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# Canadian STD Guidelines

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# **Canadian STD Guidelines**

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The Canadian STD Guidelines were prepared by the **Laboratory Centre for Disease Control (LCDC) Expert Working Group on Canadian Guidelines for Sexually Transmitted Disease:**

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The guidelines presented in this document reflect the views of the Expert Working Group on Canadian Guidelines for Sexually Transmitted Disease. They should be construed not as rules but rather as recommendations based on available information up to July 1998.

## PREFACE

These guidelines have been produced to reflect changes in practice since the *1995 Update to the Canadian Guidelines for the Prevention, Diagnosis, Management and Treatment of Sexually Transmitted Diseases in Neonates, Children, Adolescents and Adults*. A number of STD Experts reviewed and rewrote each section of the Guidelines. All chapters were then reviewed by all the members of the STD Expert Working Group and adopted through a consensus process. The fourth draft of this edition was submitted to different medical associations for further review and endorsement. The final corrections and editing of the document was done by a small sub-committee of the working group. The recommendations for prevention, diagnosis, management and treatments of STD are based on an extensive literature review and on clinical experience. For the sake of brevity, the Expert Working Group and Health Canada elected, as with the previous edition, not to include a list of references. A new user-friendly companion document, entitled *Highlights of the Canadian STD Guidelines – 1998 Edition* has also been developed.

### HOW TO USE THESE GUIDELINES

- Canadian STD Guidelines have been written for primary health care providers especially 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 allow busy professionals rapid access to the information that they need. Please take the time to initially find your way around.
  - the *Table of Contents*, the *Summary Table 1* (page 19) and the *Summary Table 2* (page 20) are designed to act as a map to guide you to the information that you might want. You will note that certain advice and guidance are repeated. This is intentional. When you need to refer elsewhere the appropriate page number should be close by.
  - blue shaded areas identify clinical issues where consultation with more experienced colleagues could be sought.

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# INTRODUCTION

This document provides Canadian recommendations for the prevention, diagnosis, management and treatment of STD when a person first presents to the health care system.

## SEXUALLY TRANSMITTED SYNDROMES

- people usually present to health care providers with symptoms and physical findings which may constitute a clinical syndrome, i.e., urethritis, 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 microbiologic confirmation. The *Summary Table 1* on page 19 lists symptoms and signs that should suggest the presence of a particular STD 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 for various age groups are presented in this document. The chapter on *Clinical Approach to the Diagnosis and Management of Sexually Transmitted Disease* (page 39) provides guidelines for optimal evaluation and management of suspected cases of STD.
- in evaluating and interacting with patients, it is vitally important that health care providers be supportive and non-judgmental, 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.

## RECOMMENDATIONS FOR INITIAL MANAGEMENT

- since health care providers do not have equal access to laboratory facilities, recommended 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
  - cases where management is required irrespective of laboratory test results.

## IMPORTANCE OF LABORATORY DIAGNOSIS

- all health care providers should have access to diagnostic tests for *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Herpes simplex* virus (HSV), Human papillomavirus (HPV) and its complications, *Treponema pallidum* and Human immunodeficiency virus (HIV). Facilities to obtain a Gram stain are the minimum level of support required.
- 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 leukocyte (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 the chapter on *Laboratory Diagnosis* (page 49).
- the degree of importance of obtaining specific microbiologic tests can vary, depending on the clinical circumstances. Specific microbiologic testing by means of culture or non-culture methods is highly desirable in the following situations:
  - evaluation of suspected sexual abuse of a child
  - evaluation of sexual assault
  - screening to detect asymptomatic infection
  - 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
  - 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 partner notification and reporting is done.

## SEXUAL ABUSE AND ASSAULT

- when an STD or sexually transmitted syndrome is detected in a prepubertal child or a youth who is not sexually active, evaluation for sexual abuse is required. The chapter on *Sexual Abuse and Sexual Assault* (page 201) provides some guidance and a list of contacts for the most current information on collecting optimal specimens for forensic evaluation in cases of child sexual abuse or sexual assault in youth and adults.

**Summary Table 1:  
Symptoms and Signs Suggesting Specific STD Syndromes**

Symptoms, Signs	(See section on page)
<p><b>Prepubertal boys</b></p> <ul style="list-style-type: none"> <li>■ urethral discharge, burning on urination, urethral or meatal itch, enuresis</li> <li>■ painful genital ulcers or lesions, painful inguinal lymphadenopathy</li> <li>■ painless genital lesions with or without inguinal lymphadenopathy</li> </ul>	<ul style="list-style-type: none"> <li>■ urethritis (69)</li> <li>■ genital ulcer disease (108)</li> <li>■ genital ulcer disease (108)</li> <li>■ genital warts and HPV infections (167).</li> </ul>
<p><b>Young and adult males</b></p> <ul style="list-style-type: none"> <li>■ urethral discharge, burning on urination, urethral or meatal itch</li> <li>■ acute onset of unilateral scrotal pain or swelling</li> <li>■ painful genital ulcers or lesions, painful inguinal lymphadenopathy</li> <li>■ painless genital lesions with or without inguinal lymphadenopathy</li> </ul>	<ul style="list-style-type: none"> <li>■ urethritis (69)</li> <li>■ epididymitis (100)</li> <li>■ genital ulcer disease (108)</li> <li>■ genital ulcer disease (108)</li> <li>■ genital warts and HPV infection (167)</li> </ul>
<p><b>Prepubertal girls</b></p> <ul style="list-style-type: none"> <li>■ vaginal discharge, itch, perianal irritation</li> <li>■ painful genital ulcers or lesions, painful inguinal lymphadenopathy</li> <li>■ painless genital lesions with or without inguinal lymphadenopathy</li> </ul>	<ul style="list-style-type: none"> <li>■ prepubertal vaginitis (95)</li> <li>■ genital ulcer disease (108)</li> <li>■ genital ulcer disease (108)</li> <li>■ genital warts and HPV infections (167)</li> </ul>
<p><b>Young and adult females</b></p> <ul style="list-style-type: none"> <li>■ vaginal discharge, odour, genital itch, introital dyspareunia, external dysuria</li> <li>■ recent onset of abdominal pain, unusual vaginal bleeding, deep dyspareunia, with or without genital discharge</li> <li>■ painful genital ulcers or lesions, painful inguinal lymphadenopathy</li> <li>■ painless genital lesions with or without inguinal lymphadenopathy</li> <li>■ internal dysuria, frequency, hematuria, nocturia, urgency</li> </ul>	<ul style="list-style-type: none"> <li>■ vulvovaginitis in youth and adults (88)</li> <li>■ cervicitis (75)</li> <li>■ pelvic inflammatory disease (80)</li> <li>■ genital ulcer disease (108)</li> <li>■ genital ulcer disease (108)</li> <li>■ genital warts and HPV infections (167)</li> <li>■ urethritis (69) or urinary tract infection</li> </ul>

**Note:** If an STD or syndrome is suspected in a prepubertal child or a youth who is not sexually active, an evaluation for sexual abuse or sexual assault is required (see page 201).

**Summary Table 2:  
Syndromic Approach to STD Diagnosis and Management**

Syndrome	Who	Organisms and Etiology	Symptoms and Signs
<b>NO SYMPTOMS BUT AT RISK</b>	<p><b>At risk:</b></p> <ul style="list-style-type: none"> <li>■ sexually active males and females &lt; 25 years of age</li> </ul> <p><b>Most at risk:</b></p> <ul style="list-style-type: none"> <li>■ contact to known case of STD</li> <li>■ street involved and/or substance use</li> <li>■ unprotected sex</li> <li>■ new or &gt; 2 partners in past 6 months</li> <li>■ men who have sex with men (MSM)</li> <li>■ previous STD</li> </ul>	<p>Chlamydia trachomatis</p> <p>Neisseria gonorrhoeae</p> <p>Herpes simplex virus (HSV)</p> <p>Human papillomavirus</p> <p>HIV</p> <p>Hepatitis A virus especially in MSM</p> <p>Hepatitis B virus</p> <p>Hepatitis C virus mostly in IDU</p> <p>Others</p>	<p>None</p> <p><b>OR</b></p> <p>subtle</p>
<b>URETHRITIS AND CERVICITIS</b>	<p><b>At risk:</b></p> <p>Sexually active males and females &lt; 25 years</p> <p><b>Most at risk:</b></p> <ul style="list-style-type: none"> <li>■ sexually active and</li> <li>■ contact to known case of STD</li> <li>■ street involved substance use</li> <li>■ new or &gt; 2 partners in past 6 months</li> </ul>	<p>Chlamydia trachomatis</p> <p>Neisseria gonorrhoeae</p> <p>Trichomonas vaginalis</p> <p>Herpes simplex virus (HSV)</p> <p>Others</p> <p><b>Cause urethritis but not cervicitis:</b></p> <p>Mycoplasma hominis</p> <p>Ureaplasma urealyticum</p>	<p><b>Males:</b></p> <ul style="list-style-type: none"> <li>■ urethral discharge</li> <li>■ burning on urination</li> <li>■ irritation in the distal urethra or meatus</li> <li>■ unexplained pyuria</li> </ul> <p><b>Females:</b></p> <ul style="list-style-type: none"> <li>■ genital discharge</li> <li>■ lower abdominal pain of recent onset</li> <li>■ intermenstrual bleeding</li> <li>■ purulent or mucopurulent cervical discharge</li> </ul> <p>➡ Check for abdominal tenderness</p>

**Note:** Patients may present with more than one STD; this summary provides an outline of investigations and relevant pages where to find more information. In many cases, screening for other STD should be carried out.

Diagnostic Features	Specimens and Testing	Treatment	Contact Management
<p>If sexual contact occurred &lt; 1 week previously, tests may not yet be positive.</p> <p><b>Note:</b> HIV Antibody window period could be as long as 3 months.</p>	<p>Cervical/urethral swabs OR urine for <i>C. trachomatis</i></p> <p>Cervical/urethral swabs for <i>N. gonorrhoeae</i> if "Most at Risk"</p> <p>Exam for ulcers/papules</p> <p>Test for HSV if lesions</p> <p>HIV testing and counselling</p> <p><b>Females:</b></p> <ul style="list-style-type: none"> <li>■ exam for abdominal tenderness</li> <li>■ Pap smear if &gt;1 year since previous one</li> <li>■ pregnancy test if missed period</li> </ul>	<p>If known contact to STD, same treatment as index patient. Otherwise, treat on results of screening.</p> <p>Consider immunization against hepatitis B for all "At Risk" and against hepatitis A for men who have sex with men (MSM).</p>	<p>If tests are positive, manage accordingly.</p>
<p><b>Males:</b></p> <ul style="list-style-type: none"> <li>■ <math>\geq 4</math> polymorphonuclear (PMN) cells per oil immersion field on Gram stain of discharge</li> </ul> <p><b>Females:</b></p> <ul style="list-style-type: none"> <li>■ Signs are best detected during a non-menstrual phase.</li> <li>■ Mucopurulent endocervical discharge in women "Most at Risk" (OR when follow-up is uncertain) may be sufficient for presumptive treatment.</li> </ul>	<p><b>Males:</b></p> <p>Urethral swabs for:</p> <ul style="list-style-type: none"> <li>■ Gram stain, culture for <i>N. gonorrhoeae</i>, test for <i>C. trachomatis</i>.</li> </ul> <p>Alternative for <i>C. trachomatis</i>: urine PCR.</p> <p><b>Females:</b></p> <p>Vaginal swab for:</p> <ul style="list-style-type: none"> <li>■ pH test, amine odour whiff test, wet mount, Gram stain.</li> </ul> <p>Endocervical swab for:</p> <ul style="list-style-type: none"> <li>■ Gram stain, culture for <i>N. gonorrhoeae</i>, test for <i>C. trachomatis</i>.</li> </ul> <p>Alternative for <i>C. trachomatis</i>: urine PCR.</p>	<p><math>\geq 9</math> years:</p> <ul style="list-style-type: none"> <li>■ cefixime 400 mg orally in a single dose <b>PLUS</b> azithromycin 1 g orally in a single dose <b>OR</b> doxycycline 100 mg orally bid for 7 days.</li> </ul> <p><b>Males under 9 years</b> (cervicitis does not occur in prepubertal girls):</p> <ul style="list-style-type: none"> <li>■ cefixime 8 mg/kg orally in a single dose (max. 400 mg) <b>PLUS</b> azithromycin 10-15 mg/kg orally in a single dose (max. 1 g).</li> </ul>	<p>Treat all partners who have had sexual contact with the index case within at least 60 days prior to the onset of symptoms with:</p> <ul style="list-style-type: none"> <li>■ cefixime 400 mg <b>PLUS</b> azithromycin 1 g in single doses.</li> </ul> <p>Patients and contacts should abstain from unprotected sex until 7 days after treatment of both partners is complete.</p>

Syndrome	Who	Organisms and Etiology	Symptoms and Signs
<b>PELVIC INFLAMMATORY DISEASE (PID)</b>	<p><b>At risk:</b></p> <ul style="list-style-type: none"> <li>■ sexually active females.</li> </ul> <p><b>Most at risk:</b></p> <ul style="list-style-type: none"> <li>■ youth &lt; 25 years</li> <li>■ previous PID</li> <li>■ recent upper genital tract instrumentation</li> <li>■ presence of an intrauterine device (IUD).</li> </ul>	<p>Neisseria gonorrhoeae</p> <p>Chlamydia trachomatis</p> <p>Gram-negative rods complicated by anaerobes</p>	<p>➔ Mostly subtle</p> <ul style="list-style-type: none"> <li>■ lower abdominal pain</li> <li>■ deep dyspareunia</li> <li>■ abnormal bleeding</li> <li>■ cervical motion tenderness or adnexal tenderness</li> <li>■ right upper quadrant pain may be present</li> <li>■ cervicitis in 30% or less</li> <li>■ fever in severe cases only (&lt; 40%)</li> <li>■ adnexal mass in complicated cases.</li> </ul>
<b>EPIDIDYMITIS</b>	<p><b>Most at risk:</b></p> <ul style="list-style-type: none"> <li>■ males &gt; 35 years.</li> </ul>	<p>Gram-negatives (increase in males &gt; 35 years).</p> <p>Chlamydia trachomatis</p> <p>Neisseria gonorrhoeae</p>	<ul style="list-style-type: none"> <li>■ unilateral scrotal swelling and/or tenderness, maximal over the head of the epididymis, occasionally bilateral</li> <li>■ may have erythema and edema of the overlying skin</li> <li>■ with/without discharge</li> <li>■ redness, swelling and fever only in severe cases.</li> </ul>

Diagnostic Features	Specimens and Testing	Treatment	Contact Management
<p>➡ Keep a high index of suspicion.</p> <p>Adnexal or cervical motion tenderness is sufficient to make diagnosis but is not specific.</p> <p>Do not rely on negative ultrasound to rule out.</p> <p><b>Hospitalize if:</b></p> <ul style="list-style-type: none"> <li>■ cannot rule out surgical emergency</li> <li>■ tubo-ovarian abscess</li> <li>■ severe illness</li> <li>■ failed oral therapy</li> <li>■ follow-up is uncertain.</li> </ul> <p><b>Consider for hospitalization if:</b> HIV infection, youth (if compliance is uncertain), pregnancy.</p>	<p>Urine ± serum pregnancy test to rule out ectopic pregnancy.</p> <p><b>Vaginal swab for:</b></p> <ul style="list-style-type: none"> <li>■ pH test, amine odour whiff test, wet mount, Gram stain.</li> </ul> <p><b>Endocervical swab for:</b></p> <ul style="list-style-type: none"> <li>■ culture for <i>N. gonorrhoeae</i>, test for <i>C. trachomatis</i>.</li> </ul> <p>Alternative for <i>C. trachomatis</i>: urine PCR</p> <p>Consider endometrial biopsy.</p> <p>White blood cell count may be elevated if febrile.</p> <p>Ultrasound if tubo-ovarian abscess is suspected.</p>	<p>Most compliant patients require only oral therapy.</p> <p>Re-assess all patients on day 3 of treatment. If not improving, consult with a colleague experienced in this area.</p> <p><b>IV therapy:</b></p> <ul style="list-style-type: none"> <li>■ cefoxitin 2 g IV 8 hourly PLUS doxycycline 100 mg IV or orally bid (both for at least 48 hours).</li> </ul> <p><b>Step down from IV therapies:</b></p> <ul style="list-style-type: none"> <li>■ cefixime 400 mg orally bid PLUS doxycycline 100 mg orally bid to complete 14 days of total therapy.</li> </ul> <p><b>Oral therapy:</b></p> <ul style="list-style-type: none"> <li>■ cefixime 800 mg orally in a single dose PLUS doxycycline 100 mg orally bid for 14 days.</li> </ul> <p>See pp. 84-87 for alternative regimens.</p>	<p>Treat all partners who have had sexual contact with the index case within at least 60 days prior to the onset of symptoms with:</p> <ul style="list-style-type: none"> <li>■ cefixime 400 mg PLUS azithromycin 1 g orally in single doses.</li> </ul> <p>Patients and contacts should abstain from unprotected sex until 7 days after treatment of both partners is complete.</p>
<p>➡ Sudden onset: if torsion of the testicle is a possibility, this is a surgical emergency.</p>	<p><b>Urethral swabs for:</b></p> <ul style="list-style-type: none"> <li>■ Gram stain, culture for <i>N. gonorrhoeae</i>, test for <i>C. trachomatis</i>.</li> </ul> <p>Alternative for <i>C. trachomatis</i>: urine PCR</p> <p>Mid-stream urine for bacterial C&amp;S (to look for urinary tract pathogens).</p>	<p><b>Epididymitis due to <i>N. gonorrhoeae</i>/<i>C. trachomatis</i>:</b></p> <ul style="list-style-type: none"> <li>■ cefixime 800 mg orally in a single dose PLUS doxycycline 100 mg bid for 10 days.</li> </ul> <p><b>Epididymitis due to enteric organism:</b></p> <ul style="list-style-type: none"> <li>■ ofloxacin 300 mg orally bid for 10 days.</li> </ul>	<p>Treat all partners who have had sexual contact with the index case within at least 60 days prior to the onset of symptoms with:</p> <ul style="list-style-type: none"> <li>■ cefixime 400 mg orally in a single dose PLUS azithromycin 1 g per os, one dose</li> </ul> <p>STD patients and contacts should abstain from unprotected sex (if sexually transmitted) until 7 days after treatment of both partners is complete.</p>



Syndrome	Who	Organisms and Etiology	Symptoms and Signs
PAPULAR GENITAL LESIONS	<b>At risk:</b> <ul style="list-style-type: none"> <li>■ sexually active males and females</li> </ul>	Human papillomavirus (HPV)  Molluscum contagiosum  Skin tags  Cancer	<ul style="list-style-type: none"> <li>■ growths on anogenital and/or mucous membranes (Condyloma acuminata), frequently multiple and polymorphic</li> <li>■ molluscum lesions may heal spontaneously with or without scarring within 2 to 3 months; infection may last longer and warrant treatment</li> <li>■ non-inflammatory</li> </ul>
PROCTITIS	<b>Most at risk:</b> <ul style="list-style-type: none"> <li>■ men who have sex with men</li> <li>■ history of receptive anal and/or oral-anal sex</li> </ul>	Neisseria gonorrhoeae  Chlamydia trachomatis  Herpes simplex virus (HSV)  Treponema pallidum (syphilis)  Others	<ul style="list-style-type: none"> <li>■ anorectal pain</li> <li>■ with/without discharge</li> <li>■ tenesmus</li> <li>■ erythema and wall ulceration on anoscopy</li> <li>■ pus</li> <li>■ may be perianal herpetic lesions with inguinal adenopathy</li> </ul>

Diagnostic Features	Specimens and Testing	Treatment	Contact Management
<p>Often subclinical or clinically apparent but asymptomatic.</p> <p><b>Warts:</b></p> <ul style="list-style-type: none"> <li>■ cauliflower-like</li> <li>■ usually asymptomatic</li> <li>■ can cause bleeding, pruritus.</li> </ul> <p><b>Molluscum:</b></p> <ul style="list-style-type: none"> <li>■ round umbilicated papule(s).</li> </ul> <p><b>Cancer:</b></p> <ul style="list-style-type: none"> <li>■ chronic lesion especially associated with ulceration or irregular pigmentation.</li> </ul>	<p>Direct examination of external genitalia, magnification by hand lens or colposcope.</p> <p><b>Females:</b></p> <ul style="list-style-type: none"> <li>■ Pap smear if &gt; 1 year since previous.</li> <li>➔ If abnormal, refer to knowledgeable colleague.</li> <li>➔ Biopsy if cancer suspected.</li> </ul>	<p><b>HPV:</b></p> <ul style="list-style-type: none"> <li>■ primarily for cosmetic reasons or for relief of symptoms. Treatment does not eliminate carriage, recurrences, or contagiousness of HPV.</li> </ul> <p><b>Conservative:</b></p> <ul style="list-style-type: none"> <li>■ local treatment with liquid nitrogen or podophyllotoxin.</li> </ul> <p>See pp. 169-171 for equivalent therapies.</p>	<p>All women should be reminded of need for regular Pap smear:</p> <ul style="list-style-type: none"> <li>■ annually until 2 subsequent normal smears are obtained, then</li> <li>■ every 2 or 3 years according to local guidelines.</li> </ul> <p>Patients and contacts should abstain from sexual activity while warts are present, and inform their sex partner(s) that they have genital warts.</p>
<p>Several pathogens are often present concurrently.</p> <p>If diarrhea or abdominal cramping, consult with a colleague experienced in this area.</p>	<p>Anal swab for <i>C. trachomatis</i>/<i>N. gonorrhoeae</i> (DFA/EIA testing technologies not recommended for anus).</p> <p>Swab suspicious lesions for HSV diagnostic test.</p> <p>Syphilis serology.</p> <p>Anal swab for Gram stain.</p> <p>Attempt to minimize stool contamination of swabs.</p>	<p><b>If no indication of HSV:</b></p> <p><b>Treat for proctitis due to <i>N. gonorrhoeae</i>/<i>C. trachomatis</i>:</b></p> <ul style="list-style-type: none"> <li>■ cefixime 400 mg PLUS azithromycin 1 g orally in single doses.</li> </ul> <p><b>If indication of HSV:</b></p> <ul style="list-style-type: none"> <li>■ treat as for HSV (see Genital Ulcer Disease, page 26).</li> </ul>	<p>Test for <i>C. trachomatis</i>/<i>N. gonorrhoeae</i> and, if indicated, treat all contacts back at least 60 days with:</p> <ul style="list-style-type: none"> <li>■ cefixime 400 mg PLUS azithromycin 1 g orally in single doses.</li> </ul> <p>Patients and contacts should abstain from unprotected sex until 7 days after treatment of both partners is complete.</p>

Syndrome	Who	Organisms and Etiology	Symptoms and Signs
GENITAL ULCER DISEASE	<b>Most at risk:</b> <ul style="list-style-type: none"> <li>■ previous genital lesion or STD</li> <li>■ contact with commercial sex workers</li> <li>■ new partner in past 6 months</li> <li>■ sex with person from or in countries where syphilis or chancroid are endemic</li> <li>■ contact to known case of genital ulcer disease</li> </ul>	Herpes simplex virus (HSV).  Treponema pallidum (syphilis)  Haemophilus ducreyi (chancroid)  Lymphoma-granuloma venereum (LGV) and Granuloma inguinale are very rare unless sex with person from or in endemic country.  Non-infectious ulcers.	<b>Genital herpes:</b> <ul style="list-style-type: none"> <li>■ majority of HSV cases may have subtle or unrecognized symptoms/signs</li> </ul> <p>➔ Keep a high index of suspicion.</p> <ul style="list-style-type: none"> <li>■ grouped multiple vesicles → superficial circular ulcers</li> <li>■ smooth margin and erythematous base</li> <li>■ shallow</li> </ul> <p>If atypical see Decision Tree for Genital Ulcers in the Highlights of Canadian STD Guidelines –1998 Edition.</p>
			<b>Syphilis:</b> <ul style="list-style-type: none"> <li>■ papule → chancre</li> <li>■ indurated with serous exudate</li> <li>■ single in 70% of cases</li> <li>■ smooth margin and base</li> </ul>

Diagnostic Features	Specimens and Testing	Treatment	Contact Management
<p><b>Genital herpes:</b></p> <ul style="list-style-type: none"> <li>■ typical ulcers usually painful</li> <li>■ genital pain</li> <li>■ inguinal lymph nodes enlarged, non-fluctuant and tender</li> <li>■ fever and malaise (especially in primary infection)</li> </ul>	<p><b>Genital herpes:</b></p> <ul style="list-style-type: none"> <li>■ Swab base of freshly unroofed vesicle or fresh ulcer for HSV culture.</li> <li>■ Non-culture diagnoses are less accurate.</li> <li>■ Always test for syphilis.</li> </ul>	<p>☞ Topical treatment of no value.</p> <p><b>Genital herpes:</b></p> <p>First episode:  <ul style="list-style-type: none"> <li>■ acyclovir 400 mg tid for 5 to 7 days</li> </ul> <b>OR</b>            famciclovir 250 mg tid for 5 to 7 days  <b>OR</b>            valacyclovir 500-1000 mg bid for 5 to 7 days.</p> <p>Recurrent episode with prodrome:  <ul style="list-style-type: none"> <li>■ acyclovir 400 mg tid for 5 days</li> </ul> <b>OR</b>            famciclovir 125 mg bid for 5 days  <b>OR</b>            valacyclovir 500 mg bid for 5 days.</p> <p>Chronic suppressive therapy:  <ul style="list-style-type: none"> <li>■ acyclovir 400 mg bid orally daily</li> </ul> <b>OR</b>            famciclovir 250 mg bid orally daily  <b>OR</b>            valacyclovir 500 mg orally daily (1 or 2 doses).</p>	<p>Patients and contacts should abstain from sexual activity while lesions are present, and inform their sex partner(s) that they have genital ulcers.</p> <p><b>Genital herpes:</b></p> <ul style="list-style-type: none"> <li>■ provide counselling and explain natural history of disease</li> <li>■ discuss asymptomatic shedding, sexual transmission, and risk of neonatal infection.</li> </ul>
<p><b>Syphilis:</b></p> <ul style="list-style-type: none"> <li>■ ulcers often painless</li> <li>■ firm, enlarged, non-fluctuant, non-tender lymphadenopathy common.</li> </ul>	<p><b>Syphilis:</b></p> <ul style="list-style-type: none"> <li>■ syphilis serology to include non-treponemal (e.g., RPR, VDRL) and treponemal-specific tests (e.g., TP-PA, MHA +/- FTA).</li> <li>■ obtain serous exudate for darkfield or FA exam.</li> </ul>	<p><b>Syphilis:</b></p> <ul style="list-style-type: none"> <li>■ benzathine penicillin G 2,4 to 7,2 million UIM (depending on stage of disease).</li> </ul>	<p><b>Syphilis:</b></p> <p>All partners who have had sexual contact with the index case within 3 to 12 months (depending on stage of disease), must be located, tested and treated appropriately.</p>

Syndrome	Who	Organisms and Etiology	Symptoms and Signs
<b>HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION</b>	<p>All pregnant women should be offered HIV testing and counselling.</p> <p><b>Most at risk:</b></p> <p>Infants born to mothers with HIV infection.</p> <p>Youth and adults who have:</p> <ul style="list-style-type: none"> <li>■ unprotected sex</li> <li>■ sex with person known to be HIV infected</li> <li>■ sex with multiple partners</li> <li>■ anal intercourse</li> <li>■ shared needle-syringe</li> <li>■ history of hepatitis B or other STD</li> <li>■ street involvement.</li> </ul> <p>Persons from endemic countries.</p>	Human Immunodeficiency virus (HIV).	<p>➔ Most cases are asymptomatic.</p>
<b>VAGINAL DISCHARGE</b>	<p><b>Most at risk:</b></p> <ul style="list-style-type: none"> <li>■ any post-pubertal woman.</li> </ul>	<p>Bacterial vaginosis (BV)</p> <p>Yeast</p> <p>Trichomonas vaginalis (now less common)</p> <p>Other/physiologic discharge.</p>	<p><b>BV:</b></p> <ul style="list-style-type: none"> <li>■ amine odour ("fishy"), worse after intercourse</li> <li>■ discharge.</li> </ul> <p><b>Yeast:</b></p> <ul style="list-style-type: none"> <li>■ itching/redness</li> <li>■ clumpy white discharge.</li> </ul> <p><b>T. vaginalis:</b></p> <ul style="list-style-type: none"> <li>■ itching/redness</li> <li>■ discharge.</li> </ul>

Diagnostic Features	Specimens and Testing	Treatment	Contact Management
<p>Seroconversion illness may present with flu-like symptoms, rash and lymphadenopathy.</p> <p><b>Symptomatic infection may include:</b></p> <ul style="list-style-type: none"> <li>■ unexplained and persistent fever, diarrhea, dry cough, weight loss, fatigue</li> <li>■ generalized lymphadenopathy</li> <li>■ recurrent mucocutaneous candidiasis</li> <li>■ new red/purple nodular skin or mucosal lesions (KS)</li> <li>■ encephalopathy</li> <li>■ herpes zoster</li> <li>■ failure to thrive in an infant.</li> </ul>	<p>All requests for HIV testing should be honored.</p> <p>HIV antibody testing should only be carried out with the consent of the person being tested and with appropriate pre-test information and post-test counselling.</p> <p><b>Infants and children:</b></p> <ul style="list-style-type: none"> <li>■ the need for testing the child and the implications of a positive result for the mother should be clearly explained</li> <li>■ direct demonstration of HIV (e.g., PCR) is required to diagnose HIV infection in infants &lt; 18 months born to HIV-positive mothers.</li> </ul>	<p>This is an increasingly complex area with rapid changes in optimal therapy.</p> <p>Recommendations for a given patient should be made in collaboration with a knowledgeable colleague.</p> <p><b>Antiretroviral therapy:</b></p> <ul style="list-style-type: none"> <li>■ three or more drugs are desirable (avoid monotherapy).</li> </ul> <p><b>Prophylaxis:</b></p> <ul style="list-style-type: none"> <li>■ Pneumocystis carinii pneumonia (PCP)</li> <li>■ Mycobacterium avium complex (MAC)</li> <li>■ immunization</li> <li>■ secondary infections.</li> </ul>	<p>Sexual and injection drug use contacts should be counselled and tested.</p>
<p>If recurrent or all tests negative, refer to a knowledgeable colleague.</p> <p><b>BV:</b></p> <ul style="list-style-type: none"> <li>■ pH &gt; 4.5</li> <li>■ whiff test positive</li> <li>■ slide: clue cells</li> <li>■ foul discharge.</li> </ul> <p><b>Yeast:</b></p> <ul style="list-style-type: none"> <li>■ pH ≤ 4.5</li> <li>■ whiff test negative</li> <li>■ slide: yeast or hyphae.</li> </ul> <p><b>T. vaginalis:</b></p> <ul style="list-style-type: none"> <li>■ pH ≥ 5</li> <li>■ slide: trichomonads.</li> </ul>	<p><b>Vaginal swab for:</b></p> <ul style="list-style-type: none"> <li>■ pH test/amine odour whiff test/wet mount/Gram stain.</li> </ul> <p><b>Endocervical swab for:</b></p> <ul style="list-style-type: none"> <li>■ culture for N. gonorrhoeae and</li> <li>■ test for C. trachomatis</li> </ul> <p><b>OR</b></p> <p>urine for C. trachomatis.</p> <p>Fungal cultures are unnecessary in acute infection.</p> <p>Cultures for Gardnerella vaginalis are never useful in diagnosis.</p>	<p><b>BV:</b></p> <ul style="list-style-type: none"> <li>■ metronidazole 500 mg orally bid for 7 days.</li> </ul> <p><b>Yeast:</b></p> <ul style="list-style-type: none"> <li>■ over the counter topical treatment,</li> </ul> <p><b>OR</b></p> <p>fluconazole 150 mg orally in a single dose.</p> <p><b>T. vaginalis:</b></p> <ul style="list-style-type: none"> <li>■ metronidazole 2 g orally in a single dose.</li> </ul>	<p><b>BV:</b></p> <p>Not required.</p> <p><b>Yeast:</b></p> <p>Only if symptoms.</p> <p><b>T. vaginalis:</b></p> <p>Test all contacts back at least 60 days and treat same as index patient.</p>

# PRIMARY PREVENTION OF SEXUALLY TRANSMITTED DISEASE

## GENERAL PRINCIPLES

- it is vastly more effective to prevent than to treat STD and their sequelae.
- actions to promote prevention take little time compared with those required to diagnose and manage STD and their sequelae, and can be conveniently interspersed in the course of routine patient care.
- physicians have a central role in the prevention of STD and in physician-patient contacts should routinely: assure complete confidentiality
  - discuss STD risk
  - plan for STD prevention
  - provide STD screening medical services.

## SEVEN PRACTICE POINTS FOR PRIMARY CARE PROVIDERS

1. Routinely communicate awareness of STD and sexual health concerns
  - be approachable on the topics of STD and sexual health concerns by providing both non-verbal and verbal primary prevention messages:
    - **non-verbal messages:** place STD- or AIDS-related posters, pamphlets, books, or cartoons in the office setting to communicate that you are aware, knowledgeable, and approachable on this topic.
    - **verbal messages:** discuss STD risk and prevention issues with each patient as appropriate.

### For young and adult patients, elements of the following script may be used:

- “Part of my work deals with patients’ sexual health concerns. Of course, everything we talk about is completely confidential.”
- “Are you sexually active?”
- “How many partners have you had during the past year or two?”
- “Do you have sex with men, women, or both?”
- “What are you doing to avoid pregnancy?”
- “What are you doing to avoid STD and AIDS?”
- “If you have any questions about this in the future, you can always ask me.”

**For prepubescent patients, including relatively young children and their parents, you may wish to say:**

“Part of my job involves answering children’s questions about sex. Do you have any? If you ever do, you can always ask me.”

**Note:** It is critical for physicians to recognize and to explain to patients that many individuals engage in serial monogamy. Serial monogamy consists of a series of faithful, monogamous relationships, **one after the other**. Although they may “feel safe” and “look safe”, serially monogamous relationships, with known and committed partners, DO NOT provide protection from STD.

## 2. Provide appropriate information

- **acceptance of sexuality:** individuals must accept the fact that they are or might be 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 stress the corresponding need for STD prevention.
- **easy-to-use advice:** direct advice to always use condoms, or to always abstain from intercourse, together with discussion of plans for reaching and maintaining these goals, may be the safest STD prevention information that can be provided.

- **planning prevention:**

- challenge patients to plan how they will discuss STD preventive actions with their partner(s) and how they will practice safer sex consistently over the long run.

**This could include discussion of plans for:**

- setting and maintaining limits on sexual activity
- initiating and maintaining consistent condom use
- seeking STD/HIV testing with a partner
- dealing with possible partner resistance in these respects.

- assess whether patients know where they can comfortably obtain condoms in their community, if they know how to use condoms correctly (see page 35), if they are aware of the signs of STD and if they know how to seek testing and treatment if needed.

- **beliefs about STD prevention:**

- discuss with patients the widespread belief that STD prevention is not necessary in “monogamous relationships” or with partners who are “known and trusted”. STD risk behaviours occur at **exceedingly** high rates within “monogamous” (actually serially monogamous) relationships with “known and trusted” partners (whose STD or HIV status actually is not known).
- while such “monogamous” relationships may feel safe to both patient and physician, they are not safe, and require consistent condom use until STD/HIV screening and discussions of continued monogamy have taken place.



- **it is not possible for a patient to assess the chances that their partner has an STD on the basis of externally observable clues, and to base STD preventive actions on guesses about whether a partner is infected.**
- it is equally impossible for a primary care provider to assess the chances that a patient or his/her partner has an STD on the basis of externally observable clues, and to base STD prevention care on guesses about whether a patient may be infected.

### 3. Plan and motivate prevention

- create a specific plan for the initiation and maintenance of STD prevention, preferably before STD preventive actions are needed.
  - stress **consistency** (e.g., “Always set sexual limits or always use condoms...”)
  - let patients know that they should feel good about preventive behaviour (e.g., “You can more or less relax and quit worrying when you consistently set limits or consistently use condoms...”)
  - inform patients that they should reward their partner for supporting their prevention activities (e.g., “A supportive partner is hard to find. Let him or her know you appreciate their co-operation...”).
- help motivate patients to practice prevention by:
  - noting the risk of STD (e.g., “Too many of my patients stop using condoms as soon as they go on the pill, and a lot of them end up getting an STD.”)
  - coupling messages about STD risk with reassuring recommendations for preventive behaviour (e.g., “If you tell your boyfriend that I strongly recommend that all my patients continue to use condoms together with the pill, and if you do so, and if you come in for your annual exam, you can reduce your risk and your concern tremendously.”).
- patients who take STD preventive action may have to engage in embarrassing public acts, such as buying condoms, seeking STD/HIV testing, and talking about STD with health care providers. Primary care providers can discuss this with their patients and identify the most “user-friendly” STD prevention resources available.

### 4. Provide appropriate STD prevention medical services

- STD prevention involves more than condoms.

**Offer a range of STD prevention medical services, as appropriate, including the following:**

- routinely discuss STD risk and plan STD prevention with patients.
- counsel about elevated STD risk when prescribing non-barrier contraception.
- routinely offer cervical cancer screening to all female patients; cervical cancer is an STD.

- routinely offer hepatitis B vaccination to patients who are not in a permanent relationship. Hepatitis B is a sexually transmissible disease.
- routinely offer HIV testing, with appropriate pre- and post-test counselling, and discuss the possibility of prevention of mother-to-child transmission with **all** pregnant patients.
- the physician cannot tell which pregnant patients are at risk of HIV on the basis of externally observable clues, nor can the physician tell which pregnant patients have partners who place them at risk.
- routinely offer STD screening to all pregnant patients, as discussed in detail in the chapter on *Issues in Pregnancy* (page 191), noting that STD is a major cause of pre-term labour and contributes to other perinatal complications.

#### 5. Secondary prevention

- **secondary prevention of STD transmission from an infected patient to others is a critical component of the management of STD infection.**
- in cases of chronic carriage of viral STD (e.g., HPV, HSV and HIV), secondary prevention can include patient disclosure to partners, appraising partners of the risks of transmission, steps that can be taken for prevention and of their relative efficacy, and of the possible need for the patient's partner to be monitored for infection.
- secondary prevention can also involve active and ongoing monitoring and encouragement of patient's STD preventive behaviour with a partner (e.g., ongoing discussion and encouragement of prevention in the case of individuals with HIV infection).

#### 6. Establish a referral network

- for assistance in addressing STD and sexual health issues that require specialist attention, the development of a list of "user friendly" colleagues experienced in STD can prove helpful.

