be the most sensitive and most specific test and is the test of choice in medico-legal considerations
  - results are highly dependent upon specimen transport and laboratory expertise
- new molecular amplification techniques (e.g., PCR, LCR, see page 191) are more sensitive than culture and are highly specific
  - false-negative results may occur due to inhibitors present in the specimen
- antigen detection techniques (e.g., DFA, EIA, see page 190) are adequate in most circumstances provided the possibility of false-positive tests is considered, and there are no legal implications
  - concerns with antigen detection tests:
    - false positives:
      - especially in low prevalence situations
      - less frequent with EIA when confirmatory tests are used
    - not appropriate if there are legal implications
    - not appropriate for rectal or nasopharyngeal specimens
- serology is rarely helpful
  - IgM-specific immunofluorescence serology is only useful for diagnosis of early chlamydial pneumonia in infants, especially if < 3 months of age
  - IgG serology for *C. trachomatis* may be useful for investigating tubal infertility (consult an expert) but is not helpful for diagnosing acute illness

Prevention

- **Primary prevention of infection is a critical part of management**
- **Patients presenting with concerns about STD and/or prevention of pregnancy provide an important opportunity for instruction and encouragement for the consistent practice of safer sex**

Reporting, contact tracing and follow-up

- *C. trachomatis* infections must be reported by laboratories and physicians to local public health authorities in all provinces and territories
- all partners who have had sexual contact with the index case while symptomatic and within the 6 weeks prior to onset of symptoms (longer if the case is asymptomatic or the history warrants); parents of infected neonates; and persons implicated in sexual abuse cases must be located, clinically evaluated and treated appropriately
- local public health authorities should be available to help with contact tracing, clinical evaluation, testing, treatment and health education; if resources for local public health authority support are limited, priority for contact tracing should be directed towards male/female adolescents/adult females < 25 years

Chlamydial Infections (cont'd).....

Reporting, contact tracing and follow-up (cont'd).....

- repeat diagnostic testing for *C. trachomatis* is not routinely indicated if a preferred treatment regimen is given and taken, symptoms and signs disappear and there is no re-exposure to an untreated partner. However, repeat testing is advisable where compliance is difficult to ensure or if an alternative treatment regimen has been used, and for all children and pregnant women
- if done, follow-up testing should be performed 3-4 weeks after the completion of effective treatment. Cultures are recommended. If a non-culture test is used for post-treatment testing, sufficient time must be allowed for the elimination of all traces of the organism (at least 4 weeks)
- in patients with apparent treatment failure, possibilities include:
  - a false-positive test result
  - failure to take medication correctly or to finish course of therapy
  - re-exposure to an untreated partner
  - infection acquired from a new partner
  - in patients with persistent symptoms also consider
    - infection with other pathogens
    - a non-infective etiology

Special considerations for children

- neonates and infants born to infected women must be treated
- sexual abuse must be considered when genital or rectal chlamydial infection is found in prepubertal children > 6 months of age, although perinatally acquired *C. trachomatis* may colonize the infant for possibly up to 3 years. Expert advice should be sought in such cases.
- antigen-detection test results are not acceptable for medico-legal reasons because of the potential for false-positive results
- parents of infected infants must be evaluated and treated as appropriate
- sexual abuse of children must be reported to the local child protection agency
- **SEE SECTION ON CHILD SEXUAL ABUSE, PAGE 133**

Management

- evaluation should be appropriate for the presenting symptoms and signs (see the appropriate section for greater detail)
- treatment should be initiated on:
  - diagnosis of a syndrome compatible with a chlamydial infection, without waiting for the results of specific diagnostic tests for *C. trachomatis*
  - diagnosis of a syndrome compatible with a chlamydial infection in a partner, without waiting for the results of specific diagnostic tests for *C. trachomatis*
  - a positive diagnostic test
  - diagnosis of *N. gonorrhoeae* infection without waiting for results of test for *C. trachomatis*

Chlamydial Infections (cont'd).....

Treatment

ADOLESCENTS AND ADULTS [except pregnant women and nursing mothers]

Urethral, endocervical, rectal infection **(pelvic inflammatory disease, see page 25; epididymitis, page 49)**	
Preferred: • **doxycycline 100 mg orally** x 2/day for 7 days **OR** • **azithromycin 1 g** orally in a single dose	*Alternative:* if tetracycline is tolerated • **tetracycline 500 mg orally** x 4/day for 7 days **OR** for patients for whom tetracyclines are contraindicated or not tolerated • **erythromycin 2 g/day orally** in divided doses for 7 days **OR** if that regimen is not tolerated • **erythromycin 1 g/day orally** in divided doses for 14 days **OR** try another formulation of erythromycin **OR** • **sulfamethoxazole 1 g orally** x 2/day for 10 days **OR** • **ofloxacin 300 mg bid** for 7 days

PREGNANT WOMEN AND NURSING MOTHERS

Urethral, endocervical, rectal infection	
Preferred: • **erythromycin 2 g/day orally** in divided doses (erythromycin estolate is contraindicated) for 7 days **OR** if that regimen is not tolerated **erythromycin 1 g/day orally** in divided doses for 14 days **OR** try another formulation of erythromycin	*Alternative in first 2 trimesters:* • **sulfamethoxazole 1 g orally** x 2/day x 10 days *Alternative in last trimester:* • **amoxicillin 500 mg orally** x 3/day for 7 days (limited data exist concerning the efficacy of this regimen)

FOR NOTES SEE PAGE 97

Chlamydial Infections (cont'd).....

Treatment (cont'd).....

NEWBORNS, INFANTS AND CHILDREN

<table>
<tr><th rowspan="2">NEWBORNS AND INFANTS a)</th><th colspan="2">CHILDREN</th></tr>
<tr><th>under 9 years</th><th>9 years or over</th></tr>
<tr><td rowspan="2">During first week of life:
infants < 2000 g
• erythromycin 20 mg/kg/day orally in divided doses
infants > 2000 g
• erythromycin 30 mg/kg/day orally in divided doses
> 1 week to 1 month
• erythromycin 40 mg/kg/day orally in divided doses

The above regimens should be given for at least 14 days.

Note: topical therapy alone for conjunctivitis is NOT adequate.</td><td rowspan="2">After 1 month of age
• erythromycin 40 mg/kg/day orally in divided doses (max 500 mg x 4/day) for 7 days
OR
• sulfamethoxazole 75 mg/kg/day orally in divided doses (max 1 g x 2/day) for 10 days</td><td>Preferred:
• doxycycline 5 mg/kg/day orally in divided doses (max 100 mg x 2/day) for 7 days
OR
• tetracycline 40 mg/kg/day orally in divided doses (max 500 mg x 4/day) for 7 days</td></tr>
<tr><td>Alternative:
for patients for whom tetracyclines are contraindicated or not tolerated
• erythromycin 40 mg/kg/day orally in divided doses (max 500 mg x 4/day for 7 days or 250 mg x 4/day for 14 days)
OR
• sulfamethoxazole 75 mg/kg/day orally in divided doses (max 1 g x 2/day) for 10 days</td></tr>
</table>

NOTES

a) newborns and infants born to infected women must be tested and treated

Erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations (except the estolate which is contraindicated in pregnancy) may be substituted.

If erythromycin has been used for treatment, repeat testing after completion of therapy is advisable.

Epidemiology/Etiology

- caused by *Treponema pallidum*
- 834 cases reported in Canada in 1993:
  267 – primary, secondary, early latent;
  4 – congenital; 657 – "other"
- females aged 15-19 years have the highest rate (3.5 cases per 100,000 population). In the United States, the increase in rates are associated with crack-cocaine use and the exchange of sex for drugs and are accompanied by a rise in the incidence of congenital syphilis.
- men and women with primary and secondary syphilis or other genital ulcer disease are at increased risk of acquiring and transmitting HIV

Clinical clues

- previous genital lesion or STD
- contact with known case
- lesions, rash – location, description, absence of pain
- non-tender lymphadenopathy

Manifestations of disease

Stage	Incubation period	Manifestations/Comments (maybe asymptomatic)
Primary	10-90 days	• painless, indurated chancre (usually genital) • non-tender regional lymphadenopathy
Secondary	4-10 weeks after primary stage	• non-pruritic maculopapular eruption (trunk, palms, soles) • generalized non-tender lymphadenopathy, • condyloma lata, mucous patches, fever, malaise
Latent – asympto-matic		• early < 1 year's duration – 25% will relapse to secondary • late > 1 year's duration
Tertiary	10-30 years	• gummatous lesions of skin, bone, subcutaneous tissue • cardiovascular – aortic aneurysm, aortic regurgitation • neurosyphilis
Congenital		• 50% risk of transmission when mother has untreated primary, secondary or early latent syphilis • may be asymptomatic in 2/3 of cases • low birth weight, hepatosplenomegaly, rash, anemia, rhinitis, metaphyseal dystrophy • stillbirth • risk: lack of ante-natal care • may present with early syphilis in first 2 years of life or with manifestations later in life, interstitial keritits

Syphilis (cont'd).....

Specimen collection

Direct or indirect fluorescent antibody test or dark-field microscopy

- to visualize *T. pallidum*
- useful for chancres of primary syphilis, condylomata lata and mucous patches of secondary syphilis
- useful for nasal discharge in neonate with "snuffles"
- not reliable for oral/rectal lesions

Serology

- "non-treponemal" tests such as VDRL, RPR, ART, RST, EIA and TRUST become positive 1-4 weeks after appearance of primary chancre, 6 weeks after exposure
- "treponemal" tests such as MHA-TP and FTA-ABS become reactive before RPR (see section on Laboratory Diagnosis of Syphilis, page 191)

CSF

- test for cells, protein and VDRL (appropriate CSF syphilis test)
- CSF examination should be carried out in cases of:
  - congenital syphilis
  - tertiary syphilis
  - when neurologic symptoms/signs are present
  - in the latent stage when serum RPR titre $\geq$ 1:16
  - in HIV patients, a lumbar puncture (LP) is strongly recommended if atypical neurologic presentation, or latent syphilis or treated syphilis but no decrease in VDRL or RPR titre. Some experts recommend an LP in all cases.
  - an LP may be considered in other patients on a case-by-case basis

Pregnant women

- all pregnant women should be screened (initially with a non-treponemal test) in early pregnancy; all pregnant women in certain groups and those with high-risk behaviours (see page 147) should be screened again in the 3rd trimester and at delivery (see section on Screening, page 157). If no ante-natal care, screen at delivery.

Tests for other STD

- **HIV** testing results are essential for determining management and follow-up of syphilis-infected individuals
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176)
    (see section on Screening, page 157)
- immunization against **hepatitis B** is recommended (see page 161)

Syphilis (cont'd).....

Laboratory diagnosis

- interpretation of syphilis serology is often difficult. Specialist advice should be sought.
- age of the patient, clinical situation, history of disease, knowledge of previous treatment and previous serologic results are very important in an assessment, e.g., a VDRL titre of 1:8 with a positive MHA-TP may need no further action if the person was adequately treated and his/her previous VDRL titre was ≥ 1:32
- elderly – little benefit of undertaking a lumbar puncture or treating a very elderly individual with reactive serology unless infectious or tertiary syphilis is suspected. Routine screening of this population on admission to extended care institutions is not recommended.

Test	Test	Possible Reason
Non-treponemal VDRL, RPR, ART, TRUST, RST, EIA	Treponemal: MHA-TP, FTA-ABS	
+	+	• syphilis – recent or previous • yaws or pinta
+	–	• no syphilis – false positive
–	–	• no syphilis or incubating disease
–	+	• consistent with syphilis, acute, previously treated or untreated • yaws, pinta or Lyme disease

Management

primary and secondary

- serology (RPR or other non-treponemal test and MHA-TP, FTA-ABS)
- also make every effort to obtain dark-field microscopy or direct or indirect fluorescent antibody test and interpret as follows:
  - if positive, treat
  - if negative, repeat test x 2 at same visit; if positive, treat
  - if results still negative and if follow-up can be ensured, test for herpes simplex virus (HSV) and await serologic and viral results
  - if dark-field examination not available or follow-up of patient with negative result cannot be ensured, treat

Syphilis (cont'd).....

Management (cont'd).....

latent

- serology (RPR or other non-treponemal test, MHA-TP, FTA-ABS)
- rule out tertiary disease by physical examination and chest x-ray
- lumbar puncture should be considered
- treat for appropriate stage

tertiary

- serology (RPR or other non-treponemal test, MHA-TP, FTA-ABS)
- CSF (VDRL, cells, protein)
  - if CSF negative, treat for late latent disease
  - if CSF positive, treat for neurosyphilis
- HIV patients may present with neurosyphilis early and often following prior therapy; frequently with atypical findings such as cerebral vascular accidents, cranial nerve abnormalities and uveitis

congenital

- serology on child and mother (RPR or other non-treponemal test and MHA-TP, FTA-ABS)
  - interpretation of a child's serologic result will depend on history of and response to treatment in pregnancy and the age of the child
  - cord blood is not an ideal sample for serology
- if skin lesions or rhinitis present, obtain specimens for dark-field microscopy or direct-fluorescent antibody test
- CSF (VDRL, cells, protein)
  - findings are difficult to interpret in the first few weeks of life in infants born to mothers with syphilis because of the normal neonatal elevations of cells and protein in CSF and the possibility of a false-positive CSF VDRL in infants with high titres of passive antibody. A normal CSF examination does not rule out neurosyphilis in the infant but is useful for comparison in follow-up.
- long bone x-rays
- treat (see page 105)

Note: syphilis serology, both non-treponemal and treponemal specific tests, are reliable in patients co-infected with HIV.

Prevention

- **Primary prevention of infection is a critical part of management**
- **Patients presenting with concerns about STD and/or prevention of pregnancy provide an important opportunity for instruction and encouragement for the consistent practice of safer sex**
- **results of testing during pregnancy and delivery must be provided to the caregiver of the infant**

Syphilis (cont'd).....

Reporting, contact tracing and follow-up

Reporting

- syphilis is reportable in all provinces and territories. Evidence of clinical disease and positive laboratory testing must be reported to the local public health authority.

Contact tracing

- all partners who have had sexual contact with the index case within the following time periods must be located and tested appropriately

  Primary Syphilis:
  – 3 months before the development of symptoms

  Secondary Syphilis:
  – 6 months before the development of symptoms

  Early Latent:
  – for 1 year before diagnosis

  Late Latent:
  – assess marital or long-term partners and children, if appropriate

  Congenital:
  – assess mother and her sexual partner(s)

  Stage undetermined:
  – use careful judgement or consult an expert

- all current sexual partners, parents of infected neonates, and persons implicated in sexual abuse and assault cases must be located, clinically and serologically evaluated, and treated with antibiotics appropriate for the stage of infection
- every effort must be made to stage the disease before treatment is initiated, since staging is critically important to the selection of treatment regimen and follow-up of this infection
- if exposure to early syphilis occurred within the previous 90 days, the person should be presumptively treated
- if exposure was more than 90 days previously and serologic test results are available, treatment should be based on these results
- local public health authorities should be available to help with contact tracing, evaluation and treatment

Follow-up

- **SEROLOGY** (RPR or other non-treponemal test and MHA-TP, FTA-ABS) should be carried out until an adequate response is achieved (see below) using the following as a guide:

  primary, secondary, early latent, congenital
  - 1, 3, 6, 12 and 24 months after treatment

  late latent, tertiary
  - 12 and 24 months after treatment

  neurosyphilis
  - 6, 12 and 24 months after treatment

  if HIV infected
  - 1, 3, 6, 12 and 24 months after treatment and yearly thereafter
- adequate serologic response is:

  primary
  - 4-fold (2 tube) drop at 6 months, 6-fold (3 tube) drop at 12 months, 8-fold (4 tube) drop at 24 months (e.g., a change in titre from 1:32 to 1:8 equals a 4-fold or 2-tube drop)

  secondary
  - 6-fold (3 tube) and 8-fold (4 tube) drop at 6 and 12 months

  early latent
  - 4-fold (2 tube) drop by 12 months
- steady drop in titre to negative or stabilization at a low level of non-treponemal tests will occur in up to 60-75% of patients with primary syphilis by 2-3 years
- 'adequate' serologic response does not necessarily mean cure if titres were initially very high (>1:512)
- if a non-treponemal test titre increases 4-fold after treatment without re-infection, the patient should be re-evaluated and a lumbar puncture done
- **IF INITIALLY ABNORMAL, CSF EXAMINATIONS** should be repeated after therapy. Time frames may vary depending upon initial clinical presentation. Discuss with an expert.
  - re-treatment may be needed if CSF response is not satisfactory
  - in congenital syphilis, a repeat LP must be done in 6 months or less, timing dependent on CSF result at delivery and subsequent serology
- treatment options for patients with treatment failure should be discussed with an expert

NOTE

- asymptomatic infants, born to mothers who received adequate penicillin treatment prior to the third trimester or more than a month before delivery, are at minimal risk of developing congenital syphilis **BUT** should be examined carefully and have follow-up serology until non-treponemal and treponemal serologic tests are negative. If treponemal serologic tests remain positive at 1 year this implies congenital syphilis and appropriate treatment should be given (see also page 106).

Syphilis (cont'd).....

Treatment

STAGE	PREFERRED TREATMENT	ALTERNATIVE TREATMENT FOR PENICILLIN ALLERGIC PATIENTS(a)
Primary Secondary Latent < 1 yr duration	*for adults:* • **benzathine penicillin G 2.4 million U IM** in single session *for children (not congenital syphilis):* • **benzathine penicillin G 50,000 U/kg IM** (up to maximum of 2.4 million U) in a single session	*for adults and adolescents:* • **tetracycline 500 mg orally** x 4/day for 14 days **OR** • **doxycycline 100 mg orally** x 2/day for 14 days *for children < 9 years and pregnant women:* *Preferred:* • **desensitization and use of penicillin** *Alternative:* • **erythromycin 40 mg/kg/ day orally** in divided doses (max 500 mg per dose) for 14 days (erythromycin estolate is contraindicated in pregnancy)(c)
Latent > 1 yr duration including cardiovascular	• **benzathine penicillin G 2.4 million U IM** weekly for 3 successive weeks	As above except that therapy should be administered for 28 days
Neurosyphilis	• **crystalline penicillin G 3-4 million U IV** 4 hourly (16-24 million U/day) for 10-14 days	
Congenital(b) Early < 1 yr Late > 1 yr	• **crystalline penicillin G 50,000 U/kg IV** 12 hourly for the first week of life, 8 hourly thereafter, for 10 days abnormal CSF or neurological involvement • **crystalline penicillin G 200,000 U/kg/day IV** 6 hourly for 10-14 days normal CSF and no neurological involvement • **crystalline penicillin G 200,000 U/kg/day IV** 6 hourly for 10-14 days **OR** • **benzathine penicillin G 50,000 U/kg IM** (max 2.4 million U) weekly for 3 successive weeks	

(a) penicillin allergic patients administered tetracycline/doxycycline/erythromycin must be followed carefully to ensure therapeutic success

(b) asymptomatic infants with negative laboratory findings born to women treated with non-penicillin regimens should receive **benzathine penicillin G 50,000 U/kg IM** as a single dose if follow-up assured

(c) erythromycin dosages refer to use of erythromycin base. Equivalent dosages of other formulations (except that estolate is contraindicated in pregnancy) may be substituted.

FOR NOTES SEE PAGE 106

NOTES

HIV infection

- **PERSONS INFECTED WITH HIV MAY REQUIRE LONGER THERAPY AND/OR HIGHER DOSES AND CLOSER FOLLOW-UP**
- most experts suggest that HIV-infected patients with early syphilis should receive **benzathine penicillin G 2.4 million U IM** weekly for 3 successive weeks

Pregnancy

- all women not previously treated should receive penicillin appropriate to their stage of disease
- re-treatment during pregnancy is unnecessary unless there is clinical or serologic evidence of new infection (a 4-fold rise in RPR titre) or history of recent sexual contact with a person with early syphilis
- erythromycin should only be utilized when penicillin allergy is reported and skin testing for penicillin allergy and desensitization is not possible and if erythromycin is used the infant should be managed at birth as if born to an untreated mother
- pregnant women receiving treatment should be advised to seek medical care if any decrease in fetal movements occur; they need not be hospitalized routinely

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, did not include penicillin, is unknown, occurred in the last month of pregnancy, or if maternal serologic response is inadequate
    OR
  - if adequate follow-up of the infant cannot be ensured

Jarisch-Herxheimer Reaction

- a febrile reaction may occur 8-12 hours after treatment of syphilis, most commonly in early disease
- the reaction is often accompanied by malaise and is not related to drug allergy
- usually lasts a few hours and can be treated with antipyretics

Epidemiology/Etiology

- HSV type 2 (HSV-2) most common (≥ 70% of primary; 98% of recurrent episodes)
- HSV type 1 (HSV-1) less common (≤ 30% of primary; 2% of recurrent episodes)
- infection life-long and predominantly asymptomatic

Natural history

- primary infections frequently asymptomatic
- usual incubation period for symptomatic primary infection = 2 to 21 days
- recurrences tend to follow sensory nerve distribution, and may appear on non-contiguous external sites related by dermatome
- asymptomatic and symptomatic recurrences common

Clinical clues

First symptomatic episode

Primary

- first clinically-evident episode in **seronegative** patient
- vesiculo-ulcerative disease at and near sites of inoculation
- usual incubation period for symptomatic primary infection = 2 to 21 days
- involves external genitalia, pubis, perineum, and perianal regions, cervix, anus or urethra (men and women), depending on type of contact
- painful lymphadenopathy common
- urinary symptoms, including hesitation and/or external dysuria (for definition, see page 174) are common in men and women and may be prolonged
- systemic symptoms (fever/muscle aches) in 40-70% of symptomatic primary infections
- benign aseptic meningitis – 10-30% of symptomatic primary infections

Non-primary

- first clinically-evident episode in **seropositive** patient
- short or long incubation (years in some patients)
- possible unilateral vesiculo-ulcerative disease similar to symptomatic recurrent disease
- systemic symptoms unusual

Genital Herpes (cont'd).....

Symptomatic recurrence

- due to reactivation of latent infection and/or recent inoculation
- symptoms less severe and duration shorter than in primary episode
- generally limited to external genitalia

Neonatal herpes

- intrauterine infection can occur at any time in pregnancy after primary infection in mother, but is rare (see below for infection during birth process). The greatest risk is in the third trimester.
- intrauterine infection does not cause malformations of fetus, but may result in severe damage as well as destructive lesions
- neonatal herpes is most often acquired during the birth process
- recurrent HSV infection rarely leads to neonatal infection despite the frequency of genital HSV infections in women
- neonates born to mothers with primary infection close to delivery are at especially increased risk, regardless of whether maternal infection is symptomatic or asymptomatic, but primary genital herpes infection in pregnancy is associated with a high rate of transmission to the neonate – up to 50%
- clinical presentation can occur shortly after birth or as late as 4-6 weeks after birth. Presentations include:
  - generalized systemic infection involving the liver, other organs and frequently the CNS with or without skin involvement – incubation period about 1 week
  - isolated CNS disease without skin or visceral involvement, incubation period 2-4 weeks
  - localized skin, conjunctival and oral disease without overt CNS or visceral disease – incubation period 1-3 weeks. Some infants with disease apparently limited to skin develop neurological damage, thus all affected infants should be treated with parenteral acyclovir.
- post-natal transmission of HSV in newborn is rare, but has occurred from mothers as well as other caregivers

Genital Herpes (cont'd).....

Specimen collection and laboratory diagnosis

- diagnosis requires
  - classical clinical presentation AND
  - culture (or other viral type-specific) documentation
- methods other than culture are available for the laboratory diagnosis of HSV infections; however, culture remains the preferable method because of specificity, sensitivity and ability to type the viral strain. Strain typing may be useful in a child who has been sexually abused.
- current serologic techniques are useful only in conjunction with culture in first episodes, to distinguish between primary and non-primary (see above)
- glycoprotein g-specific serological techniques are becoming more widely available and may be used to diagnose latent HSV-2 infection
- for further information, see section on Laboratory Diagnosis, page 195
- consider obtaining a blood sample for serological testing for **syphilis** (see section on Screening, page 157)
- consider **HIV screening**
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176)
    (see section on Screening, page 157)
- immunization against hepatitis B should be considered
  - screening for hepatitis B markers (surface antigen [HBsAg] and surface antibody [HBsAb]) should be considered pre-immunization
    (see section on Hepatitis B, page 63)

Prevention

- **counsel about risk reduction to others**
- **counsel about informing partners of history and risk**
- **patients presenting with concerns about STD provide an important opportunity for instruction and encouragement for the consistent practice of safer sex**

Reporting, contact tracing and follow-up

- HSV infections, genital and neonatal, are reportable by physicians to local public health authorities in some provinces, but not in either territory, at time of publication (April 1992). Whether cases are to be reported on suspicion or after laboratory confirmation also varies. For clarification, contact your local public health authority.

Genital Herpes (cont'd).....

Contact tracing.....

- contact tracing of cases does not need to be carried out
  - most disease presents as recurrences
  - it is difficult to assess whether a contact has ever had a primary genital infection
- cases should be encouraged to inform their regular sexual partners of the diagnosis to make them aware of the risk of infection, if uninfected, and to aid diagnosis in a partner if the disease does arise
- follow-up cultures not usually indicated, except when there are unusual recurrent symptoms

Management

Counselling

- patients with recurrent infection may not require antiviral treatment unless recurrences are severe and/or frequent
- transmission decreased by:
  - avoidance of affected skin contact during likely periods of viral shedding (prodrome to re-epithelialization)
  - adherence to safer sex practices at other times
- most common patient concerns
  - asymptomatic transmission
  - fears of partner discussions and judgments
  - loneliness, depression and low self-esteem
  - potential effect on childbearing
- counsel about risk reduction to others
- counsel about informing partners of history and risk of infection
- if pregnant, health care provider should be informed

Genital Herpes (cont'd).....

Treatment

Primary episode of genital herpes • treatment should be considered and discussed with the patient. Treatment is useful in reducing symptoms, complications and virus shedding but is only effective if given in the early stages of the symptomatic episode.	Children-prepubertal	• oral acyclovir probably effective but there are no data yet to support its use
	Adults and adolescents	• **acyclovir 200 mg orally** x 5/day for 7-10 days or until healing complete **OR** • **acyclovir 5 mg/kg IV** x 3/day for patients requiring hospitalization, switch to oral therapy when possible to complete 10 days therapy or until healing complete **Note:** initiation of treatment 6 days or more after onset of symptoms is unlikely to be of benefit
Recurrent genital herpes (see also page 112)	Children	• no data to support use of acyclovir although efficacy and safety are probably not different than for adults
	Adults and adolescents	• intermittent, early, preferably with prodrome, patient-initiated treatment of active recurrences of limited clinical benefit; (for chronic suppressive therapy see page 112) • **acyclovir 200 mg orally** x 5/day for 5 days • no role for topical acyclovir
	Immuno-compromised adults and adolescents	• intermittent, early, patient-initiated treatment of active recurrences • **acyclovir 200 mg orally** x 5/day for 5 days or until healing – chronic, suppressive therapy probably preferable (see below) – topical acyclovir may have minor role in a limited infection – severe or progressive lesions likely to be due to acyclovir resistance
	Immuno-compromised children	• **acyclovir 600 mg/m^2 orally** x 4/day for 5 days or until healing complete, may be effective
	Immuno-compromised adults and adolescents and children with acyclovir resistance	• foscarnet (investigational) 40-60 mg/kg 8 hourly – central venous access required for higher dose – restart acyclovir suppression at the conclusion of foscarnet

Treatment (cont'd).....

Chronic, suppressive treatment • objectives: – frequency and severity reduction	Children	• no data available
	Adults and adolescents	• more than 6 annual recurrences and considered likely to benefit from frequency reduction • **acyclovir 200-400 mg orally** x 2-5/day (most commonly 200 mg x 3/day) – safety established to 4 years (400 mg x 2/day) – small subgroup require higher doses • annual discontinuation – 2 recurrent episodes warranted to re-establish continuing need • suppression may decrease asymptomatic HSV shedding • special occasions (dosage as for chronic suppression, but for a defined period beginning 5 days prior to the event), e.g.: – vacations – high-stress periods – new relationships – known exposure to trigger factor, e.g., sunlight
	Immuno-compromised adults, adolescents	• **acyclovir 400-2000 mg/day orally** in 2-5 divided doses in certain individuals
	Immuno-compromised children	• **acyclovir 600 mg/m^2 orally** x 2-10/day may be effective but there are no data yet to support its use
Pregnancy		• a specialist knowledgable in this area should be consulted • use of acyclovir during pregnancy not adequately studied but possible roles include: – primary infection especially in third trimester – suppression late in pregnancy to prevent cesarean section
Neonatal herpes	Neonate and infants	• **acyclovir 30 mg/kg/day IV** 8 hourly infusions for 14 days • oral therapy NOT adequate, but may be considered in infants exposed to active HSV infection but not yet ill

Genital Warts and Genital Human Papillomavirus (HPV) Infections

Epidemiology/Etiology

- probably the most common STD
- caused by genital types of human papillomavirus (HPV)
- 10 to 30% of adult population infected although majority of patients have sub-clinical infection
- incubation period estimated at 2-3 months but may be longer
- life-long infection probable
- some types linked to cervical, vulvar, and other ano-genital tract cancers (vagina, perineum, penis, anus)
- symptomatic perinatal transmission is suspected to be infrequent. When it occurs, is associated with genital and vocal cord lesions. The incubation period is unknown.
- sign of possible child sexual abuse. Genital warts in a child > 18 months of age and particularly > 2 years warrant an investigation for abuse, although the latest age at which perinatally acquired HPV infection can become symptomatic is not clearly defined (see section on Child Sexual Abuse, page 133)

Clinical clues

- often subclinical or clinically apparent but asymptomatic
- warty growths on ano-genital skin and/or mucous membrane (*condyloma acuminata*), frequently multiple and polymorphic
  exophytic frond or cauliflower-like
  – usually asymptomatic
  – can cause bleeding, pruritus, local discharge
  flat poorly visualized (macular or papular) condyloma also found
- natural history is of fluctuation of size and number of warts
- warts can increase in size with pregnancy
- dysplasia and neoplasia on a Papanicolaou (Pap) smear may be associated with HPV infection

Genital Warts (cont'd).....

NOTE: Molluscum contagiosum

- genital warts should not be confused with **molluscum contagiosum**
- molluscum is caused by a poxvirus spread by intimate contact
- presents as smooth spherical papules with umbilicated centres on the genitalia, thighs and lower abdominal wall
- lesions will heal spontaneously, without scarring, usually within 2-3 months. Infection may last longer and warrant treatment
- therapeutic regimes used include, curretage, application of trichloracetic acid or podophyllin and cryotherapy with liquid nitrogen
- extensive molluscum, repeated recurrences and facial lesions are common in immunodeficient patients and should raise a suspicion of possible HIV infection

Specimen collection and laboratory diagnosis

- by direct examination of external genitalia; magnification by hand lens or colposcopy often helpful
- aceto-whitening (3-5% acetic acid applied to affected area for 3-5 minutes) may lead to whitening of infected epithelium. This may enhance detection of subclinical lesions but test has high false-positive and false-negative rate and requires skilful interpretation. Refer for further evaluation, if necessary.
- colposcopy for cervical and vaginal warts, proctoscopy for anal warts and urethroscopy for meatal warts
- yearly Pap smears especially important for women and adolescents with history of genital warts (see page 184)
- atypical warts
  - biopsy (specialist procedure)
- culture/serology not available
- consider obtaining a blood sample for serologic testing for **syphilis** (see section on Screening, page 157)
- consider **HIV screening**
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176)
    (see section on Screening, page 157)
- immunization against hepatitis B should be considered
  - screening for hepatitis B markers (surface antigen [HBsAg] and surface antibody [HBsAb]) should be considered pre-immunization
    (see section on Hepatitis B, page 63)

Genital Warts (cont'd).....

Prevention

- **counsel about risk reduction to others**
- **counsel about informing partners of history and risk**
- **patients presenting with concerns about STD provide an important opportunity for instruction and encouragement for the consistent practice of safer sex**

Reporting, contact tracing and follow-up

- HPV infection is not reportable to local public health authorities
- contact tracing of presumptive or proven cases of HPV infection is not useful
- routine follow-up of women with annual Pap smear

Special considerations for children

- refer to appropriate specialist since treatment can be very difficult
- consider possibility of sexual abuse
- **SEE SECTION ON CHILD SEXUAL ABUSE, PAGE 133**

Management and treatment

- **NO THERAPY ERADICATES HPV INFECTION**
- warts often difficult to control; high recurrence rate
- successful therapy will reduce visible lesion size but there is no evidence that this alters the risk of transmission or the risk of neoplastic change

Treatments that are probably not effective:

- topical interferons
- dinitrochlorobenzene sensitization and application
- immunotherapy with autogenous vaccines

Treatment: HPV-related neoplasia

- all suspicious pigmented and/or ulcerated and/or persistently pruritic and/or recalcitrant lesions should be referred to a specialist

Treatment: Asymptomatic HPV

- women should have a routine annual Pap smear
- no specific management recommended

Genital Warts (cont'd).....

Treatment (cont'd).....

ADULTS AND ADOLESCENTS (refer children to appropriate specialist)		
Lesion type	**Treatment**	**Comments**
Condyloma acuminata • uncomplicated, small external genital and perianal warts	• podophyllin, 10% in tincture of benzoin, apply to wart and not contiguous skin, wash off in 1-4 hrs, may repeat once or twice weekly total dose ≤ 1 to 2 mL per visit • podophyllin 25% in a resin, also available	• most readily available • cytotoxic, may be carcinogenic • requires physician – should never be left to self-application • frequent local reactions: erythema, tissue oedema, local pain/burning/itching/tenderness • should NOT be used in pregnancy (fetal death; systemic toxicity) • should NOT be used for treatment of cervical, meatal, vaginal or anal warts • failure rate = 23 to 78%
	• podofilox 0.5% solution, apply to wart and not contiguous skin x 2/day (every 12 hrs) for 3 days = one treatment cycle. Treatment cycle can he repeated x 3-4 only. Total dose per day not to exceed 0.5 mL	• for self-application under direction of physician • carcinogenicity not estahlished • should NOT be used in pregnancy • should NOT be used for treatment of cervical, meatal vaginal or anal warts • more efficacious than podophyllin but recently licensed and experience limited
	bi- or trichloracetic acid, repeat weekly	• caustic and astringent • applied by physician as for podophyllin • no need to wash off • protect healthy skin
Uncomplicated: small external genital and perianal warts flat warts extensive warts or cervical warts	cryotherapy (liquid nitrogen, carbon dioxide [dry ice]), or nitrous oxide in a specialized apparatus	• moderate cost with good response rate • dependent upon availability of low-to-moderate expense equipment • damage usually limited to epidermis • can be applied to cervix using special probe • especially useful where warts extensive and exophytic
Uncomplicated: more extensive, genital, perineal warts	electro-desiccation electrocautery	• requires special equipment **(specialist often required)** • multiple painful local anaesthetic injections or general anaesthesia required • good response rate • treatment of multiple warts may cause excess damage

Genital Warts (cont'd).....

Treatment (cont'd).....

Lesion	Treatment
Extensive infection/large or resistant lesions	• Patients should be referred to a specialist knowledgable in this area • treatments which may be considered: – laser – surgery – intralesional or systemic α-interferon • treatments may require multiple painful local anesthetic injections or general anesthesia and may be associated with significant morbidity
Vaginal, meatal warts	• Patients should be referred to a specialist knowledgable in this area • treatments which may be considered: – laser – topical 5-fluoracil 5% cream • treatments may be associated with significant morbidity and laser therapy usually requires general anesthesia

Epidemiology/Etiology

- > 10,200 cases of AIDS reported in Canada up to September 30, 1994
- the proportion of adult AIDS cases who are men who have sex with men has been steadily decreasing, from 81.5% in 1988 to 73.5% in 1992 and 1993. On the other hand, the proportion of adult AIDS cases who are injection drug users has been steadily increasing, from 4.6% in 1988 to 10.2 % in 1993. A small but increasing proportion of cases of AIDS are being reported in the heterosexual population of both genders.
- estimated between 30,000 to 40,000 individuals infected with HIV in Canada – most are asymptomatic
- to date, about 20% of male and female cases of AIDS acquired their infection as adolescents
- screening for HIV and method of preparation of blood products since November 1985 has minimized transmission of the infection to persons receiving blood products. The current estimated risk of infection from receipt of blood and blood products is extremely low.
- on average the time from infection to the development of clinical AIDS is 7-8 years
- risk of acquiring HIV infection may be as high as 2% after sexual contact with an HIV-infected individual. The risk increases substantially with increasing numbers of sexual partners.
- genital ulcer disease (e.g., herpes, syphilis, chancroid) enhances acquisition and transmission of HIV

HIV/AIDS in Adolescents and Adults (cont'd).....

Clinical clues

Risk factors	• unprotected sexual activity • sex with person known to be infected • sex with multiple partners • anal intercourse • sharing needles and equipment • history of hepatitis B and other STD
History	• asymptomatic • acute mononucleosis-like syndrome • aseptic meningitis • unexplained persistent fever • unexplained lymphadenopathy • unexplained chronic diarrhea • dyspnea and dry cough • recurrent mucocutaneous candidiasis • dysphagia (esophageal candidiasis) • intractable vaginal candidiasis • new red/purple skin lesions • encephalopathy • unexplained weight loss • herpes zoster

Laboratory clues

- lymphopenia
- thrombocytopenia
- anemia

HIV/AIDS in Adolescents and Adults (cont'd).....

Manifestations of disease in adults and adolescents

Primary infection	• the majority of primary infections are asymptomatic • some primary infections present clinically with an infectious mononucleosis-like illness with or without aseptic meningitis
Asymptomatic infection	• lymphadenopathy (nodes > 1 cm in diameter at 2 non-contiguous non-inguinal regions or generalized for > 3 months' duration) • thrombocytopenia
Progressive infection: conditions indicative of immunosuppression	• oral candidiasis • recurrent or chronic vaginal candidiasis • oral hairy leukoplakia • unexplained fever > 2 weeks • chronic diarrhea > 2 weeks • weight loss > 10% body weight
AIDS: multiple severe infections, unusual diseases and cancer	Opportunistic infections: • *Pneumocystis carinii*/toxoplasmosis/ cryptosporidiosis/extra-intestinal strongyloidiasis • cytomegalovirus/mucocutaneous herpes simplex (chronic or disseminated) multi-dermatomal herpes zoster (multiple locations) • candidiasis/cryptococcosis/histoplasmosis coccidioidomycosis/nocardiosis • recurrent *Salmonella* bacteremia • tuberculosis/atypical mycobacteria, e.g., *M. avium* complex Secondary cancers: • Kaposi's sarcoma/non-Hodgkin's lymphoma/cerebral lymphoma • cancer of the cervix Other diseases: • progressive multifocal leucoencephalopathy • HIV dementia/myelopathy and/or peripheral neuropathy • lymphoid interstitial pneumonitis (LIP)

Laboratory diagnosis – HIV antibody testing

- any physician can order an HIV test
- testing should only be carried out with the individual's consent
- consider testing for HIV in any person with risk behaviour (see page 120) or who has clinical or laboratory clues suggestive of HIV infection (see page 120-121)
- explain clearly the nature of the test and provide appropriate pre- and post-test counselling (see page 176)
- in all provinces and territories, a physician does not have to supply the name of the person being tested BUT in some areas, if a test is positive, the physician is obliged to report the name of the individual to the local public health authority (nominal reporting)
- anonymous testing (where the patient does not reveal his/her identity and the result is given only to the patient) is available in some provinces. Contact the local health authority for more information.
- seroconversion occurs in the majority of individuals within 12 weeks, but there are occasional reports of up to 6 months
- consider repeating all initially positive serologic tests for HIV, particularly when (indicate on the laboratory requisition that this is a repeat test):
  - the result is only verbally available from the patient
  - the result is unexpected

Prevention of transmission

- **abstinence**
- **counsel on prevention of transmission to others:**
  - **practice of safer sex including non-penetrative sexual activity**
  - **use of condoms**
  - **avoidance of sharing needles, syringes and cookers; counsel about disinfection**
  - **responsibility to inform partners of HIV infection status**
- **all pregnant women should be offered confidential HIV testing**
- **counsel infected mothers about the risk of transmission to neonate and the availability of therapy to decrease this risk**

Reporting, contact tracing and follow-up

Reporting

- AIDS is reportable by physicians to local public health authorities in all provinces and territories although specific requirements vary
- HIV infection is reportable in some provinces and territories

HIV/AIDS in Adolescents and Adults (cont'd).....