#### 7. Self-evaluation

- it can also be helpful to consider how successful you are in discussing sexual health concerns with your patients, to address areas that may need to be strengthened in your approach, and to be on the look out for practices that unintentionally *promote* STD. For example, the prescription of oral contraception without a discussion of the need for barrier contraception can often be the "cause" of serially monogamous patients ceasing condom use and substantially increasing their risk of acquiring STD.

## CONDOMS AND CONDOM USE

- **only abstinence or a truly monogamous relationship between two uninfected partners can ensure the avoidance of STD.**
- **condoms are effective in preventing the majority of STD, including HIV. Transmission of HIV from infected to uninfected partners rarely occurs in HIV serodiscordant couples who consistently use condoms.**
- 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 condom failure include improper or inconsistent use. These can be overcome by following recommendations for proper condom use (see table below).

### Recommendations for the proper use of condoms to reduce the transmission of STD

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 and not under pressure (i.e., do not store in wallet, in automobile or any place where condoms will be exposed to extreme heat or cold).
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 by fingernails, rings, teeth, etc.
5. condoms should be put on before any genital contact to prevent exposure to body fluids that may contain infectious agents.
6. make sure that the condom is placed on the penis so that it will readily unroll and that it is not placed on the penis in “backwards” position which will make it impossible to unroll.
7. 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 ensuring that no air is trapped in the tip.
8. adequate lubrication should be used. If exogenous lubrication is needed, only water-based lubricants such as K.Y. Jelly™ should be used. Petroleum or oil-based lubricants (such as petroleum jelly, cooking oils, shortening, and lotions) should not be used since they weaken the latex.

9. use of condoms with spermicides has been advocated to provide some additional protection against STD; however, if used repeatedly, spermicides may also cause mucous membrane inflammation and facilitate infection and therefore cannot be recommended unequivocally.
10. 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.
11. 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.
12. condoms should never be reused.

**Note:** It is possible to communicate many of these points to patients clearly in a simple demonstration by putting a condom over two fingers.

#### Condoms with spermicides

- the use of condoms with spermicides has been advocated as an STD prevention measure. However, if used repeatedly spermicide use may cause irritation and inflammation of mucous membranes and facilitate HIV infection through the inflamed area and therefore the use of spermicides cannot be recommended unequivocally. Spermicides may also increase risk of urinary tract infections in young women and may lead to modifications of the bacterial flora, leading to bacterial vaginosis and candidiasis.

#### Contraception

- for increased protection against pregnancy other methods of contraception, such as oral contraceptives or an intrauterine device (IUD), should be used in addition to condoms.

#### Allergy to latex

- allergy to latex has been reported. Systemic symptoms such as a rash or an eruption are significant. 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 colleague experienced in this area.

## BARRIERS TO CONDOM USE AND MEANS TO OVERCOME THESE

Perceived Barrier	Intervention Strategy
Decreases sexual pleasure (sensation) <b>Note:</b> Often perceived by those who have never used a condom.	<ul style="list-style-type: none"> <li>■ encourage patient to try.</li> <li>■ put a drop of water-based lubricant or saliva inside the tip of the condom or on the glans of the penis prior to putting on the condom.</li> <li>■ try a thinner latex condom or different brand or more lubrication.</li> </ul>
Decreases spontaneity of sexual activity	<ul style="list-style-type: none"> <li>■ encourage incorporation of condom use during foreplay.</li> <li>■ remind patient that peace of mind may enhance pleasure for self and partner.</li> </ul>
Embarrassing, juvenile, “unmanly”	<ul style="list-style-type: none"> <li>■ remind patient that it is “manly” to protect one’s self and others.</li> </ul>
Poor fit (too small or too big, slips off, uncomfortable)	<ul style="list-style-type: none"> <li>■ smaller and larger condoms are available.</li> </ul>
Requires prompt withdrawal after ejaculation	<ul style="list-style-type: none"> <li>■ reinforce the protective nature of prompt withdrawal and suggest substitution of other post-coital sexual activities.</li> </ul>
Fear of breakage may lead to less vigorous sexual activity	<ul style="list-style-type: none"> <li>■ with prolonged intercourse, lubricant wears off and the condom begins to rub. Have a <b>water-soluble</b> lubricant available to reapply.</li> </ul>
Non-penetrative sexual activity	<ul style="list-style-type: none"> <li>■ condoms have been advocated for use during fellatio; unlubricated condoms may prove best for this purpose due to the taste of the lubricant.</li> <li>■ other barriers such as dental dams or an unlubricated condom cut down the middle to form a barrier have been advocated for use during certain forms of non-penetrative sexual activity (e.g., cunnilingus and anolingual sex).</li> </ul>
Allergy to latex	<ul style="list-style-type: none"> <li>■ polyurethane condoms for women are commercially available in Canada. See page 38.</li> <li>■ a natural skin condom can be used together with a latex condom to protect the male or female from contact with latex.</li> </ul>

PRIMARY PREVENTION OF STD

## 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, including:
  - “Safer Sex Guidelines: Healthy Sexuality and HIV” Canadian AIDS Society (100 Sparks St., Ottawa, Ontario, K1P 5B7), 1994.
  - “Canadian Guidelines for Sexual Health Education” Health Canada, LCDC, (Brooke Claxton Building, Tunney’s Pasture, Ottawa, K1A 1B4), 1994.

- Internet web-site links to:
  - Laboratory Centre for Disease Control, Division of STD Prevention and Control, Bureau of HIV/AIDS and STD <<http://www.hc-sc.gc.ca/hpb/lcdc/bah>>
  - The Safer Sex Page <<http://safesex.org>>.
- the National AIDS Clearinghouse of the Canadian Public Health Association (1565 Carling Ave., Suite 400, Ottawa, Ontario, K1Z 8R1) also distributes a variety of pamphlets, posters, and other safer sex materials which can be of use.
- if you are not aware of a local source of health promotion material, contact the local public health authority or provincial/territorial director of STD control (see *Directors of STD Control*, page 236).

## FUTURE DEVELOPMENTS

- STD prevention is a rapidly evolving field and primary care providers must stay current in this area.

### Female condoms

- the “female condom” (a vaginal pouch) is commercially available and research on its STD and pregnancy prevention characteristics is emerging. Female administered viricides are also under study. These methods offer female controlled alternative STD prevention methods for the future.

### Home HIV tests

- home HIV testing (e.g., home HIV antibody specimen collection kits) may become widely available in Canada in the near future. Primary care providers should become aware of the implications of home HIV testing for their STD prevention counselling practices.

## CLINICAL APPROACH TO THE DIAGNOSIS AND MANAGEMENT OF SEXUALLY TRANSMITTED DISEASE

The purpose of this summary is to provide a clear and general approach to the diagnosis and management of sexually transmitted disease.

- diagnosis and management of STD require the following elements:
  - index of suspicion
  - history
  - physical examination
  - selected testing
  - diagnosis by syndrome or by organism
  - education and counselling
  - therapy (curative and/or palliative)
  - partner notification, partner treatment and counselling for any syndrome or organism transmitted predominantly by the sexual route
  - management of co-morbidity
  - follow-up.

### INDEX OF SUSPICION

- suspicion of STD in a patient requires an understanding of prevailing epidemiology and an assessment of individual risk.
- recent trends in the epidemiology of STD in Canada are as follows:

Disease	Prevalence in clinical practice	Trend in incidence
Chlamydia	common	slow decline
Pelvic inflammatory disease	common	slow decline
Gonorrhea	no longer common	recent dramatic decline
Syphilis	now rare	recent dramatic decline
Chancroid	exceedingly rare in Canada	-
Granuloma inguinale	exceedingly rare in Canada	-
Genital warts and/or human papillomavirus (HPV)	common	no clear trend to decline
Genital herpes	common	increase

Disease	Prevalence in clinical practice	Trend in incidence
Human immunodeficiency virus (HIV) infection	low to moderate	steady or increasing
Hepatitis B	low to moderate	slow decline with immunization
Hepatitis A	moderate	stable

- individual risk includes the following list of known behaviours associated with **increased risk of STD:**

**Any patient whose current or past history falls into one or more of these categories is considered to be most at increased risk of STD:**

- sexual contact with person(s) with known STD
- youth < 25 years of age with multiple partners
- street involvement (e.g., homelessness)
- intercourse with new partner in last 2 months
- more than two sexual partners in previous 12 months
- no contraception or non-barrier methods
- injection drug use – injection drug users are at high risk of HIV/HBV/HCV as well as other STD
- persons immigrating from or having sex in countries where certain STDs are currently epidemic, and their sexual partners
- men who have sex with men
- commercial sex workers, including “survival sex” (exchanging sex for money, drugs, shelter or food).

## COMPONENTS OF HISTORY-TAKING

- information should be requested in a simple, non-judgmental manner using language understandable to the patient.
- history should enquire into both genital and systemic symptoms associated with STD, review personal risk factors (see above) and knowledge of increased risk of STD, relevant drug treatments, allergies, and other elements of a general history.
- when HIV testing is entertained, pre-test counselling (see page 176) is often best accomplished during history-taking.
- ask about last menstrual period and most recent Papanicolaou (Pap) smear.



## PHYSICAL EXAMINATION AND SPECIMEN COLLECTION

- physical examination may be embarrassing for some patients. Therefore, physicians should develop a trusting environment
  - some patients may feel more comfortable having an assistant of the same gender present
  - all patients should be assured that confidentiality will be maintained at all times.

## COMPONENTS OF PHYSICAL EXAMINATION AND SPECIMEN COLLECTION IN YOUNG AND ADULT MALES (For prepubertal males, see Child Sexual Abuse, page 201)

### Physical examination

- general assessment.
- search for systemic signs of STD.
- inspect mucocutaneous regions, including pharynx.
- inspect external genitalia for cutaneous lesions, inflammation, urethral discharge and anatomical irregularities. When foreskin is present, retract it to inspect the glans.
- palpate inguinal lymph nodes and scrotal contents with attention to the epididymis. Have the patient or examiner “milk” the urethra to make any discharge more apparent.
- perform a perianal inspection.
- consider digital rectal examination and anoscopy if patient has practised receptive anal intercourse or has rectal symptoms.

### Laboratory tests

#### Tests useful in anyone most at increased risk, regardless of symptoms:

- urethral swabs for:
  - chlamydia test; urine specimen acceptable if nucleic acid tests (e.g., polymerase chain reaction [PCR], ligase chain reaction [LCR]) are used
  - gonorrhea culture
- throat and rectal swabs for gonorrhea (if indicated)
- HIV antibody test.

**Additional tests in certain clinical settings:**

**Syphilis serology if:**

- immigrating from or having sex in countries where syphilis is currently epidemic
- commercial sex worker
- symptoms suggestive of any stage of syphilis
- known contact to syphilis.

**If genital ulcers are present:**

- obtain a herpes culture
- specimen for direct examination for syphilis if lesions are suggestive of that diagnosis
- syphilis serology (see above)
- if contact from endemic area, consider *H. ducreyi*.

**Hepatitis B serology if:**

- immigrating from or having sex in countries where hepatitis B is highly endemic
- man who has sex with men
- commercial sex worker
- injection drug user
- street involved youth
- known contact to hepatitis B.

**Hepatitis C serology if:**

- blood product recipient prior to 1992
- injection drug user (current or past history of injection drug use).

**If urethritis symptoms present:**

- obtain a urethral swab for Gram stain.

**COMPONENTS OF PHYSICAL EXAMINATION AND SPECIMEN COLLECTION IN YOUNG AND ADULT FEMALES (For prepubertal females, see Child Sexual Abuse, page 201)**

Physical examination

- general assessment.
- search for systemic signs of STD.
- inspect mucocutaneous regions, including pharynx.
- inspect external genitalia for cutaneous lesions, inflammation, urethral discharge and anatomical irregularities. Be sure to separate labia so as to adequately visualize vaginal orifice.
- palpate inguinal lymph nodes.
- perform a perianal inspection.
- consider digital rectal examination and anoscopy if patient has practised receptive anal intercourse or has rectal symptoms.
- perform an illuminated speculum examination to visualize cervix, vaginal walls and to evaluate endocervical and vaginal discharges. Obtain specimens as indicated below.

- perform a bimanual pelvic examination to detect uterine or adnexal masses or tenderness.

**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.

## Laboratory tests

### Tests useful in anyone most at increased risk, regardless of symptoms:

- cervical swabs for:
  - chlamydia test; urine specimen acceptable if nucleic acid tests (e.g., PCR, LCR) are used
  - gonorrhea culture
- Pap smear if one has not been performed in the preceding 12 months (see page 52)
- throat and rectal swabs for gonorrhea (if indicated)
- HIV antibody test
- vaginal swab for Gram stain and trichomonas slide.

**Note:** If patient has had a hysterectomy, substitute urethral swabs for cervical swabs.

### Additional tests in certain clinical settings:

- pregnancy test if menstrual history is suggestive.

#### Syphilis serology if:

- immigrating from or having sex in countries where syphilis is currently epidemic
- commercial sex worker
- symptoms suggestive of any stage of syphilis
- known contact to syphilis.

#### If genital ulcers are present:

- obtain a herpes culture
- specimen for direct examination for syphilis if lesions are suggestive of that diagnosis
- syphilis serology (see above)
- if contact from endemic country, consider *H. ducreyi*.

#### Hepatitis B serology if:

- immigrating from or having sex in countries where hepatitis B is highly endemic
- commercial sex worker
- injection drug user
- street youth
- known contact to hepatitis B.

#### Hepatitis C serology if:

- blood product recipient prior to 1992
- injection drug user (current or past history of injection drug use).

**If clinical cervicitis is present:**

- obtain a cervical swab for Gram stain for intracellular diplococci.

**If vaginal discharge or irritation is a complaint:**

- collect vaginal specimens (smears/swabs) for pH test, amine odour/whiff test, wet mount, Gram stain.
- see *Vulvovaginitis in Youth and Adults*, page 88.

## Notes on other tests

- most patients who are at ongoing risk for STD should be immunized against hepatitis B. Routine screening for hepatitis B serology prior to immunization is not recommended. The main value of screening for hepatitis B is to detect chronic carriers so that medical follow-up and protection of contacts can be initiated. This is indicated in persons at increased risk of STD since chronic carriers are rare outside these communities.
- type-specific serological testing to indicate past exposure to Herpes simplex virus type 1 or 2 is not routinely indicated (see *Genital HSV Infections*, page 162). It should be considered for such purposes as:
  - identifying when pregnant women with no history of herpes are at risk of primary herpes infection from a partner
  - counselling long-term partners about sexual behaviour when it is unclear if both are infected with HSV-2
  - consultation with a colleague experienced in this area should be sought.
- although useful if gram-negative intracellular diplococci (*N. gonorrhoeae*) are demonstrated, counting polymorphonuclear cells on cervical smears is of little diagnostic benefit.
- vaginal cultures for *Gardnerella vaginalis*, *Ureaplasma urealyticum* and *Mycoplasma hominis* are of no diagnostic value.
- quantitative culture and speciation of yeast offers little information beyond what is available from stained smears, except if considering oral prophylaxis for recurrent candidiasis.
- the clinical role of genotyping for HPV is not established; it may prove useful in future years.

## SPECIAL CONSIDERATIONS IN SCREENING

## Pregnancy

- all pregnant women must be **offered** screening for HBs Ag and HIV testing.
- pregnant women should be screened for chlamydia and those at increased risk of STD should also be screened for gonorrhoea at first visit and may require repeat screening later if they have had additional exposure.
- see *Issues in Pregnancy*, page 191.

## Neonates

- neonates with potential or perinatal exposure to STD should be evaluated.
- consultation with a colleague experienced in this area should be sought.

## Sexual assault and abuse

- see *Sexual Abuse and Sexual Assault*, page 201.

## Donors

- donors of blood, tissues, organs, sperm and ova must routinely be screened for HIV, HBV, HCV and syphilis.
- in addition, initial and repeat screening of semen donors should include at a minimum:
  - history of increased high risk behaviour
  - urine or urethral specimens for *N. gonorrhoeae* and *C. trachomatis*
  - semen is not released unless repeat HIV antibody test at 6 months is negative.

## DIAGNOSIS BY SYNDROME OR BY ORGANISM

- the results of microbiologic testing are not immediately available in most offices. When particular symptoms and signs are present, a syndromic diagnosis may be made (see *Summary Table 2*, page 20) and treatment initiated.
- when microbiologic results are available, treatment should be directed at specific pathogens (see appropriate section(s)).

## PATIENT EDUCATION AND COUNSELLING

- identifying a person at risk for STD provides an opportunity for discussing barriers to risk reduction and means to overcome these.
- one-to-one education in this setting can be an important contribution to patient welfare and public health.
- see *Primary Prevention of STD*, page 31.
- patients and partners should abstain from unprotected intercourse until 7 days after treatment of both partners is complete (e.g., 7 days after single dose therapy).
- HIV testing should always be accompanied by pre- and post-test counselling as described on pages 176-177.

## PARTNER NOTIFICATION, PARTNER TREATMENT AND COUNSELLING

### Rationale

- partner notification is the process through which sexual partners and other contacts exposed to STD are identified, located, assessed, tested, treated epidemiologically and counselled with regard to prevention.
- contacts include sexual partners, parents of infected neonates, needle-sharing partners and people who may be involved in cases of child sexual abuse.
- partner notification, treatment and counselling are indicated for any infection or syndrome that is predominantly transmitted sexually. This not only produces a public health benefit (e.g., disease surveillance and control) but dramatically reduces the risk of re-infection for the original patient.
- laws and regulations in all provinces and territories require physicians to report specific diseases. For more information on specific reportable diseases in your region, contact your local public health unit (see page 236).
- while partner notification is sometimes construed as an exercise in societal vs. individual rights, its aim is clearly to assist people in honouring the individual rights of their partners to knowledge, health, and in some cases, life.

### Who performs partner notification?

- partner notification may be done by patients, health care providers or public health authorities
  - “patient referral” may be an acceptable alternative to “provider referral” (described below). Patient referral involves patients informing their own partners without the direct involvement of health care providers or public health authorities.
  - “provider referral” involves the notification of partners by health care providers and/or public health authorities and has shown higher rates of success in reaching partners.
- public health authorities are responsible for ensuring that partners are notified and managed.
- if your patient does not wish to notify contacts or if contacts have not come forward:
  - explore impediments to partner notification (see below)
  - inform the patient of your ethical imperative to safeguard others
  - report to public health authorities.

### Components of partner notification

- request a notification form for STD from the local public health unit.
- discuss the importance of partner notification with the patient.
- develop a notification plan including which partners will be notified by whom. Stress that:

- in the case of provider referral, partner notification is done without revealing the name of the index case to partners
- you are available to participate in discussions with partners.
- obstacles to partner notification must be discussed
  - individual cases should be assessed for physical and emotional abuse which may result from partner notification (e.g., conjugal violence, loss of employment, etc.)
  - individuals applying for Canadian citizenship (e.g., immigrants, refugees) may have specific concerns.
- sexual abuse of children must be reported to your local child protection agency.
- youth and adult cases of sexual assault and abuse should be counselled and/or referred to local crisis centres.
- all contacts of persons with curable STD (e.g., gonococcal and chlamydial infections, syphilis) should be notified and treated for the same condition as the index case.

#### How far back in time should you go?

Gonococcal infections, chlamydial infections, cervicitis, urethritis, PID	<ul style="list-style-type: none"> <li>■ 60 days</li> <li>■ if no partner in the last 60 days, to the last partner</li> </ul>
Syphilis	<ul style="list-style-type: none"> <li>■ 3 to 12 months prior to the development of symptoms, depending on the stage of the disease (see page 159)</li> </ul>
HIV	<ul style="list-style-type: none"> <li>■ start with recent contacts</li> <li>■ outer limit is onset of risk behaviour</li> </ul>
Hepatitis B carrier or acute infection	<ul style="list-style-type: none"> <li>■ all sexual and syringe-sharing contacts.</li> </ul>

- patients with genital herpes and patients with genital warts should be encouraged to notify their partner(s). Partners should be examined and counselled appropriately (see *Genital HSV Infections*, page 160, and *Genital Warts and Genital HPV Infections*, page 167).

- every effort must be made to ensure that all contacts of persons with HIV are notified, counselled and tested, since rapid initiation of antiretroviral therapy is associated with a better prognosis. This is best performed by physician and patient. If contacts are difficult to locate, many public health units offer a confidential service to assist you in this process, or consult a colleague experienced in this area. Once a person living with HIV is diagnosed with AIDS, an AIDS case report form should be completed.

## Confidentiality

- there are ethical, 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. It may be required that personal information of a reported case of an STD be forwarded, in confidence, to provincial public health authorities
  - where required by law (e.g., Criminal Code)
  - reporting of sexual abuse to child protection agencies
  - concerns about confidentiality must not impede the partner notification process.
- confidentiality applies to all persons, including:
  - infected persons
  - sexual partners
  - all youth who are competent to understand their infection and care
  - providers should apprise themselves of policies of provincial or territorial health insurance plans to guard against inadvertent disclosure to family.

## MANAGEMENT OF CO-MORBIDITY

- many STDs are transmitted in the context of other medical and social challenges.
- recurrent problems are likely unless underlying issues are dealt with.
- specific management for conditions such as drug addiction and mental illness must be integrated into the overall health care plan.



# LABORATORY DIAGNOSIS OF SEXUALLY TRANSMITTED DISEASES

## SPECIMEN COLLECTION AND TRANSPORT

### General Principles

- the swabs, transport systems, and types of tests used may vary depending on the agent sought and techniques used by the laboratory.
- laboratories may use a variety of commercial specimen collection devices. Follow the instructions provided by the manufacturer.
- contact the laboratory to obtain further information if needed.
- **for children, see page 204.**

### Specimen Collection and Submission

- in all cases physicians should ensure that:
  - appropriate collection device is used
  - specimens are obtained under optimal conditions
  - adequate specimen is collected
  - specimens are correctly labelled
  - delays in transporting specimens are avoided
  - specimens are transported under appropriate temperature conditions.

#### **In cases of sexual abuse/assault:**

- alert the laboratory to the nature of the investigation
- carefully label all specimens with the patient's name and site of collection
- document in the medical chart the site and type of specimen collected
- if indicated, arrange to have a full forensic examination (see *Forensic Evidence and Services*, page 229)
- if collecting a urine specimen, verify that amplified nucleic acid tests (e.g., PCR, LCR) are available for *C. trachomatis* and *N. gonorrhoeae*
- ensure that the laboratory methods used and the results are carefully documented
- ensure isolates and leftover samples are preserved for future reference.

### Collection of Urethral Specimens

- obtain urethral specimen with meatal or intraurethral swabs depending on the agent sought and the amount of discharge.
- “milking” the penis 3 or 4 times from the base to the glans enhances urethral discharge.
- discharge from the meatus is an ideal specimen for *N. gonorrhoeae* but not for *C. trachomatis*.
- when meatal exudate is absent, use intraurethral swab for the detection of *C. trachomatis* and *N. gonorrhoeae*.
- some laboratories may offer amplified nucleic acid tests (e.g., PCR, LCR) which allow for examination of urine for *C. trachomatis*, and in some cases, for *N. gonorrhoeae*.
- **in prepubertal boys and girls, collection of intraurethral specimen is NOT recommended; obtain urine specimens for amplified nucleic acid tests or obtain a meatal specimen using a thin swab with flexible wire shaft.**

#### To obtain an intraurethral specimen (post-pubertal patients only)

- inform the patient that obtaining the specimen may be painful and that the next urination may be painful
- ideally, the patient should not have voided for at least 2 hours, as voiding reduces the amount of exudate and may decrease the ability to detect organisms
- use thin swab with flexible wire shaft
- moistening the swab with water before insertion may help reduce discomfort
- introduce swab slowly (3 to 4 cm in males; 1 to 2 cm in females), rotate slowly, and withdraw gently
- use the swab to prepare a smear (described on page 56), and then directly inoculate appropriate culture medium, or place the swab in transport medium
- if amplified nucleic acid tests are used, follow the manufacturer’s instructions.

#### To obtain urine for amplified nucleic acid tests

- provide the patient with a leak-proof container
- ask the patient to collect only the first 10 to 15 ml of urine into the container and to cap it tightly
- patient should not have voided for at least 2 hours but this does NOT preclude testing.

#### To obtain a meatal specimen

**Note:** Obtaining a swab from the meatus usually produces transient discomfort.

- insert swab 1 to 2 cm into the meatus, rotate slowly, and withdraw gently
- use swab to prepare a smear (described on page 56), and then directly inoculate appropriate culture medium, or place the swab in transport medium
- if amplified nucleic acid tests are used, follow the manufacturer's instructions.

#### Collection of Cervical Specimens

- obtain specimen for *N. gonorrhoeae* BEFORE taking specimen for *C. trachomatis*.
- columnar epithelial cells are optimal for *C. trachomatis*. Overlying vaginal secretions and endocervical mucus should be removed by swabbing.
- obtaining several specimens from the cervix does not usually produce discomfort and may be required to perform various tests.
- in addition, a urethral/meatal specimen should be obtained when urethral discharge is present.
- **cervical specimens should NOT be taken from prepubertal girls since sexually transmitted infections in this age group involve the vagina, not the cervix.**

#### To obtain a cervical specimen

- insert a speculum to view the cervix
- remove overlying vaginal secretions
- insert a sterile cotton tipped swab 1 to 2 cm into the endocervical canal and rotate. Detection may be enhanced by using Cytobrush™ (Cytobrush™ not approved for use in pregnant women).
- rotate for 10 to 30 seconds and withdraw
- use the swab to prepare smear (see page 55-56), and directly inoculate culture medium, or place the swab in transport medium.

**Preparation of a Papanicolaou (Pap) smear**

- sample ectocervix with spatula by rotating it 360° x 2. Place specimen on one side of slide, DO NOT smear yet
- sample endocervix with Cytobrush™ by rotating 180° x 1 (not wiping). Roll Cytobrush™ with moderate pressure over ectocervical specimen smearing both ecto- and endocervical samples across the slide.
- immediate fixation of smear is essential; spray smear quickly with cytology fixative or air dry

**Note:** Evaluation of smears is unreliable in the presence of blood (e.g., menstruation).

- for women who have had a hysterectomy, specimens for *C. trachomatis* and *N. gonorrhoeae* may be obtained from the urethra, the vagina and the anus.

**Collection of Vaginal Specimens**

- **vaginal specimens are generally NOT recommended for the laboratory diagnosis of STD**
  - EXCEPT in the management of vulvovaginitis (see page 91) and child sexual abuse (see page 204).
- wet mount and Gram stained smears are useful in the diagnosis of vulvovaginitis, candidiasis, bacterial vaginosis and trichomoniasis.
- collection of vaginal specimens from youth and adults is usually done as part of a speculum examination.
- in prepubertal girls, vaginal wash specimens are most preferred and patient acceptable. If not possible, use swabs moistened with water.
- in very young children, use very thin swabs.

**To obtain a vaginal specimen**

- if present, collect pooled vaginal secretions
- if not, swab the vaginal wall in the posterior fornix, prepare a smear (see page 56), or place the swab in transport medium.

**Preparation of a wet mount for trichomonas, yeast and clue cells**

- place several drops of saline on a slide before collecting the specimen
- obtain the vaginal swab, use the swab to test the pH, then
- rotate the swab in the saline
- cover the saline preparation with a cover-slip
- immediately examine by microscopy.

### Potassium hydroxide (KOH) preparation

- for a KOH preparation, use the same technique as for the wet mount except use 10% potassium hydroxide instead of saline.

### Collection of Rectal Specimens

- specimens may be obtained blindly or through an anoscope. The latter is preferred for symptomatic patients.
- rectal specimens can only be processed for culture.

#### To obtain a rectal specimen

- for blind swabbing, the swab is inserted 2 to 3 cm into the anal canal, pressed laterally to avoid fecal material and, in the case of *C. trachomatis*, to obtain columnar epithelial cells
- if there is visible fecal contamination, discard swab and obtain another specimen
- with anoscopy, fecal contamination can be avoided and specimens can be collected under direct visualization.

### Collection of Pharyngeal Specimens

- pharyngeal specimens can only be processed for culture.
- at present, there are insufficient data on the performance of non-culture tests using pharyngeal specimens.
- for diagnosis of gonorrhea, standard culture and transport media are NOT optimal (see page 56).

#### To obtain a pharyngeal specimen

- swab the posterior pharynx and the tonsillar crypts
- use the swab to directly inoculate appropriate culture medium, or place it in transport medium
- in infants, obtain a nasopharyngeal aspirate.

### Collection of Specimens from Lesions

#### Herpes simplex virus (HSV)

- in symptomatic patients, vesicular fluid is the preferred specimen for culture.

**For the detection of HSV in symptomatic patients****Vesicles:**

- the fluid can be obtained by lifting the top from the vesicle and swabbing the lesion.

**Ulcers:**

- warn that specimen collection may hurt
- swab the lesion bed for culture and direct examination
- for direct examination:
  - obtain cellular material by firm swabbing or gentle scraping from the base of the lesion.
  - prepare smears, air dry, fix with acetone and submit promptly.
- for culture:
  - use the swab and viral transport medium supplied with the collection kit from the laboratory. Use of other swab may decrease likelihood of detection.

- DO NOT collect specimens 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.

**For the detection of HSV in asymptomatic patients****Women:**

- use a swab moistened with viral transport medium
- rub clitoral hood, labia minora, labia majora, perineum and perianal region, and place the swab in transport medium.

**Neonates:**

- use a swab moistened with viral transport medium
- gently rub conjunctiva, insert into mouth and gently rub around the lips, external ear canal, umbilicus, axillae and groin, and place in transport medium.
- specimens should be collected at 24 to 48 hours after birth.

## Treponema pallidum (syphilis)

- **contact the laboratory to obtain appropriate supplies and instructions.**

### For the detection of *T. pallidum* by dark-field microscopy or direct fluorescent antibody testing (DFA)

- remove scabs or overlying debris
- cleanse the lesion with sterile saline without preservatives
- dry the area; abrade the lesion with a dry sterile gauze pad to provoke slight bleeding and exudation of tissue fluid
- as oozing occurs, wipe away the first few drops and await the appearance of relatively clear serous exudate. It is sometimes necessary to apply pressure at the base of the lesion to express tissue fluid
- collect fluid into a capillary tube, or small bore syringe
- seal tube or cap syringe and immobilize plunger before transportation
- ensure dark-field examination is done as soon as possible after collection of material
- for fluorescent antibody staining, prepare smears (described below), air dry, and forward to the laboratory. Alternatively, exudate may be sent to the laboratory in a capillary tube.

**Note:** In cases of pregnant women suspected of syphilis, at birth sections of placenta should be collected and sent for direct fluorescent antibody testing.

## Haemophilus ducreyi (chancroid)

- **contact the laboratory to obtain appropriate supplies and instructions.**

### For detection of *H. ducreyi*

- cleanse the lesion of exudate
- obtain swab from the base of a lesion avoiding pus
- direct plating on appropriate culture medium is recommended.

## Preparing Smears for Staining (e.g., Gram stain, fluorescent antibody)

- 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.
- DO NOT spread the smear more than 1 cm<sup>2</sup> on the slide.
- for Gram stain (see page 56) 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. Air dry and fix the smear with the fixative provided.

## Gram stain technique

- if at all possible, seek the advice and assistance of an experienced laboratory technologist.
- a satisfactory result will depend on an adequate specimen, appropriate reagents and technique, as well as experience in interpreting the findings.
- if performing Gram stain, use commercially available Gram stain kit.

### Gram stain technique

- air dry then fix smear with methanol or by passing through a flame
- flood slide with crystal violet
- after 10 seconds gently wash slide with water
- flood slide with iodine
- after 10 seconds wash slide with water
- decolourize with acetone/alcohol and wash immediately with water so that there is no more than 10 seconds contact time with decolourizer
- flood with safranin or basic fuschin for 10 seconds and rinse with water
- blot slide dry with filter paper and examine under oil immersion (x 1000).

## Transport of Specimens

- **in all instances, read and follow the instructions provided by the laboratory/manufacturer.**
- optimal transport conditions vary with the specimen and the type of test being done.
- sexually transmitted pathogens are usually fastidious and fragile. Therefore, cultures and techniques that detect viable organisms may give false-negative results unless transport conditions are optimal
  - in general, transport **MUST** be as rapid as possible, with excesses of temperature avoided (i.e., room temperature is recommended for transport)
  - for *C. trachomatis* and *T. vaginalis* culture, transport specimens under refrigeration
  - for *N. gonorrhoeae*, nutritive and non-nutritive systems are commonly used, do **NOT** refrigerate
  - for Herpes simplex virus use transport under refrigeration but **DO NOT FREEZE**.



## LABORATORY DIAGNOSIS OF GONOCOCCAL INFECTIONS

- culture is preferred.
- culture for *N. gonorrhoeae* is required for the determination of antimicrobial susceptibility, in cases of sexual abuse/assault and in cases of treatment failure.
- demonstration of intracellular gram-negative diplococci by Gram stain provides presumptive diagnosis.
- **non-culture methods such as amplified nucleic acid tests (e.g., PCR, LCR) and enzyme immuno assay (EIA) are only recommended when adequate culture cannot be performed due to delays in transport of specimens.**
- serology is NOT available.

### Detection of Intracellular Gram-negative Diplococci

- the Gram stained smear is the preferred method for the direct microscopic identification of *N. gonorrhoeae*.
- the presence of Gram-negative diplococci inside polymorphonuclear leukocytes (PMNs) is highly predictive; their presence outside PMNs is NOT, and confirmation by culture is required.
- sensitivity and specificity of the Gram stain depends on the type of specimen. Urethral specimens from young and adult males have a sensitivity and specificity of 95%; endocervical specimens from adult females have a sensitivity of 45% to 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.

### Culture

- successful culture of specimens requires proper collection and transportation of appropriate specimens.
- where facilities permit, specimens should preferably be directly inoculated onto appropriate non-selective and/or selective media (supplied by the laboratory).
- alternatively, the swab must be placed into appropriate transport medium and submitted.
- two transportation 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 8 hours of collection
  - nutritive (e.g., Jembec or Transgrow media), which must be used for transport over longer periods (8 to 48 hours) and should be pre-incubated at 35° C for 18-24 hours prior to transport.

### Non-culture Methods

- DO NOT require viable organisms and are an ideal method when delays in transportation cannot be avoided.
- DO NOT provide the organism needed for antimicrobial susceptibility testing.
- suitable only for urethral and cervical specimens, and for urine only if nucleic acid tests are used (e.g., PCR).
- amplified nucleic acid tests (e.g., PCR, LCR) are NOT recommended as “test-of-cure” at less than 3 weeks following completion of therapy.
- for medico-legal purposes, a positive result obtained from amplified nucleic acid tests should be confirmed using a different set of primers.

## LABORATORY DIAGNOSIS OF CHLAMYDIAL INFECTIONS

- results are highly dependent on the type of test available, appropriate specimen collection and transport, and laboratory expertise.
- **contact the laboratory for specific instructions before submitting specimens and read and follow test kit instructions regarding specimen collection and transport.**

### Culture

- culture was traditionally considered the preferred method of laboratory diagnosis, especially for medico-legal purposes, as it is more specific than non-culture tests.
- culture has been replaced in recent years by antigen detection and other non-culture tests which do not require stringent transport conditions to preserve specimen viability, are amenable to batching and automation, and have turnaround times of 4 hours and less.

### Amplified Nucleic Acid Tests

- amplified nucleic acid tests (e.g., PCR, LCR), have been shown to be more sensitive and 98% to 100% specific compared to culture, especially when specimen transport is difficult.
- suitable for medico-legal purposes provided that positive results are confirmed using a different set of primers.
- false-positive results are rare. False-negative results may occur due to inhibitors in the specimen.
- non-invasive specimens such as urine can be used, making testing more acceptable to patients.
- both *C. trachomatis* and *N. gonorrhoeae* can be detected from a single specimen.
- these tests do not require specimen viability but transport conditions vary.  
**Consult the laboratory regarding specimen collection and transport instructions.**

### Nucleic Acid Probe Tests

- less sensitive than amplified nucleic acid tests.
- room temperature transport.
- both *C. trachomatis* and *N. gonorrhoeae* can be detected from a single specimen.
- NOT recommended for medico-legal purposes.

## Antigen Detection Tests

### Enzyme Immunoassay (EIA)

- false-positive results may occur, especially in low prevalence populations. All positive results **MUST** be confirmed with a blocking assay or direct fluorescent antibody assay.
- cannot determine adequacy of specimens.
- room temperature transport.
- **NOT** recommended for medico-legal purposes or for rectal/nasopharyngeal/urine specimens.

### Direct Fluorescent Antibody Assay (DFA)

- more sensitive than EIA but false-positive results may occur as reading of results is subjective. Therefore, **NOT** recommended for low prevalence populations or medico-legal purposes.
- presence of epithelial cells allows determination of specimen adequacy.
- room temperature transport.
- result may be available in 30 minutes upon receipt of specimen.
- **NOT** recommended for rectal or urine specimen.

### Serology

- *C. trachomatis* IgM serology is useful for diagnosing *C. trachomatis* pneumonia in infants < 3 months of age.
- serology is rarely useful for the diagnosis of acute genital chlamydial infections in youth and adults.
- elevated levels of IgG to *C. trachomatis* in infertile women may be suggestive of upper genital tract infection. Elevated levels of IgG to the lymphogranuloma venereum (LGV) serotypes of *C. trachomatis* may be suggestive of LGV infection. Consultation with a colleague experienced in this area should be sought.

## LABORATORY DIAGNOSIS OF HERPES SIMPLEX VIRUS (HSV) INFECTIONS

### Serology

- serology is NOT a substitute for detection of the agent.
- type-specific serologic testing to indicate past exposure to *Herpes simplex* virus type 1 or 2 has limited clinical application (see *Genital HSV Infections*, page 162). It should be considered for such purposes as:
  - identifying when pregnant women with no history of herpes are at risk of primary herpes infection from a partner
  - counselling long-term partners about sexual behaviour when it is unclear if both are infected with HSV-2
  - consultation with a colleague experienced in this area should be sought.

### Laboratory Detection Method

- culture remains the preferred laboratory diagnostic method unless specimen viability may be affected during transport.

Test		Sensitivity %	Specificity %	Comments
Culture	Standard method	> 99%	100%	<ul style="list-style-type: none"> <li>■ preferred method</li> <li>■ 75% specimens are positive by 2 days</li> <li>■ isolates can be stored</li> <li>■ typing can be done</li> </ul>
	Rapid method (shell vial culture)	85%	100%	<ul style="list-style-type: none"> <li>■ requires centrifugation</li> <li>■ allows overnight antigen detection</li> <li>■ typing can be done</li> </ul>
Antigen detection methods (EIA, DFA, IFA)		50-90%	65-90%	<ul style="list-style-type: none"> <li>■ NOT for cervical specimens</li> <li>■ NOT for specimens from asymptomatic patients</li> <li>■ typing can be done</li> </ul>
Cytologic methods (TZANCK)		40-60%	100% for herpes virus group	<ul style="list-style-type: none"> <li>■ swab from base of vesicle/ulcer preferred for testing</li> <li>■ detects cytopathic changes</li> <li>■ typing can NOT be done</li> </ul>
Polymerase Chain Reaction (PCR)		> 99%	> 99%	<ul style="list-style-type: none"> <li>■ useful in CNS HSV infections (e.g., Cerebro-spinal fluid as sample)</li> </ul>

## LABORATORY DIAGNOSIS OF HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION

### Serology

- HIV antibody serology is the standard method for routine diagnosis of HIV infection in individuals older than 18 months of age.
- a screen test, usually an enzyme immunoassay (EIA), is routinely carried out. If it is repeatedly reactive or yields an equivocal result, a confirmatory supplemental test such as Western blot or immunofluorescent antibody assay (IFA) is done on the same sample.
- HIV antibody is detectable in at least 97% of infected individuals within 3 months of initial infection, and 99% at 6 months.
- HIV antibody tests cannot rule out infection that occurred less than 6 months before the test.