Contact tracing

- contact tracing must be undertaken for all cases of AIDS and HIV infection
- local public health authorities should be available to help with contact tracing and evaluation; the treating physician is responsible for ensuring that contact tracing is initiated
- all children born to mothers who are or may have been infected must be evaluated (see section of HIV Infection in Children, page 127)
- all HIV-positive persons who have previously received or donated blood should be reported in confidence to the Canadian Red Cross

Follow-up

- while asymptomatic, infected persons are usually followed up at 4-6 monthly intervals

Management and treatment

- **THIS IS A RAPIDLY CHANGING AREA AND PHYSICIANS MAY WISH TO DISCUSS AND UNDERTAKE CARE IN COLLABORATION WITH AN HIV/AIDS SPECIALIST**

- ensure psychosocial support throughout follow-up
- complete a history, physical examination
  - order appropriate laboratory tests: CD4, CBC and differential, liver function tests
  - screening tests for co-infections: TB skin test (with or without anergy test), hepatitis B and C serology, non-treponemal and treponemal syphilis serology, toxoplasmosis serology, chest x-ray

Anti-retroviral therapy

- patients with CD4 (subset of helper lymphocytes) count < 0.2 x 10^9/L **routinely offer zidovudine 500-600 mg/day orally** (e.g., 200 mg x 3/day)
- patients with CD4 count < 0.5 x 10^9/L consider zidovudine
- patients with CD4 count > 0.5 x 10^9/L are not usually considered for anti-retroviral therapy; decision should be individualized
- if neurologic involvement present, discuss with HIV/AIDS specialist
- monitor patient for side effects, e.g., anemia and neutropenia
- other anti-retroviral agents are available, e.g., DDI, DDC, 3TC; their use should be discussed with an expert
- combination anti-retroviral therapy is becoming increasingly common

Management and treatment (cont'd).....

Immunization

- all HIV-infected persons should receive pneumococcal vaccine and annual influenza vaccine; consider *H. influenzae* vaccine
- when indicated, any other routine immunization should be given. The polio vaccine recommended is enhanced inactivated polio vaccine (eIPV) for the patient and all household members.

Ongoing primary care

- CD4 counts every 4-6 months
- when CD4 count falls below 0.5 x 10^9/L
  - consider anti-retroviral therapy
- CD4 count falls below 0.2 x 10^9/L
  - routinely offer anti-retroviral therapy; consider combination therapy
  - start prophylaxis against *Pneumocystis carinii*
- CD4 count falls below 0.1 x10^9/L
  - counsel about serious opportunistic infections
  - consider starting rifabutin prophylaxis against *M. avium* complex

Common treatment/prophylactic regimens for HIV patients

- anti-retroviral therapy
  - zidovudine: usually at 500-600 mg/day orally in divided doses
  - may be combined with other anti-retroviral therapy
- *Pneumocystis carinii* prophylaxis
  - cotrimoxazole: 1 adult double strength tablet daily or 3 times per week
  - alternatives: oral dapsone (3/week) or aerosolized pentamidine (1/monthly)
- *M. avium* complex prophylaxis
  - rifabutin 300 mg/daily orally
- *M. tuberculosis* prophylaxis
  - isoniazid 300 mg/daily orally (more complex regimens if resistant organism suspected)

Secondary infections

- therapy of bacterial, including mycobacterial, viral and fungal infections must be individualized and response to treatment monitored
- long-term suppressive therapy may be necessary, e.g., for CMV retinitis

Special considerations for women

- due to increased risk of cervical cancer, Pap screening should be performed at least annually

HIV/AIDS in Adolescents and Adults (cont'd).....

Management and treatment (cont'd).....

- pregnancy
  - may exacerbate symptoms of opportunistic infections (e.g., TB)
  - risk of perinatal transmission of HIV with an infected mother is 14-30%
  - zidovudine therapy (100 mg orally 5/day starting in second trimester of pregnancy; 2 mg/kg IV intrapartum; 2mg/kg orally every 6 hours for newborn for 6 weeks) can decrease transmission by two-thirds
  - consult with an expert

Human Immunodeficiency Virus (HIV) Infection in Children

Epidemiology/Etiology

- 112 cases of AIDS reported in children in Canada up to the end of September 1994, perinatal transmission accounted for 73%, receipt of blood and blood products for 12%
- screening for HIV and method of preparation of blood products since November 1985 have minimized transmission of the infection to persons with hemophilia and others receiving blood products. The current estimated risk is extremely low.
- an increasing proportion of HIV-infected infants are being born to mothers with no identified risk factors
- HIV can be transmitted to a child through sexual abuse
- even perinatally acquired HIV infection can remain asymptomatic for a number of years
- decreased risk of HIV transmission to newborn with antiretroviral therapy given during pregnancy

Clinical clues

Perinatal infection: risk factors	• mothers with risk behaviour – needle or equipment sharing – other substance abuse – sex trade worker (prostitute) – sex with multiple partners, – mother has STD – sex with infected partner – unprotected sex – anal intercourse • mother from HIV-endemic area

Acquired infection: risk factors	• receipt of blood products and/or injections in some endemic countries • sexual abuse

HIV Infection in Children (cont'd).....

Clinical clues (cont'd).....

Acquired infection in older children: history	• no symptoms • acute mononucleosis-like syndrome • history of hepatitis B and other STD • unexplained persistent fever • unexplained lymphadenopathy • unexplained chronic diarrhea • dyspnea and dry cough • recurrent mucocutaneous candidiasis • dysphagia (esophageal candidiasis) • intractable vaginal candidiasis • new red/purple skin lesions • encephalopathy • unexplained weight loss • herpes zoster • aseptic meningitis

Laboratory clues

- chronic lung infiltrates
- elevated serum IgG levels
- lymphopenia
- low platelet count
- anemia

Manifestations of symptomatic disease

Early onset disease	• generalized lymphadenopathy • hepatosplenomegaly • failure to thrive • recurrent diarrhea • chronic candidiasis • developmental delay • encephalopathy – progressive or static • recurrent bacterial infections caused by e.g., *Streptococcus pneumoniae, Haemophilus influenzae* b, *Staphylococcus aureus, Salmonella* sp • lymphoid interstitial pneumonitis • *Pneumocystis carinii* pneumonia • cardiomyopathy, bepatitis, nephropathy • malignancies are uncommon
Late onset disease	• similar presentations to HIV infections in adolescents and adults (see section on HIV Infection in Adolescents and Adults, page 119) • recurrent bacterial infections (see above) • lymphoid interstitial pneumonitis • encephalopathy

Laboratory diagnosis – HIV antibody testing

- in all infants and children where HIV disease is suspected, physicians must clearly explain the need for testing the infant and the implications of a positive result for the mother (see page 176)
- testing should be done with parental/guardian counselling and consent
- testing of the mother may be helpful in defining the risk of infection in an infant < 15 months of age, when perinatal acquisition is suspected
- early diagnosis of HIV infection allows early access to HIV therapy which can decrease progression of disease including encephalopathy and also allows early treatment and prevention of secondary infection
- a positive HIV serologic test in an infant may represent only passively transferred maternal antibody and the infant may or may not be infected. The HIV antibody test is so sensitive that maternal antibodies have been detected for up to 15 months in an infant not infected with HIV. There are laboratory tests (see section on Laboratory Diagnosis for HIV Infection, page 198) that can help detect infected infants before 15 months of age, e.g., PCR for viral genetic material, specific IgA, p24 antigen and virus isolation.
- since false-negative HIV tests in infants can occur, repeated testing may need to be done to definitively exclude the diagnosis
- a negative HIV test in a mother and/or her infant in the first few weeks postpartum does not exclude infection if the mother was infected in late pregnancy
- consultation with an expert is recommended to assist in assessing need for serology and interpretation of results

Primary prevention

- **counsel the mother about the risk of breast feeding since HIV may be transmitted through breast milk**
- **mothers of HIV-positive infants should be counselled and tested. Their sexual partners and other children should be evaluated.**

Reporting, contact tracing and follow-up

- AIDS is reportable by physicians to local public health authorities in all provinces and territories although specific requirements vary
- HIV infection is reportable in some provinces and territories

Treatment

- **THIS IS A COMPLEX ISSUE AND CONSULTATION WITH AN EXPERT IN PEDIATRIC HIV/AIDS IS ESSENTIAL**

Anti-retroviral therapy

- Perinatal infection
  - symptomatic infants and children can be treated with **zidovudine 180 mg/m^2 orally** given every 6 hours in combination with **didanosine 200-300 mg/m^2/day** divided into 2-3 doses or other anti-retroviral agents
  - zidovudine therapy in asymptomatic infections in infants and children may be considered
- Acquired infection
  - see adolescent and adult HIV infection (pages 123-4)

Prophylaxis

- *Pneumocystis carinii* (PCP) infection
  - PCP prophylaxis should be started at 4-6 weeks of age in all infants born to HIV positive mothers regardless of the infant's CD4 count
  - infants who are first identified as being HIV exposed after 6 weeks of age should be started on prophylaxis at the time of identification
  - **cotrimoxazole (TMP-SMX) – 5 mg/kg/day of trimethoprim (TMP) orally** divided into 2 doses, other similar regimens have been shown to be efficacious; oral dapsone or aerosolized pentamidine are alternatives
  - should be discussed with an expert
- Bacterial infection
  - if symptomatic, **IVIG 400 mg/kg** monthly decreases incidence of invasive bacterial infections such as *S. pneumoniae*
- Secondary infections
  - treatment of bacterial, viral and fungal infections must be individualized and response to therapy monitored. Long-term suppressive therapy may be necessary.

Immunization

- all HIV-infected children should receive immunizations on schedule including *Haemophilus influenzae* type b vaccine. Enhanced inactivated polio vaccine (eIPV) should be used for the child and all household members instead of oral polio vaccine (OPV) where appropriate. Also consider using pneumococcal vaccine and yearly influenza vaccine. BCG immunization is contraindicated.

Special considerations

- to obtain the name of your closest expert contact the provincial or territorial director of STD control or the closest children's tertiary care centre.

Sexual Abuse and Sexual Assault

A SUSPECTED OR CONFIRMED STD IN A CHILD SHOULD PROMPT CONSIDERATION OF CHILD SEXUAL ABUSE

Definition

- the sexual exploitation of a child whether consensual or not. It includes acts of exposure, sexual touching, sexual assault, and sexual exploitation of a child by prostitution or pornography. STD may be transmitted to a child through sexual abuse with oral-genital, genital-genital, and ano-genital contact.

Epidemiology

Factors affecting likelihood that a genital pathogen is sexually transmitted:

- the duration of time that a perinatally transmitted STD can persist varies with different pathogens. It is not definitively known with any pathogen.
- the likelihood that a specific STD diagnosed in a child was sexually transmitted by oral-genital, genital-genital or ano-genital contact varies with different pathogens
- the likelihood that child sexual abuse, rather than persistent perinatal transmission, has caused an infection should be strongly considered with:
  - *Neisseria gonorrhoeae* infection in a child > 1 month of age and particularly > 6 months of age
  - genital or rectal chlamydial infection > 6 months of age, although perinatally acquired chlamydial infection may colonize an infant for possibly up to 3 years
  - genital or perianal warts in a child > 18 months of age and particularly > 2 years, although the latest age at which perinatally acquired human papilloma virus infection can become initially symptomatic is not clearly defined
  - genital or perianal herpes simplex virus infection > 3 months of age, although alternative routes of transmission should be considered
  - genital *Trichomonas vaginalis* infection > 6 months of age, although there may be non-sexual means of transmission

Epidemiology (cont'd).....

- genital chancroid beyond the neonatal period (> 1 month) and particularly > 6 months of age, although there may be non-sexual means of transmission

NOTE

- bacterial vaginosis, including *Gardnerella* infection, is not by itself diagnostic of sexual abuse

Indications for screening for STD

- children sexually abused in a manner in which transmission of an STD is possible, e.g., genital-genital, oral-genital or rectal-genital contact, should be investigated
- when an STD and/or sexual abuse has been diagnosed in a child, other children at risk (siblings, household members, close social contacts) should also be assessed
- **suspected or known sexual abuse of a child MUST be reported by the primary health care provider to the local agency responsible for child protection**

Referral

Referral to or discussion with a multidisciplinary expert team is strongly recommended (see section on Referral Centres, page 207) because:

- the examination of a child under these circumstances is for both medical and legal purposes

Evaluation

A person whose role is to be supportive of the child should be present during the interview and examination.

All findings and actions taken, i.e., historical, physical and laboratory, should be clearly and completely documented (see section on Forensic Evidence, page 203).

Interview

- useful only in a child with language skills capable of detailing events or symptoms
- encourage child to describe details in his/her own words
- try to determine whether any efforts/threats have been made to discourage the child from disclosing details of the assault
- reassure the child that he/she will be believed and protected
- be non-judgemental
- use terminology that the child can understand
- use of inanimate objects, such as dolls, may be helpful
- avoid use of leading questions

Child Sexual Abuse (cont'd).....

Past developmental/medical history

- be as complete as possible
- perinatal history is important – particularly concerning maternal STD
- obtain information concerning the number of accidents, injuries, burns, scalds and ingestion of pills or other household materials that may have occurred. This may reveal other forms of abuse or neglect.
- include a full developmental history
- functional enquiry should be complete and specifically include past STD, general behaviour changes or problems and information regarding school attendance or problems

Social and family history

- a detailed description of the family structure
- obtain a complete history of medical problems suffered by both immediate and remote family members
- history of past STD, sexual or physical abuse, substance abuse, or family stress such as financial problems

Physical examination

- can be traumatic for some abused children. This can be alleviated with proper preparation of the child and the creation of a relaxed atmosphere.
- must include examination of the child for evidence of physical abuse and neglect as well as sexual abuse
- should be complete including growth parameters and neurological assessments
- confirm historical events during the physical examination by asking the child to indicate areas where touched or where pain is experienced
- assess sexual development (see section on Tanner Scale, page 201)
- examine all areas of skin and note signs of recent or past trauma or marks. If assault recent (within hours) re-evaluate 24-48 hours later as bruising or other injury may take time to become detectable.

Genital examination

- explain procedure to the child and allow him/her to see and touch instruments which are likely to be used
- attention should be paid to areas usually involved in sexual activity: the mouth, breasts, vaginal area, buttocks, rectum, and penis. Check for signs of trauma/infection such as erythema, abrasions, inflammation and discharge.
- penile lesions are usually obvious; trauma to the penis or foreskin rarely occurs as a natural event
- the perianal area and anus should be examined in both sexes. The buttocks should be separated and the anal sphincter inspected for abrasions, bruises or tears. The sphincter will usually contract quite tightly. Any sign of patulousness should be regarded with suspicion but must be corroborated with other evidence. A patulous anus may be seen in children with severe chronic fecal retention or neurologic abnormalities involving the sacral region.

Child Sexual Abuse (cont'd).....

Genital examination (cont'd).....

- examination of the vaginal area in preschool female children can usually be carried out with the child held on the lap of the parent or attendant and the child's legs held apart in the "frog position". Older children may be examined on a standard examining table without the use of gynecologic stirrups in either the supine or knee chest position. The vaginal area should be closely inspected and the labia separated so that the vaginal introitus can be examined. In prepubertal children, as the labia are separated the labia minora can usually be seen shielding the vaginal opening.
- the following should be looked for:
  - inflammation, chafing, abrasions, or bruising of the inner legs or perineal area
  - scarring or tears of labia minora
  - scarring of the posterior fourchette
  - decreased amount of or absent hymenal tissue with resultant enlargement of the hymenal opening
  - scarring, tears, or distortion of the hymen
  - purulent or other vaginal discharge
  - presence of ulcers and whether they are painful or painless
  - presence of warts, their location, size and appearance
- photographing any abnormal physical findings such as genital bruising and abrasions may be helpful for subsequent medico-legal purposes

Specimen collection and laboratory diagnosis

- testing for STD in sexually abused children and/or siblings should be restricted to where there is a history and/or physical findings which suggest oral, genital, or rectal sexual contact of the child
- in instances of acute assault, collection of specimens for forensic evidence should follow the established rape protocol procedures (see section on Forensic Evidence, page 203)
- to minimize upset for the child, appropriate specimens should be obtained during a single visit. If suspected sexual abuse occurred within 72 hours of the initial assessment, microbiological testing should be deferred since false-negative results can occur. The ideal interval for specimen collection after an acute assault in non-empirically treated patients is not clear. Generally, specimens are collected between 3 to 10 days after the incident. In cases of chronic abuse or when the incident has occurred more than 72 hours before the initial assessment, specimens should be obtained at the time of the physical examination.
- *N. gonorrhoeae* isolates should be forwarded to a reference laboratory for strain typing and antimicrobial susceptibility testing

Child Sexual Abuse (cont'd).....

Specimen collection and laboratory diagnosis (cont'd).....

- risk of STD transmission for the sexually abused child is dependent upon prevalence of STD in the community, risk of STD for the perpetrator and the extent and type of abuse
- if possible, the (alleged) perpetrator(s) should be examined for STD
- at times, a complete assessment may not be possible. Minimal investigation should include testing for *N. gonorrhoeae* and *Chlamydia trachomatis.*
- for medico-legal purposes cultures are the most appropriate tests for *N. gonorrhoeae* and *C. trachomatis*

NOTES

- all specimens must be carefully labelled with the patient's name and site of collection so that there is no confusion about the source of the specimen. The site and type of specimen collected should be documented in the medical chart.
- the laboratory must be alerted that the specimens are from a person suspected to have been sexually abused so that every effort is made to handle specimens optimally. For medico-legal purposes, both the laboratory methods for organism detection and the results should be carefully documented. All isolates should be saved so that they are available if further testing is required.
- see section on Forensic Evidence, page 203
- multiple STD may be present and, if possible, all the following cultures/tests (see table) should be done

Specimen collection and laboratory diagnosis (cont'd).....

Site	Procedure
Pharynx	• *N. gonorrhoeae* culture(a)
Rectum	• *N. gonorrhoeae* culture(a) • *C. trachomatis* culture(b) • HSV culture(c)
Urethra (males): Collecting a urethral swab in prepubertal children is difficult because of pain and the small diameter of the urethra. For practical reasons, a meatal swab rather than an intra-urethral swab should be obtained using a thin swab on a flexible metal shaft. The swab should be rotated in the meatal opening rather than introduced further into the urethra.	• *N. gonorrhoeae* culture(a) • *C. trachomatis* culture(b) • HSV culture(c)
Urine in males	• examine for *Trichomonas vaginalis* • examine for *C. trachomatis* if test available (see section on Laboratory Diagnosis, page 189)
Vagina(d): Vaginal specimens can be taken without a speculum in a relaxed child. As long as the hymenal ring is not touched, there is usually little to no sensation associated with placing swabs into the vagina. A speculum examination is only rarely required and in the prepubertal age group should be performed under a general anaesthetic.	• *N. gonorrhoeae* culture(a) • *C. trachomatis* culture(b) • Gram stain of smear, saline wet mount and 10% KOH preparation for : – *T. vaginalis* – clue cells and amine odor (whiff test) (see page 181) – pH – yeast • HSV culture(c)
Genital ulcers	• HSV culture • *Haemophilus ducreyi* culture, rarely seen in Canada, if suspected laboratory should be notified • examination of exudate for *Treponema pallidum*
Genital warts	• clinical evaluation with biopsy and histologic confirmation. Typing is optional and may be of little benefit with current state of knowledge.
Serologic samples	• syphilis(e) • HIV(f) • HBV(g) • frozen sample to be saved

FOR NOTES SEE PAGE 139

NOTES

(a) due to medico-legal issues, culture of *N. gonorrhoeae* is the preferred method of diagnosis. While the results of non-culture tests, if culture is not available, may be used to guide therapy, they will be inadequate for legal purposes.

(b) due to medico-legal issues, culture of *C. trachomatis* is the preferred method of diagnosis rather than non-culture tests. If chlamydial cultures are not available, results of non-culture tests using samples collected from urine and/or the vagina may be used to guide therapy although they should be confirmed using a blocking test. Since the positive predictive value of these tests used in this population may be as low as 50%, the results of these tests are not useful for legal purposes.

(c) cultures for HSV should be done if inflammation is present

(d) in prepubertal girls, culturing the cervix should not be done. Cervical specimens for *N. gonorrhoeae* and *C. trachomatis* become necessary for adolescent girls with Tanner Stage III and IV.

(e) optional depending upon circumstances of the abuse and prevalence of syphilis in the community. In the case of acute assault, a repeat test should be performed 6 weeks following the initial examination.

(f) optional depending upon the circumstances of the abuse, prevalence of HIV in the community and the perpetrator's risk for HIV infection. In the case of acute assault, a repeat test should be performed 24 weeks following the initial examination.

(g) optional depending upon the circumstances of the abuse, prevalence of hepatitis B in the community and the perpetrator's risk for hepatitis B infection. In the case of acute assault, a repeat test should be performed 6-12 weeks following the initial examination. If the assailant is known to be HBsAg-positive, hepatitis B immune globulin and hepatitis B vaccine should be given.

Reporting, contact tracing and follow-up

- children with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority

- if an STD is diagnosed, contact tracing of sexual contacts should be carried out
- specimens from sexual contacts should be taken with the same care and attention as specimens from the abused person (see above)
- local public health authorities should be available to help with contact tracing, clinical evaluation, testing and treatment

- follow-up cultures for "test-of-cure" are essential if an STD is found and treated
  - for gonorrhea, trichomoniasis and bacterial vaginosis, this should occur approximately 4-5 days after the completion of therapy. For gonorrhea, this should include reculturing of all positive sites.
  - the optimal timing of collection of test-of-cure specimens is unknown when *C. trachomatis* has been detected using non-culture techniques. In general, test-of-cure of chlamydial infections is done 3-4 weeks after completion of therapy.

Child Sexual Abuse (cont'd).....

Reporting, contact tracing and follow-up (cont'd).....

- follow-up treatment of the prepubertal child for syphilis is similar to that of adult patients
- follow-up serology for hepatitis B, syphilis and HIV as required (see notes to table above)
- management of children who have been sexually abused must include psychologic and social support for the child as well as other affected family members

Management and treatment

For antimicrobial therapy for specific infection, see section on specific STD

NOTES

- for acute sexual assault, empiric therapy may be offered:
  if the assailant is known to be infected
  OR
  if requested by patient, parent or guardian
  The therapy chosen should be effective against *N. gonorrhoeae*, *C. trachomatis* and incubating syphilis.

Definition

- the act of forcing another person to perform any sexual act. Includes oral, anal and vaginal penetration, or attempted penetration or molestation.

Epidemiology

- risk to men and women (for children see section on Child Sexual Abuse, page 133)
- risk of STD transmission generally low but assaulted person may acquire any STD

Evaluation

- great sensitivity is needed in assessing a person who has been sexually assaulted. The examination should not be an emotional or physical continuum of the assault.
- comprehensive assessment is needed for STD as well as for forensic purposes including physical abuse
- to be performed ideally in a centre experienced in evaluating people for STD who have been sexually assaulted

History

- penetration type and site
- STD-related symptoms

Examination

- oral/anal mucosa
- genitalia

Documentation

- all findings and actions taken, i.e., historic, physical and laboratory, should be clearly and completely documented (see section on Forensic Evidence, page 203).

Specimen collection and laboratory diagnosis

- in instances of acute assault, collection of specimens for forensic evidence should follow the established rape protocol procedures (see section on Forensic Evidence, page 203)
- to minimize upset to the patient, appropriate specimens should be obtained during a single visit. False-negative results may occur if specimens are taken within 72 hours of the assault. If institutional protocols exist, these should be consulted.
- *Neisseria gonorrhoeae* isolates should be forwarded to a reference laboratory for strain typing and antimicrobial susceptibility testing
- risk of STD transmission is dependent upon prevalence of STD in the community, risk of STD for the perpetrator and the extent and type of assault
- if possible, the (alleged) perpetrator(s) should be examined for STD
- at times, a complete assessment may not be possible. Minimal investigation should include testing for *N. gonorrhoeae* and *Chlamydia trachomatis.*
- for medico-legal purposes cultures are the most appropriate tests for *N. gonorrhoeae* and *C. trachomatis*

NOTES

- all specimens must be carefully labelled with the patient's name and site of collection so that there is no confusion about the source of the specimen. The site and type of specimen collected should be documented in the medical chart.
- the laboratory must be alerted that the specimens are from a person suspected to have been sexually assaulted so that every effort is made to handle specimens optimally. For medico-legal purposes both the laboratory methods for organism detection and the results should be carefully documented. All isolates should be saved so that they are available if further testing is required.
- multiple STD may be present and, if possible, all the following cultures/tests (see table, page 143) should be done. Sites will depend on nature of the assault.
- other specimens, e.g., stools for parasites, may be collected if indicated by history

Sexual Assault in Adolescents and Adults (cont'd).....

Specimen collection and laboratory diagnosis (cont'd).....

Site	Test
Urethra (males) Endocervix (females)	• Gram stain • culture for *N. gonorrhoeae*(a) and *C. trachomatis*(b)
Vagina	• Gram stain of smear, saline wet mount and 10% KOH preparation for: – *T. vaginalis* – clue cells and amine odor (whiff test) (see page 181) – pH – yeast
Anal canal	• *N. gonorrhoeae*(a) culture • *C. trachomatis*(b) culture
Pharynx	• *N. gonorrhoeae*(a) culture • *C. trachomatis*(b) culture
Serologic samples	• syphilis(c) • HIV(d) • HBV(e) • frozen sample to be saved

(a) due to medico-legal issues, culture of *N. gonorrhoeae* is the preferred method of diagnosis. Non-culture tests are not recommended. While the results of non-culture tests, if culture is not available, may be used to guide therapy, they will be inadequate for legal purposes.

(b) due to medico-legal issues, culture of *C. trachomatis* is the preferred method of diagnosis rather than non-culture tests. If chlamydial cultures are not available, results of non-culture tests using samples collected from urine and/or the cervix and the pharynx may be used to guide therapy although they should be confirmed using a blocking test. Since the positive predictive value of these tests used in this population may be as low as 50%, the results of these tests are not useful for legal purposes.

(c) optional depending upon circumstances of the assault and prevalence of syphilis in the community. In the case of acute assault, a repeat test should be performed 12 weeks following the initial examination.

(d) optional depending upon the circumstances of the assault, prevalence of HIV in the community and the perpetrator's risk for HIV infection. In the case of acute assault, a repeat test should be performed 12 weeks and 24 weeks following the initial examination. Appropriate pre- and post-test counselling should be carried out (see page 177).

(e) optional depending upon the circumstances of the assault, prevalence of hepatitis B in the community and the perpetrator's risk for hepatitis B infection. In the case of acute assault, a repeat test should be performed 12 weeks following the initial examination. If the assailant is known to be HBsAg-positive, hepatitis B immune globulin and hepatitis B vaccine should be given.

Sexual Assault in Adolescents and Adults (cont'd).....

Management

- difficult to distinguish between pre-existing and recently acquired STD

Initial

- for antimicrobial therapy for specific infection see section on specific STD

NOTES

- for acute sexual assault, empiric therapy may be offered:
  routinely
  OR
  if the assailant is known to be infected
  OR
  if requested by patient, parent or guardian
- the therapy chosen should be effective against *N. gonorrhoeae*, *C. trachomatis* and incubating syphilis:
  - **ciprofloxacin 500 mg orally** in a single dose **PLUS doxycycline 100 mg orally** x 2/day x 7 days
    OR
    ceftriaxone 250 mg IM in a single dose **PLUS doxycycline 100 mg orally** x 2/day x 7 days
- **offer crisis counselling and psychologic support to person assaulted and partner**
- the assailant should also receive counselling
- consider use of "morning after pill"

Follow-up

- if no initial therapy, follow-up at 7-14 days
- if empiric therapy given, follow-up at 3 weeks
- enquire about STD related symptoms. Examine and take appropriate specimens as required.
- follow-up serology for hepatitis B, syphilis and HIV as required (see notes to table on page 143)

Specific Population Concerns, Screening for Sexually Transmitted Disease, Reporting, Follow-up and Contact Tracing (Partner Follow-up)

Special considerations

Women

Pregnancy

- all pregnant women should be screened for syphilis (non-treponemal test) and hepatitis B (HBsAg) (see section on Screening, page 157)
- all pregnant women in the following groups or with these high-risk behaviours should be screened for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* infection:
  - < 25 yrs
  - injection drug user
  - other substance abuser
  - sex trade worker (prostitute)
  - street youth
  - history of STD in past year
  - new partner in past 2 months
  - unprotected sex with any of above groups and with men who have sex with men
- where no ocular prophylaxis against chlamydial or gonococcal infections is planned to be given to newborns, all pregnant women should be screened for *C. trachomatis* and *N. gonorrhoeae* in the third trimester
- consider **HIV screening** in the groups outlined above as well as women from endemic areas
  - HIV testing should always be accompanied by pre-test and post-test counselling (see page 176) (see section on Screening, page 157)
- immunization against hepatitis B should be considered if found to be non-immune (see section on Hepatitis B, page 63)
- pregnant women with a history of herpes simplex virus infection should inform their health care provider. Appropriate management of labour would have to be decided upon.
- treatment of STD in pregnant women needs special attention:
  - tetracyclines, erythromycin estolate, ciprofloxacin are contraindicated primarily due to adverse effects on the fetus or neonate. In addition, metronidazole is contraindicated in the first trimester and sulphamethoxazole is contraindicated in the third trimester.

Special Considerations (cont'd).....

Women (cont'd).....

Pregnancy (cont'd).....

- follow-up after treatment of STD in a pregnant woman is important to ensure therapeutic success
- hospitalization for evaluation and treatment of PID in a pregnant woman is recommended. PID is rare after the first trimester.

Artificial insemination

- risk of transmission of STD by donor semen is reduced if the Guidelines for Therapeutic Donor Insemination of the Canadian Fertility and Andrology Society (1988) are followed. Recommended initial and repeated donor screening includes:
  - history of high-risk behaviour for STD acquisition
  - serology for hepatitis B (HBsAg), hepatitis C (anti-HCV)(a), syphilis (non-treponemal test) and HIV
  - urethral specimens to screen for *C. trachomatis*, *N. gonorrhoeae*, ureaplasmas and mycoplasmas
  - semen specimens to screen for *N. gonorrhoeae*, ureaplasmas, mycoplasmas, and cytomegalovirus (CMV)

(a) available subsequent to 1988 guidelines

Women who have sex with women

- these women are usually at a lower risk of acquiring an STD than women who are heterosexual
- however, if they do not exclusively have sex with other women, then they may be at increased risk if their partners have high-risk behaviours, e.g., injection drug use or other substance abuse, have multiple sexual partners or are bisexual

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Neonates

- at risk of contracting STD in utero, e.g., syphilis, HIV, hepatitis B or perinatally, e.g., gonorrhea, chlamydia, herpes simplex, genital warts (human papillomavirus infection) hepatitis B, trichomoniasis
- increased risk if:
  - prolonged rupture of membranes
  - premature
  - one or both parents known to have STD
  - mother from high-risk group, e.g., sex trade worker (prostitute), injection drug user, adolescent
  - STD status of mother unknown, i.e., no prenatal care, no STD screening

Special Considerations (cont'd).....

Neonates (cont'd).....

- physicians caring for the mother and neonate must cooperate to ensure that both the mother and her sexual contacts and the neonate are treated appropriately

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Children

- risk of STD if:
  - sexually abused
  - sibling of sexual abuse case
  - signs or symptoms of urethritis, vaginitis, genital warts, or genital herpes simplex virus infection
- **sexual abuse must be considered when an STD is diagnosed (see page 133)**

Adolescents

- females 15-19 years of age have highest rates of gonorrhea and chlamydial infection in Canada
- knowledge about STD (including HIV infection) is not usually translated into safer sexual practices
- by age 14 yrs: 31% of males and 21% of females report having had sexual intercourse at least once
- by age 16 yrs: 45% are sexually active
- increased risk of STD if:
  - street youth
  - pregnant/undergoing therapeutic abortion
  - sexual contact of proven or suspected STD case
  - signs or symptoms of urethritis, cervicitis, PID, epididymitis, non-candidal vaginitis or vaginosis, genital warts, or genital ulcer disease
  - males with pyuria
  - females with lower abdominal pain
- compliance with treatment is often a major problem
  - outpatient treatment should be as straightforward as possible
  - hospitalization should be considered for serious infections such as PID
- strong emphasis should be put on educational counselling regarding STD and pregnancy prevention as part of the management of STD in all persons, especially adolescents, and it is important to ask adolescents about their sexual practices routinely and repeatedly

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Special Considerations (cont'd).....

Street youth

- defined as adolescents and young adults who spend most of their time on city streets
- most urban centres, regardless of size, have a street youth population
- heterogeneous population:
  - homeless
  - unemployed
  - young offenders
  - injection drug users and other substance abusers
  - sex trade workers (prostitutes)
- may have multiple problems needing referral
  - high prevalence of alcohol and other substance abuse, nutritional deficiency and depression
- not readily identified by appearance, enquiry about school attendance may alert to status. Non-attendance at school may be a major marker for identification of street youth.
- > 95% sexually active with high number of sexual partners and consistent condom use is low
- very high prevalence of STD: 40-50% street youth who are sex trade workers (prostitutes) have active STD
- at high risk for HIV
- unlikely to actively seek medical care. Compliance with treatment and follow-up can be a major problem.

(see section on Persons with Repeated STD, page 151)

Core groups

- STD are not evenly distributed throughout populations
- "core group" transmission – a small, definable and stable subgroup with a high prevalence of a disease responsible for the perpetuation of that disease within a community, e.g., street youth
- core groups represent less than 2% of those at risk, but directly or indirectly are responsible for many cases
- core group members share sociodemographic characteristics and are often asymptomatic carriers

STD repeaters

- may not be members of core groups but may have an association with core group members – similarly important in the overall incidence of STD
- repeat episodes are usually new infections
- a symptomatic repeater who seeks medical attention with each incident is less likely to transmit infection to others than a core transmitter who is symptomatic or asymptomatic and/or reluctant to seek medical care

Control strategies

Important strategies in attempting to interrupt the cycle of repeated STD:

- core group transmitters and STD repeaters should be the focus of intensified *patient education* when seeking medical care
  - ensure an understanding of how STD are transmitted
  - emphasize danger to themselves and others (especially women and neonates) from acute and chronic complications
  - review prevention, especially how to use latex condoms
  - underline need to stop having unprotected sex, to seek medical advice at the first sign of symptoms and to follow treatment strictly
  - make latex condoms easily available
  - facilitate counselling to change behaviour
  - involve steady partners in education and counselling

Persons with Repeated STD (cont'd).....

Control strategies (cont'd).....

- try to ensure partners are informed of possible exposure
- counsel regarding effect of alcohol and other drugs on sexual behaviour

- *re-screening* core groups and repeaters should be strongly encouraged and facilitated
  - for those who have frequent contacts, monthly check-ups at a convenient time and drop-in visits encouraged

- only *outreach* programs of education, diagnosis and treatment are likely to be effective in the short term for core group transmitters and repeaters who do not seek medical care because of lack of symptoms or other reasons
  - outreach involves taking information and clinic services to the areas where STD may be a special problem – areas often geographically isolated, economically depressed or densely crowded such as inner city cores, neighbourhoods where drug dealing is common (especially 'crack'), isolated native reserves, military enclaves, sex trade (prostitute) districts and seaports
  - in order to be successful such programs must have community support and be delivered by credible workers

- over the longer term, STD education in *schools* and STD information for the *general public* will have a positive effect

NOTE

- flexible treatment strategies may need to be considered in the management of persons with repeated STD who are resistant to other strategies
- strategies may include the use of approved oral medication in the place of injectables, patient initiated therapy and the increased availability of presumptive treatment based on suspicion

Sex trade workers

- many sex trade workers (prostitutes) have changed their sexual behaviour at work, significantly reducing their risk for most STD by the consistent use of latex condoms
- they may not use condoms consistently with their regular sexual partners and spouses; in many instances, these regular partners have high STD infection rates and act as a reservoir of infection. These individuals must, therefore, also receive appropriate treatment and follow-up.
- there are some sex trade workers who are at higher risk in their work:
  - those new to the profession, uninformed, recent immigrants, those who work episodically, those who accept more money for not using condoms, males who are receptive anal partners
- female sex trade workers are frequently sexually assaulted and often become pregnant and may not seek prenatal care

Men Who Have Sex With Men

In the 1970s and early 1980s epidemics of syphilis, gonorrhea, genital herpes simplex virus infection, genital warts, hepatitis B and human immunodeficiency virus (HIV) infection were documented in the population of men who have sex with men in North America.

In the last 5-10 years the incidence of newly acquired STD, apart from HIV infection, in this population has decreased to levels equal to or less than in the general sexually-active population.

For those STD which produce chronic, incurable infection (i.e., hepatitis B, HIV, genital herpes, genital warts), men who have sex with men can still be expected to be more frequently infected and infectious. In the future, this may not be the case.

Special considerations

Sexual history

- the basic sexual history (see section on Optimal History and Examination, page 173) is critical in establishing:
  - the presence of male same sex activity
  - the range and frequency of sexual practices
  - the level of risk for specific STD
- the best approach is to obtain the sexual practices history with a social history
  - non-judgmental, open-ended questions beginning with broad categories of sexual orientation and progressing to specific sexual practices
  - asking, "do you have sex only with men, only with women, or with both" may be a useful starting point
- specific practices common in men who have sex with men, which have greater associated STD risks
  - receptive (passive) and insertive (active) ano-genital intercourse
  - oral-anal intercourse (anilingus)
  - rectal douching in association with receptive ano-genital intercourse
  - receptive manual-anal intercourse (passive partner in anal insertion of finger or fist)

Men Who Have Sex With Men (cont'd).....

Special considerations (cont'd).....

Sexual history (cont'd).....

- contact with multiple anonymous sexual partners, has occurred frequently in bathhouses and has also been correlated with risk for various STD, especially HIV, hepatitis B and syphilis

Physical examination

- in addition to a careful genital examination and a targeted extragenital examination (see pages 174, 175), areas of particular importance in men who have sex with men are the lymph nodes, skin, sclera, oral cavity, pharynx and perianal region
- men who have sex with men who are the receptive partner for anal/rectal sex, i.e., ano-genital, oral-anal, manual-anal, should have a proctoscopic examination

Laboratory testing

- the choice of STD **diagnostic** tests in men who have sex with men is based on the differential diagnosis of the presenting syndrome, e.g., proctitis
- the choice of STD **screening** tests is based on the sexual history (see section on Screening, page 157)
- of special note is the diversity of pathogens that may cause sexually transmitted proctitis, proctocolitis and enteritis in men who have sex with men and the need to perform laboratory tests not usually associated with STD evaluations, e.g., examination of the stool for ova and parasites
- HIV and hepatitis B screening should be strongly considered in men who have sex with men

Treatment and follow-up

- as for all patients (see pages iii, iv)

Prevention

- anal intercourse is a high-risk activity for transmission of STD
- condoms break more easily during anal penetration so that abstinence from anal sex, the use of 2 condoms simultaneously, or the use of condoms designed specifically for anal sex should be recommended
- hepatitis B vaccine should be offered to men who have sex with men because of high infection rates in selected subpopulations
- safer sex considerations for men who have sex with men include:
  - special condom considerations for anal sex (see above)
  - avoidance of unprotected manual-anal intercourse and unprotected oral-anal intercourse
  - the tendency for drugs and alcohol to adversely affect safer sex behaviour decisions

Travellers away from home and to countries outside Canada have an increased likelihood of sexual behaviours which will increase their risk of acquiring STD including HIV.

Health care providers who advise travellers should review the risks of acquiring STD (including HIV infection) and strongly encourage prevention.