### HIV Serology Interpretation

- HIV antibody test results are reported as: reactive, non-reactive or indeterminate:

#### Confirmed repeatedly reactive results:

- indicate the presence of HIV antibodies which is the result of HIV infection or passive transmission from mother to infant.
- a person who tests as antibody positive should be re-tested using a second sample.

#### Non-reactive results:

- indicate the absence of HIV antibodies
- a person in the “window” period (between the initial infection and the detection of antibodies) may test antibody negative.

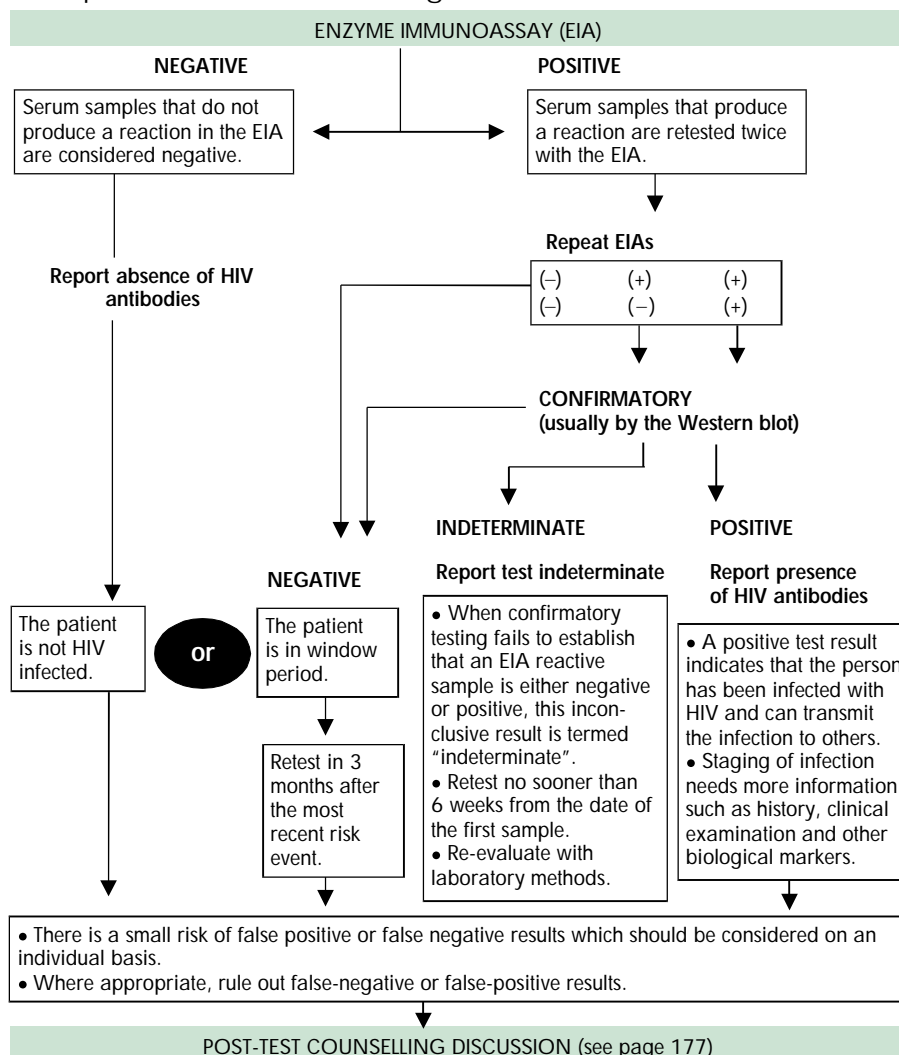
#### Indeterminate results:

- indicate that screen test is repeatedly reactive BUT the confirmatory test yields results that are neither positive nor negative
- a person with indeterminate results should be re-tested after a 3 to 6 month interval.

- a positive enzyme immunoassay (EIA) must be verified by a second independent assay, usually the Western blot.
- specialized procedures might have to be used to resolve the ambiguity of the antibody test results.
- due to the persistence of passively transferred maternal HIV antibody, a positive HIV antibody in a child < 18 months of age is not diagnostic of HIV infection. Tests such as p24 antigen assay, PCR for HIV, and virus culture can distinguish infected children (see page 64).

- repeatedly reactive screen tests not confirmed by a second independent assay occasionally occur. This represents non-specific false-positive results. If at risk, such persons should be re-tested after a 3 to 6 month interval.
- For diagnosis of HIV infection, HIV antigen, amplified nucleic acid tests (e.g., PCR), viral culture, and viral load determinations are carried out only in special situations. HIV viral load determinations are normally reserved for determining prognosis and assessing the impact of anti-retroviral therapy.

### Interpretation of HIV testing<sup>(a)</sup>



**Note:** (a) Adapted, with permission from the publisher, from Counselling guidelines for HIV testing, Canadian Medical Association, 1995; pp. 12.

## Antigen Detection

- HIV antigen can be detected by p24 antigen assays.
- p24 antigen is detectable before the appearance of HIV antibody. Therefore, it is useful for early diagnosis of HIV infection (i.e., in the window period) when antibody is not detectable.
- the p24 antigen test is useful in confirming infection in HIV antibody-positive infants.
- current assays are not very sensitive. Therefore, while a positive antigen test may be helpful, a negative test provides little reassurance that a patient is not in the “window period”.

## Amplified Nucleic Acid Detection and Quantitative Viral Load Measurement

- **contact the laboratory for specific instructions before submitting specimens.**
- extremely sensitive but has limited application in routine diagnosis of HIV infection.
- useful in the following special situations:
  - in infants born to HIV-positive mothers, amplified nucleic acid detection (e.g., PCR) is presently the diagnostic test of choice
  - monitoring progression of HIV disease, therapeutic decisions and assessing response to treatment
  - molecular epidemiologic studies.

## Culture

- **contact the laboratory for specific instructions before submitting specimens.**
- not a routine procedure; expensive and slow.
- useful in the evaluation of HIV infection status of infants born to HIV-positive mothers, and when serologic results are inconclusive.
- peripheral blood mononuclear cells (PBMC) and cerebrospinal fluid (CSF) are the preferred specimens for viral culture.



## LABORATORY DIAGNOSIS OF SYPHILIS

- direct detection of *Treponema pallidum* by dark-field microscopy or fluorescent antibody test is useful when a lesion is present.
- culture is NOT possible.
- in neonates with known or suspected congenital syphilis, collect cerebrospinal fluid (CSF) before starting treatment.

### Dark-field Microscopy/Fluorescent Antibody Test

- **contact the laboratory for specific instructions before submitting specimens.**
- performed on serous fluid expressed or vigorously scraped from lesion to detect *T. pallidum*.

Advantages:	Disadvantages:
<ul style="list-style-type: none"><li>■ both provide rapid results</li><li>■ both may give a positive finding when serologic test results are still negative</li><li>■ direct fluorescent antibody test is useful for oral and rectal lesions.</li></ul>	<ul style="list-style-type: none"><li>■ dark field microscopy needs immediate examination and expertise; false-negative results may occur when medications and systemic antimicrobials have been used</li><li>■ dark field NOT useful for oral/rectal lesions.</li></ul>

### Serology

- serologic testing is the most commonly used procedure in the diagnosis and is useful in follow-up of syphilis.
- sensitivity and specificity of serologic tests vary depending on the type of test performed and the stage of the disease.
- serologic testing is the only method for detecting latent and tertiary syphilis.
- amplified nucleic acid tests (e.g., PCR) may be available in some laboratories. Contact the laboratory for more information.
- there are two types of serologic tests carried out: non-treponemal tests and treponemal-specific tests.

### Non-treponemal tests

- first line tests used for screening; detect antigens that are NOT specific to treponemes. Tests include: venereal disease research laboratory test (VDRL), rapid plasma reagin test (RPR), automated reagin test (ART), toluidine red unheated serum test (TRUST), reagin screening test (RST) and enzyme immunoassay (EIA).

#### Advantages:

- rapid and technically simple
- VDRL test is useful for evaluation of CSF
- useful as 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 to 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 page 67)
- false-negative results in up to 40% of cases of primary syphilis and 25% of cases of untreated late latent syphilis.

### Treponemal-specific tests

- supplemental tests used for confirming non-treponemal test results; measure antibodies to cellular components of treponemes. Tests include: *Treponema pallidum* particle agglutination test (TP-PA), fluorescent treponemal antibody absorption test (FTA-ABS), and microhemagglutination for *Treponema pallidum* (MHA-TP).

#### Advantages:

- confirmation of non-treponemal test results
- FTA-ABS is highly sensitive and the first serologic test to give a positive result in infectious syphilis.

#### Disadvantages:

- cross reaction with non-venereal treponematoses (i.e., yaws, pinta and non-venereal syphilis)
- not beneficial in the evaluation of CSF
- not useful for assessing response to treatment or monitoring re-infection.

Sensitivity and specificity of serologic diagnosis of syphilis

Type of test	Stage of disease: Sensitivity % <sup>(a)</sup>				Specificity %
	Primary	Secondary	Early Latent	Late/Tertiary	
<b>Non-treponemal</b>					
■ VDRL	78 (59-87)	100	95 (88-100)	71 (37-94)	98 (96-99)
■ RPR	86 (77-100)	100	98 (95-100)	73	98 (93-99)
■ RST	82 (77-86)	100	95 (88-100)	—	97
■ TRUST	85 (77-86)	100	98 (95-100)	—	99 (98-99)
<b>Treponemal</b>					
■ MHA-TP	76 (64-90)	100	97 (94-100)	97 (94-100)	99 (98-100)
■ FTA-ABS	86 (70-100)	100	100	96	97 (94-100)

**Note:** (a) Figures in parenthesis indicate range.

## Causes of false-positive serologic tests for syphilis

### Non-treponemal tests

#### ■ infectious causes:

- bacterial endocarditis
- chancroid
- chickenpox
- infectious mononucleosis
- leprosy
- lymphogranuloma venereum
- malaria
- measles
- Mycoplasma pneumoniae
- pneumococcal pneumonia
- rickettsial disease
- tuberculosis
- viral hepatitis
- cross-reaction with other treponemal infections (yaws and pinta).

#### ■ non-infectious causes:

- advanced malignancy
- advancing age
- chronic liver disease
- connective tissue disease (e.g., SLE)
- injection drug use
- multiple myeloma
- pregnancy.

### Treponemal-specific tests

#### ■ infectious causes:

- cross-reaction with other treponemal infections (yaws and pinta)
- genital herpes
- infectious mononucleosis
- leprosy
- Lyme disease
- malaria.

#### ■ non-infectious causes:

- systemic lupus erythematosus
- thyroiditis.

## MANAGEMENT AND TREATMENT OF SPECIFIC SYNDROMES

### URETHRITIS

#### Definition

- inflammation of the urethra with or without a mucoid, mucopurulent, or purulent urethral discharge.
- an increased number of polymorphonuclear leukocytes (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 and/or signs of unexplained pyuria in a prepubertal boy or a young male who is not sexually active, sexual abuse must be considered (see Child Sexual Abuse, page 201).
- pyuria with a negative urine culture in prepubertal boys may be due to sexually transmitted urethritis.

#### Special considerations in women

- urethral infection by *C. trachomatis* or *N. gonorrhoeae* is not uncommon with or without concomitant cervicitis.
- symptoms may include dysuria and urinary frequency and thus may mimic cystitis.
- pyuria with a negative urine culture in sexually active women may be due to sexually transmitted urethritis.

#### Etiology

- important causes:
  - *Chlamydia trachomatis*
  - *Neisseria gonorrhoeae*.
- other causes:
  - *Ureaplasma urealyticum* – frequently present but its detection is not by itself an indication for treatment (see *Cautions*, page 71)
  - *Trichomonas vaginalis* – infrequent
  - *Herpes simplex virus* (HSV) infection – rare without genital lesions

**Note:** Infections may be present without symptoms/signs or PMN response; but if present, treatment is required.

## Diagnostic Features

- any of the following should prompt evaluation for urethritis:

	Children	Youth and adults
<b>Symptoms</b>	<ul style="list-style-type: none"> <li>urethral discharge</li> <li>burning on urination</li> <li>irritation in the distal urethra or meatus</li> <li>unwillingness to void</li> <li>enuresis</li> <li>vague lower abdominal pain</li> </ul>	<ul style="list-style-type: none"> <li>urethral discharge</li> <li>burning on urination</li> <li>irritation in the distal urethra or meatus</li> </ul>
<b>Signs</b>	<ul style="list-style-type: none"> <li>urethral discharge (frequent)</li> <li>meatal inflammation (infrequent)</li> <li>unexplained pyuria in youth or adults</li> <li>staining in underwear.</li> </ul>	

## Specimen Collection and Laboratory Diagnosis in Youth and Adults

**Note:** for prepubertal children see *Collection of Urethral Specimens*, page 50.

- 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 2 hours.

WITH meatal discharge:	WITHOUT meatal discharge:
<ul style="list-style-type: none"> <li>swab the discharge to prepare a slide for a stained smear (usually Gram stain) and other diagnostic tests for <i>N. gonorrhoeae</i></li> <li>if amplified nucleic acid testing (e.g., PCR, LCR) is available, the first 10 to 15 ml of any void urine is an adequate specimen for chlamydia (see page 50)</li> <li>if no PCR/LCR available, obtain an endourethral swab (inserted 3 to 4 cm) for a diagnostic test for <i>C. trachomatis</i>.</li> </ul>	<ul style="list-style-type: none"> <li>obtain endourethral swab for a slide for a stained smear (usually Gram stain) and other diagnostic tests for <i>N. gonorrhoeae</i></li> <li>if amplified nucleic acid testing (e.g., PCR, LCR) is available, the first 10 to 15 ml of any void urine is an adequate specimen for chlamydia (see page 50)</li> <li>if no PCR/LCR available, obtain endourethral swab (inserted 3 to 4 cm) for a diagnostic test for <i>C. trachomatis</i>.</li> </ul>

### Cautions

- young males and females with urethritis may be erroneously diagnosed with urinary tract infection.
- detection of *U. urealyticum* is not by itself an indication for treatment
  - routine culture for *U. urealyticum* is not indicated for diagnosis and never for screening since isolation in culture cannot alone prove 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 *Epididymitis*, page 100; *Genital Ulcer Disease*, page 108, and *Prostatitis*, page 103).
- in the absence of external lesions, a yeast infection is not a cause of urethritis.

### Consideration for Other STDs

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- HIV testing and counselling are recommended (see page 176).
- immunization against hepatitis B is recommended (see page 120).
- consider obtaining a blood sample for serologic testing of syphilis (see page 150).

### Management and Treatment

- directly observed therapy with single dose regimens is desirable to guarantee compliance.
- management and treatment depend on the availability of results of the stained smears.

Results Not Yet Available	
<b>Urethral discharge detected</b>	<p>Treat as for urethritis due to <i>N. gonorrhoeae</i> and <i>C. trachomatis</i>:</p> <p><b>9 years or older:</b></p> <ul style="list-style-type: none"> <li>■ cefixime 400 mg orally in a single dose PLUS azithromycin 1 g orally in a single dose OR doxycycline 100 mg orally bid for 7 days<sup>(b)</sup></li> </ul> <p><b>under 9 years:</b></p> <ul style="list-style-type: none"> <li>■ cefixime 8 mg/kg orally in a single dose (max. 400 mg) PLUS azithromycin 12-15 mg/kg orally in a single dose (max. 1 g) OR erythromycin 40 mg/kg in divided doses (max. 500 mg qid) for 7 days.</li> </ul> <p><b>Note:</b> For alternative regimens see <i>Gonococcal Infections</i>, page 145.</p>
<b>No urethral discharge detected</b>	<ul style="list-style-type: none"> <li>■ defer antimicrobial treatment until the microbiologic results are available <ul style="list-style-type: none"> <li>– if the results are positive, treat according to the results (see section on specific disease).</li> </ul> </li> <li>■ if the history suggests a high risk of infection, consider treating as for urethritis due to <i>N. gonorrhoeae</i> and <i>C. trachomatis</i> if appropriate follow-up cannot be assured.</li> </ul>
Results Available	
<b>Smear shows increased numbers of PMNs<sup>(a)</sup> and Gram-negative intracellular diplococci</b>	<p>Treat for urethritis due to <i>N. gonorrhoeae</i> and <i>C. trachomatis</i>:</p> <p><b>9 years or older:</b></p> <ul style="list-style-type: none"> <li>■ cefixime 400 mg orally in a single dose PLUS azithromycin 1 g orally in a single dose OR doxycycline 100 mg orally bid for 7 days<sup>(b)</sup></li> </ul> <p><b>under 9 years:</b></p> <ul style="list-style-type: none"> <li>■ cefixime 8 mg/kg orally in a single dose (max. 400 mg) PLUS azithromycin 12-15 mg/kg orally in a single dose (max. 1 g) OR erythromycin 40 mg/kg in divided doses (max. 500 mg qid) for 7 days.</li> </ul> <p><b>Note:</b> For alternative regimens see <i>Gonococcal Infections</i>, page 145.</p>



<p><b>Smear shows increased number of PMNs<sup>(a)</sup> but no intracellular diplococci</b></p>	<p>Treat for non-gonococcal urethritis:</p> <p><b>9 years or older:</b></p> <ul style="list-style-type: none"> <li>■ azithromycin 1 g orally in a single dose OR doxycycline 100 mg orally bid for 7 days<sup>(b)</sup></li> </ul> <p><b>under 9 years:</b></p> <ul style="list-style-type: none"> <li>■ azithromycin 12-15 mg/kg orally in a single dose (max. 1 g) OR erythromycin 40 mg/kg/day orally in divided doses (max. 500 mg qid) for 7 days<sup>(b, c)</sup></li> </ul> <p><b>Note:</b> For alternative regimens see <i>Chlamydial Infections</i>, page 136.</p>
<p><b>Smear shows a mean of 4 PMNs in 5 fields (x 1000)</b></p>	<p>Defer antimicrobial treatment until the microbiologic results are available:</p> <ul style="list-style-type: none"> <li>■ if the results are positive, treat according to the results (see section on specific disease).</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>■ if the history suggests a high risk of infection, consider treating for urethritis due to <i>N. gonorrhoeae</i> and <i>C. trachomatis</i> if appropriate follow-up cannot be assured.</li> </ul>

**Notes:**

- a) A mean of  $\geq 4$  PMNs per field (x 1000) in 5 fields.
- b) Doxycycline is less expensive but compliance with treatment regimens with azithromycin is better, especially in high risk populations such as street youth.
- c) Erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations may be substituted.

Prevention

- 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.
- at time of diagnosis of STD, review and monitor prevention practices.
- identify barriers to prevention practices and the means to overcome these.
- see *Primary Prevention of STD*, page 31.
- patients and contacts should abstain from unprotected intercourse until treatment of both partners is complete (i.e., 7 days after single dose therapy).

## Reporting and Partner Notification

- 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 at least 60 days prior to the onset of symptoms should be located, clinically evaluated and treated appropriately. Persons treated for gonococcal infections should also be treated for chlamydia.
- local public health authorities are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.
- testing of partner(s) for causes of urethritis may assist in the diagnosis and screening of the index case.

## Follow-up

- if a recommended treatment is given and taken for *N. gonorrhoeae* and *C. trachomatis*, 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.
- children should be re-tested (see page 209).
- 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.

## CERVICITIS IN YOUTH AND ADULTS

### Definition

- inflammation of the cervix with a mucopurulent or purulent cervical discharge AND an increased number of polymorphonuclear leukocytes (PMNs) in endocervical secretions.
- the criteria for defining cervicitis, especially when signs are minimal, are not 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.
- the majority of cervical chlamydia infections do not present with frank mucopurulent or purulent cervical discharge.

### Caution

- the above clinical findings are insensitive for diagnosis of chlamydial and gonococcal infections. Specific tests are required for women most at risk.
- sexually active women are “**at risk**” for cervicitis.
- women “**most at risk**” include:
  - contact of known case of STD
  - street involved
  - substance use
  - new or 2 partners in past 6 months
  - previous STD.

### Special considerations in children

- cervicitis does not occur in prepubertal girls. The counterpart is prepubertal vaginitis (see *Prepubertal Vaginitis*, page 95).

### Etiology

- most important known causes of cervicitis are:
  - *Chlamydia trachomatis*
  - *Neisseria gonorrhoeae*.
- *C. trachomatis* and *N. gonorrhoeae* infections are frequently present without symptoms, signs 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.
- *Ureaplasma urealyticum* and *Mycoplasma hominis* do not cause cervicitis.

## Diagnostic Features

- any of the following should prompt evaluation for cervicitis in youth and adults:

<b>Symptoms</b>	<ul style="list-style-type: none"> <li>vaginal discharge</li> <li>lower abdominal pain of recent onset</li> <li>intermenstrual, postcoital or prolonged abnormal vaginal bleeding</li> <li>deep dyspareunia</li> </ul>
<b>Signs</b>	<ul style="list-style-type: none"> <li>purulent or mucopurulent cervical discharge</li> <li>induced mucosal bleeding on taking the first endocervical swab</li> <li>if ectopy is present, edema and erythema in the area of ectopy.</li> </ul>

### Notes:

- these signs are best detected during the non-menstrual phase.
- neither symptoms nor signs are very sensitive or specific indicators.

## Specimen Collection and Laboratory Diagnosis

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

### Genital examination

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

### Endocervical specimens

- obtain endocervical swabs for a slide for a gram stained smear and for diagnostic tests for *N. gonorrhoeae* and *C. trachomatis*.
- swab cervical lesions for a diagnostic test for HSV if infection suspected.

### Papanicolaou (Pap) smear

- take a Pap smear if one has not been performed in the preceding 12 months, especially if follow-up is uncertain (see *Preparation of a Pap Smear*, page 52).

### Vaginal specimens

- collect smears/swabs for: pH test, amine odour whiff test, wet mount, and Gram stain (see *Vulvovaginitis in Youth and Adults*, page 91).

### Bimanual examination

- perform a bimanual examination to detect signs of pelvic inflammatory disease (see *Pelvic Inflammatory Disease*, page 80)

### Consideration for Other STDs

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- HIV testing and counselling is recommended (see pages 175-178).
- immunization against hepatitis B is recommended (see page 121).
- consider obtaining a blood sample for serologic testing of syphilis (see pages 151-154).

### Notes:

- detection of *C. trachomatis* may be enhanced by using 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*.
- *U. urealyticum* and *M. hominis* are not proven causes of cervicitis and should not be looked for by culture.

### Cautions

- signs of uterine or adnexal tenderness or mass on examination, or of fever in women in whom a diagnosis of cervicitis is being considered should be evaluated for PID (see page 80).
- 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 *U. urealyticum* or *M. 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 woman's risk for chlamydial and gonococcal infections, and the availability of results of a stained smear of endocervical secretions at the initial visit.
- directly observed therapy with single dose regimens is desirable to guarantee compliance.

<p><b>“Most at risk” (see page 75) OR Gram stain shows Gram-negative intracellular diplococci</b></p>	<p>Treat for <i>N. gonorrhoeae</i> and <i>C. trachomatis</i>.</p> <ul style="list-style-type: none"> <li>■ cefixime 400 mg orally in a single dose PLUS azithromycin 1 g orally in a single dose OR doxycycline 100 mg orally bid for 7 days<sup>(a)</sup></li> </ul> <p><b>Note:</b> For alternative regimens see <i>Gonococcal Infections</i>, page 145.</p>
<p><b>“At risk” (see page 75) AND No mucopurulent or purulent endocervical discharge and no Gram-negative intracellular diplococci</b></p>	<ul style="list-style-type: none"> <li>■ defer antimicrobial treatment until the microbiologic results are available</li> <li>■ if the results are positive, treat according to the results (see chapter on specific disease).</li> </ul>
<p><b>Clinical presentation compatible with cervical <i>Herpes simplex virus (HSV) infection</i></b></p>	<ul style="list-style-type: none"> <li>■ consider treatment for HSV infection (see <i>Genital HSV Infections</i>, page 160).</li> </ul>
<p><b>Note:</b> (a) compliance with treatment regimen is better with azithromycin than with doxycycline. None of these drugs is recommended for use during pregnancy. Cefixime or ceftriaxone PLUS amoxicillin 500 mg tid for 7 days should be used in pregnancy (see <i>Gonococcal Infections</i>, page 196, and <i>Chlamydial Infections</i>, page 194).</p>	

### Prevention

- 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.
- at time of diagnosis of STD, review and monitor prevention practices.
- identify barriers to prevention practices and the means to overcome these.
- see *Primary Prevention of STD*, page 31.
- patients and contacts should abstain from unprotected intercourse until treatment of both partners is complete (i.e., 7 days after single dose therapy).

### Reporting and Partner Notification

- 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, all partners who have had sexual contact with the index case within at least 60 days should be located, clinically evaluated and treated with the same regimen as the index case. 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 are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.

#### 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 treated in pregnancy should be re-tested.
- in patients with clinically or microbiologically documented treatment failure, possibilities include:
  - failure to take medication correctly
  - a false-positive test result
  - re-exposure to an untreated partner
  - infection acquired from a new partner
  - infection with other pathogens
  - a non-infective etiology.

## 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 found even if there are few or no symptoms or signs of acute PID.**

### Etiology

- in the majority of cases, PID is polymicrobial. Pathogens vary with clinical setting.

STD pathogens	Non-STD pathogens	Other organisms
<ul style="list-style-type: none"> <li>■ <i>Chlamydia trachomatis</i></li> <li>■ <i>Neisseria gonorrhoeae</i></li> </ul>	<ul style="list-style-type: none"> <li>■ anaerobes including <i>Bacteroides</i> species and <i>Peptostreptococcus</i> species</li> <li>■ <i>Escherichia coli</i></li> <li>■ <i>Streptococcus agalactiae</i></li> <li>■ <i>Haemophilus influenzae</i>.</li> </ul>	<p>Role has not been firmly established for:</p> <ul style="list-style-type: none"> <li>■ <i>Mycoplasma hominis</i></li> <li>■ <i>Ureaplasma urealyticum</i></li> <li>■ <i>Gardnerella vaginalis</i>.</li> </ul>

### Special considerations in children

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

### Epidemiology

- PID incidence is not well measured and is underestimated. In 1993-1994, there were an estimated 100 000 cases of PID with 8500 hospital admissions recorded in Canada. Increasingly, PID cases are treated as outpatients; therefore, decreasing rates of hospital admissions should be interpreted with caution.
- females 20 to 34 years of age have the highest rates of hospitalization for PID.
- outpatient visits estimated in 1990 to be at least 460 per 100 000 women.
- The rate of ectopic pregnancy, a sequelae of PID, rose steadily from the early 1970's to 1993 when the rates declined slightly and this modest downward trend has continued until 1994: the limits of the current data. In 1993 there were 7920 incidences of ectopic pregnancy in Canada (16,89 per 1000 pregnancies). However, improved diagnostic capabilities in recent years has meant that increasing numbers of ectopic pregnancies have been treated on an outpatient basis; as current statistics are taken from hospitalization data, reported numbers of ectopic pregnancies in Canada in recent years may be an underestimate of the real numbers.



### Diagnostic Features

- keep a high index of suspicion.
- any of the following should prompt evaluation for PID in sexually active youth and adults:

<b>Symptoms</b>	<ul style="list-style-type: none"> <li>■ none but at increased risk for STD (see page 40)</li> <li>■ lower abdominal pain of recent onset</li> <li>■ heavy menstrual, inter-menstrual or post-coital vaginal bleeding</li> <li>■ deep dyspareunia</li> <li>■ vaginal discharge that is not readily explained.</li> </ul>
<b>Signs</b>	<ul style="list-style-type: none"> <li>■ cervical motion tenderness</li> <li>■ adnexal tenderness on bimanual examination, with or without a mass</li> <li>■ cervicitis (purulent cervical exudate is present in 30% of PID cases)</li> <li>■ fever present in &lt; 40% of cases.</li> </ul>

- in addition, the following should prompt evaluation for PID:
  - previous episode of PID
  - presence of an intrauterine device (IUD)
  - recent upper tract instrumentation.
- **a negative ultrasound does not rule out diagnosis.**

### Major sequelae

- tubal infertility.
- ectopic pregnancy.
- chronic pelvic pain.

**Note: Women who have had an episode of PID have a 10-fold increased risk of recurrent PID, an 8-fold increased risk of ectopic pregnancy, and a 10-fold increased risk of tubal infertility.**

### Specimen Collection

#### Genital examination

- perform a speculum vaginal examination, ensuring adequate visualization of the cervical 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*. Urine samples should also be collected if amplified nucleic acid tests are used.
- evaluation of smear for PMNs is not valid during menstruation.
- swab cervical lesions for a diagnostic test for HSV if HSV infection suspected.

### Papanicolaou (Pap) smear

- take a Pap smear if one has not been performed in the preceding 12 months, especially if follow-up is uncertain (see *Preparation of a Pap Smear*, page 52).

### Vaginal specimens

- obtain vaginal smears/swabs for: pH test, amine odour whiff test, wet mount, and Gram stain (see *Vulvovaginitis in Youth and Adults*, page 88).

### Bimanual examination

- perform a bimanual examination to detect adnexal tenderness and/or mass.

### Laboratory Diagnosis

- **negative laboratory results do not rule out the diagnosis of PID.**
- if urine is negative, the serum level of  $\beta$ -human chorionic gonadotropin (HCG) should be determined to exclude pregnancy.
  - ultrasound is indicated if tubo-ovarian abscess is suspected. Ultrasound may be normal and does NOT rule out PID. Detection of tubo-ovarian abscess requires immediate referral and hospitalization.
- 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.
- detection of *C. trachomatis* and *N. gonorrhoeae* may be enhanced by using amplified nucleic acid tests (e.g., PCR, LCR) (see *Laboratory Diagnosis*, pages 57; 59).
- 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. However, in many cases PID may be present when these tests are normal.

### Considerations for Other STDs

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- HIV testing and counselling are recommended (see page 173).
- immunization against hepatitis B is recommended (see page 121).
- consider obtaining a blood sample for serologic testing of syphilis (see page 151).

### Management

- **it is essential to differentiate PID from other diseases but PID 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.**

- **for complicated or recurrent cases consultation with a colleague experienced in this area should be considered.**

#### **Hospitalize, give parenteral therapy and refer to a colleague experienced in this area when:**

- cannot rule out surgical emergency (e.g., ectopic pregnancy, appendicitis) OR
- tubo-ovarian abscess OR
- severe illness OR
- failed oral therapy OR
- patient does not tolerate oral medication.

#### **Consider for hospitalization with observed oral or parenteral therapy:**

- HIV infection OR
- youth (particularly if compliance to treatment regimen is an issue) OR
- pregnancy.

#### **Outpatient management is acceptable when typical findings are present AND:**

- there is mild to moderate illness AND
- patient can tolerate oral medications AND
- patient is judged likely to comply with treatment regimen and follow-up BUT
- **ALL PATIENTS TREATED AS OUTPATIENTS SHOULD BE RE-EVALUATED 48 TO 72 HOURS AFTER THE INITIAL ASSESSMENT**
- **THOSE WHOSE CONDITION HAS NOT IMPROVED MUST BE ADMITTED TO HOSPITAL, REASSESSED FOR ALTERNATIVE DIAGNOSES AND PARENTERAL THERAPY AND EVALUATED BY A COLLEAGUE EXPERIENCED IN THIS AREA.**

## Special Considerations

### Youth with PID

- hospitalization may be necessary for youth if compliance with both medical regimens and appointments is expected to be a problem and optimal treatment cannot be guaranteed on an outpatient basis.
- if a youth is treated as an outpatient, treatment regimens should be as simple as possible to aid compliance.

### Patients with an intrauterine device (IUD)

- IUD should not be removed until after therapy is initiated and at least 2 doses of antibiotics have been given.
- 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 is necessary when IUD is removed.

### Pregnant women

- may require hospitalization because of the need to consider other diagnoses.
- PID is rare in pregnancy, especially after the first trimester.

### Immunocompromised women

- women with HIV infection have an increased risk of developing PID and tubo-ovarian abscesses, and may have a delayed response to treatment.
- women with HIV and PID should be referred to a colleague experienced in HIV care. Assessment and treatment must be done expeditiously.

## Treatment

- therapy is directed against major pathogens with a combination of antimicrobial agents. Single antimicrobial regimens are NOT adequate for PID.
- all therapeutic regimens should be highly effective against *N. gonorrhoeae*, *C. trachomatis* and anaerobes.
- the sequelae of PID are serious and, therefore, strong consideration should be given to using a comprehensive regimen on discharge from hospital and for outpatient treatment.
- **for pregnant women, see page 86.**

## Youth and Adults (except pregnant women)

**Parenteral Therapy<sup>(a)</sup>****Preferred:**

- cefoxitin<sup>(b)</sup> 2 g IV 8 hourly  
PLUS doxycycline 100 mg IV or orally bid  
both for at least 48 hours after substantial clinical improvement has occurred.

**Alternative:**

Especially in women with adnexal mass formation consider using:

- clindamycin 900 mg IV 8 hourly  
PLUS gentamicin 1.5 mg/kg IV 8 hourly  
both for at least 48 hours after substantial clinical improvement (serum gentamicin concentrations should be monitored).

**Notes:**

- a) All parenteral therapies should be followed by a regimen from “*Step down from IV therapy*” for at least 14 days (see next box).
- b) 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.

**Step Down From Parenteral Therapy****Preferred:**

- doxycycline 100 mg orally bid to complete at least 14 days of treatment  
PLUS cefixime 400 mg orally bid to complete at least 14 days of treatment

**Alternatives:**

- ofloxacin 400 mg orally bid to complete at least 14 days of treatment<sup>(a)</sup>

For women with adnexal mass formation, tubo-ovarian abscess, peritonitis or increased risk of anaerobes consider adding:

- metronidazole 500 mg orally bid to complete at least 14 days of treatment<sup>(b)</sup>  
OR clindamycin 300 mg orally tid to complete at least 14 days of treatment.

**Notes:**

- a) Oral ofloxacin has been studied as a single agent and is effective against both *N. gonorrhoeae* and *C. trachomatis*. Despite these results, there is concern related to ofloxacin’s lack of anaerobic coverage; the addition of metronidazole provides this coverage.
- b) Advise patients taking metronidazole NOT to take any alcoholic beverages during therapy and for 48 hours post-treatment to prevent “antabuse-like” reaction.

**Oral Therapy****For patients with mild to moderate disease:**

- cefixime 800 mg orally in a single dose PLUS doxycycline 100 mg orally bid for 14 days.

**For patients with moderate to severe disease:**

- regimen listed in “*Step down from IV therapy*” (see previous page)

OR

- amoxicillin/clavulanic acid with amoxicillin component 500 mg tid for 14 days.

**Treatment of PID in Pregnant Women**

- PID is rare after the first trimester.
- Erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations (EXCEPT estolate) may be substituted. **Erythromycin estolate is contraindicated.**

**Parenteral Therapy****Preferred:**

- clindamycin 900 mg IV 8 hourly  
PLUS gentamicin 1,5 mg/kg IV 8 hourly  
both for at least 48 hours after substantial clinical improvement (serum gentamicin concentrations should be monitored).

**Alternative:**

- cefoxitin 2 g IV 8 hourly  
PLUS erythromycin 250 mg qid orally in divided doses  
both for at least 48 hours after substantial clinical improvement has occurred.

**Step Down From Parenteral Therapy****Preferred:**

- erythromycin 250 mg qid orally in divided doses to complete at least 14 days of treatment PLUS cefixime 400 mg orally bid to complete at least 14 days of treatment.

For women with adnexal mass formation, tubo-ovarian abscess, peritonitis or increased risk of anaerobes consider adding:

- clindamycin 300 mg orally tid to complete at least 14 days of treatment.

### Oral Therapy

#### Preferred:

- cefixime 800 mg orally in a single dose  
PLUS erythromycin 250 mg qid orally in divided doses to complete at least 14 days of treatment

OR if not tolerated:

- amoxicillin/clavulanic acid with amoxicillin component 500 mg tid for 14 days.

### Prevention

- **all patients with PID should be counselled regarding their future risk of PID, tubal infertility, and ectopic pregnancy.**
- 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.
- at time of diagnosis of STD, review and monitor prevention practices.
- identify barriers to prevention practices and the means to overcome these.
- see *Primary Prevention of STD*, page 31.
- patients and contacts should abstain from unprotected intercourse until treatment of both partners is complete.

### Reporting and Partner Notification

- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority.
- all partners who have had sexual contact with the index case within at least 60 days prior to the onset of symptoms should be located, clinically evaluated and treated appropriately.
- a high proportion of infected male partners may be asymptomatic.
- local public health authorities are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.

### Follow-up

- patients receiving oral or parenteral therapy should show substantial clinical improvement (e.g., decreased fever, decreased abdominal tenderness, decreased uterine, adnexal and cervical motion tenderness) within 3 days of initiated therapy. If not improving, further work-up is essential.
- all PID patients on outpatient therapy need a follow-up exam within 72 hours to confirm if clinical improvement has occurred and in 7 to 10 days to determine the complete resolution of findings on bimanual examination.

## VULVOVAGINITIS IN YOUTH AND ADULTS

The only documented STD which causes vulvovaginitis is *Trichomonas vaginalis*. However, the diagnosis and management of all types of vulvovaginitis is an important component of assessing a woman who presents with genital symptoms.

### Definition

- inflammation of the vulva, vagina, or both, and/or abnormal vaginal discharge not due to cervicitis.
- when there is infectious etiology, vulvovaginitis is caused by a disruption of the normal lactobacilli dominant flora of the vagina.