Risk

The risk of acquiring STD is increased for travellers for the following reasons:

- during periods away from their home environment, often because of absence of the usual sexual partner, travellers may have a proclivity to have sex with new partners. This risk may be increased by the use of drugs and alcohol.
- the prevalence of many STD (including HIV) is very high among men and women who may be available for transient sexual liaisons, particularly in developing countries. The likelihood of acquiring HIV infection and other STD, from anonymous heterosexual contact in many countries, is 10-100 times greater than in Canada (see section on HIV Infection in Adults and Adolescents, page 119).
- bacterial pathogens acquired in many parts of the world, including South East Asia, South America and Africa, may be more likely to be resistant to commonly used antimicrobial agents. Treatment failure is more likely and patient follow-up is recommended.
- it is not uncommon for travellers who have unprotected intercourse to acquire multiple sexually transmitted pathogens

Prevention

- health care providers must address these risks and advise travellers to avoid casual sexual contact or, if they choose to have such sexual contacts, health care providers must advise how to decrease risk by using condoms and **instruct travellers in condom use – see section on Condoms, page 7**
- immunization for hepatitis B may also be appropriate in certain circumstances (see section on Hepatitis B, page 63)

Definitions

- *screening* is the strategy to detect unrecognized infection in asymptomatic people

Categories of screening

- screening to detect asymptomatic STD infection is divided into 3 categories:

A. *Case Finding* – a patient-based strategy in individuals with an increased likelihood of one or more STD, e.g., sexual contacts to gonorrhea

B. *Focused Screening* – a group-based strategy in subpopulations with high STD prevalence rates, e.g., street youth, core groups, adolescents and those with a history of STD

C. *General Screening* – a population-based strategy in certain members of the general public who are not considered to be at increased risk for STD but in whom serious consequences may occur if infected, e.g., syphilis and HIV testing in pregnancy

Procedures	Category A case finding	Category B focused screening	Category C general screening
sexual history	√	√	√
physical examination			
– external genital	√	√	√
– internal genital	adults, adolescents	adults, adolescents	–
– targeted extragenital	√	√	√
laboratory tests			
– *Neisseria gonorrhoeae*	√	√	–
– *Chlamydia trachomatis*	√	√	–
– *Treponema pallidum*	√	√	√*
– Pap smear	adults, adolescents	adults, adolescents	(a)
– hepatitis B (HBV)	optional	optional	√
– HIV	√	√	√*

* see *General screening* on page 159
(a) see **NOTES** on page 159

NOTES

- *screening **women*** is important because women are more likely to have unrecognized infections and are at greater risk of serious complications

Screening (cont'd).....

NOTES (cont'd).....

- *screening **sexually active adolescents*** is particularly important because they are more likely to have unprotected sexual intercourse, have higher rates of infection and because females are at great risk of complications that may lead to infertility or ectopic pregnancy

Whom to screen

A. *Case Finding*
   - ***sexual contacts*** of persons proven or suspected to have urethritis, cervicitis, PID, and epididymitis should be screened by sexual history, physical examination and tested for at least *N. gonorrhoeae* and *C. trachomatis* and consider testing for HIV
   - ***sexual contacts*** of persons proven or suspected to have an infection due to *N. gonorrhoeae, C. trachomatis, T. pallidum*, hepatitis B virus or HIV should be screened by sexual history, physical examination and specific laboratory tests
   - syphilis screening should be considered annually for ***persons*** who may be ***regularly exposed*** to other STD
   - persons who have been ***sexually assaulted*** and children who have been ***sexually abused*** should be screened for case finding and to collect forensic evidence
   - ***neonates*** are at risk for congenitally acquired STD infection when one or both parents are at risk. Neonates are tested in the following circumstances:
     – one or both parents are known to have urethritis, cervicitis, PID, epididymitis or infection due to *N. gonorrhoeae, C. trachomatis, T. pallidum*, HIV or hepatitis B virus
     – when the mother is at high risk for STD (see focused screening below)
     – when the mother's STD status is unknown, i.e., no prenatal care or screening

B. *Focused screening* – Sexual history, physical examination and specific laboratory tests (see table on page 157) are recommended for:
   siblings of sexually abused children
   AND
   all *sexually active* persons with **one or more** of the following risks:
   – < 25 years of age
   – injection drug user
   – other substance abuser
   – street youth
   – history of STD in the past year
   – new partner in the past 2 months
   – 2 or more partners in the past year
   – use of non-condom contraception
   – unprotected sex (no condom used) with any of the preceding groups

Screening (cont'd).....

C. *General screening*

- ***pregnant women*** are the only group that can be recommended for general STD screening in the primary care setting
  - a sexual history, external genital examination and targeted extragenital examination should be performed at the first opportunity (see page 173)
  - if the patient falls into categories A or B (see page 157), additional laboratory tests may be required
  - history and examination may reveal STD pertinent to the pregnancy
  - all pregnant women should be screened for HBsAg, syphilis and offered HIV testing; high-risk women should be screened in the third trimester for chlamydia and gonorrhea (see section on focused screening)

NOTES

- where no ocular prophylaxis against chlamydial or gonococcal infections is planned to be given to newborns, all pregnant women should be screened in the third trimester for *N. gonorrhoeae* and *C. trachomatis*
- ***adult and adolescent females*** should be screened by Pap smear for evidence of cervical dysplasia or cancer

Screening procedures (see table on page 157)

Sexual history

- in all cases, a complete sexual history is the first step in cost-effective screening. The sexual history is summarized in section on Optimal History and Examination, page 173.

Physical examination

- the screening physical examination may include an external genital examination, an internal genital examination, i.e., speculum and bimanual, on adolescent and adult females and a targeted extragenital examination. The genital examination in children and neonates should involve the external genitalia only (see section on Optimal History and Examination, page 173).
- if a lesion or abnormality is found which suggests an STD, specific *diagnostic* tests on that abnormality are carried out in addition to the recommended *screening* tests

Screening (cont'd).....

Laboratory tests

- for ***N. gonorrhoeae*** and ***C. trachomatis***:
  - test all potentially infected sites
  - if the patient is a contact of someone known or suspected to have urethritis, cervicitis, PID, epididymitis, proctitis or an infection with *N. gonorrhoeae* or *C. trachomatis* then collect urethral (in males), cervical, rectal, and if indicated, pharyngeal specimens for *N. gonorrhoeae* (see page 187) AND cervical, urine or urethral specimens for ***C. trachomatis*** (see page 189)
- if the sites exposed are not known, *N. gonorrhoeae* cultures should include throat, rectum, male urethra, and cervix
- if the cervix is absent, e.g., surgically removed, *C. trachomatis* tests should be done from the vagina, and the urethra or on urine specimens (see page 189). For *N. gonorrhoeae,* test the rectum in addition to the urethra
- for syphilis, a non-treponemal and treponemal test are necessary when there is a suspicion of *T. pallidum* exposure. Should be considered annually in persons who may be regularly exposed to other STD
- screening tests for HIV, if positive, are always confirmed with another type of test (see section on Laboratory Diagnosis of HIV Infection, page 197)
- for cervical cancer, cervical cytology (Pap smear) should be performed regularly in adult and adolescent females
- screening tests for hepatitis B are only recommended for specific target groups and include tests for the surface antigen (HbsAg), antibodies to the surface antigen (anti-HBs) and antibodies to the core antigen (anti-HBc) (see page 161)

Special considerations

- evaluation of congenital syphilis, congenital HIV infection and congenital HPV infection of the larynx, i.e., juvenile laryngeal papillomatosis, should be carried out in consultation with a specialist knowledgable in the area
- persons in Category A do not routinely need to be screened for *N. gonorrhoeae* or ***C. trachomatis*** if the most recent exposure was more than 6 months ago; carriage of these organisms may continue beyond 6 months in a minority of cases
- primary care settings specializing in STD, e.g., STD clinics, may choose to expand on these minimum screening recommendations to include STD such as HIV, *Trichomonas vaginalis* and hepatitis B virus
- attempts should be made to screen assailants in sexual assault and sexual abuse situations as for Category B. However, this is rarely permitted by their legal counsel. Assailants should be treated for STD diagnosed in the person assaulted.

Screening (cont'd).....

Hepatitis B

- all pregnant women should be screened for hepatitis B using only the surface antigen test (HBsAg). If the result is positive, administration of combined passive-active immunization to the infected mother's newborn is required (see page 66)
- pre-immunization screening is not recommended as part of the universal immunization program for infants or pre-adolescents. Pre-immunization screening for other high-risk groups is only recommended if a) the cost of immunization exceeds the cost of screening, or b) for relatives of chronic carriers in a population with a carrier prevalence exceeding 2%
- for pre-immunization screening, screen only for antibody to core antigen (anti-HBc); if positive, test for HBsAg

Human immunodeficiency virus (HIV)

- HIV testing is strongly recommended in all pregnant women
- HIV testing is also strongly recommended in the following groups:
  - infants born to HIV-infected mothers
  - persons with multiple sexual partners
  - persons diagnosed with another STD
  - injection drug users
  - sex trade workers
  - persons from HIV-endemic areas
- HIV testing is recommended for sexual contacts of the above
- HIV testing involves a screening test and a confirmatory test (see section on Laboratory Diagnosis of HIV Infection, page 197)
- for HIV testing of neonates, see section on HIV infection in Children, page 127
- HIV testing should always be accompanied by pre-test and post-test counselling (see section on Pre- and Post-Test Counselling, page 176)

Special considerations in sexual assault and sexual abuse

- adults and adolescents who have been sexually assaulted and children who are sexually abused are screened to provide necessary medical care and to identify and collect forensic evidence
- any sexually transmissible agent may be transmitted during assault/abuse. The risk of acquiring gonococcal and/or chlamydial infection appears to be the highest.
- in addition to the screening recommended under Category A in the table, page 157, a pregnancy test should be performed on female adults and adolescents who have been sexually assaulted. Serology for syphilis and hepatitis B should be repeated at 12 weeks and for HIV at 12 and 24 weeks following the assault. All other tests should be repeated at a follow-up evaluation 21-28 days after the assaults.

Screening (cont'd).....

Management and treatment at the time of screening

- adults and adolescents who are sexual contacts of specific STD must receive treatment immediately following screening. Treat for any infection identified on examination and for any infection identified in the partner
- persons who have been sexually assaulted should be given treatment for any infection identified on examination and any infection identified in the assailant. When follow-up is doubtful and when empiric treatment is given at the request of the person who has been assaulted, treatment regimens should be effective against *N. gonorrhoeae* and *C. trachomatis*. In high-risk settings, treatment regimens should also be effective against incubating syphilis (see section on Sexual Assault, page 141).
- children who have been sexually abused should be given treatment for any infection identified on examination and for any infection identified in the assailant (see section on Child Sexual Abuse, page 133)
- siblings of children who have been sexually abused should only be given treatment for an identified infection – presumptive treatment is in general not given
- neonates whose mothers are known or suspected to have untreated cervicitis, PID or infection due to *N. gonorrhoeae* or *C. trachomatis* at the time of birth must be treated for *N. gonorrhoeae* and *C. trachomatis* with systemic antibiotics immediately following screening. Topical therapy for the eyes is **NOT** adequate (see page 89 or 90; 97).
- neonates whose mothers are known or suspected to have had untreated infection with *T. pallidum* at the time of birth must be treated for *T. pallidum* immediately following screening (see page 105-106)

Patient education

- STD screening rationale and the various procedures involved should be discussed beforehand with the patient or guardian whenever possible
- identifying a person for STD screening provides an opportunity to discuss relevant issues about risk and preventive measures. This is particularly important with adolescents.
- one-to-one STD education in this setting can be an important public health preventive measure
- patients in Categories A and B who undergo screening should be advised to abstain from sexual activity or use latex condoms <u>at least</u> until all tests are known to be negative

Screening (cont'd).....

Interval of screening

- when screening individuals for STD, consideration must be given to the possibility of false-negative results if the specimens/serology are taken too soon after contact. Sufficient time must have elapsed for the infection or immune response to have reached a level detectable by the screening test (e.g., > 72 hours after contact for testing by culture for *N. gonorrhoeae*; > 3 months for HIV testing)
- for asymptomatic persons regularly exposed who do not seek evaluation after each individual exposure, semi-annual STD check-ups should be strongly recommended and facilitated. Those at high risk who do not seek evaluation regularly should be offered assessment whenever they interact with the medical system (e.g., emergency room visit).

Re-screening

- re-screening is a strategy which seeks out previously infected persons for repeat evaluation
- STD re-screening is much more effective than primary screening
- for sexually transmissible infections which produce immunity, e.g., hepatitis B or are incurable, e.g., HIV, re-screening is unnecessary once the initial diagnosis has been made
- core group transmitters and STD repeaters (see section on Special Populations, page 151) should be re-screened frequently, at least every 6 months.

SELECTED RATES OF DETECTION OF *C. TRACHOMATIS* AND *N. GONORRHOEAE**

Risk	Prevalence of infection	
	C. trachomatis	*N. gonorrhoeae*
Males		
contact with mucopurulent cervicitis	25-50%	5-10%
contact with PID	25-50%	20-30%
Females		
contact with gonorrhea	30-40%	40-50%
contact with non-gonococcal urethritis	30-60%	3-5%
pregnant teenagers	10-20%	5-10%
females presenting to student health service	4-8%	<1%
adolescents attending walk-in clinic	10-20%	1-3%
asymptomatic adolescent sex trade workers (prostitutes)	25%	20%

* based on 1989 evidence

Screening (cont'd).....

Donors

- donors of blood, tissues, organs, sperm and ova must be routinely screened for HIV, HBV, HCV and syphilis. This is usually performed when the donor program first evaluates prospective participants.
- risk of transmission of STD by donor semen is reduced if the Guidelines for Therapeutic Donor Insemination of the Canadian Fertility and Andrology Society (1988) are followed. Recommended initial and repeated donor screening includes:
  - history of high-risk behaviour for STD acquisition
  - serology for hepatitis B (HBsAg), hepatitis C (anti-HCV), syphilis (VDRL or other non-treponemal test) and HIV
  - urethral specimens to screen for *C. trachomatis*, *N. gonorrhoeae*, ureaplasmas and mycoplasmas
  - semen specimens to screen for *N. gonorrhoeae*, ureaplasmas, mycoplasmas, and cytomegalovirus (CMV)
  - semen is not released unless repeat HIV test at 6 months is negative

Recipients

- recipients of tissue, organs, sperm or ova from donors who were not screened should themselves be considered for screening for HIV, HBV and syphilis (for timing see above)
- routine HIV screening of sperm donors was only instituted in recent years
- blood donors have been screened for HIV since November 1985, for HCV since mid-1990, and for HBV and syphilis for over 20 years
- recipients of blood or blood product transfusions between 1978 and November 1985 should be considered for HIV screening (see above)

Reporting of STD

Rationale

- disease surveillance in the community
- delineation of high-risk groups
- disease control and follow-up
- evaluation of STD/HIV control programs

Requirements

- legal obligation in all provinces and territories
- specific reportable diseases vary among provinces and territories
- practitioners should consult the local public health authority for information on specific diseases to be reported and suggested procedures for reporting follow-up and contact tracing
- see also sections on specific diseases

Reporting sexual abuse/assault

- children:
  - sexual abuse of children must be reported to the local child protection agency
  - age limit of the child may vary among the provinces and territories (contact local medical officer of health or Provincial/Territorial Director of STD Control)
- adults:
  - no obligation for practitioners to report
  - responsibility is primarily with the assaulted person
  - adults should be counselled and/or referred to local crisis centres
- local public health agencies may be helpful in evaluating the source of infection and spread to others

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Follow-up of Infected People

At the treatment visit:

- complete contact information (see below)
- advise time frame for sexual abstinence
  - for gonorrhea, chlamydia and syphilis: until treatment of case and on-going partners is complete (see also sections on specific diseases)
  - for syndromes, e.g., urethritis and cervicitis, see sections on specific syndromes

Reporting, Follow-up (cont'd).....

Follow-up of Infected People (cont'd)....

- for HIV:
  - counsel about risk reduction to others including non-penetrative sexual activity
  - discuss informing partners
- for hepatitis B:
  - counsel about risk reduction to others until vaccine has been administered to them
  - counsel about informing unimmunized partners of risk
- for human papillomavirus and herpes simplex virus:
  - counsel about risk reduction to others
  - counsel about informing partners of history and risk

At follow-up interviews, ask cases about:

- symptomatology
- compliance with therapy
- adverse reactions to therapy
- completeness of contact information (see below)
- sexual activity since treatment (re-infection, re-treatment of previous partners, and identification of additional partners must be considered) and preventive measures used
- provide clients with information on primary prevention, appropriate for the disease and their social environment
- clients with one or more infections per year should be targeted for intensive preventive counselling

Test-of-cure

- test-of-cure recommendations are outlined in each specific disease section
- test-of-cure, however, is essential in the following situations:
  - symptoms do not resolve
  - antimicrobial resistance to the treatment given is documented
  - previously documented treatment failure
  - patient is an adolescent and other situations where there is concern over compliance with taking medication
  - patient may have been re-exposed to an untreated or partially treated partner
  - patient was treated with a therapy that is not the current recommended regimen
  - cases of rectal and pharyngeal *N. gonorrhoeae* infection
  - *Treponema pallidum* infection documented (see section on Syphilis, page 99)
  - STD identified in a child and there is concern over continuing exposure
  - STD in a pregnant women
  - pelvic inflammatory disease (PID) or disseminated gonococcal infection (DGI)

Contact Tracing (Partner Follow-up)

- the process through which sexual partners and others exposed to sexually transmitted infections are identified, located, assessed, tested, treated epidemiologically and counselled with regard to prevention

Contacts

- includes sexual partners, parents of infected neonates, needle-sharing partners for HBV and HIV and people who may be involved in cases of child sexual abuse

Rationale

- treatment of primary disease and prevention of sequelae in contacts
- interruption of disease transmission
- prevention of re-infection

NOTE

- some authorities feel that ***patient referral (simplified contact tracing)*** is an acceptable alternative to ***provider referral (described below). Patient referral*** involves cases informing their contacts with no public health authority involvement in the contact tracing process.

Who should trace contacts

- attending physician **OR**
  trained and experienced public health practitioners who are available in all provinces and territories (medical officers of health, other public health physicians or public health nurses)
- public health authorities have the responsibility of ensuring that contact tracing is completed
- **discussion of the situation with partners by the case prior to any intervention by public health workers may be appropriate** **(see page 168)**
- public health authorities have certain powers to facilitate contact tracing for:
  - contacts who are difficult to locate
  - contacts who are non-compliant

NOTE

- primary health care workers including physicians should be aware that contact tracing is a time consuming activity

If contact tracing is done by private physicians, clinic staff or public health workers, the following elements should be followed:

Checklist for Contact Tracing

Case interview

- inform the case of the rationale for contact tracing
- counsel case about transmission of STD (including HIV) and risk reduction

Reporting, Follow-up (cont'd).....

Checklist for Contact Tracing (cont'd).....

- assure case that contact tracing is done without revealing his/her name, date and place of exposure
- discuss with the case whether he or she wishes to inform partners of the situation
- record identifying information about each partner as completely as possible including:
  - name/nickname
  - gender
  - address
  - telephone number (home and work)
  - physical description
  - age/birth date
  - place of work or school
  - dates and types of sexual exposure, i.e., oral, genital, anal
  - frequency of sexual exposure
  - payment for sex
  - place of meeting
- advise the case not to resume sexual activity with any partners until those involved have finished treatment
- if the case wishes to speak to contacts inform him or her that contacts will be called by a public health worker if they do not present within 2 working days

Finding contacts

- if case does not wish to advise partners
  OR
  if partners have not come forward within 2 working days
  THEN
  make every effort to convince the partner to comply
- refer to public health authority if desired and as soon as possible when:
  - partners cannot or will not be located
  - partners do not come forward
  - there is lack of compliance with testing or epidemiologic treatment

Contact procedures for partners

- take detailed sexual history
- provide information and counselling on the disease and prevention of STD
- ensure testing appropriate to the infection in the case
- the name of the case should not be revealed or confirmed
- if the contacts tests are positive, provide full case follow-up
- advise NOT to resume sexual activity until treatment is finished
- advise NOT to resume sexual activity with any other people who might be infected until they have been treated

Reporting, Follow-up (cont'd).....

Contact tracing: how far back in time should you go?