### Etiology

#### Infectious causes

Vulvitis	Vaginitis/vaginosis
<ul style="list-style-type: none"> <li>■ <i>Candida</i> species and other yeasts</li> <li>■ <i>Herpes simplex</i> virus (HSV) infection</li> </ul>	<ul style="list-style-type: none"> <li>■ 40% of cases are mixed infections or physiological discharge.</li> <li>■ 30% caused by bacterial vaginosis                             <ul style="list-style-type: none"> <li>– overgrowth of <i>Gardnerella vaginalis</i>, <i>Mycoplasma hominis</i>, anaerobes (<i>Bacteroides</i>, <i>Mobiluncus</i>) with depletion of lactobacilli</li> <li>– associated with an increased risk of puerperal and post-surgical pelvic infections, PID, and premature delivery.</li> </ul> </li> <li>■ 25% caused by candidiasis                             <ul style="list-style-type: none"> <li>– <i>Candida albicans</i> (85-90%)</li> <li>– <i>Torulopsis glabrata</i>, other <i>Candida</i> species and other yeast overgrowth.</li> </ul> </li> <li>■ 5% caused by <i>Trichomonas vaginalis</i>, a sexually transmitted protozoan infection                             <ul style="list-style-type: none"> <li>– associated with pre-term labour and low birth weight.</li> </ul> </li> </ul>

#### Notes:

- ***T. vaginalis* and HSV are most often sexually transmitted.**
- bacterial vaginosis is not sexually transmitted but is associated with sexual activity; yeasts can be transmitted from an infected female to her sexual partner. Recurrent vaginitis is often more likely caused by a disruption of the normal lactobacilli dominant flora of the vagina rather than caused by re-infection from an untreated partner.
- *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. Their detection in the absence of other conditions needing treatment is not by itself an indication for treatment.



### Non-infectious causes

- excessive physiologic secretions – a common cause of perceived vaginal discharge
- hypersensitivity (e.g., latex condoms, spermicides, vaginal douches, soap, genital preparations)
- multiple dermatologic conditions (e.g., eczema, lichen planus, lichen sclerosus, psoriasis, atrophy)
- foreign body, trauma
- lack of proper vaginal lubrication during intercourse.

**Note:** Especially when recurrent or persistent, these conditions should be referred to a colleague experienced in this area.

### Epidemiology

- among the most common problems in clinical medicine (approximately 1 million office visits per year for vaginitis alone).
- accurate diagnosis determines therapeutic success.
- frequently over-diagnosed and misdiagnosed.

### Bacterial vaginosis

- most common specific cause of vaginal infection.
- higher prevalence in sexually active women.
- many women are asymptomatic; however, some women are more at risk of complications, especially during pregnancy (see *Issues in Pregnancy*, page 191).

### Candidiasis

- 75% of all women will experience at least one episode in their lifetime.
- high rates of transient asymptomatic vaginal colonization.

### Trichomoniasis

- up to 50% asymptomatic.
- sexually transmitted, men usually asymptomatic.

### Diagnostic Features

Etiology	Predisposing factors	Symptoms	Signs/quality of discharge
<b>Bacterial vaginosis</b>	<ul style="list-style-type: none"> <li>■ often absent</li> <li>■ more common if sexually active</li> </ul>	<ul style="list-style-type: none"> <li>■ vaginal discharge</li> <li>■ fishy odour</li> <li>■ may increase after intercourse</li> </ul>	<ul style="list-style-type: none"> <li>■ grey to white thin vaginal discharge, often copious</li> <li>■ inflammation and erythema of vagina are unusual in uncomplicated BV</li> </ul>
<b>Candidiasis</b>	<ul style="list-style-type: none"> <li>■ often absent</li> <li>■ current or recent use of antibiotics</li> <li>■ pregnancy</li> <li>■ corticosteroids</li> <li>■ poorly controlled diabetes mellitus</li> <li>■ immuno-compromised</li> <li>■ rarely sexually transmitted</li> </ul>	<ul style="list-style-type: none"> <li>■ itch</li> <li>■ external dysuria</li> <li>■ vaginal discharge</li> <li>■ introital dyspareunia</li> </ul>	<ul style="list-style-type: none"> <li>■ white, clumpy adherent vaginal discharge</li> <li>■ erythema and edema of vulva, vagina and/or introitus</li> </ul>
<b>Trichomoniasis</b>	<ul style="list-style-type: none"> <li>■ sexual activity</li> </ul>	<ul style="list-style-type: none"> <li>■ profuse vaginal discharge</li> <li>■ itch</li> <li>■ introital dyspareunia</li> </ul>	<ul style="list-style-type: none"> <li>■ frothy, off-white/yellow vaginal discharge</li> <li>■ often erythema of vagina and exocervix</li> </ul>

### Pitfalls in the diagnosis and management of vaginitis

- misdiagnosis of cervicitis.
- inadequate history-taking for symptoms.
- patient not examined; no speculum examination.
- vaginal specimen not taken.
- over-treatment on the basis of culture results rather than symptoms, signs and direct tests (see next page).
- re-infection (trichomoniasis):
  - partner(s) not treated
  - new sexual contact.
- poor compliance with treatment regimen.
- chemical or hypersensitivity vaginitis associated with topical products.
- patient may have self-treated with over-the-counter vaginal preparations and/or products.

**Note:** To avoid pitfalls in diagnosis and management of vaginitis, take a complete history for medication, self-treatment and product use for all patients.

### Specimen Collection

- genital and speculum examination
  - visualize vulva carefully for lesions and for quality of discharge
  - **rule out cervicitis** (see page 75).
- collect vaginal specimens (smears/swabs) as follows:

pH test	<ul style="list-style-type: none"> <li>■ test vaginal discharge for pH               <ul style="list-style-type: none"> <li>– unreliable in the presence of blood and/or ruptured membranes</li> <li>– pH ≤ 4,5 : normal</li> <li>– pH &gt; 4,5 : suggests bacterial vaginosis or trichomoniasis</li> </ul> </li> </ul>
Amine odour/whiff test	<ul style="list-style-type: none"> <li>■ swab from vaginal discharge placed in 10% KOH               <ul style="list-style-type: none"> <li>– if “fishy odour” released, suggests bacterial vaginosis and rarely trichomoniasis.</li> </ul> </li> </ul>
Wet mount	<ul style="list-style-type: none"> <li>■ saline preparation for <i>T. vaginalis</i> and bacterial vaginosis (see page 52).</li> <li>■ 10% KOH preparation for budding yeast (see page 53).</li> </ul>
Gram stain	<ul style="list-style-type: none"> <li>■ Gram stain of air-dried slide for yeast and bacterial vaginosis (see page 56), and for <i>T. vaginalis</i> <ul style="list-style-type: none"> <li>– laboratory interpretation of bacterial vaginosis will be provided with relative number of bacterial morphotypes</li> <li>– normal: predominant large Gram-positive rods</li> <li>– abnormal: none or few Gram-positive rods but Gram-variable rods, Gram-positive cocci and/or Gram negative-rods as predominant flora.</li> </ul> </li> </ul>

#### Notes:

- 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. A smear showing hyphae and inflammation is more specific.
- when vulvitis is present without vaginitis, consider vulvar culture for yeast.

## Laboratory Diagnosis and Interpretation

### 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 (< 4,5).
- 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 pseudohyphae.
- **Note:** Not all strains of yeast show pseudohyphae

### Trichomonas vaginalis

- vaginal pH > 4,5.
- whiff test most often negative.
- wet mount preparation reveals motile flagellated trichomonads with PMNs.
- stain smear may reveal *T. vaginalis* and/or PMNs.

### Recurrent vulvovaginal candidiasis

- natural history and pathogenesis are not well established. Risk factors include:
  - uncontrolled diabetes mellitus
  - immunosuppression
  - use of corticosteroids
  - HIV infection.
- the majority of women with recurrent vulvovaginal candidiasis have no apparent predisposing conditions.
- **three or more episodes** of symptomatic vulvovaginal candidiasis within a year with at least one episode confirmed by the laboratory affect a small proportion of women (< 5%).
- in some women, recurrent episodes follow repeated courses of systemic antibacterials.

Consideration for Other STDs

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- obtain specimen(s) for the diagnosis of chlamydial and gonococcal infections. Take cervical swabs if clinically and epidemiologically indicated (see chapter on specific disease).
- HIV testing and counselling are recommended (see page 176).
- immunization against hepatitis B is recommended (see page 121).
- consider obtaining a blood sample for serologic testing for syphilis (see page 150).

Treatment

- women with HIV infection may need more prolonged therapy and may have a delayed response to treatment.

Vulvovaginitis Caused by Bacterial Vaginosis <sup>(a, b)</sup>	
If asymptomatic	If symptomatic
<p>Treatment is unnecessary UNLESS:</p> <ul style="list-style-type: none"> <li>■ high risk pregnancy (e.g., prior pre-term delivery)<sup>(c)</sup></li> <li>■ prior to IUD insertion</li> <li>■ prior to gynecologic surgery, induced abortion or upper tract instrumentation.</li> </ul>	<p><b>Preferred:</b></p> <ul style="list-style-type: none"> <li>■ metronidazole 500 mg orally bid for 7 days<sup>(d)</sup> (if breast-feeding, interrupting breast-feeding until 24 hours after completing therapy is recommended.)</li> </ul> <p><b>Alternatives:</b></p> <ul style="list-style-type: none"> <li>■ clindamycin cream 2% one full applicator (5 g) intravaginally nightly for one week (can be used in pregnancy)</li> <li>OR</li> <li>■ metronidazole gel 0,75% one full applicator (5 g) bid for 5 days intravaginally<sup>(d)</sup></li> <li>OR</li> <li>■ clindamycin 300 mg orally bid for 7 days.</li> </ul>
<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>a) Treatment is not recommended for male sexual partners for both acute or recurrent BV.</li> <li>b) Currently available lactobacilli preparations are neither successful nor helpful in restoring normal vaginal flora.</li> <li>c) If treating in pregnancy, oral therapy is preferred to prevent subclinical infection of the chorioamnion. Pregnant patients should be re-evaluated for recurrence of bacterial vaginosis if it has been found and treated.</li> <li>d) Advise patients NOT to take any alcoholic beverages during metronidazole therapy and for 48 hours post-treatment to prevent “antabuse-like” reaction.</li> </ul>	

**Vaginitis Caused by *Trichomonas vaginalis***

Treat all cases and their sexual partner regardless of symptoms with:  
 ■ metronidazole 2 g orally in a single dose<sup>(a)</sup>

**Note:**  
 (a) Advise patients NOT to take any alcoholic beverages during metronidazole therapy and for 48 hours post-treatment to prevent “antabuse-like” reaction.

**Vulvovaginal Candidiasis (VVC)<sup>(a, b, c)</sup>**

If asymptomatic	If symptomatic
Treatment is unnecessary.	<p><b>Intravaginal therapy:</b></p> <ul style="list-style-type: none"> <li>■ non-prescription intravaginal preparations (e.g., clotrimazole, miconazole) are effective. The azole derivatives have higher clinical and mycologic cure rates than do the polyenes (Nystatin). These include ovules and creams for 1, 3, and 7 days, which all appear to have similar efficacy. Some women may have individual adverse effects such as vulvar irritation and burning, and treatment can be appropriately modified.</li> </ul> <p><b>Oral therapy:</b></p> <ul style="list-style-type: none"> <li>■ fluconazole 150 mg orally in a single dose (contraindicated in pregnancy). Appears to have equal efficacy to intravaginal products.</li> </ul>

- Notes:**
- a) Suppressive therapy should be considered in women with HIV.
  - b) Recurrent VVC requires further investigation and different therapeutic strategies. Consultation with a colleague experienced in this area may need to be sought.
  - c) Male sexual partners should only be treated if *Candida* balanitis is present; use miconazole or clotrimazole cream applied bid for 7 days.

**Reporting and Partner Notification**

- cases of vaginitis are not notifiable by physicians or laboratories to local public health authorities.
- partner notification of patients with vaginitis is not routine EXCEPT in the case of trichomoniasis.

**Follow-up**

- follow-up is not necessary unless signs and symptoms persist or reappear.
- however, follow-up of bacterial vaginosis in late pregnancy may be indicated to detect clinical relapses which require re-treatment if pregnancy is high risk.

## 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
  - *Chlamydia trachomatis*
  - *Neisseria gonorrhoeae*.
- other causes include:
  - foreign body, with or without overgrowth of normal flora (the commonest cause)
  - trauma
  - *Shigella* sp. (not an STD)
  - Herpes simplex virus (HSV)
  - *Trichomonas vaginalis*.

■ 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 they are diagnosed, other symptoms or signs of abuse should be sought carefully. Depending upon results, cases should be referred to a colleague experienced in child abuse 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.

### Diagnostic Features

- the normal non-estrogen stimulated vaginal squamous epithelium is susceptible to infection with chlamydia and gonorrhea, therefore, **vaginal** specimens should be collected (NOT endocervical).
- speculum examination is NOT indicated in prepubertal girls unless there is unexplained bleeding.
- any of the following symptoms and signs should prompt evaluation for prepubertal vaginitis:
  - vaginal discharge
  - perineal irritation.

**Indications to refer prepubertal girls with vulvovaginitis to a colleague experienced in this area include:**

- 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 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 for *N. gonorrhoeae*, group A streptococci, *Shigella* sp., and *T. vaginalis* (if available)
  - a second swab can be used for *C. trachomatis* diagnosis by culture or amplified nucleic acid tests (e.g., PCR, LCR)
  - 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).
- a vaginal wash technique is preferred to multiple vaginal swabs if nucleic acid tests are used for *C. trachomatis* and *N. gonorrhoeae*.
- in addition, pharyngeal and rectal swabs can be obtained for culture of *N. gonorrhoeae* and *C. trachomatis* diagnosis by either culture or amplified nucleic acid tests.

**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*, amplified nucleic acid techniques (e.g., PCR, LCR, page 59) are the preferred method. As many as 50% of positive tests are false-positives when other non-culture tests (e.g., EIA, DFA) are used in this low prevalence age group, which only adds to the difficulty in assessment for possible child abuse.
- 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), to save remaining samples and save any pathogenic isolates for submission to a reference laboratory.
- see *Forensic Evidence and Services*, page 229.



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*:

<b>Gram-negative intracellular diplococci present</b>	■ treat for prepubertal vaginitis due to <i>N. gonorrhoeae</i> and <i>C. trachomatis</i> (see below).
<b>Gram-negative intracellular diplococci not detected</b>	■ defer antimicrobial treatment until the microbiologic results are available. If the results are positive, treat according to the results (see below).

*N. gonorrhoeae*

**Preferred** <sup>(a)</sup>:

- cefixime 8 mg/kg orally in a single dose (max. 400 mg)  
PLUS azithromycin 12-15 mg/kg in a single dose (max. 1 g) OR  
erythromycin 40 mg/kg/day orally (max. 500 mg qid) in divided doses for 7 days<sup>(b)</sup>  
OR
- ceftriaxone 125 mg IM in a single dose  
PLUS azithromycin 12-15 mg/kg in a single dose (max. 1 g) OR  
erythromycin 40 mg/kg/day orally (max. 500 mg qid) in divided doses for 7 days<sup>(b)</sup>

**Alternative:**

- spectinomycin 40 mg/kg IM (max. 2 g) in a single dose  
PLUS azithromycin 12-15 mg/kg in a single dose (max. 1 g) OR  
erythromycin 40 mg/kg/day orally (max. 500 mg qid) in divided doses for 7 days<sup>(b)</sup>

**Notes:**

- 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, follow-up cultures for “test-of-cure” must be obtained.
- b) Erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations may be substituted.

***C. trachomatis*****Preferred:**

- azithromycin 12 to 15 mg/kg (max. 1 g) orally in a single dose<sup>(a)</sup>

**Alternatives:**

- erythromycin 40 mg/kg/day orally in divided doses (max. 500 mg qid for 7 days or 250 mg qid for 14 days)<sup>(b)</sup>  
OR
- sulfamethoxazole 75 mg/kg/day orally in divided doses (max. 1 g bid) for 10 days.

**Notes:**

- (a) For prepubertal children 9 years and older, azithromycin can be substituted with: doxycycline 5 mg/kg/day orally in divided doses (max. 100 mg bid) for 7 days.
- (b) Erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations may be substituted.

***T. vaginalis***

- metronidazole 40 mg/kg orally (max. 2 g) in single dose  
OR
- metronidazole 15-20 mg/kg/day orally in three divided doses (max. 250 mg tid) for 7 days

**Bacterial Vaginosis**

- metronidazole 15-20 mg/kg/day orally in three divided doses (max. 250 mg tid) for 7 days.

***Herpes Simplex Virus (HSV)***

- see *Genital HSV Infections*, page 163.

**Reporting and Partner Notification**

- 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 and is not known precisely 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 causing an infection should be strongly considered in the following cases:**

- gonococcal infection in a child > 1 month of age and particularly > 6 months of age.
- genital or rectal chlamydial infection in a child > 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 in a child > 3 months of age, although alternative routes of transmission should be considered.
- genital *T. vaginalis* infection in a child > 6 months of age, although there may be non-sexual means of transmission.

Consultation with a colleague experienced in child abuse 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 assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.

#### Follow-up

- follow-up must be arranged and repeat diagnostic testing for *N. gonorrhoeae* and *C. trachomatis* should be carried out (see page 209).
- follow-up is carried out to ensure that the STD has been treated adequately so that, if there is a recurrence, it is diagnosed as a re-infection not a “relapse”. The conduct of the re-examination must take into account the psychological state of the child.

## EPIDIDYMITIS IN YOUTH 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 and occasionally with erythema and edema of the overlying skin.

**Note:** When epididymitis is accompanied by urethral discharge, 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 which should be suspected when onset of scrotal pain is sudden.

### Etiology

Sexually active men < 35 years of age	Sexually active men > 35 years of age
<ul style="list-style-type: none"> <li>■ <i>Chlamydia trachomatis</i></li> <li>■ <i>Neisseria gonorrhoeae</i></li> <li>■ with structural abnormalities of the urinary tract: <ul style="list-style-type: none"> <li>– facultative gram-negative aerobes</li> <li>– other classical urinary tract pathogens.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ Gram-negative aerobes</li> <li>■ other classical urinary tract pathogens</li> <li>■ less frequent: <ul style="list-style-type: none"> <li>– <i>C. trachomatis</i></li> <li>– <i>N. gonorrhoeae</i>.</li> </ul> </li> </ul>

### Epidemiology

- it is uncommon for males to present with epididymitis to STD clinics in Canada.
- complicates < 1% of identified sexually transmitted urethritis.

### 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 (a surgical emergency) must be excluded.

### Diagnostic Features

- any of the following should prompt evaluation for epididymitis:
  - unilateral scrotal swelling and/or tenderness, maximal over the head of the epididymis, occasionally bilateral
  - possible erythema and edema of the overlying skin.

- obtain history 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 colleague experienced 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 for diagnostic tests

- if careful questioning reveals risk for STD, AND:

WITH meatal discharge:	WITHOUT meatal discharge:
<ul style="list-style-type: none"> <li>■ obtain meatal swab for a slide for a stained smear (usually Gram stain) and for a diagnostic test for <i>N. gonorrhoeae</i></li> <li>■ obtain endourethral swab or urine for a diagnostic test for <i>C. trachomatis</i></li> </ul>	<ul style="list-style-type: none"> <li>■ obtain endourethral swab for a slide for a stained smear (usually Gram stain) and for a diagnostic test <i>N. gonorrhoeae</i></li> <li>■ obtain endourethral swab or urine for diagnostic test for <i>C. trachomatis</i></li> </ul>

- if no polymorphonuclear cells consider diagnosis other than infection.

Urinalysis and culture

- for all patients, whether or not they are or have been sexually active, obtain a mid-stream urine specimen for routine culture for aerobic urinary tract pathogens.

Considerations for Other STDs

(applicable when epididymitis due to STD)

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- HIV testing and counselling are recommended (see pages 175-176).
- immunization against hepatitis B is recommended (see page 121).
- consider obtaining a blood sample for serologic testing of syphilis (see page 150).

**Note:** In some cases when technical expertise is available, 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.

## Management and Treatment

### Epididymitis Most Likely Due to *N. gonorrhoeae* or *C. trachomatis*

- cefixime 800 mg orally in a single dose  
PLUS doxycycline 100 mg bid for 10 days.

**Note:** Alternative regimens, see pages 145; 136. (If using ceftriaxone as part of an alternative regimen, a dose of 250 mg IM is recommended for this indication.)

### Epididymitis Most Likely Due to Enteric Organisms

- ofloxacin 300 mg orally bid for 10 days.

Caution: If clinically not improving or non-responsive, consultation with a colleague experienced in this area is recommended.

## Prevention

- 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.
- at time of diagnosis of STD, review and monitor prevention practices.
- identify barriers to prevention practices and the means to overcome these.
- see *Primary Prevention of STD*, page 31.
- patients and contacts should abstain from unprotected intercourse until treatment of both partners is complete (i.e., 7 days after single dose therapy).

## Reporting and Partner Notification

- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority.
- local public health authorities are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.
- 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 regimen effective against uncomplicated *C. trachomatis* (see page 136) and *N. gonorrhoeae* (see page 145).

## 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.

## PROSTATITIS IN YOUTH AND ADULTS

Prostatitis is generally not considered an STD. It is included here to assist health care providers in the management of men who present with genital symptoms.

### Definition

- inflammation of the prostate with an increased number of polymorphonuclear leukocytes (PMNs) in prostatic fluid.
- bacterial prostatitis is characterized by an increased number of bacteria in prostatic fluid or urine (obtained after prostatic massage) compared with the first-void and mid-stream urine.

### Etiology

Usual causes	Potential or rare causes
<ul style="list-style-type: none"> <li>■ facultative Gram-negative urinary pathogens (e.g., <i>Escherichia coli</i> and <i>Proteus</i> spp)</li> </ul>	<ul style="list-style-type: none"> <li>■ Gram-positive urethral organisms (e.g., coagulase-negative staphylococci and diphtheroids)</li> <li>■ <i>Neisseria gonorrhoeae</i> (rare)</li> <li>■ <i>Chlamydia trachomatis</i> (role has not been established)</li> <li>■ genital mycoplasmas (role has not been established)</li> <li>■ <i>Trichomonas vaginalis</i> (role has not been established).</li> </ul>

### Epidemiology

- microbiologically documented prostatitis caused by recognized sexually transmitted pathogens is exceedingly rare. The possible role of *C. trachomatis* and mycoplasmas has not been established.
- prostatitis is more common than previously recognized, particularly in older men.

### Notes:

- although prostatitis is defined as inflammation of the prostate gland, 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.
- unresponsive microbiologically documented prostatitis is theoretically associated with micro abscesses. Regular prostatic massages are recommended in such cases.

- 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 prostatic fluid
  - in non-bacterial prostatitis, the culture results are negative but there is a significant PMN response in the prostatic fluid
  - in prostatic dysuria, the culture results are negative and there is minimal or no PMN response in the prostatic fluid.

### Special considerations in children

- prostatitis does not occur in prepubertal boys.

### Diagnostic Features

- any of the following should prompt evaluation for prostatitis:

Symptoms	Acute bacterial	<ul style="list-style-type: none"> <li>■ sudden onset of chills, fever and malaise with frequency, difficulty voiding and, occasionally, acute retention.</li> </ul>
	Other	<ul style="list-style-type: none"> <li>■ frequency, urgency or nocturia</li> <li>■ dysuria</li> <li>■ difficulty starting the urinary stream, poor flow of urine and/or post-void dribbling</li> <li>■ sensation of fullness in the rectum</li> <li>■ pain in the perineum, suprapubic region, or rectum</li> <li>■ ejaculate of abnormal colour or consistency</li> <li>■ post-ejaculation pain or hemospermia</li> <li>■ rarely, a urethral discharge.</li> </ul>
Signs		<ul style="list-style-type: none"> <li>■ perineal tenderness</li> <li>■ unusual prostatic tenderness</li> <li>■ “bogginess” of the prostate</li> </ul> <p><b>Note:</b> Tenderness and “bogginess” of the prostate are not necessarily present with proven bacterial prostatitis and its presence does not establish a diagnosis of prostatitis.</p>

### 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 (see page 69) or epididymitis (see page 100).



- 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 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.

#### Caution

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

#### 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.
- 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.

#### Cautions

- **this interpretation is accepted for facultative Gram-negative organisms but is more controversial for Gram-positive organisms.**
- **consider prostatitis in patients with recurrent relapsing non-gonococcal urethritis (see *Urethritis*, page 69).**

## 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 page 71).

### Epididymitis Strongly Suspected

- manage as for epididymitis (see page 102).

### 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:
  - HOSPITALIZE and initially treat with a combination of a  $\beta$ -lactam antimicrobial (e.g., ampicillin) AND an aminoglycoside, (e.g., gentamicin), OR a similar regimen.
- minimal OR no prostatic tenderness, no significant 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:
  - HOSPITALIZE 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-sulphamethoxazole 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.

### Reporting and Partner Notification

- sexual partners of patients with prostatitis do not usually require evaluation or treatment because prostatitis is not typically caused by a sexually transmitted pathogen.
- patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to the local public health authority.
- local public health authorities are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.

### Follow-up

- appropriate follow-up should be arranged depending on the proven or presumed diagnosis.

## GENITAL ULCER DISEASE

### Definition

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

### Etiology/Epidemiology

- comprise at least 2 to 5% of visits to physicians for possible STD; 70 to 80% are due to *Herpes simplex virus* (HSV).
- small numbers are caused by *Treponema pallidum* or *Haemophilus ducreyi*.
- 3 to 5% of ulcers have 2 or more pathogens.
- women and men with genital ulcer disease are at increased risk of acquiring and transmitting HIV.
- *Lymphogranuloma venereum* (LGV) and *Granuloma inguinale* (GI) are rare causes of genital ulcer disease in Canada.
- *H. ducreyi* is causing focal urban epidemics in North America, particularly among cocaine users. Commercial sex workers are the usual reservoir. These outbreaks are also associated with HIV infection.

Disease	% of genital ulcer disease	Incubation period
Genital HSV infection	70-80%	2-21 days
Primary syphilis	5%	9-90 days (mean: 21 days)
Chancroid	< 1%	4-14 days

**Note:** Remainder due to trauma, candidiasis, non-specific erosive balanitis or vulvitis, psoriasis, Behçet's, Reiter's, malignancy, scabies or idiopathic causes.

### Special considerations for children

- sexual abuse must be considered when genital ulcer disease is found in children beyond the neonatal period. Consultation with a colleague experienced in such cases should be sought.
- see *Child Sexual Abuse*, page 201.
- 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 a 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.

### Diagnostic Features

- previous genital lesion or STD.
- contact with commercial sex workers.
- syphilis and chancroid: travel to endemic areas, sexual activity with a new partner.
- HIV: sexual activity, receptive oral sex.
- contact with person with genital ulcer disease.

### Manifestations (Ulcers and Vesicles)

**Note:** Diagnosis is often inadequate if based on history and physical examination alone. Concurrent infection with HIV changes the clinical features of genital ulcers due to these three infections.

Disease	Site	Appearance	Other symptoms/signs
<b>Genital Herpes simplex virus (HSV) infection</b>	<b>Males:</b> <ul style="list-style-type: none"> <li>■ glans, prepuce, penile shaft, anus, rectum in men who have sex with men</li> </ul> <b>Females:</b> <ul style="list-style-type: none"> <li>■ cervix, vulva, vagina, perineum, legs and buttocks</li> </ul>	<ul style="list-style-type: none"> <li>■ grouped multiple vesicles → superficial circular ulcers on erythematous base</li> <li>■ smooth margin and base</li> <li>■ shallow</li> </ul>	<ul style="list-style-type: none"> <li>■ ulcers usually painful and/or pruritic</li> <li>■ genital pain</li> <li>■ inguinal lymph nodes enlarged, non-fluctuant and tender</li> <li>■ fever and malaise (primary infection)</li> </ul>
<b>Primary syphilis</b>	<ul style="list-style-type: none"> <li>■ at site of inoculation</li> </ul>	<ul style="list-style-type: none"> <li>■ papule → chancre</li> <li>■ indurated with serous exudate</li> <li>■ single in 70% of cases</li> <li>■ smooth margin and base</li> </ul>	<ul style="list-style-type: none"> <li>■ ulcers often painless</li> <li>■ firm, enlarged, non-fluctuant, non-tender lymphadenopathy common</li> </ul>
<b>Chancroid</b>	<ul style="list-style-type: none"> <li>■ at site of inoculation</li> </ul>	<ul style="list-style-type: none"> <li>■ single or multiple necrotising ulcers</li> <li>■ 2 or more in 50% of cases</li> <li>■ non-indurated</li> <li>■ ragged undermined margin</li> <li>■ irregular base</li> </ul>	<ul style="list-style-type: none"> <li>■ ulcers painful</li> <li>■ often painful swelling and suppuration of regional lymph nodes with erythema and edema of over-lying skin.</li> </ul>

## Specimen Collection and Laboratory Diagnosis

### *T. pallidum* (syphilis)

- dark-field examination or direct fluorescent antibody test on serous fluid from ulcers. Syphilis serology to include a non-treponemal test (e.g., RPR, VDRL) and at least one treponemal-specific test (e.g., TP-PA, MHA-TP, FTA-ABS) (see *Syphilis*, page 151).

### Herpes simplex virus (HSV)

- culture should be carried out on at least three ulcers UNLESS infection has been confirmed previously with same presentation (see *Specimen Collection*, page 53).

### *H. ducreyi* (chancroid)

- culture or nucleic acid tests (e.g., PCR).
- **inform laboratory in advance** as special procedures need to be followed – a smear for Gram stain may also be useful (see page 55).

### Consideration for other STD

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- obtain specimen(s) for the diagnosis of chlamydial and gonococcal infections.
- HIV testing and counselling are recommended (see page 173). Patients with syphilis and chancroid are at especially at high risk.
- immunization against hepatitis B is also recommended (see page 121).

## Management

### Results not yet available

- minimally, blood should be obtained for syphilis serology for non-treponemal (e.g., RPR, VDRL) and treponemal-specific tests (e.g., TP-PA, MHA-TP) PLUS swab from ulcers for *Herpes simplex virus* (HSV).
- treat for both syphilis and chancroid if follow-up is uncertain (see pages 155; 112).

Results available for RPR, VDRL, TP-PA, MHA-TP	
Dark-field examination/ fluorescent antibody test <b>POSITIVE</b> (motile corkscrew spirochetes present)	<ul style="list-style-type: none"> <li>■ treat for syphilis (see page 155).</li> </ul>
Dark-field examinations, fluorescent antibody tests <b>AND</b> Tests for <i>Herpes simplex</i> virus (HSV) infection and <i>H. ducreyi</i> are <b>NEGATIVE</b> or not performed	<ul style="list-style-type: none"> <li>■ <b>treat as syphilis if:</b> <ul style="list-style-type: none"> <li>– there is a recent history of contact with infectious syphilis or</li> <li>– clinical suspicion is strong and follow-up cannot be ensured.</li> </ul> </li> </ul> <p>OTHERWISE</p> <ul style="list-style-type: none"> <li>■ <b>Consider therapy for HSV:</b> <ul style="list-style-type: none"> <li>– if laboratory tests are negative and presentation typical of <i>Herpes simplex</i> virus infection (see page 160).</li> </ul> </li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>■ <b>treat for chancroid (see page 112)</b> <ul style="list-style-type: none"> <li>– if presentation suggests chancroid.</li> </ul> </li> </ul>

Treatment

<b>Syphilis – Primary</b>
■ see <i>Syphilis</i> , page 155.
<b>Genital <i>Herpes Simplex</i> Virus (HSV) Infection</b>
■ see <i>Genital HSV Infections</i> , page 163.

**Chancroid****Adults****Preferred:**

- azithromycin 1 g orally single dose.

**Alternatives:**

- ciprofloxacin 500 mg orally bid for 3 days (not recommended for prepubertal children, pregnant women or nursing mothers)  
OR
- ceftriaxone 250 mg IM as a single dose  
OR
- erythromycin 2 g/day orally in divided doses for 7 days<sup>(a)</sup>.

**Children****Preferred:**

- azithromycin 12-15 mg/kg in a single dose (max. 1 g)

**Alternatives:**

- erythromycin 50 mg/kg/day orally in divided doses for 7 days (max. 500 mg qid)<sup>(a)</sup>.

**Note:** (a) Those administered erythromycin must be followed carefully to ensure therapeutic success. Erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations (estolate contraindicated in pregnancy) may be substituted.

**Prevention**

- 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.
- at time of diagnosis of STD, review and monitor prevention practices.
- identify barriers to prevention practices and the means to overcome these.
- see *Primary Prevention of STD*, page 31.
- patients and contacts should abstain from unprotected intercourse until treatment of both partners is complete (i.e., 7 days after single dose therapy).

**Reporting and Partner Notification**

- patients with conditions that are notifiable according to provincial and territorial laws and regulations must 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. Partner's notification is vitally important for rare conditions such as syphilis and chancroid in order to prevent an outbreak.
- when treatment is indicated for the diagnosis of primary syphilis, all partners who have had sexual contact with the index case within 3 months prior the onset of symptoms must be located, tested and treated with a similar regimen to that used for the index case.



- local public health authorities are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.

#### Follow-up

- 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 *Syphilis*, page 159.

## SEXUALLY TRANSMITTED DISEASE – ASSOCIATED HEPATITIS

This chapter deals with hepatitis A virus (HAV), hepatitis B virus (HBV), and hepatitis C virus (HCV).

### Definition

- inflammation of the liver caused by sexually transmissible pathogens.

### Etiology/Epidemiology

- diseases of major concern which can be associated with sexual transmission are hepatitis B, hepatitis A, cytomegalovirus (CMV), Epstein-Barr virus (EBV) infection, syphilis, and HIV seroconversion illness. Sexual transmission of hepatitis C is possible but is infrequent.
- acute infection with hepatitis A, B, and C, EBV or CMV is often asymptomatic or non-specific in presentation.
- hepatitis B and C viruses may cause chronic infection, chronic hepatitis, cirrhosis, and hepatocellular carcinoma.

### Hepatitis B

- most common STD causing hepatitis.
- in 1995, 3034 cases of hepatitis B were reported in Canada. In 1994, 3078 cases were reported; at least 1137 of these were acute and likely newly acquired. The incidence rate of acute hepatitis B appears to be decreasing.
- the estimated prevalence of chronic carriers in the general population is less than 0,5%.
- sexual transmission accounts for at least 45% of new 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 important sources of infection in Canada.

**Persons at high risk of hepatitis B include:**

- infants born to HBsAg-positive women
- injection drug users who share needles and/or equipment
- persons with multiple sexual partners, especially men who have sex with men, commercial sex workers and street youth
- persons born, having sex in or whose parents lived in areas of high endemicity
- sexual and household contacts of an acute case
- those with exposure to blood (e.g., health care workers)
- incarcerated and mentally challenged institutionalized persons.

**Hepatitis A**

- 2108 reported cases in 1995 (7,1/100 000 population in Canada).
- cases transmitted most commonly by fecal-oral contamination (e.g., household contact) and food.
- can be transmitted through sexual activity, especially in men who have sex with men.
- travellers to areas of high endemicity are considered at high risk, especially due to sexual activity and food contamination (see *Travellers*, page 220).
- there are reports of a high rate of fatal complications in those co-infected with HCV or HIV.

**Hepatitis C**

- the estimated prevalence in the general population is between 0,5 and 1%.
- highest rate of transmission in injection drug users who share needles, snorting straws and/or other drug use equipment.
- modes of transmission:
  - parenteral exposure to contaminated blood
  - sexual transmission also occurs but much less efficiently than hepatitis B
  - perinatal transmission (mother to child) occurs but much less efficiently than hepatitis B.

**Persons at high risk of hepatitis C include:**

**Most at risk:**

- injection drug users who share needles, snorting straws and/or other drug use equipment
- persons who have received blood or blood products prior to the introduction of highly sensitive blood donor screening for hepatitis C in May 1992

**At risk:**

- persons with occupational parenteral exposure to blood of known case of hepatitis C (i.e., health care workers)
- sexual partner(s) of known case of hepatitis C

Special considerations in children

- universal prenatal screening for HBsAg is recommended.
- hepatitis B immunization is recommended for children younger than 7 years of age whose families have immigrated to Canada from areas where there is a high prevalence of hepatitis B and who may be exposed to HBV carriers through their extended families and/or within their communities.
- for all children born to HBsAg-positive mothers, give HBIG 0.5 ml at birth prior to discharge PLUS hepatitis B immunization beginning in the new-born period.
- hepatitis B immunization must be given to all children with a household contact who is HBsAg-positive.
- universal hepatitis B immunization programs for all school-aged children or infants are available in Canada.
- see section on *Prevention*, pages 120-122.

Diagnostic Features

<b>If symptomatic:</b>	<b>If asymptomatic:</b>
<ul style="list-style-type: none"> <li>■ malaise, anorexia with or without jaundice</li> <li>■ arthralgia, urticaria, fever</li> <li>■ liver enzymes elevated.</li> </ul>	<ul style="list-style-type: none"> <li>■ search for epidemiologic clues (see section on <i>Epidemiology</i>, page 114)</li> <li>■ liver enzymes elevated.</li> </ul>

### Manifestations of Disease

Disease	Incubation period	Acute hepatitis (% symptomatic)	Outcome
Hepatitis B	45-180 days	<ul style="list-style-type: none"> <li>&lt; 10% of childhood infections</li> <li>50% of adult infections</li> </ul>	<ul style="list-style-type: none"> <li>&lt; 1% develop fulminant hepatitis</li> <li>overall 1-10% of adults become chronic carriers</li> <li>acquired perinatally or as a young child, the carrier rate may exceed 90%.</li> </ul>
Hepatitis A	15-45 days	<ul style="list-style-type: none"> <li>&lt; 10% childhood infections</li> <li>50% of adult infections</li> </ul>	<ul style="list-style-type: none"> <li>no chronic carriers</li> <li>high fatality rate if co-infected with HCV.</li> </ul>
Hepatitis C	14-168 days	<ul style="list-style-type: none"> <li>most often asymptomatic</li> </ul>	<ul style="list-style-type: none"> <li>chronic carriage occurs in as many as 85% of infections.</li> </ul>

### Laboratory Diagnosis and Interpretation of Hepatitis Serology

- suspect acute viral hepatitis: obtain serum for IgM-HAV, HBsAg, IgM anti-HBc, anti-HCV

### Key serologic markers of viral hepatitis<sup>(a)</sup>

<p><b>Hepatitis B</b></p> <p><b>HBsAg: hepatitis B surface antigen</b></p> <ul style="list-style-type: none"> <li>indicates current infection or a chronic carrier state.</li> <li>is generally the first detectable serologic marker.</li> <li>in acute infection, precedes increase in aminotransferases and clinical signs by up to one month.</li> <li>generally ceases to be detectable within 6 months; stays present longer in a chronic carrier state.</li> </ul> <p><b>anti-HBs: antibody to hepatitis B surface antigen</b></p> <ul style="list-style-type: none"> <li>indicates immunity to the virus acquired as a result of previous infection or vaccination (vaccination induces the presence of anti-HBs, not of anti-HBc).</li> <li>is detectable a few weeks after the disappearance of HBsAg.</li> <li>persists for many years.</li> </ul>	<p><b>HBeAg: hepatitis B e antigen</b></p> <ul style="list-style-type: none"> <li>indicates maximum contagiousness.</li> <li>appears shortly after the appearance of HBsAg; indicates an intense viral replication phase.</li> <li>normally persists for 3 to 6 weeks during acute hepatitis but can remain present much longer during chronic hepatitis.</li> </ul> <p><b>anti-HBe: antibody to hepatitis B e antigen</b></p> <ul style="list-style-type: none"> <li>in the presence of HBsAg, indicates less contagiousness than the presence of HBeAg.</li> </ul>
	<p><b>Hepatitis A</b></p> <p><b>anti-HAV: hepatitis A virus antibody</b></p> <p><b>IgM anti-HAV:</b></p> <ul style="list-style-type: none"> <li>indicates a recent or current infection.</li> <li>is present as soon as clinical signs appear.</li> </ul>

- is present temporarily (a few months) after the administration of hepatitis B immune globulin (HBIG).

**total anti-HBc:  
antibody to hepatitis B core antigen**

- becomes positive shortly after the start of clinical signs, or 1 to 4 weeks after the appearance of HBsAg.
- precedes the appearance of anti-HBs by several weeks to several months.
- indicates recent or previous infection.
- is generally detectable for life.

**IgM anti-HBc:**

- indicates acute or recent infection.
- is generally present during the first 3 to 6 months after an acute infection.

- Disappears within 3 to 6 months.

**IgG anti-HAV:**

- indicates long-term protection acquired as a result of previous infection or vaccination.
- is present temporarily (for a few months; variation depending on the administered dose) following the administration of human immune globulin (IG).

**Hepatitis C**

**anti-HCV: hepatitis C virus antibody**

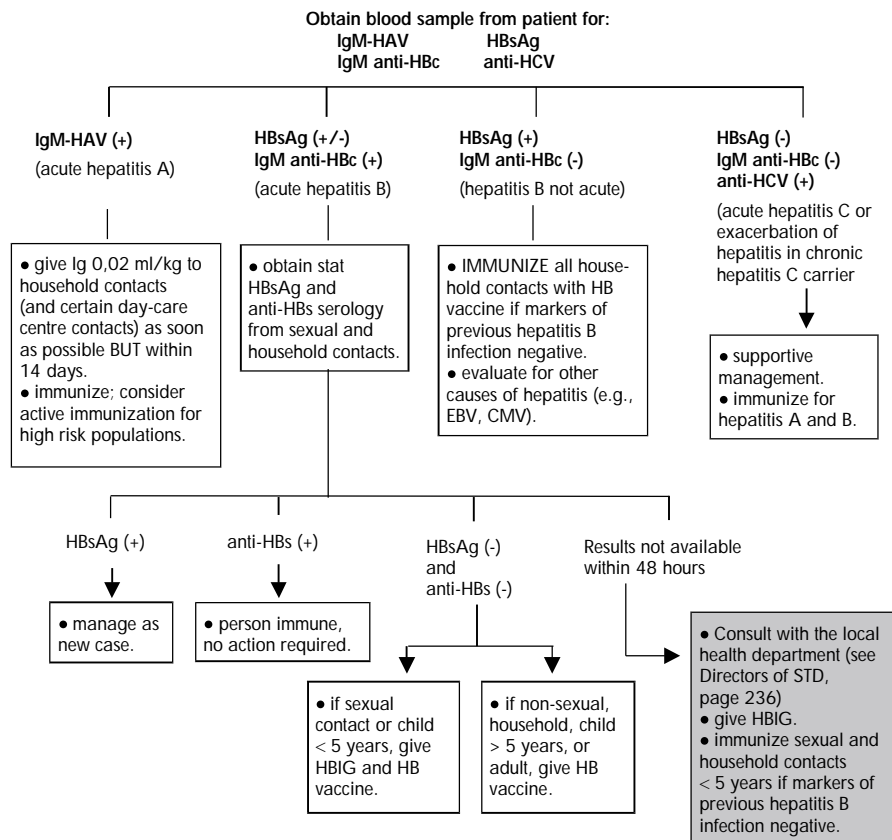
- indicates a recent or chronic infection.
- is detectable from several to many weeks (within 24 weeks) following the start of clinical signs.
- can be absent during the acute phase.
- does not mean the resolution of hepatitis C.
- does not indicate protection against the virus.

**Note:** (a) Adapted with permission from the publisher, *Maladies transmissibles sexuellement. Guide pratique*. Régies régionales de la santé et des services sociaux, Montréal-Centre et Laval, 1996; p. 11.

Considerations for Other STDs

- obtain specimen(s) for the diagnosis of chlamydial and gonococcal infection if clinically indicated.
- HIV testing is strongly recommended, especially when hepatitis is suspected to be parenterally transmitted (see page 173).
- consider obtaining a blood sample for serologic testing of syphilis (see page 150).
- see *Clinical Approach to the Diagnosis and Management of STD* (page 39).

## Management of Clinical Case of Hepatitis



### Notes:

- co-infection of hepatitis A, B, C is possible.
- in cases of clinical acute hepatitis where IgM anti-HAV (-) AND test for acute hepatitis B (-) AND anti-HCV (-) or not performed:
  - determine anti-HCV unless this was done during initial evaluation (absence of anti-HCV does not exclude acute hepatitis C); repeat the test 3 and 6 months after onset of symptoms
  - consider testing for other causes (e.g., mononucleosis, cytomegalovirus infection).
- every opportunity should be taken to immunize all patients at high risk of hepatitis B especially those < 5 years of age because of a much higher risk if infected of becoming a chronic carrier.

- condoms should be used by all sexual contacts at risk of acquiring hepatitis B while primary immunization is in progress.
- chronic hepatitis caused by HBV or HCV may be amenable to antiviral therapy. Consultation with a colleague experienced in this area is recommended.

## 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; useful up to 14 days. Start a course of hepatitis B vaccine
  - for on-going regular sexual partners, test and immunize susceptibles
  - counsel about risk reduction until primary course of vaccine has been completed.

### Hepatitis A

- passive immunization with immune globulin (0.02 ml/kg; maximum 2.0 ml within 14 days of contact.
- consider active immunization against hepatitis A and B.

### 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.

## Prevention

- counsel about safer injection drug practices and provide information concerning rehabilitation.
- counsel about good hygiene.
- 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.
- at time of diagnosis of STD, review and monitor prevention practices with all patients.
- identify barriers to prevention practices and the means to overcome these.
- see *Primary Prevention of STD*, page 31.



### Routine serologic testing

- not routinely indicated to monitor response to immunization; EXCEPT in neonates test one month after the last dose of vaccine for HBsAg and anti-HBs to verify efficacy of prophylaxis.
- useful to detect HBsAg carriers in persons at highest risk of sexually transmitted hepatitis (e.g., men who have sex with men, injection drug users, commercial sex workers and immigrants); where follow-up cannot be assured, give first dose of immunization.

### Immunization against hepatitis B

- immunization against hepatitis B virus is highly effective in preventing infection and disease and is strongly recommended for **all children with a household contact who is HBsAg-positive**.
- immunization is strongly recommended for all newborns of HBsAg positive mothers:
  - give HBIG 0,5 ml at birth prior to discharge PLUS hepatitis B immunization beginning in the new-born period (second dose at 1 month; third dose at 6 months). Test for HBsAg status and anti-HBs 1 month after the third dose has been received.
- universal hepatitis B immunization programs for all infants and/or pre-adolescents are recommended. Within a decade, youth aged 15 to 19 will constitute a cohort that has been immunized.
- in addition, the following target communities at risk of hepatitis B should be immunized at any opportunity:

#### Immunize against hepatitis B at any opportunity

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>■ children &lt; 7 years of age whose families have immigrated to Canada from areas where there is a high prevalence of hepatitis B and who may be exposed to HBV carriers through their extended families and/or within their communities.</li> <li>■ clients and staff of institutions for the developmentally challenged</li> <li>■ commercial sex workers</li> <li>■ communities with high endemicity of HBV infection</li> <li>■ hemodialysis patients</li> <li>■ household contacts of chronic carrier</li> <li>■ injection drug users</li> <li>■ inmates of long-term correctional facilities</li> </ul> | <ul style="list-style-type: none"> <li>■ international travellers, particularly those who plan on staying more than 6 months in a highly endemic region or who will have close contact (especially sexual contact) with the local population</li> <li>■ persons who have recently acquired an STD</li> <li>■ persons whose regular sexual partner is HBsAg-positive</li> <li>■ persons with multiple sexual partners</li> <li>■ men who have sex with men</li> <li>■ persons with occupational risk related to parenteral exposure to blood or blood contaminated body fluids</li> <li>■ recipients of blood products</li> <li>■ youth</li> </ul> |
|---|---|
- AND sexual partners of any of the above.

### Pre-immunization screening for hepatitis B

- screen only for anti-HBc (because of its longer duration); if positive, test for HBsAg.
- not recommended as part of the universal immunization program for infants or young children.
- in other persons at high risk of hepatitis B, only recommended if the cost of immunization exceeds the cost of screening, OR in populations with carrier prevalence exceeding 2%.

### Immunization against hepatitis A

- universal immunization is not currently recommended.
- immunization is recommended for persons considered at high risk, especially due to sexual activity and food contamination such as:
  - injection drug users
  - men who have sex with men
  - street youth
  - travellers to areas of high endemicity.

### Prevention of hepatitis C

- no vaccine is available.

### Reporting and Partner Notification

- hepatitis B and hepatitis A are reportable in all provinces and territories; hepatitis C is reportable in most jurisdictions.
- report whether a case is acute or chronic (hepatitis B or C) AND the likely mode of transmission, if possible.
- local public health authorities should be available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.

## OPHTHALMIA NEONATORUM

### Etiology

- 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
  - young mother.

STD-Related Etiology	% Neonatal conjunctivitis	Incubation period	Severity of conjunctivitis	Associated problems
<i>Chlamydia trachomatis</i>	10-20%	5-14 days	+	pneumonitis 3 weeks– 3 months
<i>Neisseria gonorrhoeae</i>	< 1%	2-5 days	+++	disseminated infection
<i>Herpes simplex virus</i> (HSV)	< 1%	7-14 days	+ keratitis, ulceration	disseminated infection

- most common non-STD causes: *Staphylococcus aureus*, chemical conjunctivitis.

### Epidemiology

- purulent conjunctivitis occurs in < 1% of neonates in Canada.
- decreased incidence of gonococcal neonatal ophthalmia with routine eye prophylaxis.
- may occur despite eye prophylaxis.

### 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. No need to obtain specimens for diagnostic testing from the infant prior to instituting prophylactic therapy.
- 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.

- consider testing the mother for other STD (see *Clinical Approach to the Diagnosis and Management of STD*, page 39):
  - HIV testing and immunization against hepatitis B are recommended (see page 121)
  - if HIV antibody test is positive in a neonate, this does not necessarily mean infection of the infant (see *HIV Infection in Children*, page 182)
  - consider obtaining a blood sample for serologic testing of syphilis (see page 150).

## 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

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

#### Notes:

- Topical therapy alone for conjunctivitis is NOT adequate.
- Erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations may be substituted.

### Infection with *N. gonorrhoeae*

- HOSPITALIZE and institute appropriate infection control precautions until 24 hours 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 colleague experienced in this area as soon as possible.

#### Therapy<sup>(a, b, c)</sup>:

**If there is a delay in clinical presentation for treatment of symptoms OR if other risk factors exist which would increase the risk for systemic infection (e.g., prolonged rupture of membranes):**

- ceftriaxone 25-50 mg/kg/day IV or IM in a single daily dose for 2 to 3 days while awaiting blood culture results
- OR
- cefotaxime 25mg/kg IV every 12 hours for 2 to 3 days while awaiting blood culture results.

<b>If ophthalmia neonatorum only and no systemic disease suspected:</b>	<ul style="list-style-type: none"> <li>■ ceftriaxone 25-50mg/kg IV or IM in a single dose, not to exceed 125 mg.</li> </ul>
<b>If systemic disease is proven:</b>	<ul style="list-style-type: none"> <li>■ ceftriaxone 25-50mg/kg IV or IM in single daily doses for 7 days (extend therapy to 14 days if meningitis is demonstrated)<sup>(b)</sup></li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>■ cefotaxime 25mg/kg IV every 12 hours for 7 days (extend therapy to 14 days if meningitis is demonstrated)</li> </ul>

To each of the above regimens, add erythromycin at age-appropriate doses for 14 days<sup>(c)</sup> (as indicated on page 100 for *C. trachomatis*).

**Notes:**

- a) Topical therapy alone for conjunctivitis is NOT adequate. Additional topical antibiotics are not necessary for the treatment of gonococcal conjunctivitis.
- b) Prolonged use of ceftriaxone in neonates has been associated with precipitation of bile in the gall bladder resulting in elevation of bilirium levels.
- c) Erythromycin dosages refer to the use of erythromycin base. Equivalent dosages of other formulations may be substituted.

**Infection with *Herpes Simplex Virus*  
(see also *Genital HSV Infections*, page 160)**

- HOSPITALIZE and isolate.
- consultation with colleagues experienced in pediatrics and ophthalmology is recommended.

**Therapy:**

- acyclovir 45-60 mg/kg/day IV 1 to 2 hour infusion q8h for 14 to 21 days PLUS trifluridine or acyclovir or other anti-herpes ophthalmic solution bid for 14 days.

**Prevention**

- screening the infant prior to instituting prophylaxis is not necessary.
- 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.

**Reporting, Partner Notification 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 partner(s) should be located, clinically evaluated and treated appropriately.
- local public health authorities are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.

## SEXUALLY TRANSMITTED INTESTINAL AND ENTERIC INFECTIONS

### Definitions of Clinical Syndromes

#### Proctitis

- inflammation of the rectal mucosa not extending beyond 15 cm from the anal verge.
- symptoms include: anorectal pain, tenesmus, constipation, bloody stools and/or mucopurulent discharge.
- findings on sigmoidoscopy include erythema, friability and/or ulcerations of the rectal mucosa.
- transmission is usually due to direct inoculation of pathogens into the rectum during anal intercourse.

#### Colitis and proctocolitis

- inflammation of the colon (colitis) or of rectal mucosa extending more than 15 cm from the anal verge (proctocolitis).
- symptoms include: diarrhea, abdominal pain and/or fever (with or without proctitis symptoms).
- transmission is usually by the fecal-oral route.

#### Enteritis

- inflammation of the duodenum, jejunum and/or ileum.
- symptoms include: diarrhea, abdominal pain, bloating, cramps and/or nausea.
- transmission is usually by the fecal-oral route.

#### Notes:

- several pathogens are often present concurrently so that mixed infections are frequent.
- anal human papillomavirus (HPV) infection (genital warts) can sometimes be present in males with proctitis but does NOT cause symptoms of proctitis.
- in those infected with HIV, infection is often more severe and the list of potential causes is greater.
- trauma and foreign bodies may also 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.

## Etiology

Syndrome	Most important causes
<b>Proctitis</b>	<ul style="list-style-type: none"> <li>■ <i>Neisseria gonorrhoeae</i></li> <li>■ <i>Herpes simplex virus</i> (HSV)</li> <li>■ <i>Chlamydia trachomatis</i>, including LGV strains</li> <li>■ <i>Treponema pallidum</i> (syphilis)</li> </ul>
<b>Proctocolitis or Colitis</b>	<ul style="list-style-type: none"> <li>■ <i>Entamoeba histolytica</i></li> <li>■ <i>Campylobacter</i> species</li> <li>■ <i>Shigella</i> species</li> <li>■ toxin-producing <i>Clostridium difficile</i></li> <li>■ <i>Escherichia coli</i>, including O157:H7</li> </ul>
<b>Enteritis</b>	<ul style="list-style-type: none"> <li>■ <i>Giardia</i></li> <li>■ <i>E. coli</i>, including O157:H7</li> <li>■ additional etiologic considerations in HIV infection: <ul style="list-style-type: none"> <li>– Cytomegalovirus</li> <li>– <i>Mycobacterium avium</i> complex</li> <li>– <i>Cryptosporidium</i></li> <li>– <i>Salmonella</i> species</li> <li>– <i>Isospora</i></li> <li>– <i>microsporidia</i></li> </ul> </li> </ul>

## 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 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

- specimen collection should be adapted to the clinical presentation and the clinical history. In some cases of enteritis, evaluation for sexually transmitted pathogens is not relevant.
- evaluate for other STD if indicated:
  - evaluate young and adult males for urethritis (see *Urethritis*, page 69)
  - evaluate young and adult females for cervicitis (see *Cervicitis*, page 75)



- evaluate prepubertal girls for vaginitis (see *Prepubertal Vaginitis and Vulvitis*, page 95)
- evaluate prepubertal males for urethritis (see *Collection of Urethral Specimens*, page 50).
- 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 page 65) and a diagnostic test for HSV
  - obtain a biopsy of the lesions if the diagnosis is uncertain.

#### Rectal specimen

- obtain rectal swabs, preferably under direct vision through an anoscope or a proctoscope for diagnostic test for *N. gonorrhoeae*, culture for *C. trachomatis* and HSV (antigen detection tests for chlamydia are not recommended for rectal specimens) and gram stain.

#### Stool specimen if indicated by clinical presentation or history

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

#### Blood culture

- if patient is febrile and systemically ill, obtain blood cultures.

#### Considerations for Other STDs

(if indicated by clinical presentation or history)

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- HIV testing and counselling are recommended (see pages 175-178).
- immunization against hepatitis A for groups such as men who have sex with men and against hepatitis B for those at ongoing risk of sexual or parenteral acquisition of HBV is recommended (see page 121).
- screening for hepatitis B markers (surface antigen [HBsAg] and surface antibody [HBsAb]) should be considered before immunization in certain high risk individuals (see *Hepatitis B*, page 114).
- consider obtaining a blood sample for serologic testing of syphilis (see page 150).

## 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:

<p><b>Presence of a purulent or mucopurulent rectal discharge</b> OR <b>Rectal smear shows increased number of polymorphonuclear leukocytes (PMNs) with or without gram-negative intracellular diplococci</b></p>	<p>Treat for proctitis due to <i>N. gonorrhoeae</i> and <i>C. trachomatis</i>.</p> <p><b>9 years and older:</b></p> <ul style="list-style-type: none"> <li>ceftriaxone 250 mg IM in a single dose PLUS azithromycin 1 g orally in a single dose.</li> </ul> <p><b>under 9 years:</b></p> <ul style="list-style-type: none"> <li>cefixime 8 mg/kg orally in a single dose (max. 400 mg) PLUS azithromycin 12-15 mg/kg orally in a single dose (max. 1 g)</li> </ul> <p><b>Note:</b> For alternative regimens see section on <i>Gonococcal Infections</i>, page 145.</p>
<p><b>If rectal smear shows no or few PMNs</b></p>	<ul style="list-style-type: none"> <li>defer treatment until the results of diagnostic tests are available</li> <li>if the results are positive, treat according to the results (if an STD, see section on specific disease)</li> <li>if the results are negative, reassess.</li> </ul>
<p><b>Presence of external lesions typical of <i>Herpes simplex virus</i> infection (HSV)</b></p>	<ul style="list-style-type: none"> <li>consider treating for HSV (see <i>Genital HSV Infections</i>, page 160).</li> </ul>
<p><b>Dark-field microscopy positive lesion</b></p>	<ul style="list-style-type: none"> <li>treat for syphilis (see page 150).</li> </ul>
<p><b>Evidence for infection at other sites</b></p>	<ul style="list-style-type: none"> <li>manage for the appropriate syndrome (if an STD, see section on specific disease).</li> </ul>
<p><b>Epidemiologic reason to suspect the presence of a certain STD (e.g., contact with <i>N. gonorrhoeae</i> or syphilis)</b></p>	<ul style="list-style-type: none"> <li>manage for the STD (see section on specific disease).</li> </ul>

## Prevention

- 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.
- anal intercourse is the main mode of sexual transmission of pathogens that cause proctitis, and oral-anal sex is the main mode of sexually transmitted infections that cause proctocolitis/colitis and enteritis. Given these, risks of fecal-oral contamination should be discussed, particularly with:
  - commercial sex workers
  - street youth
  - men who have sex with men.
- see *Primary Prevention of STD*, page 31.
- at time of diagnosis of STD, review and monitor prevention practices.
- identify barriers to prevention practices and the means to overcome these.
- counselling about hygiene is recommended.

## Reporting and Partner Notification

- 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 for bacterial proctitis is indicated, all partners who have had sexual contact with the index case within at least 60 days prior to onset of symptoms should be located, clinically evaluated and treated with the same regimen as the index case. Persons treated for gonococcal infections should also be treated for chlamydia.
- local public health authorities are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.

## Follow-up

- follow-up should be arranged.
- 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 for syphilis, where serologic follow-up is necessary (see *Syphilis*, page 150).

# MANAGEMENT AND TREATMENT OF SPECIFIC DISEASES

## CHLAMYDIAL INFECTIONS

### Etiology

- caused by *Chlamydia trachomatis*.

### Epidemiology

- 37 551 cases reported in 1995 alone (total incidence rate: 126,8/100 000 population).
- frequent in sexually active youth:
  - reports are most common for females 15 to 24 years of age (incidence in females 15 to 19 years: 1 109,1/100 000 population; females 20 to 24 years: 1 041,7/100 000 population)
  - under-diagnosed in males
- > 50% of males and 70% of females can be asymptomatic.
- if symptomatic, incubation period is 2 to 6 weeks but can be longer.
- *N. gonorrhoeae* occasionally presents concurrently with *C. trachomatis*.
- long-term carriage occurs.

### Diagnostic Features

#### Behavioural factors

- contact with person with a proven infection or a compatible syndrome.
- sexually active youth < 25 years of age.
- previous STD.

### Symptoms

Females	Males	Neonates and infants
<ul style="list-style-type: none"> <li>■ most often asymptomatic</li> <li>■ genital discharge</li> <li>■ internal dysuria (when urinary tract infection ruled out)</li> <li>■ lower abdominal pain</li> <li>■ abnormal vaginal bleeding</li> <li>■ deep dyspareunia</li> </ul>	<ul style="list-style-type: none"> <li>■ urethral discharge</li> <li>■ dysuria</li> <li>■ urethral itch</li> <li>■ epididymal pain</li> </ul>	<ul style="list-style-type: none"> <li>■ conjunctivitis in neonates and pneumonia in infants &lt; 6 months of age.</li> </ul>

## Manifestations of Disease

Neonates and infants	Children	Youth and adults
<ul style="list-style-type: none"> <li>■ conjunctivitis in neonates</li> <li>■ pneumonia in infants &lt; 6 months of age</li> </ul>	<ul style="list-style-type: none"> <li>■ urethritis</li> <li>■ vaginitis</li> <li>■ proctitis</li> <li>■ conjunctivitis</li> <li>■ Lymphogranuloma venereum</li> </ul>	<p><b>Females:</b></p> <ul style="list-style-type: none"> <li>■ cervicitis</li> <li>■ pelvic inflammatory disease (PID)</li> <li>■ urethritis</li> <li>■ perihepatitis</li> </ul> <p><b>Males:</b></p> <ul style="list-style-type: none"> <li>■ urethritis</li> <li>■ epididymitis</li> </ul> <p><b>Males and females:</b></p> <ul style="list-style-type: none"> <li>■ proctitis</li> <li>■ conjunctivitis</li> <li>■ Reiter's syndrome</li> <li>■ Lymphogranuloma venereum</li> </ul>

## Major sequelae

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>■ females: <ul style="list-style-type: none"> <li>- pelvic inflammatory disease</li> <li>- chronic pelvic pain</li> <li>- infertility</li> <li>- ectopic pregnancy</li> <li>- Reiter's syndrome.</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>■ males: <ul style="list-style-type: none"> <li>- epididymo-orchitis</li> <li>- Reiter's syndrome</li> <li>- infertility (rare).</li> </ul> </li> </ul> |
|--|--|

## Laboratory Diagnosis

- results are dependent on the type of test available, appropriate specimen collection and transport, and laboratory expertise.
- culture was traditionally considered the preferred method of laboratory diagnosis, especially for medico-legal purposes as it is more specific than non-culture tests.
- new amplified nucleic acid tests (e.g., PCR, LCR) are more sensitive than culture, are highly specific, more acceptable to patients and are suitable for forensic purposes (see *Laboratory Diagnosis*, page 59).
- antigen detection techniques (e.g., DFA, EIA) with confirmatory testing are an alternative (see page 60). These techniques are NOT appropriate for rectal, nasopharyngeal or urine 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 but is not helpful for diagnosing acute illness. Consultation with a colleague experienced in this area is recommended.

### Specimen Collection

- the sample should include epithelial cells as *C. trachomatis* is an obligate intracellular parasite. Pus may not contain many such cells.

### Routine specimen sites

- cervix in young and adult females (see page 51).
- urethra in young and adult males and prepubertal boys if urine not feasible (see page 50).
- urine (first 10 to 15 ml) for males and females (see page 50).
- vagina/rectum in prepubertal girls (see page 52; 53).

### Other sites

- women undergoing laparoscopy for investigation of pelvic inflammatory disease should have endometrial or fimbrial biopsy specimens taken for amplified nucleic acid tests (e.g., PCR or LCR).
- if the cervix has been surgically removed, rectal swab for culture and urethral swab for testing.
- if proctitis is considered or if rectal penetration has occurred, rectal swab for culture.
- conjunctival scraping for ocular infection (with use of topical anesthetic).
- nasopharyngeal aspirate in infants < 6 months of age.
- bubo aspirate in *Lymphogranuloma venereum*.

**Note:** For further information on specimen transport, see page 56.

### Considerations for Other STDs

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- consider obtaining specimen(s) for the diagnosis of gonococcal infection.
- HIV testing and counselling are recommended (see page 176).
- immunization against hepatitis B is recommended (see page 121).
- consider obtaining a blood sample for serologic testing of syphilis (see page 150).

## 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*.

## Treatment

- **directly observed therapy with single dose regimens is desirable to guarantee compliance.**

### Treatment – Youth and adults

#### Urethral, Endocervical, Rectal Infection (except in pregnant women and nursing mothers)

Pelvic inflammatory disease, see page 80  
Epididymitis, see page 100

##### Preferred:

- azithromycin 1 g orally in a single dose<sup>(a)</sup>

##### Alternative:

- doxycycline 100 mg orally bid for 7 days

##### Other alternatives:

- ofloxacin 300 mg bid for 7 days

OR

- erythromycin 2 g/day orally in divided doses for 7 days<sup>(b)</sup>

OR

- erythromycin 1 g/day orally in divided doses for 14 days<sup>(b)</sup>

##### Notes:

- (a) If vomiting occurs more than one hour post administration, a repeat dose is not required.
- (b) 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.

**Urethral, Endocervical, Rectal Infection in Pregnant Women and Nursing Mothers**

**Preferred:**

- amoxicillin 500 mg orally tid for 7 days  
OR
- erythromycin 2 g/day orally in divided doses for 7 days<sup>(a)</sup>

**Alternative:**

- azithromycin 1 g orally in a single dose<sup>(b)</sup>

**Notes:**

- (a) Erythromycin dosage refers to the use of erythromycin base. Equivalent dosages of other formulations (EXCEPT the estolate which is contraindicated in pregnancy) may be substituted. If erythromycin or amoxicillin has been used for treatment, repeat testing after completion of therapy is advisable.
- (b) To date, there are limited data collected on azithromycin in pregnancy but it is considered to be safe in this context by many experts.

Treatment – Neonates, infants and children

- topical therapy alone for conjunctivitis is NOT adequate.

Neonates and Infants <sup>(a)</sup>	Children	
	under 9 years	9 years and older
<p><b>During first week of life:</b></p> <ul style="list-style-type: none"> <li>■ infants &lt; 2000 g: erythromycin 20 mg/kg/day orally in divided doses<sup>(b)</sup></li> <li>■ infants &gt; 2000 g: erythromycin 30 mg/kg/day orally in divided doses<sup>(b)</sup></li> </ul> <p><b>&gt; 1 week to 1 month</b></p> <ul style="list-style-type: none"> <li>■ erythromycin 40 mg/kg/day orally in divided doses<sup>(b)</sup></li> </ul> <p>The above regimens should be given for at least 14 days.</p>	<p><b>After 1 month of age:</b></p> <ul style="list-style-type: none"> <li>■ azithromycin 12-15 mg/kg (max. 1 g) orally in a single dose</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>■ sulfamethoxazole 75 mg/kg/day orally in divided doses (max. 1 g bid) for 10 days</li> </ul>	<p><b>Preferred:</b></p> <ul style="list-style-type: none"> <li>■ azithromycin 12-15 mg/kg (max. 1 g) orally in a single dose</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>■ doxycycline 5 mg/kg/day orally in divided doses (max.100 mg bid) for 7 days</li> </ul> <p><b>Alternatives:</b></p> <ul style="list-style-type: none"> <li>■ erythromycin 40 mg/kg/day orally in divided doses (max.500 mg qid for 7 days or 250 mg qid for 14 days)<sup>(b)</sup></li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>■ sulfamethoxazole 75 mg/kg/day orally in divided doses (max. 1 g bid) for 10 days</li> </ul>



**Notes:**

- (a) Neonates and infants born to infected mothers must be tested and treated.
- (b) 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.

## Prevention

- 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.
- at time of diagnosis of STD, review and monitor prevention practices.
- identify barriers to prevention practices and the means to overcome these.
- see *Primary Prevention of STD*, page 31.
- provide counselling for the prevention of reproductive sequelae.
- patients and contacts should abstain from unprotected intercourse until treatment of both partners is complete (i.e., 7 days after single dose therapy).

## Reporting and Partner Notification

- *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 within at least 60 days prior to diagnosis, parents of infected neonates (i.e., mother and her sexual partner), and persons implicated in sexual abuse cases must be located, clinically evaluated and treated with the same regimen as the index case.
- local public health authorities are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education. If resources for local public health authority support are limited, priority for partner notification should be directed towards youth < 25 years of age.

## Special considerations for children

- neonates and infants born to infected mothers **MUST** be tested and treated.
- sexual abuse must be considered when genital, rectal or pharyngeal chlamydial infection is diagnosed in any prepubertal child, although perinatally acquired *C. trachomatis* can persist in an infant for up to 3 years. Consultation with a colleague experienced in such cases should be sought. Siblings and other children possibly at risk must also be evaluated.
- sexual abuse of children must be reported to the local child protection agency.
- see *Child Sexual Abuse*, page 201.
- follow-up cultures for “test-of-cure” are indicated approximately 4 weeks after completion of therapy.

## Follow-up

- repeat diagnostic testing for *C. trachomatis* is not routinely indicated if a recommended treatment is given and taken AND symptoms and signs disappear AND there is no re-exposure to an untreated partner.
- 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, repeat testing should be performed at 3 to 4 weeks after the completion of effective treatment. Culture or amplified nucleic acid tests are recommended.
- in patients with apparent treatment failure, possibilities include:
  - failure to take medication correctly or to finish course of therapy
  - re-exposure to an untreated partner
  - infection acquired from a new partner
  - a false-positive result.
- in patients with persistent symptoms, infection with other pathogens and a non-infective etiology should also be considered.

## GONOCOCCAL INFECTIONS

### Etiology

- caused by *Neisseria gonorrhoeae*.
- *Chlamydia trachomatis* and other STD pathogens are often also present.

### Epidemiology

- 5 303 reported cases in 1995; most affected are males 20 to 24 years of age (incidence: 70,0/100 000 population) and females 15 to 19 years (incidence: 87,8/100 000 population).
- rates of gonococcal infections are now low. Therefore, case finding and partner notification are critical strategies to control this infection because it appears that a network of people with high transmission activities play a key role in maintaining current prevalence level.
- **proportion of penicillin-resistant organisms > 1% in most areas of Canada and may reach 15% or higher in certain urban and 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%
  - continued monitoring for antimicrobial resistance is important for ensuring high cure rates for this treatable infection
- highest incidence groups: females 15 to 19 years of age and males 20 to 24 years of age.
- usual incubation period, 2 to 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.
- HIV transmission is enhanced in people with concomitant gonococcal infections.

### Diagnostic Features

#### Behavioural factors

- contact with a person with proven infection or a compatible syndrome.
- unprotected sex with a partner originating from an area with high endemicity (also higher risk of resistance).
- travellers to endemic country who have had unprotected sex with local population (higher risk of resistance).
- commercial sex workers.
- sexually active youth < 25 years of age with multiple partners.
- street-involved youth.
- men who have unprotected sex with men.

## Symptoms of genital tract infection with *N. gonorrhoeae*

Females	Males	Neonates
<ul style="list-style-type: none"> <li>■ vaginal discharge</li> <li>■ dysuria</li> <li>■ abnormal vaginal bleeding</li> <li>■ lower abdominal pain</li> <li>■ deep dyspareunia</li> <li>■ rectal pain and discharge if proctitis (see Sexually Transmitted Intestinal and Enteric Infections, page 127).</li> </ul>	<ul style="list-style-type: none"> <li>■ urethral discharge</li> <li>■ dysuria</li> <li>■ urethral itch</li> <li>■ epididymal pain</li> <li>■ rectal pain and discharge if proctitis (see Sexually Transmitted Intestinal and Enteric Infections, page 127).</li> </ul>	<ul style="list-style-type: none"> <li>■ conjunctivitis</li> <li>■ sepsis.</li> </ul>

## Manifestations of Disease

Neonates and infants	Children	Youth and adults
<ul style="list-style-type: none"> <li>■ ophthalmia neonatorum</li> <li>■ neonatal amniotic fluid infection syndrome</li> <li>■ disseminated gonococcal infection</li> </ul>	<ul style="list-style-type: none"> <li>■ urethritis</li> <li>■ vaginitis</li> <li>■ conjunctivitis</li> <li>■ pharyngitis</li> <li>■ proctitis</li> <li>■ disseminated gonococcal infection</li> </ul>	<p><b>Females:</b></p> <ul style="list-style-type: none"> <li>■ cervicitis</li> <li>■ pelvic inflammatory disease</li> <li>■ urethritis</li> <li>■ perihepatitis</li> <li>■ bartholinitis</li> </ul> <p><b>Males:</b></p> <ul style="list-style-type: none"> <li>■ urethritis</li> <li>■ epididymitis</li> </ul> <p><b>Females and males:</b></p> <ul style="list-style-type: none"> <li>■ pharyngitis</li> <li>■ conjunctivitis</li> <li>■ proctitis</li> <li>■ disseminated gonococcal infection: arthritis, dermatitis, endocarditis, meningitis</li> </ul>

## Major Sequelae

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>■ females: <ul style="list-style-type: none"> <li>- pelvic inflammatory disease</li> <li>- infertility</li> <li>- ectopic pregnancy</li> <li>- chronic pelvic pain</li> <li>- Reiter's syndrome.</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>■ males: <ul style="list-style-type: none"> <li>- epididymo-orchitis</li> <li>- Reiter's syndrome</li> <li>- infertility (rare).</li> </ul> </li> </ul> |
|--|--|

## Laboratory Diagnosis

- cultures obtained less than 48 hours after exposure may be negative.
- culture is the preferred method and is especially recommended in cases of:
  - sexual abuse of children (rectal, pharyngeal, vaginal)
  - sexual assault
  - treatment failure
  - evaluation of cervicitis and PID
  - infection acquired overseas.
- antimicrobial 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 are an ideal method when delays in transportation cannot be avoided (see *Laboratory Diagnosis*, page 57).
- amplified nucleic acid tests may be considered but measures should be taken to continue surveillance for antimicrobial resistance, which requires culture.
- whenever possible, culture is the recommended method because it allows for antimicrobial susceptibility testing. If not possible, the first 10 to 15 ml of urine (patient should not have voided for at least 2 hours) should be used for amplified nucleic acid testing.

## Specimen Collection

### Routine specimen sites

- urethra in young and adult males, with/without meatal discharge (see page 50)
  - prepubertal boys (see page 50).
- cervix in young and adult females (see page 51).
- rectum in females and in men who have sex with men (see page 53)
  - colonization can occur without anal intercourse.
- prepubertal girls (see page 50; 51).
- pharynx with history of oral-genital contact (see page 53).

### Other sites

- 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 (put in hemoculture bottle) in disseminated disease.
- joint (synovial) fluid should also be examined by Gram stain.
- epididymal aspirate in men with epididymitis.

- conjunctiva for ocular infection.
- urine (first 10 to 15 ml) for amplified nucleic acid test if culture is not available.

**Note:** For further information on specimen transport, see page 56.

Site/Specimen	Test	Comments
<b>Urethra</b> (young and adult males)	<ul style="list-style-type: none"> <li>■ Gram stain (for intracellular diplococci)</li> <li>■ culture</li> <li>■ non-culture test</li> </ul>	<ul style="list-style-type: none"> <li>■ generally diagnostic of gonorrhoea.</li> <li>■ confirmation and antimicrobial susceptibility testing</li> <li>■ calcium alginate or Dacron™ swabs are recommended.</li> <li>■ only in cases where culture not practical (does not provide antibiotic susceptibility).</li> </ul>
<b>Endocervix/urethra</b> (young and adult females)	<ul style="list-style-type: none"> <li>■ Gram stain for intracellular diplococci</li> <li>■ culture</li> <li>■ non-culture tests</li> </ul>	<ul style="list-style-type: none"> <li>■ sensitivity lower than in urethral specimens in males but may be diagnostic of gonorrhoea.</li> <li>■ confirmation and antimicrobial susceptibility testing.</li> <li>■ calcium alginate or Dacron swabs are recommended.</li> <li>■ only in cases where culture not practical (does not provide antibiotic susceptibility).</li> </ul>
<b>Pharynx/conjunctiva/rectum</b>	<ul style="list-style-type: none"> <li>■ culture (Gram stain and non-culture tests not suitable for these sites)</li> </ul>	<ul style="list-style-type: none"> <li>■ confirmation and antibiotic susceptibility.</li> </ul>
<b>Urine</b> (males and females)	<ul style="list-style-type: none"> <li>■ amplified nucleic acid test (e.g., PCR, LCR)</li> </ul>	<ul style="list-style-type: none"> <li>■ if culture is not available or if transport of the specimen is delayed.</li> <li>■ If symptomatic or if patient does not respond, the second test must be culture.</li> </ul>
<b>Systemic infection</b>	<ul style="list-style-type: none"> <li>■ genital testing</li> <li>■ blood culture</li> <li>■ gram stain and culture of skin lesion</li> <li>■ joint fluid if arthritis.</li> </ul>	

**Notes:**

- specimens should be taken for diagnosis of gonococcal infection and chlamydial infection (for swab type for chlamydia, see page 59).
- culture has the advantage of allowing for further testing for antimicrobial susceptibility.

- if symptomatic or if patient does not respond, the second test must be culture.

#### Transport

- contact the laboratory for specific instructions regarding the preferred method of transport of specimens to ensure pathogen survival for purposes of culture (see *Laboratory Diagnosis of Gonococcal Infections*, page 59).
- transport of gonococcal specimens for culture should be at ambient temperature NOT 4° C as recommended for other organisms.