- gonococcal infections:
  - within 4 weeks prior to onset of symptoms, longer if the case is asymptomatic or the history warrants
  - if the case is a child, the mother as well as the suspected sexual contact of the child should be evaluated
- chlamydial infections:
  - within 6 weeks prior to onset of symptoms, longer if the case is asymptomatic or the history warrants
  - if the case is a child, the mother as well as the suspected sexual contact of the child should be evaluated
- syphilis:
  - primary: at least 3 months before the development of symptoms
  - secondary: at least 6 months before the development of symptoms
  - early latent: at least 1 year
  - late latent: assess marital or long-term partners
  - congenital: assess mother
  - stage undetermined: consult a specialist knowledgable in the area
- HIV infection:
  evaluate sexual AND needle-sharing partners
  - start with most recent contacts
  - outer time limit is start of risk behaviour
  - sero-negativity of partners during a given time may be reason not to look further back
  - partners should be counselled and tested with consent
- hepatitis B:
  - for post-exposure immunization, within 2 weeks of date of diagnosis
  - for ongoing regular sexual partners, test and immunize susceptibles
  - if resources allow, identify sexual or needle-sharing partners for 6 months prior to the onset of symptoms or longer if the case is asymptomatic or if the history warrants
- urethritis:
  - within 6 weeks prior to onset of symptoms or longer if history warrants
- cervicitis:
  - within 6 weeks prior to onset of symptoms or longer if history warrants
- pelvic inflammatory disease:
  - within 6 weeks prior to onset of symptoms or longer if history warrants

Reporting, Follow-up and Contact Tracing Notes

Multiple STD

- one STD is a risk factor for others
- the presence of one STD should alert the practitioner to look for others
- the presence of one STD may facilitate the transmission of HIV
- people with STD may be at risk for HIV
- HIV testing, with counselling and consent, should be encouraged

Confidentiality

- there are ethic, legal, and professional obligations to maintain confidentiality at all times and within the bounds of other obligations such as
  - reporting STD to local health authorities (practitioners should check with their local authority). It may be required that personal information of a reported case of an STD be forwarded, in confidence, to provincial health authorities.
  - where required by law, e.g., Criminal Code
  - reporting of sexual abuse to child protection agencies; concerns about confidentiality must not impede contact-tracing procedures
- penalties for breaches of confidentiality:
  - civil litigation
  - professional discipline
  - public health law charges
- confidentiality applies to all persons, including:
  - infected persons
  - sexual partners
  - **all adolescents who are competent to understand their infection and care**
- practitioners should apprise themselves of policies of provincial health insurance plans to guard against inadvertent disclosure to family

Appendices

Appendix I

Optimal History and Examination of Suspected Cases of Sexually Transmitted Disease in Adolescents and Adults

History

- health care providers may feel reluctant to ask appropriate questions
- information should be requested in a simple, non-judgemental way, to assist patients to provide information willingly
- appropriate language is important, patients may not use or understand medical terms
- the information obtained should be recorded

NOTE

- the following guidelines are comprehensive; a shorter assessment may be adequate in selected circumstances, e.g., an acute episode of gonococcal urethritis in a heterosexual male 4 days after contact with a new partner

Chief complaint

- should be recorded; indirect terms or non-medical terms may be used by patients

Basic history

- age
- sexual preference: male, female or both, e.g., ask "do you have sex with men, women or both?"
- sexual history: age at first sexual intercourse; time since last sexual intercourse with most recent partner and second most recent partner; number of partners in the previous 2 months and how many were new; number of partners in preceeding year and how many were new; total number of partners in lifetime; types of sexual activity (oral, genital or anal); previous STD (when, types and treatment); sexual contact with partner(s) from areas with a high prevalence of resistant organisms; and disease in partner(s)
- measures taken to avoid STD: use of condoms, spermicides or diaphragm
- most recent use of antimicrobials
- risk factors for infection with HIV: homosexual or heterosexual intercourse with a person at high risk of HIV infection; shared use of needles or syringes

Basic history (cont'd).....

- for women: last menstrual period and any possibility of pregnancy; prior pregnancies and their outcome; and results of prior Papanicolaou smears
- for adolescents: ask whether the sexual activity was consensual (consider sexual assault or abuse if the sexual activity was not consensual)

Functional inquiry

- males
  - urethral discharge, including amount, colour and time of day most noticeable (in urethritis the discharge is most prominent after a long period without voiding); dysuria; or itch or irritation in the distal urethra or meatus
  - pain or swelling in the scrotum or inguinal region; genital rash or lesions; or rectal discharge, itch or pain
  - arthritis or arthralgias; conjunctivitis; rash at other body sites; lymphadenopathy; fever or chills
  - diarrhea; cough; weight loss
- females
  - vaginal discharge, including amount and colour; itch; odour; pain with intercourse on penetration (introital dyspareunia); burning with urination as the urine passes over the external genitalia (external dysuria); or genital rash or lesions
  - lower abdominal pain; deep pain on intercourse (deep dyspareunia); postcoital, mid-cycle or excessive menstrual bleeding
  - frequency; urgency; burning with urination as the urine passes through the urethra (internal dysuria); nocturia; or hematuria
  - arthritis or arthralgias; conjunctivitis; rash at other body sites; lymphadenopathy; fever or chills
  - diarrhea; cough; weight loss

Physical examination

- physical examination of the genitalia may be embarrassing to the patient
- it is important that the patient be properly prepared and reassured and that modesty be respected as much as possible
- **for genital examination of an adult or adolescent, careful consideration should be given to having an assistant of the same gender as the patient present in the room during the examination; physicians should be aware of the guidance of their provincial/territorial licensing authority in this regard**
- all findings should be recorded
- appropriate infection control procedures should be followed
- careful evaluation of the entire genital region is required, plus a targeted extragenital examination to detect other manifestations of STD
- a targetted extragenital examination should include the pharynx, conjunctiva, lymph nodes and skin on the palms, forearms and soles

Optimal History and Examination – Adolescents and Adults (cont'd).....

Physical examination (cont'd).....

- before the genitalia are specifically evaluated, the skin of the lower abdomen and thighs should be examined, the inguinal regions palpated to detect lymphadenopathy, the pubic hair inspected for lice and nits, and the perianal region inspected for abnormalities

Males

- specific examination should include the following procedures:
  - observation and palpation of the penis and glans for lesions, retracting the foreskin
  - examination of the meatus for urethral discharge
  - stripping the urethra from the base to the glans 3 or 4 times to detect small amounts of urethral discharge
  - note amount and colour of any discharge detected
  - observation and palpation of the scrotum to detect lesions, tenderness or swelling
  - examination of the perianal region
  - if symptoms indicate, proctoscopy may be considered

Females

- specific examination (which must include a speculum examination with adequate visualization of the cervical os) includes the following procedures:
  - observation and palpation of the external genitalia, including the labia, to detect lesions, swelling, erythema or discharge
  - palpation of the urethra
  - speculum examination to describe the colour of the vaginal walls, the amount and colour of vaginal secretions, and any vaginal lesions; to describe the appearance of the exocervix and the endocervical contents, paying special attention to the amount and colour of the endocervical discharge; to wipe off the secretions overlying the cervix and repeat the description of the cervical contents as well as carefully noting the presence or absence of cervical ectopy, edema or erythema in an area of ectopy and the presence of cervical lesions; and to note any bleeding induced by taking endocervical swabs
  - bimanual pelvic examination: the vaginal walls, cervix, uterus and adnexa should be carefully palpated to detect tenderness or masses. The cervix should be moved laterally to determine its mobility and to detect cervical motion tenderness.
  - examination of the perianal region
  - if symptoms indicate, proctoscopy may be considered

NOTE

- in certain circumstances, e.g., primary genital herpes, speculum and bimanual examination may have to be deferred because of severe discomfort, until the acute symptoms have subsided

Pre- and post-test counselling for HIV infection

NOTE

- for more information on laboratory diagnosis of HIV infection see page 197
- counselling will have to be appropriate to the age of the infected person

PRE-TEST DISCUSSION

Clarify

- the test is for antibodies to HIV; not a test for AIDS
- majority of persons produce detectable antibodies within 12 weeks (occasional reports of positivity taking up to 6 months)
- a non-reactive or negative test (a)(b) may mean:
  - no exposure or
  - too soon to detect antibodies or
  - person incapable of forming antibodies (rare)
- a positive test (a)(c) means:
  - infection with HIV
  - person is infectious to others through blood, breast milk, or sexual contact
- interpretation of an indeterminate result will need specialist assistance
- transmission risks:
  - direct blood to blood contact
  - sharing needles or syringes
  - infected mother to child during pregnancy (at birth or via breast milk)
  - sexual contact:
    - anal sex (very high risk)
    - vaginal sex (high risk)
    - oral sex (low risk)
  - recipient of blood or blood products in Canada before November 1985 (elsewhere risk will vary depending on testing of donated blood)
  - HIV **not** casually transmitted through sweat, saliva, tears

Discuss

- specific risks, sexual and otherwise
- whether future testing will be necessary
- precautions
  - latex condoms (not natural skin)
  - avoidance of casual/anonymous sex
  - no sharing of needles or syringes

Explore

- psychological implications of testing:
  - coping mechanisms need to be in place
  - preparation for either result:
    - support systems available (personal, community, medical) should be known

Explain

- post-test counselling procedure
- reporting requirements for HIV infection. Depends on jurisdiction and availability of anonymous testing (see section on HIV Infection in Adolescents and Adults, page 119).

Pre- and post-test counselling for HIV infection (cont'd).....

POST-TEST DISCUSSION

Non-reactive or negative(b)

- clarify person's identity with result
- interpret:
  - no infection or
  - risks within the past 6 months dictate retesting is necessary 6 months after last possible exposure
  - reinforce risk reduction:
    - needle/syringe sharing avoided
    - avoid high-risk activities
  - use lubricated latex condoms with safer sex practices
  - avoid pregnancy until retest, if retest is necessary

Reactive/positive (b)(c)

- clarify person's identity with the result
- interpretation:
  - infected with HIV
  - not diagnostic of AIDS
  - explain that confirmation tests to rule out "false positives" have been performed
- first priority:
  - deal with the issues important to the infected person
  - discuss coping and support systems
  - deal with soon, not necessarily right away:
    - partner notification (by self or contact tracing)
    - infectivity (reinforce mechanisms of transmission, high- and low-risk behaviours)
    - specific guidance for HIV transmission avoidance:
      - protection of others from blood, body fluids, sexual secretions
      - avoid pregnancy
      - avoid donating blood, organs, tissue, sperm, breast milk
      - inform health care providers including family physician and dentist
      - medical follow-up:
        - screen for syphilis, hepatitis B, tuberculosis, other STD
        - referrals where required for further generalist, specialist support, immune testing, treatment and counselling
        - discuss health-enhancing lifestyle modifications, empowerment
        - discuss issues of confidentiality in the health care system, community and at school or work

After: Rekart M, Pengelly B, Antiviral Update, October 1991

(a) some laboratory reports include screening (usually ELISA) results and the result of a confirmatory test (e.g., Western blot) if used. A reactive screening test result and a negative confirmatory test result is a negative result.

(b) positive antibody tests of saliva and urine should be repeated on serum or plasma

(c) a positive HIV serologic test in an infant may represent only passively transferred maternal antibody and the infant may or may not be infected. The HIV antibody test is so sensitive that maternal antibodies have been detected for up to 15 months in an infant not infected with HIV. There are laboratory tests (see section on Laboratory Testing for HIV Infection, page 197) that can help distinguish infected infants at an earlier age, e.g., PCR for viral genome, specific IgA, p24 antigen and virus isolation. However, these tests are not widely available.

Appendix II

Laboratory Diagnosis of Sexually Transmitted Disease – Specimen Collection and Transport

General principles

- the swabs, types of tests and transport systems used may vary depending on the techniques offered by the laboratory
- the principles of specimen collection are relatively independent of the type of test used
- in certain situations the laboratory should be contacted, e.g., in cases of sexual abuse or assault and for dark-field examination for *Treponema pallidum*

For collection of specimens in cases of sexual abuse or assault:

- all specimens must be carefully labelled with the patient's name and site of collection so that there is no confusion about the source of the specimen
- the site and type of specimen collected should be documented in the medical chart
- a full forensic examination should be carried out if indicated (see Appendix IV: Forensic Evidence and Forensic Services, page 203)
- the laboratory must be alerted that the specimens are from a person suspected to have been sexually abused or assaulted so that every effort is made to handle specimens optimally
- for medico-legal purposes both the laboratory methods for organism detection and the results should be carefully documented
- all isolates should be saved so that they are available if further testing is required

Pitfalls in specimen collection:

- no specimen taken
- wrong swab used (see sections on specific diseases)
- adequate specimen not taken
- mislabelling
- prolonged transport time
- freezing in transit

Specimen Collection and Transport (cont'd).....

Collection of specimens

Urethra – males – adolescents and adults

- urethral material is obtained with meatal or intraurethral swabs
- the choice depends on the organism and the amount of urethral discharge
- detection of urethral discharge is enhanced by stripping the urethra (milking the penis 3 or 4 times from the base to the glans)
- discharge from the meatus is an appropriate specimen for testing for *Neisseria gonorrhoeae*
- for the detection of *N. gonorrhoeae* where no meatal exudate is present and for the detection of *Chlamydia trachomatis*, an intraurethral swab should be used
- some laboratories may examine a first-void urine for the detection of *C. trachomatis* in symptomatic males using a non-culture test

To obtain a meatal specimen:

- insert swab 1 to 2 cm into the meatus
- use swab to prepare a slide (see below) for a stained smear (usually Gram stain – see below) and to inoculate directly culture or transport medium

NOTE

- the same swab can be used to prepare a slide (see below) and to inoculate culture media or transport media
- obtaining a swab from the meatus usually produces transient discomfort

To obtain an intraurethral specimen:

- tell the patient that obtaining the specimen will be painful and that the next urination will be painful
- since the procedure is painful, conditions for collection should be optimal
- ideally, the patient should not have voided for at least 4 hours, as voiding reduces the amount of exudate and may decrease the ability to detect organisms
- thin swab with flexible wire shaft is used
- introduce swab slowly to 3 to 4 cm
- rotate slowly
- withdraw gently
- use swab to prepare a slide (see below) for a stained smear (usually Gram stain – see below) and to directly inoculate culture medium and transport medium

NOTE

- some authorities suggest moistening the swab with sterile non-bacteriostatic saline before insertion to attempt to reduce discomfort

To obtain a first-void urine:

- provide the patient with a sterile plastic container which has a large enough opening
- ask the patient to collect only the first 10-15 mL into the container and to cap it tightly

Urethra – prepubertal boys

- collecting an intraurethral specimen in prepubertal boys is difficult because of pain and the small diameter of the urethra.
- for practical rather than scientific reasons, a meatal rather than an intraurethral specimen should be obtained, using a thin swab on a flexible wire shaft
- the swab should be rotated in the meatal opening rather than introduced further into the urethra

Urethra – adolescent and adult females

- as for males, a thin swab on a flexible wire shaft should be used
- is only recommended for routine use in women with a surgically removed cervix – in an adult or adolescent the swab should be inserted 1-2 cm and rotated

Specimen Collection and Transport (cont'd).....

Urethra – prepubertal girls

- in a prepubertal girl a meatal specimen should be obtained, using a thin swab on a flexible wire shaft

Cervix – adolescent and adult females

- **cervical specimens should not be taken from prepubertal girls since sexually transmitted infections in this age group involve the vagina, not the cervix**
- insert a speculum to view the cervix
- specimens for *N. gonorrhoeae* should usually be taken before those for *C. trachomatis* since columnar epithelial cells are required in specimens for detection of *C. trachomatis* and each successive specimen removes more of the mucus and overlying debris
- when obtaining a specimen to diagnose gonorrhea it is not necessary to clear cervical mucus
- for diagnosis of chlamydial infections, overlying vaginal secretions and endocervical mucus should be removed by swabbing

To obtain a cervical specimen:

- insert swab or cytobrush 2 to 3 cm into the endocervical canal (cytobrush not approved for use in pregnant women)
- rotate for 10 to 30 seconds
- withdraw and prepare a slide (see below) and directly inoculate culture or transport media

NOTE

- obtaining several specimens from the cervix does not usually produce discomfort and may be required to perform various tests

Vagina – adolescents and adults

- collection of vaginal swabs from adolescents and adults is usually done as part of a speculum examination
- if present, pooled vaginal secretions are collected
- if not, the vaginal wall in the posterior fornix is swabbed and swabs are then used to prepare a slide (see below) and to inoculate culture or transport media

Specimen Collection and Transport (cont'd).....

Vagina – adolescents and adults (cont'd).....

For preparation of a wet mount:
- place several drops of saline on a slide before collecting the specimen
- obtain the vaginal swab
- rotate the swab in the saline
- cover the saline with a coverslip
- immediately examine by microscopy

For a potassium hydroxide (KOH) preparation, use the same technique as for the wet mount (see above) except use 10% potassium hydroxide instead of saline

Vagina – prepubescent children
- vaginal specimens can be taken without a speculum in girls, with swabs that have been moistened with sterile non-bacteriostatic saline
- in very young children collection of secretions with eye droppers or very thin swabs are more appropriate

Rectum
- specimens may be obtained blindly or through an anoscope. The latter is preferred for symptomatic patients.

To obtain a rectal specimen:
- for blind swabbing, the appropriate swab is inserted 2 to 3 cm into the anal canal, pressed laterally to try to avoid fecal material and, in the case of *C. trachomatis*, to obtain columnar epithelial cells
- if there is visible fecal contamination of specimen it should be discarded and another swab used
- with anoscopy, specimens can be taken under direct visualization, avoiding fecal material

Pharynx
- the posterior pharynx and the tonsillar crypts are swabbed. The swab is used to inoculate culture or transport media for chlamydial and gonococcal infections.
- in the young infant a nasopharyngeal aspirate is used for the collection of specimens for *C. trachomatis*

Specimen Collection and Transport (cont'd).....

Lesions

- usually vesicles or ulcers

For the detection of herpes simplex virus:

Symptomatic patients

- if electron microscopy is required, collect fluid into a small bore syringe or capillary tube
- if present, vesicles should be broken and fluid collected onto a swab and the base of the lesion vigorously rubbed or scraped (for non-culture tests, infected cells are necessary). Appropriate specimen collection will usually be painful. The swab should be placed in viral transport media for culture or into an appropriate container for specific non-culture tests.
- for ulcers swab the lesion bed

NOTE

- use the swab supplied with the collection kit from the laboratory. Use of other swabs may decrease likelihood of identification.

Asymptomatic patients

- specimens should not be obtained from **asymptomatic patients** unless
  - pregnant woman at completion of an active clinical phase and diagnosis not previously confirmed
  - woman in labour who has a history of genital ulcers or active lesion in order to identify high-risk neonates
  - neonate born to mother with possible history of genital herpes at time of delivery
  - routine prenatal testing of mothers is *NOT* indicated
- method for collection from asymptomatic woman
  - using one swab pre-moistened in saline:
    rub clitoral hood, labia minora, labia majora, perineum and perianal region and place into transport medium
- method for collection from asymptomatic neonate
  - using one swab pre-moistened in saline:
    gently apply to conjunctiva, insert into mouth and gently rub around the lips, external ear canal, umbilicus, axillae and groin and place into transport medium

Specimen Collection and Transport (cont'd).....

For the identification of *T. pallidum* (dark-field microscopy):

- remove scabs or overlying debris
- gently debride lesion to induce exudation relatively free of blood
- collect fluid into a capillary tube or small bore syringe
- seal tube or cap syringe and immobilize plunger before transportation

For culture of *Haemophilus ducreyi* (chancroid):

- exudate should be cleaned off lesion
- swab should be obtained from the base of a lesion avoiding pus
- direct plating on culture media is recommended

Preparing a slide:

- the swab should be rolled gently onto the slide. This preserves cellular morphology better than if the swab is vigorously moved back and forth on the slide.
- it is not necessary to cover more than approximately 1 cm^2 on the slide
- for Gram stain (see below) and similar stains the slide is allowed to air dry
- for certain non-culture tests, e.g., for the detection of *C. trachomatis*, the swab is rolled gently onto a well on a slide

NOTE: use swab supplied with non-culture test kit

- allow to dry as for Gram stain, but before transport to the laboratory it must be chemically fixed

Pap smear technique:

- use the specially designed wooden spatula and make a 360° sweep around the cervix with the smaller arm of the end of the spatula inside the endocervix. Spread the sample obtained along the length of one half of a glass slide in a continuous motion.
  THEN
- take an endocervical specimen with a dry cotton swab and roll the sample obtained along the length of the other half of the glass slide in a continuous motion
  THEN
- spray the slide with cytology fixative and send to the laboratory in the container supplied

Specimen Collection and Transport (cont'd).....