#### Consideration for Other STDs

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- obtain a specimen for the diagnosis of chlamydial infection.
- HIV testing and counselling are recommended (see page 176).
- immunization against hepatitis B is recommended (see page 121).
- consider obtaining a blood sample for serologic testing of syphilis (see page 150).

#### Management

- based on site of infection and laboratory results.
- the diagnosis of gonorrhea should be confirmed by the identification of *N. gonorrhoeae* by culture or urine for amplified nucleic acid tests (e.g., PCR, LCR) if culture is not available. All confirmed or suspected cases **MUST** be treated.

Results Available	
Gram stain	<ul style="list-style-type: none"> <li>■ treat for gonococcal and chlamydial infection if Gram-negative intracellular diplococci observed.</li> <li>■ the presence of gram-negative diplococci outside polymorphonuclear leukocytes (PMNs) is an equivocal finding which must be confirmed by culture. If positive, treat.</li> <li>■ the presence of PMNs without diplococci does not indicate or exclude gonococcal infection.</li> </ul>
Culture test	<ul style="list-style-type: none"> <li>■ treat all positives.</li> </ul>
Amplified nucleic acid test (e.g., PCR, LCR)	<ul style="list-style-type: none"> <li>■ a positive test is diagnostic of gonorrhea and the patient should be treated.</li> </ul>

Results of Smear/Culture/Nucleic Acid Test Unavailable	
Urethral/cervical mucopurulent discharge observed	<ul style="list-style-type: none"> <li>■ treat for gonorrhoea and C. trachomatis.</li> </ul>
No urethral/cervical mucopurulent discharge	<ul style="list-style-type: none"> <li>■ defer therapy until smear/culture/nucleic acid test results available.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>■ if follow-up uncertain and history and symptoms suggestive treat for gonorrhoea and C. trachomatis.</li> <li>■ treat for gonorrhoea and C. trachomatis if partner positive.</li> </ul>

### Treatment

- all patients treated for gonorrhoea should also be treated for chlamydial infection.
- **directly observed therapy with single dose regimens is desirable to guarantee compliance.**

### Youth and adults

Urethral, Endocervical, Rectal, Pharyngeal Infection (except pregnant women and nursing mothers)	
Pelvic inflammatory disease, see page 80 Epididymitis, see page 100	
<b>Preferred:</b> <ul style="list-style-type: none"> <li>■ cefixime 400 mg orally in a single dose<sup>(a)</sup></li> </ul>	<b>Alternative (IM):</b> <ul style="list-style-type: none"> <li>■ ceftriaxone 125 mg IM in a single dose<sup>(a, b)</sup></li> </ul> <b>Other alternatives:</b> <ul style="list-style-type: none"> <li>■ ciprofloxacin 500 mg orally in a single dose<sup>(c)</sup></li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>■ ofloxacin 400 mg orally in a single dose<sup>(c)</sup></li> </ul>
<b>All regimens followed by empiric treatment for chlamydial and non-gonococcal infections:</b> <ul style="list-style-type: none"> <li>■ azithromycin 1 g orally in a single dose OR doxycycline 100 mg orally bid for 7 days (for alternatives, see page 137).</li> </ul>	
<b>Notes:</b> <p>(a) Cefixime and ceftriaxone should not be given to persons with cephalosporin allergy or a history of immediate and/or anaphylactic reactions to penicillins.</p> <p>(b) The preferred diluent for IM ceftriaxone is 1% lidocaine without epinephrine (0,9 ml/250 mg, 0,45 ml/125 mg) to reduce discomfort.</p> <p>(c) Ciprofloxacin and ofloxacin should not be used if there is a possibility that the infection was acquired in Southeast Asia or is epidemiologically linked to a case from that region. If either ciprofloxacin or ofloxacin is used in such a case, a test-of-cure is recommended. Both drugs are contraindicated in pregnancy.</p>	



**Urethral, Endocervical, Rectal or Pharyngeal Infection in Pregnant Women and Nursing Mothers**

**Preferred:**

- cefixime 400 mg orally in a single dose.

**Alternatives (IM):**

- ceftriaxone 125 mg IM in a single dose<sup>(a)</sup>
- OR
- spectinomycin 2 g IM in a single dose<sup>(b)</sup>

**All regimens followed by empiric treatment for chlamydial and non-gonococcal infections:**

- amoxicillin 500 mg orally tid for 7 days OR 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) (for alternative, see page 137).

**Notes:**

- (a) Cefixime and ceftriaxone should not be given to persons with cephalosporin allergy or a history of immediate and/or anaphylactic reactions to penicillins.
- (b) If spectinomycin is used, a test-of-cure is recommended.

**Gonococcal Ophthalmia Disseminated Infection: Arthritis, Meningitis**

- consultation with a colleague experienced in this area is essential.
- HOSPITALIZATION is necessary for meningitis and may be necessary for other disseminated infection.

**Preferred initial therapy:**

- ceftriaxone 2 g/day IV/IM PLUS doxycycline/azithromycin while awaiting consultation<sup>(a)</sup>.

**Note:**

- (a) The preferred diluent for IM ceftriaxone is 1% lidocaine without epinephrine (0,9 ml/250 mg, 0,45 ml/125 mg) to reduce discomfort.

**Treatment – Children under 9 years of age<sup>(a)</sup>**

**Urethral, Vaginal, Rectal, Pharyngeal Infection**

**Preferred:**

- cefixime 8 mg/kg orally in a single dose (max. 400 mg)<sup>(b, c)</sup>
- OR
- ceftriaxone 125 mg IM in a single dose<sup>(c, d)</sup>

**Alternative:**

- spectinomycin 40 mg/kg IM (max. 2 g) in a single dose

**All regimens followed by treatment for chlamydial infection:**

- azithromycin 10-15 mg/kg orally in a single dose (max. 1 g) OR erythromycin 40 mg/kg/day orally in divided doses (max. 500 mg qid) for 7 days<sup>(a)</sup>

**Notes:**

- (a) Erythromycin dosages refer to erythromycin base. Equivalent dosages of other formulations may be substituted.
- (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 ensured. If follow-up cannot be ensured, use ceftriaxone 125 mg IM in place of cefixime.
- (c) Cefixime and ceftriaxone should not be given to persons with cephalosporin allergy or a history of immediate and/or anaphylactic reactions to penicillins.
- (d) The preferred diluent for IM ceftriaxone is 1% lidocaine without epinephrine (0,9 ml/250 mg, 0,45 ml/125 mg) to reduce discomfort.

**Disseminated Infection: Arthritis, Meningitis, Gonococcal Ophthalmia Beyond Neonatal Period**

- HOSPITALIZATION and consultation with a colleague experienced in this area are essential.

**Preferred initial therapy:**

- Ceftriaxone 50 to 100 mg/kg/day IM or IV PLUS azithromycin/erythromycin while awaiting consultation<sup>(a)</sup>.

**Note:**

- (a) The preferred diluent for IM ceftriaxone is 1% lidocaine without epinephrine (0,9 ml/250 mg, 0,45 ml/125 mg) to reduce discomfort.

## Treatment – Neonatal infection

**Ophthalmia Neonatorum**

- HOSPITALIZE and institute appropriate infection control precautions until 24 hours 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 to 100 mg/kg/day IV or IM (single dose therapy may be adequate if blood culture is negative).
- consult with a colleague experienced in this area as soon as possible.

**Neonates 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<sup>(a, b)</sup>

**if < 7 days 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:**

- The preferred diluent for IM ceftriaxone is 1% lidocaine without epinephrine (0,9 ml/250 mg, 0,45 ml/125 mg) to reduce discomfort.
- Erythromycin dosages refer to erythromycin base. Equivalent dosages of other formulations may be substituted.

**Prevention**

- 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.
- at time of diagnosis of STD, review and monitor prevention practices.
- identify barriers to prevention practices and the means to overcome these.
- see Primary Prevention of STD, page 31.
- provide counselling for the prevention of reproductive sequelae.
- patients and contacts should abstain from unprotected intercourse until treatment of both partners is complete (i.e., 7 days after single dose therapy).

**Reporting and Partner Notification**

- with the changing epidemiology of *N. gonorrhoeae* and the actual low rates of infection, case finding and partner notification are critical strategies for maintaining control of gonococcal infections in Canada.
- 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 the index case within at least 60 days prior to the onset of symptoms; parents of infected neonates (i.e., mother and her sexual partner), and persons implicated in sexual abuse cases must be located, clinically evaluated and treated with the same regimen as the index case. Persons treated for gonococcal infections should also be treated for *C. trachomatis* since co-infections are common.
- local public health authorities are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.

### Special considerations for children

- neonates and infants born to infected mothers **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. Consultation with a colleague experienced in such cases should be sought. Siblings and other children possibly at risk must also 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 *Child Sexual Abuse*, page 201.
- follow-up cultures for test-of-cure are indicated approximately 4 to 5 days after the completion of therapy. These should include reculturing of all positive sites.

### Follow-up

- repeat diagnostic testing for *N. gonorrhoeae* is not routinely indicated 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 is documented
- compliance is uncertain
- pharyngeal or rectal gonorrhea is diagnosed
- there is re-exposure to an untreated partner
- there is concern over a false-positive non-culture test result
- infection occurs during pregnancy
- PID or disseminated gonococcal infection (DGI) is diagnosed
- patient is a child and there is concern with ongoing exposure.

## SYPHILIS

### Etiology

- caused by *Treponema pallidum*.

### Epidemiology

- 581 cases reported in Canada in 1995 (incidence of primary, secondary, early latent: 0,5/100 000 population)
  - 145 primary, secondary, early latent
  - 2 congenital
  - 434 "other".
- males aged 20 to 24 years have the highest incidence rate (1,4/100 000 population).
- men and women with primary and secondary syphilis or other genital ulcer disease are at increased risk of acquiring and transmitting HIV.
- syphilis should be considered in persons who have had sexual contact in areas of high endemicity (e.g., travellers to Southeast Asia, Eastern Europe, etc.).
- though rare, congenital syphilis is a serious infection and may leave debilitating sequelae.

### Diagnostic Features

#### Behavioural factors

- contact with known case of syphilis.
- person originating from or sex with person from syphilis endemic area.
- commercial sex work.
- street involvement.

#### Symptoms and signs

- current or past history of lesions or rash (see *Manifestations of Disease*, page 151)
- previous genital lesion or STD.

#### Special considerations in pregnant women

- universal screening of pregnant women has remained standard of care in most jurisdictions.
- there is controversy over whether this remains practical where syphilis prevalence is very low.
- pregnant women at increased risk for syphilis include:
  - youth < 25 years of age
  - commercial sex workers
  - women originating from a syphilis endemic area
  - injection drug users
  - street youth

- special efforts should be made to screen pregnant women at risk early in pregnancy. If there has been no ante-natal care, screen at delivery. Neonates should not be discharged from the hospital before syphilis results are available when ante-natal care is uncertain.

### Manifestations of Disease

Stage	Incubation Period	Manifestations/Comments (may be asymptomatic)
Primary	10-90 days	<ul style="list-style-type: none"> <li>■ painless, indurated chancre (usually genital)</li> <li>■ non-tender regional lymphadenopathy</li> </ul>
Secondary	4-10 weeks after primary stage	<ul style="list-style-type: none"> <li>■ non-pruritic maculopapular eruption (trunk, palms, soles)</li> <li>■ generalized non-tender lymphadenopathy</li> <li>■ condyloma lata, mucous patches, fever, malaise</li> </ul>
Latent – asymptomatic		<ul style="list-style-type: none"> <li>■ early &lt; 1 year's duration – 25% will relapse to secondary</li> <li>■ late &gt; 1 year's duration</li> </ul>
Tertiary	10-30 years	<ul style="list-style-type: none"> <li>■ gummatous lesions of skin, bone, subcutaneous tissue</li> <li>■ cardiovascular – aortic aneurysm, aortic regurgitation</li> <li>■ neurosyphilis</li> </ul>
Congenital		<ul style="list-style-type: none"> <li>■ 50% risk of transmission when mother has untreated primary, secondary or early latent syphilis</li> <li>■ may be asymptomatic in 2/3 of cases</li> <li>■ low birth weight, rhinitis, hepatosplenomegaly, rash, anemia, metaphyseal dystrophy</li> <li>■ stillbirth</li> <li>■ may present with early syphilis in first 2 years of life or with manifestations later in life (e.g., interstitial keratitis).</li> </ul>

### Laboratory Diagnosis

- interpretation of syphilis serology is often difficult. Advice from a colleague experienced in this area 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.

### Interpretation of serologic tests for syphilis

Non-treponemal test: VDRL, RPR, ART, TRUST, RST, EIA	Treponemal-specific test: TP-PA, MHA-TP, FTA-ABS	Possible Reason
+	+	<ul style="list-style-type: none"> <li>■ syphilis – recent or previous.</li> <li>■ yaws or pinta.</li> </ul>
+	-	<ul style="list-style-type: none"> <li>■ no syphilis – false positive.</li> <li>■ rarely seen in very early syphilis</li> </ul>
-	+	<ul style="list-style-type: none"> <li>■ consistent with syphilis, primary or latent. Previously treated or untreated.</li> <li>■ yaws, pinta or Lyme disease.</li> </ul>
-	-	<ul style="list-style-type: none"> <li>■ no syphilis or incubating disease.</li> </ul>

### Specimen Collection

Direct or Indirect Fluorescent Antibody Test (DFA/IFA) or Dark-field Microscopy

- see page 65.
- 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 to 4 weeks after appearance of primary chancre, 6 weeks after exposure.
- treponemal-specific tests such as *Treponema pallidum* particle agglutination (TP-PA), MHA-TP and FTA-ABS usually become reactive before RPR (see *Laboratory Diagnosis of Syphilis*, page 65).

### Cerebrospinal fluid (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 > 1:16
  - previously treated patients who fail to achieve an adequate serologic response
  - **in HIV patients, a lumbar puncture (LP) is strongly recommended if neurologic symptoms and/or signs are present 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.**

### Considerations for Other STDs

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- obtain specimen(s) for the diagnosis of chlamydial and gonococcal infections.
- HIV testing and immunization against hepatitis B are recommended (see page 121).

### Management

#### Primary and secondary syphilis

- serology: non-treponemal test (e.g., RPR) and treponemal-specific test (TP-PA/MHA ± FTA).
- 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:	<ul style="list-style-type: none"> <li>■ repeat test twice; if positive, treat.</li> <li>■ if results still negative and if follow-up can be ensured await syphilis serology results.</li> <li>■ if dark-field examination not available or follow-up of patient with negative result cannot be ensured, treat.</li> </ul>

- obtain culture from ulcer for *herpes simplex* virus (HSV).



### Latent syphilis

- serology: non-treponemal test (e.g., RPR) and treponemal-specific test (TP-PA/MHA  $\pm$  FTA). A negative non-treponemal test result does NOT rule out latent syphilis.
- rule out tertiary disease by physical examination and chest X-ray.
- lumbar puncture should be considered.
- treat for appropriate stage.

### Tertiary syphilis

- serology: non-treponemal test (e.g., RPR) and treponemal-specific test (TP-PA/MHA  $\pm$  FTA). A negative non-treponemal test result does NOT rule out tertiary syphilis.
- 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 syphilis

- venous sample for serology on child and mother: non-treponemal test (e.g., RPR) and treponemal-specific test (e.g., TP-PA)
  - cord blood is not an appropriate sample for serology. A venous sample must be obtained from the child and the mother
  - interpretation of a child's serologic result will depend on history of and response to treatment in pregnancy and the age of the child.
- examine placenta by dark-field examination or by direct fluorescent antibody test.
- 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 below).

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

## Treatment

Stage	Preferred Treatment	Alternative Treatment for Penicillin Allergic Patients <sup>(a)</sup>
Primary, secondary, latent < 1 year duration	<b>For youth and adults:</b> <ul style="list-style-type: none"> <li>■ benzathine penicillin G 2,4 million U IM in single session.</li> </ul>	<b>For youth and adults:</b> <ul style="list-style-type: none"> <li>■ doxycycline 100 mg orally bid for 14 days.</li> </ul>
	<b>For children (not congenital syphilis):</b> <ul style="list-style-type: none"> <li>■ benzathine penicillin G 50 000 U/kg IM (up to maximum of 2,4 million U) in a single session.</li> </ul>	<b>For children &lt; 9 years and pregnant women:</b> <b>Preferred:</b> <ul style="list-style-type: none"> <li>■ desensitization and use of penicillin (see page 156).</li> </ul> <b>Alternative:</b> <ul style="list-style-type: none"> <li>■ erythromycin 40 mg/kg/day orally in divided doses (max. 500 mg per dose) for 14 days <sup>(b)</sup>.</li> </ul>
Latent > 1 year duration, including cardiovascular	<ul style="list-style-type: none"> <li>■ benzathine penicillin G 2,4 million U IM weekly for 3 successive weeks.</li> </ul>	<ul style="list-style-type: none"> <li>■ as above except that therapy should be administered for 28 days.</li> </ul>
Neurosyphilis	<ul style="list-style-type: none"> <li>■ crystalline penicillin G 3-4 million U IV 4 hourly (16-24 million U/day) for 10-14 days.</li> </ul>	

### Notes:

- a) Penicillin allergic patients administered doxycycline/erythromycin must be followed carefully to ensure therapeutic success.
- b) Erythromycin dosages refer to use of erythromycin base. Equivalent dosages of other formulations (EXCEPT that estolate is contraindicated in pregnancy) may be substituted

### Congenital Syphilis<sup>(a)</sup>

Stage	Preferred treatment
Early < 1 year:	<ul style="list-style-type: none"> <li>■ crystalline penicillin G 50 000 U/kg IV 12 hourly for the first week of life, 8 hourly thereafter, for 10 days of total therapy.</li> </ul>
Late > 1 year:	<b>Abnormal CSF or neurologic involvement:</b> <ul style="list-style-type: none"> <li>■ crystalline penicillin G 200 000 U/kg/day IV 6 hourly for 10-14 days.</li> </ul>
	<b>Normal CSF and no neurologic involvement:</b> <ul style="list-style-type: none"> <li>■ crystalline penicillin G 200 000 U/kg/day IV 6 hourly for 10-14 days</li> <li>OR</li> <li>■ benzathine penicillin G 50 000 U/kg IM (max. 2,4 million U) weekly for 3 successive weeks.</li> </ul>

**Note:**

(a) 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 cannot be ensured.

**Penicillin Desensitization**

- patients who have a positive skin test to one of the penicillin determinants can be desensitized.
- this is a straightforward, relatively safe procedure that can be done orally or IV. Oral desensitization is thought to be safer, simpler and easier.
- patients should be desensitized in a hospital setting because serious IgE-mediated allergic reactions, although unlikely, can occur. Desensitization can usually be completed in about 4 hours, after which the first dose of penicillin is given.
- STD programs should have a referral centre where patients with positive skin tests can be desensitized. After desensitization patients must remain on penicillin continuously for the duration of the course of therapy.

**Oral desensitization protocol for patients with a positive skin test**

Penicillin V suspension dose <sup>(a)</sup>	Amounts <sup>(b)</sup> Units/ml	MI	Units	Cumulative dose (units)
1	1 000	0,1	100	100
2	1 000	0,2	200	300
3	1 000	0,4	400	700
4	1 000	0,8	800	1 500
5	1 000	1,6	1 600	3 100
6	1 000	3,2	3 200	6 300
7	1 000	6,4	6 400	12 700
8	10 000	1,2	12 000	24 700
9	10 000	2,4	24 000	48 700
10	10 000	4,8	48 000	96 700
11	80 000	1,0	80 000	176 700
12	80 000	2,0	160 000	336 700
13	80 000	4,0	320 000	656 700
14	80 000	8,0	640 000	1 296 700

**Notes:**

- (a) Interval between doses, 15 minutes; elapsed time, 3 hours and 45 minutes; cumulative dose 1,3 million units.
- (b) The specific amount of drug is diluted in approximately 30 ml of water and then administered orally.

## Special Considerations

### 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 non-treponemal test 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. 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 maternal infection occurred late in gestation.
- infants should be treated at birth:
  - if symptomatic
  - if infant's non-treponemal titre is 4 fold (2 tube) higher than mother's
  - if maternal treatment was inadequate, did not include penicillin, is unknown, occurred in the last month of pregnancy, or if maternal serologic response is inadequateOR
  - if adequate follow-up of the infant cannot be ensured.

### Jarisch-Herxheimer Reaction

- a febrile reaction may occur 8 to 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.
- It usually lasts a few hours and can be treated with antipyretics.

### Prevention

- results of testing during pregnancy and delivery must be provided to the primary caregiver of the infant.
- 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.
- at time of diagnosis of STD, review and monitor prevention practices.
- identify barriers to prevention practices and the means to overcome these.
- see Primary Prevention of STD, page 31.

### Reporting and Partner Notification

- 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.
- 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 a colleague experienced in such cases.

- 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 are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.

### Follow-up

- serology (non-treponemal test [e.g., RPR] and treponemal-specific test [e.g., TP-PA]) should be carried out until an adequate response is achieved 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 as follows:

Primary:	■ 2-tube drop at 6 months; 3-tube drop at 12 months; 4-tube drop at 24 months (e.g., a change in titre from 1:32 to 1:8 equals 2-tube drop).
Secondary:	■ 3-tube and 4-tube drop at 6 and 12 months.
Early latent:	■ 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 to 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 (see indications for LP, page 153).
- if initial non-treponemal titre was low or absent, a raising titre after therapy may indicate treatment failure and the need for further investigation.

- IF INITIALLY ABNORMAL, CSF EXAMINATIONS should be repeated after therapy. Time frames may vary depending upon initial clinical presentation. Discussion with a colleague experienced in this area is recommended:
  - 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 a colleague experienced in this area.

**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 likely implies congenital syphilis and appropriate treatment should be given (see also *Congenital syphilis*, page 157).

## GENITAL HERPES SIMPLEX VIRUS (HSV) INFECTIONS

### Etiology

- caused by *Herpes simplex virus* (HSV) types 1 and 2.

### Epidemiology

- genital infections can occur with HSV types 1 and 2 (HSV-2 more common than HSV-1).
- frequency of recurrences for HSV-2 is very high (98% of patients).
- infection is life-long and predominantly asymptomatic.
- transmission routes include genital-genital, oral-genital, oral or genital-anal.
- auto-inoculation (self-infection) from previous oro-labial HSV-1 infection is rare.
- asymptomatic viral shedding and transmission occur commonly (more common in HSV-2).

### Natural History

- initial infections are frequently asymptomatic.
- usual incubation period for symptomatic primary infection is 2 to 21 days.
- recurrences tend to follow sensory nerve distribution and may appear on non-contiguous external sites related by dermatome S2, S3.
- asymptomatic, atypical, minimally symptomatic and symptomatic recurrences are more common than typical presentations.

### Diagnostic Features

#### First symptomatic episode

##### Primary:

- first clinically evident episode in **HSV-antibody negative** individuals.
- vesiculo-ulcerative disease at and near sites of inoculation.
- usual incubation period for symptomatic primary infection is 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 inguinal lymphadenopathy common.
- urinary symptoms, including hesitation and/or external dysuria, are common in men and women and may be prolonged.
- systemic symptoms (e.g., fever/myalgia) in 40% to 70% of symptomatic primary infections.
- benign aseptic meningitis occurs in 10% to 30% of symptomatic primary infections.

**Non-primary:**

- first clinically evident episode occurs in **HSV-antibody positive** individuals.
- typically a shorter course through which systemic symptoms are not usual.
- possible unilateral or bilateral (in women) vesiculo-ulcerative disease similar to symptomatic recurrent disease.

**Recurrences:**

- most patients presenting with a first symptomatic episode are experiencing recurrences.
- long latency (years in some patients).

## Symptomatic recurrences

- due to reactivation of latent infection.
- symptoms are less severe and their duration is shorter than in the first symptomatic (primary) episode.
- symptoms are generally limited to external genitalia and are unilateral.

## Asymptomatic shedding of HSV

- occurs in individuals who do and do not get symptomatic episodes.
- occurs from multiple genital sites and is more common with HSV-2.

## Special Considerations in Children – Neonatal Herpes

- intrauterine infection is rare.
- neonatal herpes is most often acquired during the birth process.
- recurrent HSV-2 infection rarely leads to neonatal infection.
- neonates born to mothers with primary infection close to delivery are at especially increased risk (up to 50%), regardless of whether maternal infection is symptomatic or asymptomatic. Most cases (70%) of children with neonatal herpes are born to women with no history of genital herpes.
- prevention should involve establishing when an uninfected woman is at risk of acquiring primary infection from an infected partner and developing strategies to reduce the risk of transmission (see page 195).
- clinical presentation usually occurs shortly after birth, but can occur as late as 4 to 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 to 4 weeks.
  - localized skin, conjunctival and oral disease without overt CNS or visceral disease (incubation period 1 to 3 weeks). Some infants with disease apparently limited to skin develop neurologic damage, thus all affected infants should be treated with parenteral acyclovir.
- post-natal transmission of HSV in neonates is rare, but has occurred from mothers as well as other primary caregivers (usually HSV-1).

**Specimen Collection and Laboratory Diagnosis**

- clinical diagnosis requires:
  - typical or atypical lesions AND
  - culture or other type-specific diagnostic test (e.g., DFA).
- culture remains the preferred method because of specificity, sensitivity and ability to type the viral strain.
  - strain typing is desirable in most cases to allow for more accurate prognosis regarding recurrences and so that counselling on partner susceptibility may be informed
  - strain typing may be needed when assessing a child who has been sexually abused.
- other non-culture methods are available for the laboratory diagnosis of HSV infections:
  - non-type-specific serology may be useful to distinguish between primary and non-primary HSV infections
  - type-specific serologic testing to indicate past exposure to *Herpes simplex* virus type 1 or 2 is not routinely indicated. It should be considered for such purposes as:
    - identifying when pregnant women with no history of herpes are at risk of primary herpes infection from a partner
    - counselling long-term partners about sexual behaviour when it is unclear if both have genital infections with HSV-1 or HSV-2
  - consultation with a colleague experienced in this area should be sought.
  - amplified nucleic acid tests are useful to diagnose neonatal herpes and CNS infection (see *Laboratory Diagnosis*, page 62).
  - for further information, see *Laboratory Diagnosis*, page 62.

- DO NOT collect specimens from asymptomatic patients unless the patient is:
  - a woman in labour with active lesions in order to identify high-risk neonates
  - a neonate born to mother with history of active genital herpes lesions at time of delivery.

Consideration for Other STDs

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- obtain specimen(s) for the diagnosis of chlamydial and gonococcal infections.
- HIV testing and counselling are recommended (see page 173).
- immunization against hepatitis B is recommended (see page 121).
- consider obtaining a blood sample for serologic testing of syphilis, now and in 4 to 6 weeks (see page 150).

Treatment

First episode

- 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	Youth and Adults
<ul style="list-style-type: none"> <li>■ acyclovir 20mg/kg/day (max. 200 mg) qid for 5 to 7 days.</li> </ul>	<ul style="list-style-type: none"> <li>■ acyclovir 400 mg tid for 5 to 7 days OR famciclovir 250 mg tid for 5 to 7 days OR valacyclovir 500-1000 mg bid for 5 to 7 days.</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>■ <b>No role for topical antivirals.</b></li> <li>■ Treatment is unlikely to be of benefit if crusts have formed on lesions.</li> </ul>

Recurrent episodes

Children/Prepubertal	Youth and Adults*
<ul style="list-style-type: none"> <li>■ no data to support use of acyclovir although efficacy and safety are probably not different than for adults</li> </ul>	<ul style="list-style-type: none"> <li>■ famciclovir 125 mg orally bid for 5 days OR valacyclovir 500 mg orally bid for 5 days OR acyclovir 400 mg orally tid for 5 days.</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>■ No role for topical antivirals.</li> <li>■ Best results if initiated early with prodromal symptoms.</li> <li>■ Patient-initiated treatment of well established recurrences is of limited clinical benefit.</li> <li>■ (for chronic suppressive therapy, see below).</li> </ul>

**Immuno-Compromised Children, Youth and Adults:**

- more likely to require more aggressive therapies (e.g., IV or high dose oral therapy).
- consultation with a colleague experienced in this area should be sought.

\* **Note:** There may be a small clinical advantage to using famciclovir or valacyclovir over acyclovir for episodic therapy.

Chronic, suppressive treatment

- objectives: reduction of frequency and severity of recurrences, reduction of asymptomatic HSV shedding; psychological benefit to the patient.
- suppressive therapy should be discussed with all patients who have had recurrences of HSV infection.

Children/Prepubertal	Youth and Adults
<ul style="list-style-type: none"> <li>■ no data available.</li> </ul>	<ul style="list-style-type: none"> <li>■ acyclovir 400 mg orally bid daily OR famciclovir 250 mg orally bid daily OR valacyclovir 500 mg orally once daily or 250 mg orally, bid*</li> </ul> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>■ More than six annual recurrences and considered likely to benefit from reduction in frequency of recurrences (e.g., severe symptoms with each recurrence).</li> <li>■ Some patients may require higher doses or greater dosing frequency.</li> <li>■ Annual evaluation of therapy.</li> </ul> <p><b>Pregnancy:</b></p> <ul style="list-style-type: none"> <li>■ consultation with a knowledgeable colleague in this area should be sought.</li> <li>■ suppressive therapy with acyclovir during the third trimester is currently under study.</li> </ul>

\* If suppression of viral shedding is a goal of suppressive therapy, bid regimens are currently recommended.

Neonatal herpes

Neonates and Infants
<ul style="list-style-type: none"> <li>■ acyclovir 45-60 mg/kg/day IV 8 hourly infusions for 14 to 21 days.</li> </ul> <p><b>Note:</b> Consultation with a knowledgeable colleague in this area should be sought.</p>

## Prevention

- 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.
- at time of diagnosis of STD, review and monitor prevention practices.
- identify barriers to prevention practices and the means to overcome these.
- condoms may not be effective in preventing sexual transmission of HSV because of the location of lesions or of asymptomatic shedding, and because of the risk of transmission during oral-genital sex. Other safer sex practices should be discussed.
- see *Primary Prevention of STD*, page 31.

## Management

**Genital HSV Infections are recurrent and incurable. Therefore, counselling is a critical part of management. All patients who have genital HSV infections and their sexual partner(s) are likely to benefit from learning about the chronic aspects of the disease after the acute illness subsides.**

- transmission of genital herpes is decreased by:
  - avoidance of affected skin contact during obvious periods of viral shedding (prodrome to re-epithelialization)
  - adherence to safer sex practices at other times
  - daily suppressive antiviral therapy markedly reduces viral shedding and thus may reduce transmission.
- most common patient concerns include:
  - asymptomatic transmission
  - fears of being judged or rejected by partner
  - loneliness, depression and low self-esteem
  - potential effect on childbearing.

### **Counselling patients with genital HSV infection should include the following:**

- explain the natural history of the disease, with emphasis on the potential for recurrent episodes, asymptomatic shedding and sexual transmission. Sexual transmission of HSV may occur during asymptomatic periods where there is no evidence of lesions. Counselling should be directed at these persons to prevent further spread of the infection.
- advise patients that they should abstain from sexual activity while lesions are present and inform their sex partner(s) that they have genital herpes. The use of condoms should be encouraged during all sexual exposures with new sex partners.
- long-term couples may require counselling on the pros and cons of continuous condom use.

- discuss the risk of neonatal infection with all patients, including men. Women who have genital herpes should be advised to inform health care providers who care for them during pregnancy about their HSV infection.
- advise patients with first episode of genital herpes that episodic antiviral therapy of recurrent episodes may shorten the duration of lesions and suppressive antiviral therapy can ameliorate or prevent recurrent outbreaks.

### Reporting, Partner Notification

- genital HSV infections are reportable by physicians to local public health authorities in some provinces, but not in either territory, at time of publication. Neonatal HSV infections are reportable in some provinces only. Whether cases are to be reported on suspicion or after laboratory confirmation also varies. For clarification, contact your local public health authority (see page 236).
- partner notification 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.
- patients with genital herpes should be encouraged to inform their regular sexual partner(s) 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

- follow-up cultures are not usually indicated, EXCEPT when there are unusual recurrent symptoms.
- follow-up counselling is an important component of managing patients with genital herpes.

## GENITAL WARTS AND GENITAL HUMAN PAPILOMAVIRUS (HPV) INFECTIONS

### Etiology

- caused by genital genotypes of human papillomavirus (HPV).

### Epidemiology

- the most common viral STD.
- 10% to 30% of adult population infected with HPV although the majority of patients have sub-clinical infection.
- 1% to 2% life time risk of clinically visible exophytic warts.
- incubation period estimated at 2 to 3 months for exophytic warts but may be years for pre-cancerous or cancerous lesions.
- clinically visible exophytic lesions are rarely associated with cancer:
  - only some genotypes of HPV infection are linked to cervical, vulvar, anorectal and penile cancers and the genotypes most commonly causing exophytic warts have not been linked to these malignancies.
- symptomatic perinatal transmission is suspected to be infrequent. When it occurs, it is associated with genital and vocal cord lesions. The incubation period is unknown.
- perinatal transmission is usually clinically apparent within 2 years.
- genital warts in a child older than 18 months, and particularly in a child older than two years of age, may be a sign of sexual abuse and warrants an investigation (see *Child Sexual Abuse*, page 201).
- patients with HIV infection often present with extensive ano-genital warts and are poorly responsive to treatment.
- progression to neoplasia is strongly associated with smoking and HIV infection.

### Diagnostic Features

- may be subclinical or clinically apparent but usually asymptomatic.
- growths on ano-genital skin and/or mucous membrane (*condyloma acuminata*) are frequently multiple and polymorphic
  - exophytic frond or cauliflower-like to papular in appearance
  - keratinized slightly elevated lesions (bowenoid lesions)
  - flat, macular condyloma also found
  - occasionally are the cause of bleeding, pruritus, local discharge.
- most frequent site of genital HPV infection in females is the cervix.
- multiple sites often involved (e.g., cervix, vagina, vulva etc.).
- natural history is of fluctuation of size, number of warts and, in many cases, eventual clearance.

- warts can increase in size and number with pregnancy.
- intraepithelial lesions (dysplasia and neoplasia) on a Papanicolaou (Pap) smear usually indicate cervical involvement.

#### Differential diagnosis:

- molluscum contagiosum
- micropapillomatosis labialis (vestibular papillae)
- pearly penile papules
- seborrheic keratoses
- intradermal nevi
- skin tags
- intraepithelial neoplasia

#### Atypical and/or non-healing warts

- all suspicious pigmented and/or ulcerated and/or persistently pruritic and/or recalcitrant lesions require a biopsy and should be referred to a colleague experienced in this area.

#### Specimen Collection and Laboratory Diagnosis

- by direct examination of external genitalia, magnification by hand lens, or use of a colposcope.
- in patients with external genital warts, colposcopy is not routinely required.
- colposcopy for clinically visible warts of cervix and anus and urethroscopy if extensive meatal warts are visible.

**Regular Pap smears are important for all sexually active young and adult females with or without a history of genital warts (see *Preparation of a Pap smear*, page 52)**

- current national and provincial guidelines recommend annual Pap smears until 2 subsequent normal Pap smears are obtained; then every 2 to 3 year interval according to local guidelines.
- cancer is more frequent in sexually active women who have not had regular or annual Pap smears.
- HPV typing is not useful for external genital warts but is under study for triaging women with squamous cells of undetermined significance (ASCUS) or low grade squamous intraepithelial lesions (LGSIL).
- serology not commercially available.

### Aceto-whitening

- 5% acetic acid applied to genital skin or cervix for 3 to 5 minutes may lead to whitening of infected epithelium for the detection of subclinical lesions but this test has a high false-positive rate especially in women with borderline positive Pap smears.
- in patients with clinically obvious lesions, aceto-whitening is not necessary to establish diagnosis or efficacy of treatment for HPV infection.
- refer to a colleague experienced in this area for further evaluation, if necessary.

### Consideration for Other STDs

- see *Clinical Approach to the Diagnosis and Management of STD*, page 39.
- obtain specimen(s) for the diagnosis of chlamydial and gonococcal infections.
- HIV testing and counselling are recommended (see page 173).
- immunization against hepatitis B is recommended (see page 121).
- consider obtaining a blood sample for serologic testing of syphilis (see page 152).

### Management and Treatment

- **NO THERAPY GUARANTEES CURE OF HPV INFECTION.**
- cell-mediated immunity may eradicate HPV over time.
- warts often have high persistence/recurrence rate.
- however, 80% of patients with external genital warts experience complete clearance.
- clearance of cervical lesions approaches 90-95%.
- it is expected that removal of visible lesions decreases the risk of transmission and may influence the risk of cancerous change at the cervix but does not eliminate the risk of either of these outcomes.

Poorly effective or incompletely evaluated treatments include:

- interferon
- dinitrochlorobenzene sensitization and application
- immunotherapy with autogenous vaccines
- 5% 5-fluorouracil cream.

### Treatment for patients with sub-clinical lesions

- lesions may only be visible after examination or application of aceto-whitening (see above).



- no specific management is recommended or necessary for sub-clinical lesions of external anogenital skin as neither recurrences of clinical warts or transmission to partners is affected.
- women should have routine Pap smears at a frequency consistent with local guidelines (see page 168).

Special considerations for children and pregnant patients

- refer to a colleague experienced in this area since the psychological aspects and management can be difficult.
- consider the possibility of sexual abuse (see *Child Sexual Abuse*, page 201).
- Caesarian section is not recommended unless warts obstruct the birth canal.
- Approximately 50% of cases of condyloma associated with pregnancy spontaneously regress in the first 3 months after delivery.
- The risk of treatment related complications during pregnancy may be greater than the risk of developing laryngeal papillomatosis.

Treatment for youth and adults

- when available, cryotherapy is the preferred treatment. Aggressive treatment of genital warts can leave scarring.