Gram stain technique

- **if at all possible, the advice and assistance of an experienced laboratory technician should be obtained to ensure that the best possible technique is used. A satisfactory result will depend on an adequate specimen, appropriate reagents and technique as well as experience in interpreting the findings.**
- fix slide by passing through a flame
- flood slide with crystal violet (10 g of 90% dye in 500 mL of absolute methyl alcohol)
- after 10 seconds gently wash slide with water
- flood slide with iodine (6 g of iodine crystals, 12 g of KI and 1800 mL of distilled water)
- after 10 seconds wash slide with water
- decolorize with acetone-alcohol (400 mL acetone with 1200 mL of 95% ethyl alcohol) and wash immediately with water
- flood with safranin (10 g of 99% safranin dye in 1000 mL of distilled water) for 10 seconds and rinse with water
- blot slide dry with filter paper and examine under oil immersion (x1000)

Transport of specimens

- optimal transport conditions vary with the specimen and the type of test being done
- sexually transmitted pathogens are usually fastidious and fragile, and thus cultures and techniques that detect viable organisms may give false-negative results unless transport conditions are optimal
- in general, for the recovery of infectious organisms transport must be as rapid as possible, with excesses of temperature avoided
- for *C. trachomatis* the ideal transportation temperature is 4° C
- for specimens to detect *N. gonorrhoeae,* nutritive and non-nutritive systems are commonly used – in all cases ambient (room) temperature, not 4° C, is recommended for transport
- for herpes simplex virus use rapid refrigerated transport but DO NOT FREEZE unless specifically instructed to do so by the laboratory
- when the test used is based on the detection of products of organisms or on antigen detection, conditions for transport are usually less stringent

Laboratory Diagnosis of Gonococcal Infections

General principles

- demonstration of intracellular gram-negative diplococci by Gram stain followed by culture and identification of the microorganism
- culture of *Neisseria gonorrhoeae* is recommended:
  - for screening of high-risk groups and possible contacts
- culture for *N. gonorrhoeae* is required for determination of antimicrobial susceptibility:
  - in cases of sexual abuse of children and sexual assault of adolescents and adults
  - for the evaluation of cervicitis and pelvic inflammatory disease (PID), i.e., to document course of infection and susceptibility
  - in cases of treatment failure
- non-culture methods, while not recommended, may be used where viability of specimens for culture cannot be maintained due to transportation time
- no serological methods are recommended for the diagnosis of present or past gonococcal infections

Detection of intracellular gram-negative diplococci

- the Gram stain is the stain of choice for the direct microscopic identification of gram-negative intracellular diplococci
- the presence of gram-negative diplococci outside polymorphonuclear leucocytes (PMNs) is not highly predictive and should be confirmed by culture
- PMNs without diplococci is a negative finding in the diagnosis of gonococcal infections
- sensitivity and specificity of the Gram stain depends on the site from which the specimen was obtained
  - Gram stain of urethral specimens from symptomatic adolescent and adult males has a sensitivity and specificity of > 95%; endocervical specimens from adult females have a sensitivity of 45-65% and a specificity of > 90%
- sensitivity and specificity of the direct Gram stain for specimens collected from other sites are low and the procedure is not recommended

Laboratory Diagnosis of Gonococcal Infections (cont'd).....

Culture of primary specimens

- successful culture of specimens requires proper collection of specimens
- where facilities exist, specimens should preferably be directly inoculated on to appropriate non-selective and/or selective media (which inhibit growth of normal flora but not gonococci) supplied by the local laboratory, e.g., New York City or modified Thayer Martin media
- if the specimen cannot be plated directly onto culture media, the swab must be inserted into appropriate transport medium supplied by the local laboratory – 2 systems are available:
  - non-nutritive (e.g., Amies or Stuart's media), which must be maintained at room temperature and transported to the laboratory as soon as possible and the specimen inoculated onto culture media within 24 hours
    OR
  - nutritive (e.g., Jembec or Transgrow media), which must be used for transport over longer periods (1-2 days) and should be pre-incubated at 35° C prior to transport

Identification of N. gonorrhoeae

- cultures are incubated and typical gonococcal colonies are selected for Gram staining, oxidase positivity and ß-lactamase testing
- a pure culture is obtained and the identity of the microorganism is confirmed using biochemical and serologic tests
- antimicrobial susceptibilities are carried out to monitor appropriateness of therapy

Strain typing

- a number of methods have been used to type strains for epidemiologic reasons and to establish patterns of strain transmission
- methods are carried out by reference laboratories

Non-culture methods

- does not require viable organisms and is an acceptable alternative only when culture is impossible due to difficulties in transporting specimens for culture, e.g., commercially available solid phase enzyme immunoassay (EIA) to detect gonococcal antigens in urogenital specimens.
- suitable only for urethral and cervical specimens
- does not provide the culture essential for β-lactamase and antimicrobial susceptibility testing
- has a lower sensitivity and specificity than culture
- NOT recommended in cases of child sexual abuse and sexual assault

Laboratory tests and interpretation (consult with the laboratory which you intend to use concerning a collection, testing and reporting protocol)

Cell culture to detect viable organisms	
method: • swab collected into a transport medium • sample must be delivered to the laboratory within 24 hrs at refrigerator temp (freezing and thawing detrimental) • specimen should be refrigerated and transported in dry ice if transport time is expected to exceed 24 hrs	interpretation: • accepted standard test when comparing other diagnostic procedures • heavily contaminated specimens may be toxic to cell cultures • useful for all body sites except urine • false-positive results are very rare • cannot assess adequacy of specimen • suitable for medico-legal purposes • sensitivity dependent on specimen transport and laboratory expertise
Molecular Detection Techniques	
A. Amplification Techniques (e.g., PCR: Polymerase Chain Reaction; LCR: Ligase Chain Reaction)	
method: specimen a) urine: males and females • first 10 cc of urine after not voiding for at least 2 hrs • collected into sterile urine container b) urethral and endocervical specimens • collected into special tubes provided with kit • agitated for 10 sec • swab discarded transport • specimens are stable at room temperature; should be transported to the laboratory as soon as possible • do not refrigerate, freeze or thaw	interpretation: • increased sensitivity compared to cell culture, especially when specimen transport is difficult • useful only for endo-cervical, urethral and urine specimens • false-positive results are rare • false-negative results may occur due to inhibitors in specimens • cannot assess adequacy of specimen • not yet suitable for medico-legal purposes

Laboratory Diagnosis of Chlamydial Infections (cont'd).....

B. Non-amplification Techniques	
method: specimen • urethral or endocervical specimen collected into transport medium transport • specimens are stable at room temperature for up to 1 week but ideally they shonld be delivered to the laboratory as soon as possible – • do not refrigerate, freeze or thaw	interpretation: • less sensitive than amplified techniques • useful only for endocervical and urethral specimens • false-positive results are rare • cannot assess adequacy of specimen • NOT suitable for medico-legal purposes and for genital specimens from children
Fluorescein-conjugated monoclonal antibody/direct fluorescent antibody test (DFA)	
method: • swab rolled onto well on slide • air dried • fix with acetone • transported to laboratory • results may be available in 30 min	interpretation: • reading of slides is subjective and requires expertise • presence of epithelial cells allows determination of an adequate specimen • sites: urethra, endocervix • not suitable for low prevalence populations due to false-positive rate • NOT suitable for genital specimens from children • in neonates and infants may use for nasopharyngeal aspirates and conjunctival swabs

Enzyme immunoassay (EIA) (for antigen detection)	
method: • swab immediately placed in special vial provided with kit and transported to laboratory at room temperature – • positive results must be confirmed by the laboratory using a blocking test or DFA	interpretation: • cannot determine adequacy of specimen • sites: urethra, endocervix • a number of false-positive results will occur especially in low prevalence population (must do confirmatory testing) • NOT suitable for genital specimens from children • may use for nasopharyngeal aspirates and conjunctival swabs from infants
Serology	
specimen: • serum for serology if diagnosis of *Chlamydia trachomatis* pnenmonia is suspected in infants • serum for *C. trachomatis* specific IgG may be useful in investigating tubal infertility	• *C. trachomatis* specific IgM is suggestive of perinatally acquired pneumonia • *C. trachomatis* specific IgG is suggestive of previous chlamydial infection (cross-reacting antibodies to other chlamydiae (e.g., *C. psittaci* or *C. pneumoniae*) may make interpretation difficult); consult with laboratory • elevated levels of IgG to *C. trachomatis* in infertile women is suggestive of upper genital tract infection

NOTE: Pap smears are not reliable for the diagnosis of *C. trachomatis*.

Laboratory Diagnosis of Syphilis

General principles

- the diagnosis of syphilis differs from the diagnosis of most STD in that serologic study is exceedingly important and culture is not possible
- as with other types of STD, direct detection of the organism is useful

Dark-field microscopy

- dark-field microscopy is performed on serous fluid expressed or vigorously scraped from lesion

Advantages

- specimen is viewed immediately so that it provides rapid result
- often gives a positive result when serologic tests results are still negative

Disadvantages

- need for immediate evaluation
- susceptibility to topical medications and systemic antimicrobials (giving false-negative results)
- expertise required
- not useful for oral or rectal lesions

Direct fluorescent antibody test

- specimens obtained in the same manner as for dark-field examination can be placed on a slide, air dried and transported to a laboratory
- test is a suitable alternative when dark-field microscopy is not immediately available
- useful for oral or rectal lesions

Serologic study

- serologic testing is the most important procedure in the diagnosis and follow-up of syphilis, and it is the only method for detecting latent and tertiary syphilis

2 general classes of tests:

Non-treponemal tests:

- e.g., VDRL, rapid plasma reagin test (RPR), automated reagin test (ART), toluidine red unheated serum test (TRUST), reagin screening test (RST) and enzyme immunoassay (EIA)
  - detect a reaction to antigens that are not specific to treponemes

Laboratory Diagnosis of Syphilis (cont'd).....

Non-treponemal tests (cont'd).....

Advantages

- rapid
- technically simple
- can be automated
- useful for evaluation of cerebrospinal fluid (VDRL only)
- useful as an indicator of re-infection
- can quantitate the degree of reactivity and follow the adequacy of treatment by a decrease in titre

Disadvantages

- a delay of 1-4 weeks between time of development of the primary chancre and detection of antibody
- false-positive results owing to non-specific cross reactivity (see table below)
- tests are non-reactive in up to 40% of cases of primary syphilis and 25% of cases of untreated late latent disease

Treponemal specific tests:

- measure antibodies to cellular components of treponemes, e.g., microhemagglutination for *Treponema pallidum* (MHA-TP) and fluorescent treponemal antibody absorption test (FTA-ABS)

Advantages

- main use of these tests is to differentiate true positive results of non-trepomenal tests from false-positive results and to diagnose latent syphilis, when non-treponemal tests may give negative results
- FTA-ABS is the first serologic test to give a positive result in infectious syphilis

Disadvantages

- false-positive results
- cross reaction with non-venereal treponematoses, i.e., yaws, pinta and non-venereal syphilis
- uncertain benefit in the evaluation of cerebrospinal fluid
- because of the persistence of antibody, these tests are not useful for assessing response to treatment or monitoring re-infection

Laboratory Diagnosis of Syphilis (cont'd).....

SENSITIVITY AND SPECIFICITY OF SEROLOGIC DIAGNOSIS OF SYPHILIS

Type of test	Sensitivity, %; Stage			Specificity
	Primary	Secondary	Latent	
Non-treponemal				
VDRL	80%	100%	71%	98%
Rapid plasma reagin test (RPR)	86%	100%	73%	98%
Treponemal				
Microhemagglutination for pallidum (MHA-TP)	82%	100%	94%	99%
Fluorescent treponemal antibody absorption test (FTA-ABS)	98%	100%	96%	98%

CAUSES OF FALSE-POSITIVE SEROLOGIC TESTS FOR SYPHILIS

Non-treponemal tests (RPR and VDRL)

- Infectious causes
  - bacterial:
    - pneumococcal pneumonia
    - bacterial endocarditis
    - chancroid
    - malaria
    - leprosy
    - rickettsial disease
    - mycoplasma pneumonia
    - lymphogranuloma venereum
    - tuberculosis
    - cross-reaction with other treponemal infections – yaws and pinta
  - viral:
    - measles
    - chickenpox
    - infectious mononucleosis
    - viral hepatitis
- Non-infectious causes
  - pregnancy
  - injection drug use
  - connective tissue disease, e.g., SLE
  - advancing age
  - chronic liver disease
  - multiple myeloma
  - advanced malignancy
  - anti-cardiolipin antibody syndromes

Treponemal tests (FTA-ABS and MHA-TP)

- Infectious causes
  - Lyme disease
  - leprosy
  - infectious mononucleosis
  - malaria
  - cross-reaction with other treponemal infections
    - yaws and pinta
- Non-infectious causes
  - systemic lupus erythematosus
  - thyroiditis

Laboratory Diagnosis of Herpes Simplex Virus Infections

General principles

- diagnosis requires
  - classical clinical presentation AND
  - culture (or other viral type-specific) documentation
- serology has no role in routine laboratory confirmation of disease

Specimen Collection (see section on Specimen Collection and Transport, page 179)

NOTES

Symptomatic patients

- reasons for false-negative results:
  - swabbed lesion not directly visualized
  - specimens not taken from lesions are likely to be culture negative except in neonatal herpes, e.g., conjunctiva, mouth

Asymptomatic patients

- specimens should not be obtained from asymptomatic patients unless:
  - pregnant woman at completion of an active clinical phase and diagnosis not previously confirmed
  - woman in labour who has a history of genital ulcers or active lesion in order to identify high-risk neonates
  - neonate born to mother with possible history of genital herpes at time of delivery
- routine prenatal testing of mothers is *NOT* indicated
- method for collection from asymptomatic woman
  - using one swab pre-moistened in saline:
    rub clitoral hood, labia minora, labia majora, perineum and perianal region and place into transport medium
- cervical swabs for herpes simplex virus (HSV) generally warranted only when primary herpes suspected
- method for collection from asymptomatic neonate
  - using one swab pre-moistened in saline:
    gently apply to conjunctiva, insert into mouth and gently rub around the lips, external ear canal, umbilicus, axillae and groin and place into transport medium

Laboratory Diagnosis of Herpes Simplex Virus Infections (cont'd).....

Specimen transport

(see section on Specimen Collection and Transport, page 179)

- use rapid refrigerated transport but DO NOT FREEZE unless specifically instructed to do so by the laboratory

Laboratory detection methods

Test		Sensitivity %	Specificity %	Comments
Culture (a)	Standard methods	> 99%	100%	• gold standard • 75% specimens positive by 2 days • isolates can be stored • typing can be done
	Rapid methods (shell vial culture)	85%	100%	• requires centrifugation • allows overnight antigen detection • typing can be done
Antigen detection methods IFA or EIA		50-90%	65-90%	• not for cervical specimens or specimens from asymptomatic patients • typing can be done
Cytologic methods (TZANCK)		40-60%	100% for herpes virus group	• vesicles preferred for testing • detects cytopathologic changes • typing cannot be done
Electron microscopy		• insensitive	100% for herpes virus group	• requires aspirated fluid • typing cannot be done

(a) culture remains the preferable laboratory diagnostic method unless transportation of specimens will affect viability of virus

NOTE

- serology may be useful for:
  - differentiating between primary and non-primary episodes in patients with a first clinical episode
  - documenting seroconversion in children and persons who have been sexually assaulted and who do not have a history of herpetic disease
  - determining if transplant patient is at risk of HSV disease during immunosuppression
- extensive counselling required to interpret serology result
- serology is not a replacement for viral culture

Tests and interpretation

Serology to detect HIV antibody

NOTE: positive HIV antibody test results using saliva or urine should be repeated using serum or plasma

method:

- usually enzyme linked immunoassay
- can be performed using serum or plasma

interpretation:

- if reactive, followed by a confirmatory assay such as immunoblot, indirect immunofluorescence (IFA) and/or radioimmune precipitation assay (RIPA)
- confirmed positive serologic findings indicate infection with HIV, not a disease state
- HIV antibody results are reported as positive, negative and indeterminate

  POSITIVE results signify the presence of specific anti-HIV antibodies which are the result of an HIV infection or passive transmission from mother to infant

  NEGATIVE report indicates HIV-specific antibodies were not detected
  - a person in the "window phase" following HIV infection may test as antibody negative

  INDETERMINATE laboratory findings occur when the sample tests as screen-test repeat reactive and the confirmatory test yields results that are neither negative nor do they meet the definition of HIV positivity
  - individuals receiving indeterminate results can be retested at 6-weekly intervals
  - uncertainty of the laboratory findings can usually be resolved by retesting
  - occasionally specialized procedures might have to be employed to resolve the ambiguity of the antibody results
- individuals lacking risk activities, who test as antibody positive, should be re-tested using an independently collected sample
- the extreme sensitivity of the commercial antibody assays may result in some cross-contaminated samples being reported as antibody positive. Samples submitted for anti-HIV testing should be collected carefully.
- a positive HIV antibody test in an infant may represent only passively transferred maternal antibody and the infant may or may not be infected. The HIV antibody test is so sensitive that maternal antibodies have been detected for up to 15 months in an infant not infected with HIV. There are laboratory tests that can help distinguish infected infants at an earlier age, e.g., PCR for viral genome, specific IgA, p24 antigen and virus isolation (see below). These tests are not widely available.

Laboratory Diagnosis of HIV Infection (cont'd).....

Circulating HIV antigens	
method: • HIV p24 assays	interpretation: • all positive findings using these assays must be confirmed by a blocking assay (a second, supplemental test) • may be useful in limited situations, such as the "window phase" preceding the development of antibodies to HIV following infection, for prognosis and in confirming infection in antibody-positive infants
HIV isolation by culture	
method: • HIV from peripheral blood lymphocytes or other body fluids, such as CSF • performed using a co-culture technique • virus can be isolated from virtually all HIV antibody-positive persons (> 99%) • not a routine procedure • isolation may be attempted in clinical trial settings, or when serologic results are ambiguous • the specific conditions of HIV culture necessitate that physicians contact the laboratories before submitting samples for HIV culture	interpretation: • the results are reported as positive or negative • although virus may be isolated from nearly all HIV antibody-positive persons, several attempts may be required prior to isolating virus from infected individuals
Detection of HIV genetic material by polymerase chain reaction (PCR) **Detection of serum IgA**	
PCR: • extremely sensitive procedure but application in the diagnosis of HIV infection is limited • procedure is useful in – quantification of virus – resolution of the infection status of newborns born to HIV-positive mothers – the typing of HIV isolates – molecular epidemiologic studies PCR and IgA: • experimental tests available in only a few Canadian centres; used as adjuncts to tests routinely available and not used in place of standardized procedures (HIV antibody assays)	

Sensitivity and Specificity of Laboratory Tests

With culture, false-negative results are possible but false-positive results are rare.
Non-culture techniques can give both false-positive and false-negative results, the proportions of which are inversely related to each other and this is dependent upon the cutoff level for positivity set by the manufacturer of the test.

- sensitivity: of all those with the disease, how many have a positive test
  specificity: of all those without the disease, how many have a negative test
- sensitivity and specificity do *not* depend upon prevalence of disease in the population. They are purely a measure of how good the test is.

- Positive Predictive Value (PPV): of all those with a positive test, how many have the disease
- Negative Predictive Value (NPV): of all those with a negative test, how many do not have the disease
- predictive values are dependent upon prevalence of the disease in the population and determine how useful a test will be in a specific population
- you may determine *who* has the disease by the single most accurate laboratory test (gold standard) or by carrying out several different tests which may indicate a positive diagnosis

See below for examples

Sensitivity and Specificity of Laboratory Tests (cont'd).....

Examples:

- you evaluate a new chlamydia diagnostic test in an adolescent clinic, testing 2000 women of whom 200 have the disease (10% prevalence)

		Disease +	–	Total
Test	+	190	50	240
	–	10	1750	1760
	Total	200	1800	2000

sensitivity = 190/200 = (95.0%)
specificity = 1750/1800 = (97.2%)
PPV = 190/240 = (79.2%)
NPV = 1750/1760 = (99.4%)

- You take the new test to a family practice clinic and ask them to try it out. They test 2000 women of whom 20 have disease (1% prevalence)

		Disease +	–	Total
Test	+	19	55	74
	–	1	1925	1926
	Total	20	1980	2000

sensitivity = 19/20 = (95.0%)
specificity = 1925/1980 = (97.2%)
PPV = 19/74 = (25.7%)
NPV = 1925/1926 = (99.9%)

- by moving the test into a setting with a lower disease prevalence the sensitivity and specificity stayed the same but the PPV dropped from 79.2% to 25.7%. Thus in the family practice clinic, "of all of those with a positive test (n = 74) only 19 (25.7%) will actually have disease". This risk of false identification is especially important with STD due to the possible consequences for a relationship and in the case of children.