Lesion Type	Treatment	Comments
<b>Small external genital and perianal warts and cervical intraepithelial lesions</b>  <b>Note:</b> If flat warts, cryotherapy is preferred.	<ul style="list-style-type: none"> <li>■ cryotherapy (liquid nitrogen, carbon dioxide [dry ice]), or nitrous oxide in a specialized apparatus.</li> </ul>	<ul style="list-style-type: none"> <li>■ moderate cost with good response rate.</li> <li>■ damage usually limited to epidermis.</li> <li>■ can be applied to cervix using special probe.</li> <li>■ especially useful where warts exophytic.</li> </ul>
	<ul style="list-style-type: none"> <li>■ podofilox 0,5% solution/gel.</li> </ul>	<ul style="list-style-type: none"> <li>■ for self-application under direction of physician</li> </ul>
	<ul style="list-style-type: none"> <li>■ treatment cycle: apply to wart (not contiguous skin) every 12 hours for 3 days of each week (4 days off)</li> </ul>	<ul style="list-style-type: none"> <li>■ should NOT be used in pregnancy</li> <li>■ should NOT be used for treatment of cervical, meatal, vaginal or anal warts</li> </ul>
	<ul style="list-style-type: none"> <li>■ cycle can be repeated for up to 7 weeks only (total dose per day not to exceed 0,5 ml).</li> </ul>	<ul style="list-style-type: none"> <li>■ more efficacious and stable than podophyllin.</li> </ul>
	<ul style="list-style-type: none"> <li>■ podophyllin, 10-25%, apply to wart and not contiguous skin, wash off in 1 to 4 hours.</li> </ul>	<ul style="list-style-type: none"> <li>■ requires physician – should NEVER be left to self-application.</li> </ul>

Lesion Type	Treatment	Comments
	<ul style="list-style-type: none"> <li>■ may repeat once or twice at weekly intervals (total dose ≤1 to 2 ml per visit).</li> <li>* (see below)</li> </ul>	<ul style="list-style-type: none"> <li>■ frequent local reactions: erythema, tissue oedema, local pain/burning/itching/tenderness, bullous reaction.</li> <li>■ should NOT be used in pregnancy (fetal death; systemic toxicity)</li> <li>■ should NOT be used for treatment of cervical, meatal, vaginal or anal warts</li> <li>■ Failure rate: 23 to 78%.</li> </ul>
	<ul style="list-style-type: none"> <li>■ bi- or trichloroacetic acid, repeat weekly.</li> </ul> <p><b>Note:</b> 50% to 80% solutions are most effective.</p>	<ul style="list-style-type: none"> <li>■ Caustic, may produce ulceration.</li> <li>■ Applied by physician as for podophyllin.</li> <li>■ No need to wash off.</li> <li>■ Protect healthy skin.</li> </ul>
More extensive, genital, perineal warts	<ul style="list-style-type: none"> <li>■ electro-fulguration</li> <li>■ electro-excision</li> </ul>	<ul style="list-style-type: none"> <li>■ requires special equipment (specialist often required)</li> <li>■ local and rarely general anesthesia is required</li> <li>■ good response rate</li> <li>■ poor depth control may cause excess damage and scarring.</li> </ul>
Extensive (large or resistant) internal lesions including vaginal, cervical and meatal warts	<ul style="list-style-type: none"> <li>■ consider: <ul style="list-style-type: none"> <li>– laser</li> <li>– surgery</li> <li>– electroexcision and fulguration.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ patients should be referred to a colleague experienced in this area</li> <li>■ treatments may require local or general anesthesia</li> <li>■ low rates of complications in expert hands.</li> </ul>

\*Imiquimod, another topical therapy, will soon be available in Canada for the treatment of genital warts. Because of lack of comparative data, it is difficult to recommend Imiquimod as first line treatment; it would be more useful for refractory cases.

## Prevention

- 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.
- condoms may not be effective in preventing sexual transmission of HPV because of the location of lesions. Other safer sex practices should be discussed.

### **Counselling patients with genital warts about means of risk reduction to self and others should include the following:**

- explain the natural history of the disease, with emphasis on the differences between types of genital warts and their association with cancer, the potential for recurrent episodes and sexual transmission.
  - advise patients that they should inform their sex partner(s) that they have genital warts. The use of condoms should be encouraged during all sexual exposures with new sex partners.
  - inform female patients that **women who access regular Pap screening** (see page 168) **have markedly diminished rates of invasive cancer.**
  - encourage patients to examine themselves for lesions in the future and seek medical attention promptly if lesions appear.
- at time of diagnosis of STD, review and monitor prevention practices.
  - identify barriers to prevention practices and the means to overcome these.
  - see *Primary Prevention of STD*, page 31.

## Reporting, Partner Notification and Follow-up

- HPV infection is not reportable to local public health authorities.
- partner notification of presumptive or proven cases of HPV infection is not useful.
- routine follow-up of women with annual Pap smear.
- treatment and/or referral of asymptomatic partners is not indicated.

## HUMAN IMMUNODEFICIENCY VIRUS (HIV) AND AIDS IN YOUTH AND ADULTS

### Epidemiology

- it is estimated that 40 000 to 50 000 Canadians are infected with HIV, most of whom are asymptomatic.
- the proportion of new reports of HIV attributable to injection drug use, female gender and aboriginal ethnicity has been increasing in recent years.
- after a long-term decline in numbers of men who have sex with men testing positive for HIV, incidence now appears constant.
- more than 14 500 cases of AIDS were reported in Canada up to the end of December 1996.
- the proportion of adult AIDS cases who are men who have sex with men decreased, from 85,3% in 1988 to 79,1% in 1996.
- the proportion of AIDS cases occurring in injection drug users and women has been steadily increasing since 1988.
- in Canada, blood donors have been screened and tested for HIV infection since 1985 and this has resulted in a marked decrease in the proportion of HIV cases transmitted through blood products. The current estimated risk of infection from receipt of blood and blood products is exceedingly low in Canada (approximately 1 per million units of blood).
- the time from initial HIV infection to the development of clinical AIDS averages 8 to 11 years, but progression can occur rarely in < 1 year.
- the risk of acquiring HIV infection from a single sexual contact with an HIV infected person may average 1-2/1000 but is very variable. This risk increases with increasing number of exposures and viral load in the infected person.
- genital ulcer disease (e.g., genital herpes, syphilis, chancroid) enhances sexual transmission of HIV.

**Note:** The advent of effective combination antiretroviral therapy may influence the perception of HIV infection as a serious chronic disease. Therefore, renewal of prevention messages is an important strategy to control HIV infection.

### Diagnostic Features

#### Risk behaviours

- unprotected sexual activity
- sex with person known to be HIV infected
- sex with multiple partners
- anal intercourse, particularly receptive
- sharing of syringes and other injection drug use equipment (i.e., “works”)
- history of hepatitis B and/or other STDs.

## History

- most cases are asymptomatic.
- primary infection may be accompanied by an acute mononucleosis-like syndrome and/or aseptic meningitis. A maculopapular rash may also be present.
- symptomatic infection may have the following features:
  - unexplained persistent fever
  - unexplained lymphadenopathy (usually generalized)
  - unexplained chronic diarrhea
  - dyspnea and dry cough
  - recurrent mucocutaneous candidiasis
  - dysphagia (esophageal candidiasis)
  - new red/purple nodular skin or mucosal lesions (Kaposi's sarcoma)
  - unexplained weight loss
  - encephalopathy
  - herpes zoster, especially if severe, multidermatomal or disseminated
  - increased frequency or severity of mucocutaneous *Herpes simplex* infection
  - loss of vision.

## Manifestations of Disease in Youth and Adults

<b>Primary infection</b>	<ul style="list-style-type: none"> <li>■ non-specific or asymptomatic.</li> <li>■ clinical manifestations are variable and may include: fever, sore throat, lymphadenopathy, lethargy, anorexia, rash, mucosal ulcerations, meningoencephalitis, and rarely the occurrence of AIDS-related conditions.</li> </ul>
<b>Asymptomatic infection</b>	<ul style="list-style-type: none"> <li>■ many patients fall into this category.</li> <li>■ generalized lymphadenopathy is frequently present.</li> <li>■ thrombocytopenia may be present.</li> </ul>
<b>Progressive infection</b>  (conditions indicative of immuno-suppression)	<ul style="list-style-type: none"> <li>■ oral candidiasis.</li> <li>■ oral hairy leukoplakia.</li> <li>■ unexplained fever greater than 2 weeks.</li> <li>■ chronic diarrhea greater than 3 weeks.</li> <li>■ unexplained weight loss greater than 10% body weight.</li> <li>■ unexplained anemia "of chronic disease".</li> <li>■ fatigue or lethargy.</li> <li>■ recurrent or chronic vaginal candidiasis.</li> <li>■ cervical dysplasia.</li> </ul>

<p><b>AIDS defining opportunistic conditions</b></p> <p>(may require a concurrent positive HIV serology to be diagnostic of AIDS)</p>	<ul style="list-style-type: none"> <li>■ viral infections:           <ul style="list-style-type: none"> <li>– cytomegalovirus (CMV)</li> <li>– colitis/retinitis</li> <li>– chronic ulcerated herpes simplex (HSV)</li> <li>– multidermatomal zoster (VZV)</li> <li>– progressive multifocal leukoencephalopathy (PML)</li> </ul> </li> <li>■ fungal infections:           <ul style="list-style-type: none"> <li>– invasive candidiasis</li> <li>– aspergillosis</li> <li>– cryptococcosis</li> </ul> </li> <li>■ bacterial infections:           <ul style="list-style-type: none"> <li>– recurrent pneumonia</li> <li>– salmonellosis</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ mycobacterial infections:           <ul style="list-style-type: none"> <li>– <i>M. tuberculosis</i></li> <li>– <i>M. avium complex</i></li> <li>– <i>M. kansasii</i></li> </ul> </li> <li>■ parasitic infections:           <ul style="list-style-type: none"> <li>– <i>P. carinii pneumonia</i></li> <li>– <i>T. gondii</i></li> <li>– gastrointestinal infection</li> </ul> </li> <li>■ neoplasia:           <ul style="list-style-type: none"> <li>– Kaposi’s sarcoma</li> <li>– non-Hodgkin’s lymphoma</li> </ul> </li> <li>■ other:           <ul style="list-style-type: none"> <li>– HIV encephalopathy</li> <li>– wasting</li> </ul> </li> </ul>
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### Laboratory Diagnosis – HIV Antibody Testing

- any physician can order an HIV test.
- **testing should only be carried out with the consent of the person being tested.**
- HIV antibody testing should be offered to any person with risk behaviour, any person who has clinical or laboratory clues suggestive of HIV infection, or any person who requests it
  - explain clearly the nature of the test AND
  - provide appropriate pre- and post-test counselling.
- CD4 count and viral load testing are not used as screening or diagnostic tests.
- p24 antigen testing, though occasionally useful in diagnosis of primary or acute infection, is insensitive for screening purposes (see *Laboratory Diagnosis of HIV*, page 62).
- in all provinces and territories, a physician does not have to supply the name of the person being tested BUT in some jurisdictions, the physician is required to report the name of the individual to the local public health officials (nominal reporting) if the test results are positive.
- non-nominal or anonymous testing (where the patient does not reveal his/her identity and the result is only given to the individual tested) is available in many jurisdictions. Contact the local public health authority for more information (see page 236).

- seroconversion occurs in the majority of individuals within 12 weeks of infection, but occasionally the antibody response may be delayed up to 6 months. Physicians should be mindful of this when timing serology. Patients suspected of seroconverting require specialized testing and should be evaluated by a colleague experienced in the area of HIV infection.
- repeat all initial positive serologic tests for HIV using a second blood specimen to confirm the diagnosis.

### Pre-test and Post-test Counselling

- counselling will have to be age appropriate and individualized to the patient being tested.

#### Pre-test counselling discussion for HIV infection

- Clarify:**
- confidentiality of HIV testing and counselling.
  - testing options available (i.e., nominal, non-nominal, anonymous).
  - the test is for antibodies to HIV; NOT a test for AIDS.
  - the majority of persons produce detectable antibodies within 3 months.
  - a non-reactive or negative test <sup>(a, b)</sup> may mean:
    - no infection, OR
    - too soon to detect antibodies.
  - a positive test <sup>(a, c)</sup> means:
    - infection with HIV
    - person is infectious to others through unprotected sexual contact, blood or breast milk.
  - an indeterminate result means another test needs to be performed.
  - HIV is NOT casually transmitted through sweat, saliva or tears.
- Transmission risks are:
- direct blood to blood contact
  - sharing needles or syringes
  - sexual contact: anal sex (very high risk); vaginal sex (high risk); oral sex (low risk)
  - infected mother to child during pregnancy, at birth or via breast milk
  - recipient of blood or blood products in Canada before November 1985 (elsewhere risk will vary depending on testing of donated blood).

<b>Discuss:</b>	<ul style="list-style-type: none"> <li>■ specific risks, sexual and otherwise.</li> <li>■ if pregnant: discuss availability of therapy to decrease the risk of mother-to-child transmission (decreased by 80%).</li> <li>■ whether future testing will be necessary.</li> <li>■ risk reduction behaviours:             <ul style="list-style-type: none"> <li>– consistent use of latex condoms</li> <li>– avoidance of casual/anonymous/unprotected sex</li> <li>– no sharing of needles, syringes or injection drug use equipment.</li> </ul> </li> </ul>
<b>Explore:</b>	<ul style="list-style-type: none"> <li>■ psychological implications of testing:             <ul style="list-style-type: none"> <li>– coping mechanisms for either result; support systems available (personal, community, medical) should be known.</li> </ul> </li> </ul>
<b>Explain:</b>	<ul style="list-style-type: none"> <li>■ the need to return for test result and schedule the post-test counselling visit             <ul style="list-style-type: none"> <li>– obtain agreement for follow-up if patient fails to return.</li> </ul> </li> <li>■ post-test counselling procedure.</li> <li>■ partner notification and reporting requirements for HIV infection (depends on jurisdiction and availability of anonymous testing).</li> </ul>

### Post-test Counselling for HIV infection

<b>Non-reactive or negative results<sup>(b)</sup>:</b>	<ul style="list-style-type: none"> <li>■ interpret:             <ul style="list-style-type: none"> <li>– no infection or</li> <li>– risks within the past 3 months dictate re-testing is necessary 3 months after last possible exposure.</li> </ul> </li> <li>■ reinforce risk reduction:             <ul style="list-style-type: none"> <li>– avoid high-risk activities</li> <li>– avoid needle/syringe sharing</li> <li>– use lubricated latex condoms with safer sex practices.</li> </ul> </li> </ul>
<b>Reactive or positive results<sup>(b,c,d)</sup>:</b>	<ul style="list-style-type: none"> <li>■ interpret:             <ul style="list-style-type: none"> <li>– infected with HIV, not diagnostic of AIDS</li> <li>– explained tht confirmation testes to rule out false-positives have been performed.</li> </ul> </li> <li>■ first priority:             <ul style="list-style-type: none"> <li>– deal with the issues important to the infected person</li> <li>– discuss coping and support systems</li> </ul> </li> </ul>



- discuss benefits of early treatment and follow-up. Further medical support, immune testing, HIV viral load testing, and counselling are required.
- deal with soon:
  - partner notification (by self or public health unit)
  - 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 donating blood, organs, tissue, sperm, breast milk
    - inform family physician and consider informing other health care providers (e.g., dentist).
- medical care:
  - screen for syphilis, hepatitis B, tuberculosis, other STDs
  - referrals where required
  - discuss health-enhancing lifestyle modifications, empowerment
  - discuss issues of confidentiality in the health care system, community and at school or work.

#### Notes to Pre- and Post-test Counselling Discussions:

- (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) For interpretation of indeterminate results, see page 62.
- (d) A positive HIV serologic test in an infant may represent only passively transferred maternal antibody and the infant may or may not be infected. Maternal antibodies have been detected for up to 18 months in an infant not infected with HIV. There are laboratory tests that can help distinguish infected infants at an earlier age (see *Laboratory Diagnosis of HIV Infection*, page 62). However, these tests are not widely available.

#### Prevention

- patients presenting with concerns about HIV infection provide an important opportunity for instruction and encouragement for the consistent practice of safer sex.
- at time of diagnostic testing of HIV, review and monitor prevention practices.
- identify barriers to prevention practices and the means to overcome these.
- see *Primary Prevention of STD*, page 31.

## Sexual transmission

- sexual activities can be divided into three categories of risk:
  - NO RISK of transmission (e.g., touching, kissing, hugging)
  - LOW RISK of transmission (e.g., oral intercourse without ejaculation, insertive intercourse with latex condom use)
  - HIGH RISK of transmission (e.g., insertive or receptive intercourse without a condom).
- patients should be counselled that:
  - only abstinence and “no risk” activities are guaranteed to prevent transmission
  - low-risk activities (risk reduction) are preferable to high risk activities and in particular, the regular use of latex condoms markedly reduces the risk of sexual transmission of HIV, but does not eliminate the risk completely (see *Primary Prevention of STD*, pages 31-38). Female condoms may be useful.
- infected individuals should be strongly encouraged to inform past and future sexual partners regarding their known HIV-positive status.
- ongoing counselling and discussion of sexual behaviour is appropriate.

## Parenteral transmission

- active injection drug users (IDU) should be offered access to appropriate drug addiction treatment facilities and counselled on the health risk associated with IDU.
- failing this, harm reduction should be stressed, including non-sharing of syringes and adopting safer modes of drug use.
- in addition, needle exchange programs and other sources of sterile syringes should be discussed. Bleaching is not a substitute for using new equipment but may reduce the risk of parenteral HIV transmission if new equipment is not available.

## Mother-to-child transmission

- all pregnant women should be offered confidential HIV testing and counselling.
- HIV-positive women of childbearing potential should be counselled about the risk of mother-to-child transmission. They should also be given complete information regarding contraceptive and reproductive options as well as the availability of therapy to decrease the risk of transmission to the child (see *HIV Infection in Pregnancy*, page 199).
- breast-feeding should be avoided where safe alternative feeding is feasible as HIV has been transmitted to infants through breast milk.

## Reporting and Partner Notification

- AIDS is reportable by physicians to local public health authorities in all provinces and territories.
- HIV infection is reportable in some provinces and territories, and such reporting may be nominal or non-nominal, depending on the jurisdiction.
- partner notification must be undertaken in all cases of AIDS and HIV infection.
- local public health authorities are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education. The treating physician is responsible for ensuring that partner notification is initiated.
- all children born to mothers who are, or may be, HIV infected must be evaluated (see *HIV Infection in Children*, page 182).
- all HIV-positive persons who have previously received or donated blood should be reported in confidence to the local Canadian Red Cross Blood Transfusion Service office.

## Treatment and Follow-up

THIS IS AN INCREASINGLY COMPLEX AREA WITH RAPID CHANGES IN OPTIMAL THERAPY AS NEW RESEARCH BECOMES AVAILABLE. RECOMMENDATIONS FOR A GIVEN PATIENT SHOULD BE MADE IN COLLABORATION WITH A COLLEAGUE EXPERIENCED IN HIV/AIDS.

## Guiding principle

- all symptomatic infected persons are usually followed at 4 to 6 month intervals if untreated, but more frequently if antiretroviral therapy is administered or if symptomatic.

## First visits

- ensure psychosocial support throughout follow-up.
- complete a medical history and physical examination.
- order laboratory tests: complete blood count with leukocyte differential, CD4 lymphocyte count, plasma HIV-RNA viral load, hepatic function tests, serology for hepatitis B and C, and syphilis serology. Submit cervical Pap smear.
- a tuberculin skin test should be performed. A negative test may not rule out diagnosis.
  - if past exposure to *M. tuberculosis* is indicated (induration  $\geq$  5mm in diameter), the patient should be assessed for active tuberculosis
  - if active tuberculosis is excluded, and the patient has not previously received therapy to prevent or treat tuberculosis, isoniazid 300 mg once daily is highly effective in preventing the development of active tuberculosis. Rifampin 600 mg daily or rifabutin 300 mg daily can be used for isoniazid-resistant strains or when isoniazid toxicity precludes isoniazid use
  - consultation with a colleague experienced in this area should be sought.

- immunization should be discussed according to current guidelines. All HIV-positive persons should receive pneumococcal vaccine and annual influenza vaccine should be considered. When indicated, components of a routine immunization should be updated. Only IPV is recommended for patients and household members. Although vaccinations of any kind may temporarily increase plasma viral load, the benefits of administration are generally felt to outweigh the risk.

### Ongoing visits

- CD4 counts and viral load testing should be performed every 3 to 4 months.
- there are two components to drug treatment: antiretroviral therapy and drugs to prevent or treat opportunistic infections.

#### Antiretroviral Therapy

This is a rapidly evolving field and any decision on specific therapy for a given patient should be made in collaboration with a colleague experienced in HIV/AIDS.

- all HIV-infected persons should be offered therapy with at least three agents to which they have not previously been exposed.
- monotherapy should be avoided as it is associated with the emergence of drug resistance.
- patients must be instructed to take medication regularly as missed doses and under-dosing can promote drug resistance.
- significant drug interactions can occur with some antiretroviral drugs.

#### Common Prophylactic Regimens for Opportunistic Infections

##### When CD4 count $< 0,2 \times 10^9$ (or $< 20\%$ of lymph count):

- *Pneumocystis carinii* pneumonia (PCP) prophylaxis.
- PCP prophylaxis also indicated if oral candidiasis or prior PCP, regardless of CD4 count.

##### When CD4 count $< 0,050 \times 10^9$ :

- *Mycobacterium avium* complex (MAC) prophylaxis.

##### Secondary infections:

- treatment and prevention of bacterial, viral, parasitic and fungal infections must be individualized and response to therapy monitored.
- in many instances, long-term suppressive therapy is required.

### Special considerations in women

- due to an increased risk of cervical neoplasia, Pap smears should be performed at least annually.

## HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION IN CHILDREN

### Epidemiology

- in 1995, 2,1% of all positive HIV antibody tests were from children ≤15 years of age.
- an increasing proportion of HIV-infected infants are being born to mothers with no identified risk factors.
- 158 cases of AIDS were reported in children in Canada up to the end of December 1996; mother-to-child transmission accounted for 75%, receipt of blood and blood products for < 10%.
- 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 (1/1 000 000 units of blood).
- HIV can be transmitted to a child through sexual abuse.
- even perinatally acquired HIV infection can remain asymptomatic for a number of years.
- antiretroviral therapy given during pregnancy, labour, and the first 6 weeks after birth markedly decreases risk of HIV transmission to neonates.

### Diagnostic Features

#### Risk factors

Perinatal infection	<ul style="list-style-type: none"> <li>■ mother NOT screened for HIV and/or did not receive antiretroviral therapy during pregnancy.</li> <li>■ mothers with increased HIV risk:               <ul style="list-style-type: none"> <li>– mother from HIV-endemic area</li> <li>– sharing of syringe or other injection drug use equipment</li> <li>– other substance abuse</li> <li>– sex with HIV infected partner(s)</li> <li>– commercial sex work.</li> </ul> </li> </ul>
Acquired infection	<ul style="list-style-type: none"> <li>■ receipt of infected blood products and/or injections in some endemic countries (in Canada, the HIV risk with a blood transfusion is 1 in a million units).</li> <li>■ sexual abuse or commercial sex work.</li> <li>■ sharing needles or drug use equipment.</li> </ul>

## Symptoms

### ■ Most Infants and Children Infected with HIV Are Asymptomatic.

General	Specific	
<ul style="list-style-type: none"> <li>■ irritability</li> <li>■ poor weight gain</li> <li>■ developmental delay.</li> </ul>	<ul style="list-style-type: none"> <li>■ persistent/recurrent respiratory problems</li> <li>■ persistent/recurrent otitis/sinusitis</li> <li>■ persistent rash</li> <li>■ persistent thrush.</li> </ul>	<ul style="list-style-type: none"> <li>■ persistent lymphadenopathy</li> <li>■ persistent/recurrent diarrhea</li> <li>■ persistent/recurrent fever.</li> </ul>

Pediatric HIV classification <sup>(a)</sup>				
Immunologic categories	N: No signs/symptoms	A: Mild signs/symptoms	B: Moderate signs/symptoms	C: Severe signs/symptoms
No evidence of suppression	N1	A1	B1	C1
Evidence of moderate suppression	N2	A2	B2	C2
Severe suppression	N3	A3	B3	C3

#### Note:

(a) Adapted from *Pediatric immunodeficiency virus (HIV) classification, MMWR* 1994, vol. 43, RR-12 issue.

## 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 *Pre-test Counselling Discussion*, page 176).
  - testing should be done with parental/guardian counselling and consent.
  - when perinatal acquisition is suspected, HIV antibody testing of the mother may be helpful in defining whether there is risk of infection in an infant < 18 months of age.
  - 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 opportunistic infections. Diagnosis of HIV in pregnancy allows antiretroviral therapy to begin prepartum, intrapartum, and to the neonate, which decreases HIV transmission risk.
- discussion with a colleague experienced in pediatric HIV/AIDS is recommended to determine need for serology, culture, amplified nucleic acid tests and for interpretation of results.

- a positive HIV antibody test result 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 18 to 24 months in an infant not infected with HIV. The laboratory tests which can help detect infected infants before 15 months of age include polymerase chain reaction (PCR) test for viral genetic material, p24 antigen and virus isolation (see *Laboratory Diagnosis of HIV Infection*, page 62).
- since false-negative PCR, p24 antigen and virus isolation HIV test results can occur in infants, repeat testing using at least two of these viral detection tests, OR one test at least 2 months apart, is recommended in at risk situations (e.g., infant HIV positive serology < 18 months of age). Cord blood is not a suitable specimen because it may be contaminated with maternal blood.
- a negative HIV antibody test result 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.

## Treatment

THIS IS AN INCREASINGLY COMPLEX AREA WITH RAPID CHANGES IN OPTIMAL THERAPY AS NEW RESEARCH BECOMES AVAILABLE. RECOMMENDATIONS FOR SPECIFIC THERAPY FOR A GIVEN PATIENT SHOULD BE MADE IN COLLABORATION WITH A COLLEAGUE EXPERIENCED IN PEDIATRIC HIV/AIDS.

- there are two components to drug treatment: antiretroviral therapy and drugs to prevent or treat opportunistic infections:

### Antiretroviral Therapy

- this is a rapidly evolving field and any decision on specific therapy for a given patient should be made in collaboration with a colleague experienced in pediatric HIV/AIDS.
- antiretroviral therapy should be discussed with the infected child's primary caregiver.
- all infants and children with HIV infection should be offered combination antiretroviral therapy with a regimen of at least three agents (one of which must be able to pass into the CNS).
- monotherapy should be avoided as it is associated with the emergence of drug resistance.
- patients must be instructed to take medication regularly as missed doses and under-dosing promote the development of drug resistance.
- significant drug interactions can occur with some antiretroviral drugs.

**Common Prophylactic Regimens for Opportunistic Infections Include:**

***Pneumocystis carinii* (PCP) infection prophylaxis:**

- PCP prophylaxis should be started at 4 to 6 weeks of age in all infants born to HIV-positive mothers regardless of whether the mother received antiretroviral therapy during pregnancy. Prophylaxis should be continued until the diagnosis of HIV is excluded. All infants and children diagnosed with HIV infection should be maintained on PCP prophylaxis.
- trimethoprim (TMP) 5 mg/kg/day AND sulfamethoxazole 25 mg/kg/day in divided doses two times a day, 7 days a week or 3 days a week; other similar regimens have been shown to be efficacious. Oral dapsone or aerosolized pentamidine are alternatives.

**Secondary infections:**

- treatment and prevention of bacterial, viral, parasitic and fungal infections must be individualized and response to therapy monitored.
- long-term suppressive therapy may be necessary.

**Immunization:**

- all infants and children with HIV infection require immunization (hepatitis B immunization should be given in infancy and not delayed until school-based program).
- on schedule and regardless of CD4 count: diphtheria, tetanus, pertussis, inactivated polio, and *Haemophilus influenzae* type b vaccine.
- with caution: measles, mumps, rubella
  - if no evidence of immunosuppression by CD4 count and asymptomatic
  - contraindicated if severely immunosuppressed (see table below).
- recommended additional immunizations: pneumococcal vaccine and yearly influenza vaccine.  
Contraindicated vaccines: BCG, MMR if severely immunosuppressed.

Immunosuppression in infants and children based upon age-specific CD4 lymphocyte count

Immunosuppression	Age		
	< 12 months	1-5 years	6-12 years
No evidence of suppression	> 1500	> 1000	> 500
Moderate suppression	750-1499	500-999	200-499
Severe suppression	< 750	< 500	< 200

Special consideration

- to obtain the name of your closest colleague experienced in pediatric HIV/AIDS contact the provincial or territorial director of STD control (see page 236) or the closest HIV children’s care centre.



### Primary Prevention

- offering screening of all pregnant women to determine HIV status and giving antiretroviral therapy if positive, during prepartum, intrapartum and first 6 weeks of life, can decrease the risk of transmission by 80% (e.g., from 25-30% to less than 10%).
- 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 and Partner Notification

- AIDS is reportable by physicians to local public health authorities in all provinces and territories.
- HIV infection is reportable in some provinces and territories, and such reporting may be nominal or non-nominal, depending on the jurisdiction.

### Follow-up

- infants and children with HIV infection require frequent careful follow-up and monitoring of clinical status, CD4 count and viral load. Consultation with a colleague experienced in pediatric HIV/AIDS should be sought.

## ECTOPARASITIC INFESTATIONS

### PUBIC LICE

#### Etiology/Epidemiology

- caused by *Phthirus pubis* (crab louse).
- humans are the only reservoir.
- shorter life span off host (24 hours) than head lice (several days).
- usually present in pubic hair but may be found in chest, armpit, eyelashes or facial hair.
- transmission occurs through intimate sexual and non-sexual contact.

#### 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.
- if necessary, submit nits or scabs in a container for microscopic examination.

#### Management

- clothes and fomites: washing 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.

#### Treatment

##### **Pubic Lice**

Wash the affected area and apply pediculocide formulation (cream, lotion or shampoo) according to package instructions:

- 1% permethrin cream rinse OR 0,33% pyrethrins-piperonyl butoxide shampoo/conditioner OR 1% lindane shampoo.
- repeat in 7 to 10 days.

**Notes:**

- pediculosis of the eyelashes should not be treated with permethrin, pyrethrin or lindane. Recommended treatment: occlusive ophthalmic ointment to the eyelid margins bid for 10 days.
- gamma benzene hexachloride (lindane) can cause neurotoxicity. Instructions for use must be carefully followed to minimize risk of toxicity. Contraindicated in young children, in pregnancy and in lactating women.
- permethrin cream rinse has similar efficacy with less toxicity than 1% lindane, and cure rates are greater than 80%.
- pruritis may persist for several days after treatment.

## SCABIES

## Etiology/Epidemiology

- caused by *Sarcoptes scabiei*.
- transmission:
  - often non-sexual, through close person-to-person contact, e.g., in families
  - shared personal articles (clothes, bedding)
  - sexual transmission does occur: usually need more than brief contact
  - most affected are those sexually active between 15 and 40 years.

## Manifestations

- intense 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

- based on history, index of suspicion and examination.
- if necessary, skin scraping of a burrow to remove the mite or ova for microscopic examination.
- burrow ink test: apply fountain pen ink to outside of the burrow, wipe skin (with alcohol), the burrow track may be visualized.

## Management

- wash clothes and bedding.
- examine and treat sexual partner(s) 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.

## Treatment

### Scabies

- permethrin cream 5%:
  - apply to affected areas of the body from the neck down; leave for 8 to 12 hours; shower and apply clean clothes.
- OR gamma benzene hexachloride/lindane:
  - 1% cream or lotion; utilize as per permethrin.
  - more toxicity than permethrin.
  - contraindicated in young children, in pregnancy and in lactating women.
- OR crotamiton 10% cream (less effective than permethrin or lindane):
  - apply nightly x 2 and wash off thoroughly 24 hours after last application.
- OR 5% sulfur in petroleum (less effective than permethrin or lindane):
  - apply nightly x 3 and wash off thoroughly 24 hours after last application.

### Note:

- Ivermectin single dose 200 µg/kg orally OR 0,8% topical solution is a potential treatment modality particularly helpful for immunocompromised patients or for patients who have refractory symptoms.
- In pregnancy permethrin is the only agent that should be used.

## Reporting and Partner Notification

- pubic lice and scabies infestations are NOT reportable to local public health authorities.
- partner notification of ectoparasitic infestations is NOT required.

## Follow-up

- follow-up only if clinically necessary.

# ISSUES IN PREGNANCY

## GENERAL PRINCIPLES

### Screening

- all pregnant women should be offered HIV testing and counselling.
- any pregnant woman whose current or past history reveals STD risk behaviours should be screened for chlamydial and gonococcal infections.
- pregnant women at increased risk for syphilis include:
  - youth < 25 years of age
  - injection drug users
  - commercial sex workers
  - street involved
  - women originating from or who had sex with a person from a syphilis endemic area.
- screening for HBsAg is strongly recommended for pregnant women at risk, and all children born to HBsAg-positive mothers should be actively AND passively immunized (see *Hepatitis B*, page 121). Immunization against hepatitis B virus is highly effective in preventing infection and disease.

### Therapy

- treatment of STD in pregnant women and in nursing mothers needs special attention.
- initiation of antiretroviral therapy during pregnancy is critical for the protection of infants born to mothers infected with HIV as it markedly reduces the risk of maternal-fetal transmission.
- the following drugs are **contraindicated**:
  - erythromycin estolate
  - sulfamethoxazole (in the third trimester)
  - fluoroquinolones
  - podophyllin/podophyllotoxin, 5-FU
  - doxycycline/tetracycline
  - gamma benzene hexachloride/lindane
  - interferons.
- follow-up after treatment of STD in a pregnant woman is important to ensure therapeutic success.
- hospitalization for evaluation and treatment of pelvic inflammatory disease (PID) in a pregnant woman is recommended. PID is rare after the first trimester.

## PREGNANCY TERMINATION

- women who have had an abortion are at greater risk of STD. Screening for STD is recommended prior to proceeding with termination of pregnancy. In order to avoid complications of pregnancy termination when bacterial vaginosis is present, pre-abortion treatment of bacterial vaginosis is advisable.

## ARTIFICIAL INSEMINATION

- risk of transmission of STD by donor semen is reduced since donors must routinely be screened for HIV, HBV, HCV and syphilis.
- semen is not released unless repeat HIV antibody test at 6 months is negative.
- in addition, initial and repeat screening of semen donors should include at a minimum:
  - history of increased high-risk behaviour
  - urine or urethral specimens for *N. gonorrhoeae* and *C. trachomatis*.

## MANAGEMENT OF STD IN PREGNANCY

**Note:** Diseases are listed alphabetically and not according to risk to mother or child.

### Bacterial Vaginosis

- bacterial vaginosis is not an STD but is frequently seen in persons at risk for STD.

### Management of an infected mother

If asymptomatic	If symptomatic
<ul style="list-style-type: none"> <li>■ screening may be of benefit at 12 to 16 weeks if high risk pregnancy (e.g., previous premature rupture of membranes, low birth weight, miscarriage, stillbirth, endometritis, premature delivery).</li> <li>■ if test is positive, treat as for symptomatic.<sup>(c)</sup></li> </ul>	<p><b>Third trimester</b> (oral therapy is recommended<sup>(a)</sup>):</p> <ul style="list-style-type: none"> <li>■ metronidazole 500 mg orally bid for 7 days <sup>(b)</sup></li> </ul> <p><b>Other trimesters:</b></p> <ul style="list-style-type: none"> <li>■ clindamycin 300 mg orally bid for 7 days OR</li> <li>■ clindamycin cream 2% 5 g nightly intravaginally for 5 days OR</li> <li>■ metronidazole gel 0,75% bid intravaginally for 5 days.</li> </ul>
<p><b>Notes:</b></p> <p>(a) Oral therapy should be utilized to prevent subclinical infection of the chorioamnion.</p> <p>(b) Advise patients NOT to take any alcoholic beverages during metronidazole therapy and for 48 hours post-treatment to prevent “antabuse-like” reaction.</p> <p>(c) Re-evaluate for recurrence of bacterial vaginosis if it has been found and treated.</p>	

### Chlamydial Infections (*C. trachomatis*)

Infected mother OR mother is a contact of an infected person	When there is a risk to neonate
<ul style="list-style-type: none"> <li>■ treat with: amoxicillin 500 mg orally tid for 7 days OR erythromycin 2 g/day orally in divided doses for 7 days<sup>(a,b)</sup></li> <li>■ for alternative regimens see page 137</li> <li>■ amoxicillin is preferred to erythromycin because fewer side effects and greater rate of completion result in greater effectiveness.</li> <li>■ “test-of-cure”.</li> </ul>	<ul style="list-style-type: none"> <li>■ prophylaxis for ophthalmia neonatorum (see page 123)</li> <li>■ erythromycin for chlamydial infection in the new-born (dosage varies with infant’s birth weight, see page 137).</li> </ul>
<p><b>Notes:</b></p> <p>(a) Erythromycin dosage refers to the use of erythromycin base. Equivalent dosages of other formulations (EXCEPT the estolate which is contraindicated in pregnancy) may be substituted. If erythromycin or amoxicillin has been used for treatment, repeat testing after completion of therapy is advisable.</p> <p>(b) To date, there are limited data collected on azithromycin in pregnancy but it is considered to be safe in this context by many experts.</p>	

### Ectoparasitic Infestations

Infected mother	When there is a risk to neonate
<p><b>Pubic Lice:</b></p>	
<ul style="list-style-type: none"> <li>■ wash affected area; apply pediculocide formulation (1% permethrin cream rinse OR 0,33% pyrethrins-piperonyl butoxide shampoo/conditioner) according to package instructions; repeat in 7 to 10 days.</li> </ul>	<ul style="list-style-type: none"> <li>■ surveillance of symptoms and signs if mother diagnosed prior to delivery.</li> </ul>
<p><b>Scabies:</b></p>	
<ul style="list-style-type: none"> <li>■ apply permethrin cream 5% to affected areas of the body from the neck down, leave for 8 to 12 hours.</li> </ul>	<ul style="list-style-type: none"> <li>■ surveillance of symptoms and signs if mother diagnosed prior to delivery.</li> <li>■ if mother diagnosed and treated prior to delivery but symptomatic at delivery, treat with permethrin cream 5%.</li> </ul>



## Genital Herpes Simplex Virus (HSV) Infections

- pregnant women with a history of HSV infection should be advised to discuss appropriate management with health care providers.