Appendix III

Tanner Scale of Sexual Maturity

- sexual maturity ratings have replaced the traditional indicators of growth status such as height, weight and skinfold thickness. Sexual maturity ratings have proven useful in assessing growth and development during adolescence.
- classification of patients may be done as part of a general physical examination and does not require any special procedures.
- the scale of development is based on secondary sexual characteristics. The ratings range from stage 1, which represents the prepubertal child, to stage 5, which represents the adult.

Boys: genital development

- Stage 1: preadolescent. Testes, scrotum and penis are about the same size and proportion as in early childhood.
- Stage 2: enlargement of scrotum and testes. Skin of scrotum reddens and changes in texture. Little or no enlargement of penis.
- Stage 3: enlargement of penis, at first mainly in length. Further growth of testes and scrotum.
- Stage 4: increase size of penis, with growth in breadth and development of glans. Testes and scrotum larger. Scrotal skin darkened.
- Stage 5: genitalia are adult in size and shape.

Girls: breast development

- Stage 1: preadolescent. Elevation of papilla only.
- Stage 2: breast bud stage. Elevation of breast and papilla as small mound. Enlargement of diameter of areola.
- Stage 3: further enlargement and elevation of the breast and areola, with no separation of their contours.
- Stage 4: projection of areola and papilla to form a secondary mound above the level of the breast.
- Stage 5: mature stage. Projection of papilla only, owing to recession of the areola to the general contour of the breast.

Tanner Scale (cont'd).....

Both sexes: pubic hair

- Stage 1: preadolescent. Vellus over pubes is not developed further than that over abdominal wall, i.e., no pubic hair.
- Stage 2: sparse growth of long, slightly pigmented downy hair, straight or slightly curled, chiefly at base of penis and along labia.
- Stage 3: hair is considerably darker, coarser and more curled. It spreads sparsely over the junction of pubes.
- Stage 4: hair is adult in type, but area covered is still considerably smaller than in adult. No spread to medial surface of thighs.
- Stage 5: hair is adult in quantity and type, with distribution of horizontal (or classic "feminine" in females) pattern. Spread to medial surface of thighs but not up linea alba or elsewhere above base of inverse triangle (spread up linea alba occurs late and is rated Stage 6).

Appendix IV

Forensic evidence

- although children who report sexual molestation are rarely lying, forensic evidence is invaluable in supporting their testimony. This is also the case with adults.
- the purpose of forensic analysis of specimens is to establish that sexual contact occurred. This is done by confirming the presence of seminal fluid or saliva or both and demonstrating that the antigenicity of any secretions (e.g., seminal fluid, saliva and blood) is compatible with the antigenic profile of the accused person.
- in some situations it is impossible to collect certain specimens for forensic analysis. The availability of specimens depends on the sex of the perpetrator, the nature of the molestation (fondling vs. penetration) and time between the event and the examination. An interval of more than 48 hours or cleansing the sexually abused areas will reduce the availability of specimens and the strength of forensic evidence.
- when specimens are being collected as forensic evidence with the objective of establishing the identification of the perpetrator, certain strict guidelines must be followed. This is essential if the information gathered is to be unequivocally accepted in court. Particular attention must be paid to the manner of collection, the labelling and identification of individual specimens, and obtaining signed specific consent forms. For details on the collection of specimens for forensic analysis, local police authorities should be consulted (see below).

Collection of specimens

- an attempt should be made to obtain specimens of seminal fluid ("pristine material") from all possible sites with sterile cotton swabs. The swabs are then allowed to air dry. The forensic laboratory will use these specimens for sperm counts, acid pbosphatase tests, identification of ABO antigens and protein 30, and gene tracing.

Collection of specimens (cont'd).....

- an accompanying blood sample (2 mL in a Vacutainer® tube [Becton-Dickinson, Mountainview, California] containing heparin) is necessary to identify ABO antigens
- any residual fluids from affected areas such as the vaginal vestibule should be collected by aspiration. A sterile eye dropper is ideal for this purpose in children. Before aspiration, the area is moistened with 1-2 mL of sterile non-bactericidal saline for specimens that are to be cultured. For non-culture tests, either 1-2 mL of sterile non-bactericidal saline or non-bactericidal distilled water can be used. If saline is used, the specimens can be examined for motile sperm by means of the hanging-drop method. A positive finding suggests that the sexual activity occurred less than 6 hours previously. Sterile distilled water may make the sperm non-motile. A smear of the material obtained, stained with eosin-fuchsin or the Christmas tree stain, can identify any spermatozoa present when examined under X 1000 magnification. Confirmation by the forensic laboratory is essential to ensure acceptability of the evidence in court.
- demonstration of saliva on the body or clothing of the person who has been abused or assaulted may provide further confirmatory evidence. Salivary amylase may be detectable days or even weeks after deposition. Samples can be collected with any clean cotton swab. The swab is moistened slightly with distilled water and rubbed over the affected area of the body or clothing. The specimen is allowed to dry and is then packaged and labelled. If a child or adult is unclear about which area(s) is affected, the common target areas (the neck, breast, belly, genital area, penis, thighs and buttocks) could be swabbed; a separate swab should be used for each area and labelled accordingly. Adjacent areas should be swabbed for control samples.
- judgement is required in deciding whether these investigations are sensible. It is pointless to collect such samples if weeks have elapsed since the incident or if the critical areas have since been bathed.
- the body and the clothing worn at the time of the incident should be carefully inspected for trace evidence (foreign material left by the perpetrator). Items commonly sought include hair from any part of the body, clothing fibres, lubricants, petroleum jelly and lipstick. Any suspicious material should be removed with forceps, folded in a piece of clean paper and put in a separate, properly labelled envelope.
- if the assaulted or abused person has reached puberty, the pubic hair should be combed and any free hair collected, folded in a piece of paper or tissue and put in a labelled envelope. Hairs can be used as evidence only if compared with samples from the suspected perpetrator. It is necessary to have several sample hairs not only from the suspect but also from the person assaulted or abused. To be absolutely reliable, the victim's hairs (usually pubic) have to be plucked individually and must include the root. Between 8 and 12 hairs are necessary. Because this a painful procedure, sample hairs

Forensic Evidence and Services (cont'd).....

Collection of specimens (cont'd).....

from the victim need not be obtained until a suspect has been identified and sample hairs have been obtained from that person.

- collecting nail scrapings and screening clothing and body parts with ultraviolet light are no longer considered of forensic value

Forensic services

- investigative and scientific forensic laboratory services to detect evidence of sexual assault and abuse are available throughout Canada
- services are supplied by the Royal Canadian Mounted Police and by provincial, regional and local police forces
- current legislation on abuse of children obligates physicians to notify local child protection agencies of such cases. These local agencies maintain close liaison with police force personnel familiar with the investigation of suspected abuse and with the availability of forensic laboratory services.
- physicians should not submit specimens for forensic study directly to laboratories. This should be done through police services.
- physicians wishing to consult scientists on forensic matters may do so by contacting the nearest laboratory
- most forensic evaluations do not include tests to detect STD

Manager
Forensic Laboratory
Royal Canadian Mounted Police
5201 Heather St.
Vancouver, British Columbia
V5Z 3L7
(604) 264-3405

Officer-in-Charge
Forensic Laboratory
Royal Canadian Mounted Police
15707 118th Ave.
Edmonton, Alberta
T5V 1B7
(403) 451-7400

Officer-in-Charge
Forensic Laboratory
Royal Canadian Mounted Police
Box 6500
Regina, Saskatchewan
S4P 3J7
(306) 780-5810

Officer-in-Charge
Forensic Laboratory
Royal Canadian Mounted Police
621 Academy Rd.
Winnipeg, Manitoba
R3N 0E7
(204) 983-4280

Director
Centre of Forensic Sciences
25 Grosvenor St.
Toronto, Ontario
M7A 2G8
(416) 965-2561

Officer-in-Charge
Central Forensic Laboratory
Royal Canadian Mounted Police
P.O. Box 8885
Ottawa, Ontario
K1G 3M8
(613) 993-0986

Officer-in-Charge
Forensic Laboratory
Royal Canadian Mounted Police
'C' Division
P.O. Box 559
Westmount (Québec)
H3Z 2T4
(514) 939-8342

Officer-in-Charge
Forensic Laboratory
Royal Canadian Mounted Police
Box 1320
Sackville, New Brunswick
E0A 3C0
(506) 536-1527

Officer-in-Charge
Forensic Laboratory
Royal Canadian Mounted Police
3151 Oxford St.
P.O. Box 1802
Halifax, Nova Scotia
B3K 5L9
(902) 426-8886

Appendix V

This list of child abuse treatment centres in Canada is not inclusive; however, it can be used as a reference for obtaining more specific local information.

Newfoundland
Child Protection Team
Dr. Charles A. Janeway Child
Health Centre
710 Newfoundland Dr.
St. John's, Newfoundland
A1A IR8
(709) 778-4607

Nova Scotia
Child Abuse Team
Izaak Walton Killam Hospital
for Children
5850 University Ave.
Halifax, Nova Scotia
B3J 3Y9
(902) 424-3121

New Brunswick
Child Protection Consultation Team
Moncton Hospital
135 MacBeath Ave.
Moncton, New Brunswick
E1C 6Z8
(506) 855-1600, local 292

Child Abuse Team
Saint John Regional Hospital
P.O. Box 2100
Saint John, New Brunswick
E2L 4L2
(506) 648-6811

Referral Centres (cont'd).....

Quebec

Child Protection Clinic
Montreal Children's Hospital
2300 Tupper St.
Montreal (Québec)
H3H 1P3
(514) 937-8511

Comité de prévention de
l'enfance maltraitée
Hôpital Maisonneuve-Rosemont
5415, boul. de l'Assomptions
Montréal (Québec)
H1T 2M4
(514) 254-8341

Offenses sexuelles
Hôpital Sainte-Justine
3175, ch. Ste-Catherine
Montréal (Québec)
H3T 1C5
(514) 345-4721

Comité de prévention de
l'enfance maltraitée
Centre hospitalier de
l'université Laval
2705, boul. Laurier
Ste-Foy (Québec)
G1V 4G2
(418) 656-4141

Comité de prévention de
l'enfance maltraitée
Centre hospitalier universitaire
de Sherbrooke
Sherbrooke (Québec)
J1H 5N4
(819) 563-5555

Ontario

Child Abuse Committee
Peel Memorial Hospital
20 Lynch St.
Brampton, Ontario
L6W 2Z8
(416) 451-1710

Child Protection Team
McMaster University Medical Centre
P.O. Box 2000, Stn. A
Hamilton, Ontario
L8N 3Z5
(416) 521-2100

Child Protection Team
Hotel Dieu Hospital
166 Brock St.
Kingston, Ontario
K7L 5G2
(613) 544-3310

Child Abuse Team
Children's Hospital of Western
Ontario
800 Commissioners Rd. E
London, Ontario
N6A 4G5
(519) 681-6711

Referral Centres (cont'd).....

Child Abuse Team
Mississauga Hospital
100 Queensway W
Mississauga, Ontario
L5B 1B8
(416) 279-7330

Child Protection Program
Children's Hospital of Eastern Ontario
401 Smyth Rd.
Ottawa, Ontario
K1H 8L1
(613) 737-2317

Child Abuse Committee
Sarnia General Hospital
483 North East St.
Sarnia, Ontario
N7T 6Y7
(519) 364-3661

Child Abuse Team
Scarborough Centenary Hospital
2867 Ellesmere Rd.
Scarborough, Ontario
M1E 4B9
(416) 284-8131

Chief of Pediatrics
St. Joseph's General Hospital
35 N Algoma St.
P.O. Box 3251
Thunder Bay, Ontario
P7B 5G7
(807) 343-2431

Suspected Child Abuse and Neglect Program
Hospital for Sick Children
555 University Ave.
Toronto, Ontario
M5G 1X8
(416) 598-6275

Child Abuse Team
North York General Hospital
4001 Leslie St.
Willowdale, Ontario
M2K 1E1
(416) 492-4648

Manitoba
Dauphin and St. Rose SCAN Teams
I5 1st Ave. SW
Dauphin, Manitoba
R7N 1R9
(204) 638-7024

Child Protection Centre
Children's Hospital of Winnipeg
Health Sciences Centre
685 William Ave.
Winnipeg, Man.
R3E OWl
(204) 787-2811

Saskatchewan
Child Abuse Team
Regina General Hospital
1440 14th Ave.
Regina, Saskatchewan
S4P 0W5
(306) 359-4444

Referral Centres (cont'd).....

Child and Youth Service
Department of Psychiatry
University Hospital
Saskatoon, Saskatchewan
S7N 0X0
(306) 244-2323

Alberta
Child Abuse Program
Alberta Children's Hospital
1820 Richmond Rd. SW
Calgary, Alberta.
T2W 3Pl
(403) 229-7886

Department of Pediatrics
University of Alberta Hospital
4th Floor, CSB
University of Alberta
Edmonton, Alberta
T6G 2E2
(403) 492-6370

British Columbia
Child Protection Service
Royal Columbian Hospital
204-250 Keary St.
New Westminster, British Columbia
V3L 5E7
(604) 526-1891

Children's Hospital
4480 Oak St.
Vancouver, British Columbia
V6H 3V4
(604) 875-2345

Sexual Assault Assessment Project
Department of Family Practice
University of British Columbia
5804 Fairview Ave.
Vancouver, British Columbia
V6T IW5
(604) 228-5431 or 738-4121

Suspected Child Abuse and Neglect Team
Victoria General Hospital
35 Helmcken Rd.
Victoria, British Columbia
V8Z 6R5
(604) 727-4212

Northwest Territories
Infectious Disease Control
Department of Health
Government of the Northwest Territories
P.O. Box 1320
Yellowknife, Northwest Territories
X1A 2L9
(403) 920-8646

Yukon
Infectious Disease Control Officer
Yukon Region
Whitehorse General Hospital
5 Hospital Rd.
Whitehorse, Yukon Territory
Y1A 3H7
(403) 668-9444

Appendix VI

Provincial and Territorial Directors of STD Control

For more information on the control of STD, consult initially your local health authority or provincial/ territorial director of STD control (see below)

Director
Disease Control & Epidemiology
Department of Health
P.O. Box 8700
St. John's, Newfoundland
A1B 4J6 **(709) 729-3430**

Provincial Epidemiologist
Department of Health
P.O. Box 2000, Sullivan Bldg.
Charlottetown, Prince Edward Island
C1A 7N8 **(902) 368-4978**

Provincial Epidemiologist
Department of Health & Fitness
P.O. Box 488
Halifax, Nova Scotia
B3J 2R8 **(902) 424-8698**

Provincial Epidemiologist
Department of Health & Community Services
P.O. Box 5100, Carleton Place
Fredericton, New Brunswick
E3B 5G8 **(506) 453-3092**

Prévention et Promotion de la santé
Ministère de la Santé et des Services sociaux
1075, chemin Ste-Foy
Québec (Québec)
G1S 2M1 **(418) 643-6390**

Senior Medical Consultant
Disease Control Service
Ontario Ministry of Health
15 Overlea Blvd., 5th Floor
Toronto, Ontario
M4H 1A9 **(416) 327-7428**

Provincial/Territorial Directors of STD Control (cont'd).....

Director
Health Promotion, Protection and Disease Prevention
Manitoba Health
3 – 800 Portage Avenue
Winnipeg, Manitoba
R3G 0N4 **(204) 945-6839**

Director
Microbiology and Communicable Disease
Saskatchewan Health
3211 Albert Street
Regina, Saskatchewan
S4S 5W6 **(306) 787-8316**

Director
Sexually Transmitted Disease Control
Alberta Health
Executive Building – 4th Floor
10105 – 109th Street
Edmonton, Alberta
T5J 1M8 **(403) 427-2830**

Director, STD Control
BC Centre for Disease Control
828 West 10th Avenue
Vancouver, British Columbia
V5Z 1L8 **(604) 660-6178**

Chief Medical Officer
Infectious Disease Control
Medical Directorate, Department of Health
P.O. Box 1320
Government of Northwest Territories
Yellowknife, Northwest Territories
X1A 2L9 **(403) 920-8646**

Infectious Disease Control Officer
Yukon Region
Whitehorse General Hospital
No. 5 Hospital Road
Whitehorse, Yukon Territory
Y1A 3H7 **(403) 668-9444**

Appendix VII

For more information on laboratory diagnosis of STD consult initially your local facility or your nearest public health laboratory (see below)

Director
Newfoundland Public Health Laboratories
The Leonard A. Miller Centre for Health Services
100 Forest Road, P.O. Box 8800
St. John's, Newfoundland
A1B 3T2 **(709) 737-6565**

Director of Laboratories
Department of Public Health
Pathology Institute
5788 University Avenue
Halifax, Nova Scotia
B3H 1V8 **(902) 428-4110 or 3629**

Director, Division of Laboratories
Provincial Health Laboratory
Queen Elizabeth Hospital
P.O. Box 6600, Riverside Drive
Charlottetown, Prince Edward Island
C1A 8T5 **(902) 566-6309**

Director
Department of Laboratory Medicine
P.O. Box 2100, University Avenue
Saint John, New Brunswick
E2L 4L2 **(506) 648-6501**

Directeur scientifique
Ministère des affaires sociales
Direction des Laboratoire
20045, chemin Ste-Marie ouest
Ste-Anne-de-Bellevue (Québec)
H9X 3R5 **(514) 457-2070**

Provincial Laboratories (cont'd).....

Director
Laboratory Services Branch
Ontario Ministry of Health
P.O. Box 9000, Terminal A
Toronto, Ontario
M5W 1R5
(416) 235-5941

Ontario Regional Laboratories

Director
Ottawa Public Health Laboratory
2380 Saint Laurent Blvd.
Ottawa, Ontario
K1G 5A4
(613) 736-6800

Director
Kingston Public Health Laboratory
Box 240
Kingston, Ontario
K7L 4V8
(613) 548-6630

Director
Peterborough Public Health
Laboratory
Box 265
Peterborough, Ontario
K9J 6Y8
(705) 743-6811

Director
Orillia Public Health Laboratory
Box 600
Orillia, Ontario
L3V 6K5
(705) 325-7449

Director
Hamilton Public Health Laboratory
Box 2100
Hamilton, Ontario
L8N 3R5
(416) 385-5379

Director
Palmerston Public Health
Laboratory
Box 700
Palmerston, Ontario
N0G 2P0
(519) 343-3102

Director
London Public Health Laboratory
Box 5704, Terminal "A"
London, Ontario
N6A 4L6
(519) 455-9310

Director
Windsor Public Health Laboratory
Box 1616
Windsor, Ontario
N9A 6S2
(519) 969-4341

Director
Timmins Public Health Laboratory
67 Wilson Avenue
Timmins, Ontario
P4N 2S5
(705) 267-6633

Provincial Laboratories (cont'd).....

Director
Sault Ste. Marie Public Health
Laboratory
Box 220
Sault Ste. Marie, Ontario
P6A 5L6
(705) 254-7132

Director
Thunder Bay Public Health
Laboratory
Box 1100, Station "F"
Thunder Bay, Ontario
P7C 4X9
(807) 622-6449

Director
Cadham Provincial Laboratory
7650 William Avenue,
P.O. Box 8450
Winnipeg, Manitoba
R3C 3Y1
(204) 944-0270

Director, Laboratory and Disease
Control Services Branch
Saskatchewan Health
H.E. Robertson Laboratory
3211 Albert Street
Regina, Saskatchewan
S4S 5W6
(306) 787-3129

Director
Provincial Laboratory of Public
Health for Northern Alberta
University of Alberta
Edmonton, Alberta
T6J 2J2
(403) 492-8903

Director
Provincial Laboratory of Public
Health
3030 Hospital Drive N.W.
P.O. Box 2490
Calgary, Alberta
T2P 2M7
(403) 270-1201

Director, Division of Laboratories
Health Branch
828 West 10th Avenue
P.O. Box 34020, Postal Station D
Vancouver, British Columbia
V6J 4M3
(604) 660-6032