Infected mother	Mother is a contact of an infected person	When there is a risk to neonate
<ul style="list-style-type: none"> <li>■ check for lesions, symptoms and signs.</li> <li>■ caesarean section is recommended only for those with active genital lesions.</li> <li>■ risk of transmission to the baby is much greater during primary infection than during recurrence.</li> <li>■ if benefits outweigh risks, treat primary and early recurrent lesions, treat with acyclovir (appears safe in pregnancy) (for dosage, see page 164).</li> <li>■ suppressive therapy of episodes during late third trimester is currently under study.</li> </ul>	<ul style="list-style-type: none"> <li>■ if male sexual contact has history of any HSV and serology for female is negative, there is a major risk for primary infection.                             <ul style="list-style-type: none"> <li>– consider suppressive therapy for male during all of pregnancy</li> <li>– counsel about safer sex practices.</li> <li>– discuss risk of transmission with oral sex.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ infant at risk if maternal history of genital HSV.</li> <li>■ risk of transmission during primary infection is 40% to 50% greater than during recurrence.</li> <li>■ swab mother at delivery for HSV culture.</li> <li>■ swab neonate (skin, mouth, eye, rectum) at 24 to 48 hours for HSV culture and maintain surveillance of the infant's symptoms and signs.</li> <li>■ if neonatal HSV infection is a concern, consult with a colleague experienced in this area as soon as possible.</li> </ul>

## Genital Warts and Genital Human Papillomavirus (HPV) Infection

Infected mother	Mother is a contact of an infected person	When there is a risk to neonate
<ul style="list-style-type: none"> <li>■ regular Pap smear (see page 168).</li> <li>■ colposcopy if cervical warts or if indicated by presence of squamous cell dysplasia on Pap smear.</li> <li>■ avoid: podophyllin, podophyllotoxin, 5-FU.</li> <li>■ prefer: cryotherapy, bi- or trichloroacetic acid.</li> <li>■ caesarean section for obstetric reason only.</li> </ul>	<ul style="list-style-type: none"> <li>■ encourage consistent condom use.</li> <li>■ Pap smear if one has not been performed in the preceding 12 months.</li> </ul>	<ul style="list-style-type: none"> <li>■ genital HPV may be transmitted to neonate during birth (rare).</li> <li>■ recurrent respiratory papillomatosis may occur but rare.</li> <li>■ in cases of genital HPV in a child, consider sexual abuse (see page 201).</li> </ul>

## Gonococcal Infections (*N. gonorrhoeae*)

Infected mother OR mother is a contact of an infected person	When there is a risk to neonate
<ul style="list-style-type: none"> <li>■ treat with: cefixime 400 mg orally in a single dose PLUS amoxicillin 500 mg orally tid for 7 days OR 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) <sup>(a)</sup>.</li> <li>■ for alternative regimens see page 146.</li> <li>■ “test-of-cure”.</li> </ul>	<ul style="list-style-type: none"> <li>■ prophylaxis for ophthalmia neonatorum (see page 123).</li> <li>■ for active ocular infection start ceftriaxone 50 to 100 mg/kg/day IV or IM (single dose therapy may be adequate if blood culture is negative) and consult with a colleague experienced in this area as soon as possible.</li> </ul>

**Note:**

(a) Erythromycin estolate is contraindicated.

## STD-Associated Hepatitis

### Hepatitis A virus (HAV) infection

Infected mother	Mother is a contact of an infected person	When there is a risk to neonate
<ul style="list-style-type: none"> <li>■ prophylaxis with gammaglobulin for household contact.</li> <li>■ consider immunisation</li> </ul>	<ul style="list-style-type: none"> <li>■ if contact or at risk, no contraindication to using gammaglobulin or HAV vaccine.</li> </ul>	<ul style="list-style-type: none"> <li>■ surveillance of symptoms and signs.</li> <li>■ prophylaxis if at risk of contracting HAV.</li> </ul>

## Hepatitis B virus (HBV) infection

Infected mother	Mother is a contact of an infected person	When there is a risk to neonate
<ul style="list-style-type: none"> <li>document diagnosis and plan for treatment of neonate.</li> </ul>	<ul style="list-style-type: none"> <li>if contact or at risk, no contraindication for HBIG or HBV vaccine.</li> </ul>	<ul style="list-style-type: none"> <li>surveillance of symptoms and signs.</li> <li>risk for chronic hepatitis <math>\geq 90\%</math>.</li> <li>HBIG and vaccine within 12 hours of birth (for dosage, see page 121).</li> <li>special attention to complete three-dose schedule since long-term exposure is possible and there may be difficulty in reaching family for third dose.</li> <li>follow-up HB Ab titre 1 to 2 months after completion of HBV vaccine series.</li> </ul>

## Hepatitis C virus (HCV) infection

Infected mother	Mother is a contact of an infected person	When there is a risk to neonate
<ul style="list-style-type: none"> <li>assess eligibility for therapy.</li> <li>greater risk of progression.</li> <li>if injection drug use, discuss addiction and stress harm reduction: <ul style="list-style-type: none"> <li>switching to safer forms of drug administration</li> <li>non-sharing of syringes, snorting straws, needle exchange programs and other sources of sterile drug use equipment</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>if injection drug use, discuss addiction and emphasize harm reduction.</li> </ul>	<ul style="list-style-type: none"> <li>surveillance of symptoms and signs.</li> <li>careful follow-up of mother and infant, regardless of apparent success with harm reduction.</li> <li>test infant by PCR if younger than 12 months of age or by Ab if older than 12 months.</li> <li>if HCV infection is documented: <ul style="list-style-type: none"> <li>HBV vaccine</li> <li>HAV vaccine after one year of age</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>– methadone maintenance therapy for heroin user.</li> <li>■ advise mother on risk of transmission to neonate (approximately 5%; greater if mother co-infected with HIV) and theoretical risk of transmission during breast-feeding.</li> </ul>		<ul style="list-style-type: none"> <li>– advise mother on risk of child receiving repeat toxic agents (e.g., drugs, alcohol).</li> </ul>
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### Syphilis (*T. pallidum*)

Infected mother OR mother is a contact of an infected person	When there is a risk to neonate
<ul style="list-style-type: none"> <li>■ treat with: benzathine penicillin G 2,4 to 7,2 million U IM (dosage varies depending on stage of disease, see page 155)</li> <li>■ if allergic, see Penicillin Desensitization, page 156.</li> </ul>	<ul style="list-style-type: none"> <li>■ elevated risk of stillbirth with untreated maternal infection.</li> </ul>
	<ul style="list-style-type: none"> <li>■ if congenital syphilis is a possibility, consult with a colleague experienced in this area.</li> </ul>

### Trichomoniasis

Infected mother OR mother is a contact of an infected person	When there is a risk to neonate
<ul style="list-style-type: none"> <li>■ metronidazole 2 g orally in a single dose OR 250 mg orally bid for one week.</li> </ul> <p><b>Note:</b> Some experts would still avoid metronidazole in the first trimester. A less effective alternative is clotrimazole.</p>	<ul style="list-style-type: none"> <li>■ trichomoniasis may be passed on to an infant girl at delivery but the infection is self-limited.</li> </ul>

## HIV INFECTION IN PREGNANCY

- **HIV transmission to infants can be reduced (by 80%) by identifying women who may not be aware of their HIV infection and by the subsequent use of antiretroviral agents.**

### Routine Offering of HIV Antibody Testing and Counselling

- HIV antibody testing and counselling should be offered to all pregnant women.
- selective testing based on a questionnaire or a risk identification scale is not acceptable. Offering the test should be standard practice for physicians who have patients who are pregnant or are intending to conceive.
- all testing should be done with:
  - informed consent of the mother
  - pre- and post-test counselling
  - a discussion of the advantages/disadvantages of testing in pregnancy to individuals and to the pregnancy.
- discussion of HIV testing should occur **as early as possible** to maximize the opportunity for choices in pregnancy management.
  - HIV transmission from mother-to-child occurs in 25% of untreated HIV infected mothers
  - this risk is reduced by 80% with appropriate management in pregnancy, intrapartum and postpartum
  - experience in Canada has shown that a vast majority of HIV infected children are born to mothers who were not screened.

### First visit

- explain that the test is voluntary.
- explain advantages and disadvantages of testing in pregnancy.
- identify testing options available in the region (e.g., nominal, non-nominal and anonymous testing).
- discuss the confidentiality of test results in relation to office or clinical procedures and communication of results to partners.
- discuss the stress related to waiting for test results and possible reactions to learning the results.
- discuss the possibility of her partner participating in the process.
- arrange a return appointment and explain the need for a follow-up visit to obtain the test result.
- repeat testing in pregnancy depends on evaluation of ongoing risk.
- if the woman has chosen not to be tested, document the refusal and reasons for it.
- discuss risk reduction and explore specific ways in which she can avoid or reduce risk-producing behaviour.

## Management

- women with HIV infection will require counselling concerning pregnancy interruption or continuation. Reasons which may influence pregnancy interruption or continuation may vary.
- it is extremely important to explore these issues in a non-judgmental fashion. The woman should be fully informed regarding the implications of HIV infection to herself and the effects that it will have on the pregnancy and the risk to the infant.
- women who decide to continue with their pregnancy should be offered antiretroviral medication.
- women who choose not to be treated are at high risk for HIV transmission and require:
  - early testing of the infant
  - close follow-up and close follow-up of the infant
  - see *HIV Infection in Children*, page 182.
- as management of HIV infection in pregnancy is complex and treatment guidelines are rapidly changing, consultation with a colleague experienced in HIV disease is recommended

## Treatment

**This is an increasingly complex area with rapid changes in optimal therapies as new research becomes available. Recommendations for a given patient should be made in collaboration with a colleague experienced in HIV/AIDS in women.**

- the treatment combination which has been proven to reduce transmission to the neonate from 25% to 8% is the use of:
  - zidovudine (AZT) monotherapy starting at 14 to 34 weeks and continuing to delivery PLUS intravenous zidovudine during labour and delivery PLUS oral zidovudine to the infant for 6 weeks.
- if a pregnant woman is going to initiate antiretroviral therapy in pregnancy, she should be offered combination antiretroviral therapy taking into consideration potential toxicity to the fetus since monotherapy is now considered inappropriate for HIV infection.
- full explanation of this therapy in the context of pregnancy should occur and drugs should be selected based on the best available toxicity information at that time.

# SEXUAL ABUSE AND SEXUAL ASSAULT

## 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

- child sexual abuse and sexual assault is common; this happens in all segments of our society.

### 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:

- *N. gonorrhoeae* infection in a child >1 month of age and particularly > 6 months of age.
- genital or rectal chlamydial infection in a child > 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 papillomavirus infection (HPV) can become initially symptomatic is not clearly defined.
- genital or perianal *Herpes simplex* virus infection in a child > 3 months of age, although alternative routes of transmission should be considered.
- genital *T. vaginalis* infection in a child > 6 months of age, although there may be non-sexual means of transmission.

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

**Note:** Bacterial vaginosis and positive cultures for *Gardnerella* infection (not a diagnostic test for BV) are not by themselves 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 team of colleagues experienced in the area of child abuse is strongly recommended (see *Referral Centres for STD in Children*, page 233) because the examination of a child under these circumstances is for both medical and legal purposes and because of the need to conduct the evaluation with the highest level of skill and sensitivity.

#### 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 *Forensic Evidence and Services*, page 229).
- to avoid further traumatizing the child, evaluation should not proceed without his/her understanding and consent

#### 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 taken seriously and protected.
- be non-judgmental.
- use terminology that the child can understand.



- enquire about what acts took place; use of inanimate objects such as dolls may be helpful to demonstrate.
- avoid use of leading questions.

#### 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.
- 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 neurologic 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 *Tanner Scale of Sexual Maturity*, page 225)
- examine all areas of skin and note signs of recent or past trauma or marks. If assault recent (within hours) re-evaluate 24 to 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. A patulous anus may be seen in children with severe chronic fecal retention or neurologic abnormalities involving the sacral region and occasionally in sexual abuse. This is complex and therefore, if there are concerns, consultation with a colleague experienced in child abuse is recommended.
- examination of the vaginal area in pre-school 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 both 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 carried out only when 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 sexual assault protocol procedures (see *Forensic Evidence and Services*, page 229).
- 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, microbiologic 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 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.
- 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.
- at times, a complete assessment may not be possible. Minimal investigation should include testing for *C. trachomatis*. Testing for *N. gonorrhoeae* should also be included if the alleged perpetrator is known to be positive, the rate of *N. gonorrhoeae* in the community is high, and/or vaginal or urethral discharge is present.
- though new in this setting, many experts now consider the most appropriate test for *N. gonorrhoeae* and *C. trachomatis* to be urine for amplified nucleic acid techniques (e.g., PCR, LCR) because of its high sensitivity (adult data) and high patient acceptability (low pain). For *N. gonorrhoeae*, culture is preferable if at all feasible. If not possible, amplified nucleic acid techniques should be used. If amplified nucleic acid tests are used for either pathogen, a confirmatory second assay using different primers should be done.
- if possible, the (alleged) perpetrator(s) should be examined for STD.

**Notes:**

- all specimens must be carefully labeled 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 *Forensic Evidence and Services*, page 229.
- multiple STD may be present and, if possible, all the following cultures/tests should be done:

Site/Specimen	Procedure
<p><b>Urine</b> (males and females)</p> <p><b>If urine for amplified nucleic acid test not available:</b></p> <p><b>Urethra</b> (males):</p> <ul style="list-style-type: none"> <li>■ 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.</li> </ul>	<ul style="list-style-type: none"> <li>■ examine for <i>T. vaginalis</i></li> <li>■ examine for <i>C. trachomatis</i> and <i>N. gonorrhoeae</i> if amplified nucleic acid test available, see <i>Laboratory Diagnosis</i>, page 59</li> <li>■ <i>N. gonorrhoeae</i> culture<sup>(a)</sup></li> <li>■ test for <i>C. trachomatis</i><sup>(b)</sup></li> <li>■ HSV culture<sup>(c)</sup></li> </ul>
<p><b>Vagina</b> (females)<sup>(d)</sup>:</p> <ul style="list-style-type: none"> <li>■ 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 anesthetic.</li> <li>■ Swabs used to obtain specimens must be pre-moistened to minimize discomfort.</li> <li>■ A vaginal wash technique is preferred to multiple vaginal swabs if nucleic acid tests are used for <i>C. trachomatis</i> and <i>N. gonorrhoeae</i></li> </ul>	<ul style="list-style-type: none"> <li>■ <i>N. gonorrhoeae</i> culture<sup>(a)</sup></li> <li>■ test for <i>C. trachomatis</i><sup>(b)</sup></li> <li>■ Gram stain of smear, saline wet mount and 10% KOH preparation for (see page 53): <ul style="list-style-type: none"> <li>– clue cells and amine odour (whiff test)</li> <li>– pH</li> <li>– yeast</li> </ul> </li> <li>■ <i>T. vaginalis</i> culture or if not available wet mount</li> <li>■ HSV culture<sup>(c)</sup></li> </ul>
<p><b>Pharynx</b></p>	<ul style="list-style-type: none"> <li>■ <i>N. gonorrhoeae</i> culture<sup>(a)</sup></li> <li>■ test for <i>C. trachomatis</i><sup>(i)</sup></li> </ul>
<p><b>Rectum</b></p>	<ul style="list-style-type: none"> <li>■ <i>N. gonorrhoeae</i> culture<sup>(a)</sup></li> <li>■ test for <i>C. trachomatis</i><sup>(b)</sup></li> <li>■ HSV culture<sup>(c)</sup></li> </ul>

Site/Specimen	Procedure
Genital ulcers	<ul style="list-style-type: none"> <li>■ HSV culture</li> <li>■ <i>H. ducreyi</i> (rare) culture. If suspected, laboratory should be notified (see page 55)</li> <li>■ examination of exudate for <i>T. pallidum</i>.</li> </ul>
Genital warts	<ul style="list-style-type: none"> <li>■ clinical evaluation with biopsy and histologic confirmation. Typing is of little benefit with current state of knowledge and is not widely available.</li> </ul>
Serologic samples	<ul style="list-style-type: none"> <li>■ syphilis<sup>(e)</sup></li> <li>■ HIV<sup>(f)</sup></li> <li>■ HBV<sup>(g)</sup>, HCV<sup>(h)</sup></li> <li>■ frozen sample to be saved</li> </ul>

**Notes to table on pages 206-207:**

- (a) For medico-legal purposes, culture of *N. gonorrhoeae* is the preferred method of diagnosis; PCR is also acceptable. Other non-culture tests are not recommended. While the results of other non-culture tests, if culture is not available, may be used to guide therapy, they will be inadequate for legal purposes.
- (b) For medico-legal purposes, culture of *C. trachomatis* or PCR for *C. trachomatis* are the preferred methods of diagnosis rather than other non-culture tests. New amplified nucleic acid tests for urine (e.g., PCR, LCR) are more sensitive than culture, are highly specific and more acceptable to patients. When chlamydial amplified nucleic acid tests are used they should be confirmed using a second set of primers. There are few data on the performance of PCR on rectal specimens. Chlamydia culture is documented to perform adequately for specimens from that site. EIA and DFA are NOT acceptable alternatives due to high rate of false-positives in low prevalence populations.
- (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 youth with Tanner Stage III and IV (*Tanner Scale of Sexual Maturity*, page 225).
- (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 12 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 12 weeks following the initial examination. Appropriate pre- and post-test counseling should be carried out (see pages 176-177).

- (g) Optional depending upon the circumstances of the abuse, prevalence of hepatitis B in the community and the alleged 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.
- (h) Optional since hepatitis C virus transmission is low through sexual contact.
- (i) This test is optional and would be used for the management of patient and not to determine the origin of the infection because perinatal chlamydia is reported to persist in the naso-pharynx up to 4-6 months after birth.

### Management and Treatment

- for antimicrobial therapy for specific infection, see section on specific STD.
- hepatitis B vaccine is recommended (unless the child has already been immunized):
  - give HBIG preferably within 48 hours of exposure; efficacy decreased if given after 7 days. Start a course of hepatitis B vaccine.
- 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.

#### **Chosen therapy should be effective against *N. Gonorrhoeae*, *C. Trachomatis* and incubating syphilis:**

- cefixime 8 mg/kg orally in a single dose (max. 400 mg)  
PLUS azithromycin 15 mg/kg orally in a single dose (max. 1 g) OR  
erythromycin 40 mg/kg/day orally in divided doses (max. 500 mg qid)  
for 7 days.

- post-exposure HIV prophylaxis is a contentious issue:
  - available data are based on occupational exposure to HIV from a known HIV infected person
  - some experts recommend post-exposure prophylaxis in a setting where the assailant is known to be infected with HIV
  - consultation with a colleague experienced in this area should be sought.
- if pregnancy is a possibility, consider using “the morning after pill”:
  - ovral 2 tablets 12 hours apart (total of 4 tablets), beginning preferably 12 to 24 hours and no later than 72 hours after intercourse.
  - this regimen is less effective beyond this time and totally ineffective at 7 days. The pooled failure rate is 1,8%. The combination is a total dose of 200 µg of ethinyl estradiol and 2 mg of norgestrel.

- antibiotics may interfere with the effectiveness of “the morning after pill”. When both are to be used, STD prophylaxis should be taken 24 hours after the morning pills:
  - for those that present < 72 hours after the assault and want to avoid prophylactic antibiotics, offer STD testing after 72 hours.

### Reporting and Partner Notification

- 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.
- local public health authorities are available to assist with partner notification and help with appropriate referral for clinical evaluation, testing, treatment and health education.

### Follow-up

- follow-up cultures for “test-of-cure” are indicated if an STD is found and treated:
  - for gonorrhea and trichomoniasis, this should occur approximately 4 to 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 amplified nucleic acid tests. In general, test-of-cure of chlamydial infections is done 4 weeks after completion of therapy.
- follow-up treatment of the prepubertal child for syphilis is similar to that of adult patients (see page 155).
- follow-up serology for hepatitis B, syphilis and HIV as required (see notes to table, page 207).
- management of children who have been sexually abused must include psychological and social support for the child as well as other affected family members.

## SEXUAL ASSAULT IN YOUTH AND ADULTS

### 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 women and men (for children see *Child Sexual Abuse*, page 201).
- 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 continuation 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

- sexual contact including penetration type and site.
- STD-related symptoms.

### Examination

- oral/anal mucosa.
- genitalia.
- general physical examination for bruises, abrasions, etc.

### Documentation

- all findings and actions taken ( i.e., historic, physical and laboratory) should be clearly and completely documented (see *Forensic Evidence and Services*, page 229).

### Specimen Collection and Laboratory Diagnosis

- in instances of acute assault, collection of specimens for forensic evidence should follow the established sexual assault protocol procedures (see *Forensic Evidence and Services*, page 229).



- 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.
- *N. 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.
- at times, a complete assessment may not be possible. Minimal investigation should include testing for *N. gonorrhoeae* and *C. trachomatis*.
- for medico-legal purposes, culture of *N. gonorrhoeae* and/or PCR for *C. trachomatis* are the preferred methods of diagnosis rather than other non-culture tests.
  - new amplified nucleic acid tests (e.g., PCR, LCR) are more sensitive than culture, are highly specific and more acceptable to patients.
  - when chlamydial amplified nucleic acid tests are used they should be confirmed using a second set of primers.
  - there are few data on the performance of PCR on rectal specimens. Chlamydia culture is documented to perform adequately for specimens from that site.
  - EIA and DFA are NOT acceptable alternatives due to high rate of false-positives in low prevalence populations.
- if possible, the (alleged) perpetrator(s) should be examined for STD.

**Notes:**

- all specimens must be carefully labeled 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.
- other specimens (e.g., stools for parasites) may be collected if indicated by history.
- multiple STD may be present and, if possible, all the following cultures/tests (see table, page 212) should be done. Sites will depend on nature of the assault.

Site/Specimen	Procedure
<b>Urine</b> (males and females)	<ul style="list-style-type: none"> <li>■ examine for <i>T. vaginalis</i>.</li> <li>■ examine for <i>C. trachomatis</i> if amplified nucleic acid test available (see <i>Laboratory Diagnosis</i>, page 59).</li> </ul>
<b>Urethra</b> (males) <b>Endocervix</b> (females)	<ul style="list-style-type: none"> <li>■ Gram stain</li> <li>■ Culture for <i>N. gonorrhoeae</i><sup>(a)</sup> and test for <i>C. trachomatis</i><sup>(b)</sup></li> </ul>
<b>Vagina</b>	<ul style="list-style-type: none"> <li>■ Gram stain of smear, saline wet mount and 10% KOH preparation for (see pages 55; 53): <ul style="list-style-type: none"> <li>– clue cells and amine odour/whiff test</li> <li>– pH</li> <li>– yeast</li> </ul> </li> <li>■ <i>T. vaginalis</i> culture or if not available wet mount</li> </ul>
<b>Anal canal</b>	<ul style="list-style-type: none"> <li>■ <i>N. gonorrhoeae</i><sup>(a)</sup> culture</li> <li>■ test for <i>C. trachomatis</i><sup>(b)</sup></li> </ul>
<b>Pharynx</b>	<ul style="list-style-type: none"> <li>■ <i>N. gonorrhoeae</i><sup>(a)</sup> culture</li> <li>■ test for <i>C. trachomatis</i><sup>(b)</sup></li> </ul>
<b>Serologic samples</b>	<ul style="list-style-type: none"> <li>■ syphilis<sup>(c)</sup></li> <li>■ HIV<sup>(d)</sup></li> <li>■ HBV<sup>(e)</sup>, HCV<sup>(f)</sup></li> <li>■ frozen samples to be saved.</li> </ul>

**Notes:**

- (a) For medico-legal purposes, culture of *N. gonorrhoeae* is the preferred method of diagnosis; PCR is also acceptable. Other non-culture tests are not recommended. While the results of other non-culture tests, if culture is not available, may be used to guide therapy, they will be inadequate for legal purposes.
- (b) For medico-legal purposes, culture of *C. trachomatis* or PCR for *C. trachomatis* are the preferred methods of diagnosis rather than other non-culture tests. New amplified nucleic acid tests for urine (e.g., PCR, LCR) are more sensitive than culture, are highly specific and more acceptable to patients. When chlamydial amplified nucleic acid tests are used they should be confirmed using a second set of primers. There are few data on the performance of PCR on rectal specimens. Chlamydia culture is documented to perform adequately for specimens from that site. EIA and DFA are NOT acceptable alternatives due to high rate of false-positives in low prevalence populations.

- (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 following the initial examination. Appropriate pre-and post-test counseling should be carried out (see page 176-177).
- (e) Optional depending upon the circumstances of the abuse, prevalence of hepatitis B in the community and the alleged 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.
- (f) Optional since hepatitis C virus transmission is low through sexual contact.

### Management

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

### Initial visit

- for antimicrobial therapy for specific infection see section on specific STD.
- HBIG and hepatitis B vaccine is recommended unless hepatitis B vaccine has already been received.
- 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.

**Chosen therapy should be effective against *N. gonorrhoeae*,  
*C. trachomatis* and incubating syphilis:**

- cefixime 400 mg orally in a single dose  
PLUS azithromycin 1 gram orally in a single dose  
OR
- ceftriaxone 125 mg IM in a single dose  
PLUS azithromycin 1 gram orally in a single dose

- **offer crisis counseling and psychological support to person assaulted and partner.**
- post-exposure HIV prophylaxis is a contentious issue:
  - available data are based on occupational exposure to HIV from known HIV infected person
  - some experts recommend post-exposure prophylaxis in a setting where the assailant is known to be infected with HIV
  - consultation with a colleague experienced in this area should be sought.
- if pregnancy is a possibility, consider using the “morning-after-pill”:
  - overall 2 tablets 12 hours apart (total of 4 tablets), beginning preferably 12 to 24 hours and no later than 72 hours after intercourse.
  - this regimen is less effective beyond this time and totally ineffective at 7 days. The pooled failure rate is 1,8% per cycle. The combination is a total dose of 200 µg or ethinyl estradiol and 2 mg of norgestrel.
- antibiotics may interfere with the effectiveness of the “morning after pill”. When both are to be used, STD prophylaxis should be taken 24 hours after the morning pill:
  - for those that present < 72 hours after the assault and want to avoid prophylactic antibiotics, offer STD testing after 72 hours.

#### Follow-up visit

- if no initial therapy, follow-up at 7 to 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 syphilis and HIV as required (see notes to table on page 212).

## SPECIAL POPULATION CONCERNS

### PERSONS WITH REPEATED STD

#### Core Groups

- STDs are not evenly distributed throughout populations.
- a “core group” (a small, definable subgroup with a high prevalence of a disease) can be responsible for the perpetuation of that disease within a community (e.g., street youth, commercial sex workers, etc.).
- core groups represent less than 2% of those at risk, but directly or indirectly are responsible for proportionately many more cases.
- core group members share sociodemographic characteristics and are often asymptomatic carriers.

#### STD Repeaters

- may not be members of core groups but usually 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 include the following:

#### Patient education

- core group transmitters and STD repeaters should be the focus of intensified “patient education” when seeking medical care, including:
  - 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 practices, especially recommendations for the proper use of latex condoms (see page 35).
  - underline need to stop having unprotected sex with both regular and occasional partners and the need to seek medical advice at the first sign of symptoms and to follow treatment strictly.

- make latex condoms easily available. In certain situations female condoms may be more suitable.
- facilitate counselling to change behaviour.
- involve steady partners in education and counselling.
- try to ensure partners are informed of possible exposure.
- counsel regarding effect of alcohol and other drugs on sexual behaviour.
- evaluate psychological health and social context (e.g., financial problems, conjugal violence, etc.) which may impede STD preventive practices.

### Screening

- regular screening of core group members and STD repeaters should be strongly encouraged and facilitated
- for those who have frequent contacts, monthly check-ups at a convenient time and drop-in visits should be encouraged.

### Outreach

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

### STD education for the general population

- over the longer term, STD education in schools and STD information for the general public will have a positive effect.
- management of STD is dependent on the management of larger social issues such as poverty and abuse and on widespread provision of STD education.
- see *Canadian Guidelines for Sexual Health Education*. Division of STD Prevention and Control, Health Canada, Ministry of Supply and Services, Ottawa, 1994.

### Notes:

- 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, increased availability of presumptive treatment based on suspicion, and patient referral (simplified partner notification).

## Commercial Sex Workers

- many commercial sex workers 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.

**Some commercial sex workers are at higher risk in their work.  
These include:**

- those new to the profession
  - the uninformed
  - recent immigrants
  - those who work episodically
  - those who accept more money for not using condoms
  - transgendered individuals (i.e., transvestites, transsexuals)
  - persons with serious psychiatric illness
  - those who are receptive anal partners
  - survival sex workers exchanging sex for money, drugs, shelter or food.
- in addition, female commercial sex workers often become pregnant and may not seek prenatal care.

## MEN WHO HAVE SEX WITH MEN

- epidemics of syphilis, gonorrhea, genital herpes, genital warts, hepatitis B, hepatitis A and human immunodeficiency virus (HIV) infection have been documented in the population of men who have sex with men.
- in the last 5 to 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. However, risk behaviour in young gay males is a great concern.

### Sexual History

- basic sexual history is critical in establishing:
  - the presence of same sex activity
  - the range and frequency of sexual practices
  - the level of risk for specific STD.
- the best approach is to obtain a history of sexual practices with non-judgmental, open-ended questions beginning with broad categories of sexual orientation and progressing to specific sexual practices
  - asking “Do you have sex with men, with women, or both?” may be a useful starting point.
- specific practices common in men who have sex with men, which are associated with increased risk of STD, are:
  - 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 (insertion of finger or fist in anus of passive partner).
- contact with multiple anonymous sexual partners has occurred frequently in bathhouses and has been correlated with risk for various STD, especially HIV, hepatitis B, hepatitis A and syphilis.

### Physical Examination

- in addition to a careful genital examination and a targeted extragenital examination, areas of particular importance in men who have sex with men are the lymph nodes, skin, sclera, oral cavity, pharynx and perianal region.
- anoscopy or proctoscopy should be done in symptomatic men who have sex with men who are the receptive partner for anal/rectal sex.

### 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.



- 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, hepatitis B, gonorrhoea and syphilis screening should be strongly considered in men who have sex with men.

#### Treatment and Follow-up

- as for all patients.

#### Prevention

- anal intercourse is a high-risk activity for transmission of STD.
- the use of condoms specifically designed for anal sex and proper lubrication should be recommended.
- hepatitis B and hepatitis A vaccines should be offered to men who have sex with men because of high infection rates (see *STD Associated Hepatitis*, page 114).
- 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.
  - avoidance of unprotected oral-anal intercourse.
  - the tendency for drugs and alcohol to adversely affect safer sex behaviour decisions.
  - high risk of HIV infection in patient or partner(s).

## TRAVELLERS

- travellers may have an increased likelihood of sexual behaviours which in turn increase their risk of acquiring STD, including HIV.
- health care providers who advise travellers, in addition to the general pre-travel recommendations (e.g., vaccination, water contamination, etc.) should review the risks of acquiring STD, including HIV infection, and strongly encourage prevention.

### Risk

- risk of acquiring STD is increased for travellers for the following reasons:
  - during periods away from their home environment, because of a combination of one or more factors (absence of the usual sexual partner(s), sense of well-being brought by long awaited holiday, perception of ease of access, etc.), travellers may have a proclivity to have sex with new partners. This risk may be increased by the use of drugs and alcohol, and ease of access in some countries.
  - 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 may be 10 to 100 times greater than in Canada.
  - 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.
  - strains of HIV called type-0, mainly found in Africa, may not be detected by some routine HIV antibody tests. There may be more false-negatives in these cases. If this is a concern for your patient, call the laboratory.
  - it is not uncommon for travellers who have unprotected intercourse to acquire multiple sexually transmitted pathogens
  - several STDs acquired in other countries are seldom seen in Canada and may present both diagnostic and treatment difficulties to Canadian physicians (e.g., genital ulcer disease, especially chancroid).

## Prevention

### Pre-travel visit

- health care providers should address increased risk of acquiring STD for travellers, advise travellers to avoid casual sexual contact, and always use condoms if they have sex.
- counselling travellers prior to travel should include a discussion on:
  - how to decrease risk by using condoms and how to use condoms properly (see *Condoms and Condom Use*, page 35)
  - advice to bring their own condoms when away from their home environment and to store condoms in such a way that they are not damaged.
- persons whose spouse or regular sex partner(s) travel frequently can be at risk of acquiring STD without necessarily being aware of this risk.
- immunization for hepatitis B and hepatitis A may also be appropriate in certain circumstances (see *Hepatitis B*, page 121).

### Post-travel visit

- counselling should review and monitor prevention practices, identify barriers to prevention practices and the means to overcome these (see *Primary Prevention of STD*, page 31).
- examination for STD.

## YOUTH AND STREET YOUTH

### Youth

- youth who are sexually active will frequently have serial short term monogamous relationships (i.e., serial monogamy).
- females 15 to 19 years of age have the highest rates of chlamydial and gonococcal infections in Canada.
- knowledge about STD, including HIV infection, is not usually translated into safer sexual practices.
- by 14 years of age, 31% of males and 21% of females report having had sexual intercourse at least once.
- by 16 years of age, 45% have had sexual intercourse at least once.

#### Youth are at increased risk of STD if:

- street involved
  - pregnant or undergoing therapeutic abortion
  - sexual contact of proven or suspected STD case
  - symptoms or signs 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 regimen is often a major problem
    - outpatient treatment should be as straightforward as possible
    - hospitalization should be considered for serious infections such as pelvic inflammatory disease (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.

### Street Youth

- defined as young males and females **who spend most of their time on city streets** (by choice or not).
- most urban centres, regardless of size, have a street youth population.
- > 95% are sexually active with a high number of sexual partners and consistently low condom use.
- very high prevalence of STD: 40 to 50% street youth who are commercial sex workers 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 *Persons with Repeated STD*, page 215.

#### Street youth are a heterogeneous population including:

- homeless
- unemployed
- young offenders
- injection drug users and other substance abusers
- commercial sex workers, including “survival sex” (exchange of sex for money, drugs, shelter or food)
- may have multiple problems needing referral
- high prevalence of alcohol and other substance abuse, nutritional deficiency, depression and other mental health problems
- non-attendance at school may be a major marker for identification of street youth.

#### Special Management Issues

- if sexually active, consider STD screening and routine offering of HIV testing whenever youth present for medical care.
- when clinically or epidemiologically indicated, provide empiric therapy for chlamydia/gonorrhea while awaiting the results of diagnostic tests.
- hepatitis B vaccination should be offered to all youth who have not been previously immunized. Testing for HBsAg prior to immunization should be considered. In cases where compliance with treatment regimens or follow up is uncertain, the first dose of vaccine can be administered at the same time as the blood is sent for HBsAg testing.
- hepatitis A immunization should be offered to youth at increased risk of acquiring hepatitis A infection (see *STD Associated Hepatitis*, page 122).
- directly observed therapy with single dose regimens is desirable to guarantee compliance in these groups.
- anticipate difficulties in obtaining information concerning partner notification.
- provide condoms or information concerning their availability.
- needle exchange, free condom services

**Note:** Youth with STD and/or HIV, particularly street youth, constitute a significant “core group” with high levels of transmission efficiency. This has resulted in a significant increase in HIV incidence and prevalence among youth and the maintenance of STD at higher rates in this population compared to the decreasing rates in many other populations (see *Persons with Repeated STD*, page 215).

## APPENDICES

### APPENDIX I: 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: Increased 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.

**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 II: SENSITIVITY AND SPECIFICITY OF LABORATORY TESTS

### General Principles

- sensitivity and specificity are purely a measure of how good the test is. They are NOT dependent upon prevalence of the disease in the population.
  - 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.
- predictive values are dependent upon prevalence of the disease in the population. They determine how useful a test will be in a specific population.
  - 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.

### Examples

- you evaluate a new chlamydia diagnostic test in a youth clinic, testing 2000 females, of whom 200 have the disease (10% prevalence):

		<i>Disease</i>		Total
		+	–	
<i>Test</i>	+	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):

		<i>Disease</i>		Total
		+	-	
<i>Test</i>	+	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 the 74 with a positive test, only 19 (25.7%) actually have disease. **This risk of false-positive is especially important in dealing with STD, due to the possible consequences for contacts, relationships and in the case of children.**

## APPENDIX III: FORENSIC EVIDENCE AND SERVICES

### Forensic Evidence

- forensic evidence is invaluable in supporting the testimony of victims of sexual assault.
- the purpose of forensic analysis of specimens is to establish one or more of the following:
  - that there was some form of association between victim and accused
  - that sexual contact occurred
  - that the assault was violent or forceful thereby indicating lack of consent.

#### Types of forensic analyses most useful in sexual assault:

- identification of semen or other body fluids
  - forensic DNA analysis
  - microscopic hair examination
  - textile damage assessment
  - examinations involving fibres and other types of trace evidence.
- 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 *Forensic Laboratories*, page 231).

### Collection of Specimens

- **Physicians need to familiarize themselves with the test kit before they have to use it.**
- an approved sexual assault examination kit should be used for the collection of specimens and the instructions contained therein should be carefully followed.
- 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 phosphatase tests and DNA typing.

- a known blood sample should be collected from the victim using autolancets and special paper provided in approved sexual assault kits.
- 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 to 2 ml of sterile non-bactericidal saline for specimens that are to be cultured. For non-culture tests, either 1 to 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 can identify any spermatozoa present when examined under  $\times 1000$  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 known hair samples not only from the suspect, but also from the person assaulted or abused.
  - a known pubic hair sample should consist of at least 30 hairs obtained by combing different areas of the pubic region.

- a known head hair sample should consist of at least 20 hairs from each of 5 different areas of the scalp (centre, front, and both sides) obtained by combing.
- pubic hair should not be plucked.

It is essential for DNA analysis to collect the root of the hair. If the samples of pubic and head hair cannot be collected by combing, plucking the hair is not recommended during the first examination. This is to avoid further traumatizing the victim. It is therefore suggested that the sampling be completed at a subsequent visit.

### **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 federal, provincial, regional and local agencies and 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.

### **Forensic Laboratories**

#### **Nova Scotia**

Officer-in-Charge  
Forensic Laboratory  
Royal Canadian Mounted Police  
3151 Oxford Street, P.O. Box 8208  
Halifax (Nova Scotia) B3K 5L9  
**Tel.: (902) 426-8886 Fax: (902) 426-5477**

#### **Quebec**

Laboratoire de sciences judiciaires et  
de médecine légale  
1701 Parthenais Street, P.O. Box 1500  
Montreal (Quebec) H2K 3S7  
**Tel: (514) 873-2704 Fax: (514) 873-4847**

#### **Ontario**

Director  
Centre of Forensic Sciences  
25 Grosvenor Street  
Toronto (Ontario) M7A 2G8  
**Tel: (416) 314-3200 Fax: (416) 314-3225**

Chief Scientific Officer  
Central Forensic Laboratory  
Royal Canadian Mounted Police  
1200 Vanier Parkway, P.O. Box 8885  
Ottawa (Ontario) K1G 3M8  
**Tel.: (613) 993-0986 Fax: (613) 952-7325**

**Ontario (cont'd)**

Northern Regional Forensic Laboratory  
70 Foster Drive, Suite 500  
Sault Sainte-Marie (Ontario) P6A 6V3  
**Tel.: (705) 945-6550 Fax: (705) 945-6569**

**Manitoba**

Officer-in-Charge  
Forensic Laboratory  
Royal Canadian Mounted Police  
621 Academy Road  
Winnipeg (Manitoba) R3N 0E7  
**Tel.: (204) 983-4280 Fax: (204) 983-6399**

**Saskatchewan**

Officer-in-Charge  
Forensic Laboratory  
Royal Canadian Mounted Police  
P.O. Box 6500  
Regina (Saskatchewan) S4P 3J7  
**Tel.: (306) 780-5810 Fax: (306) 780-7571**

**Alberta**

Officer-in-Charge  
Forensic Laboratory  
Royal Canadian Mounted Police  
15707 - 118th Avenue  
Edmonton (Alberta) T5V 1B7  
**Tel.: (780) 451-7400 Fax: (780) 495-6961**

**British Columbia**

Officer-in-Charge  
Forensic Laboratory  
Royal Canadian Mounted Police  
5201 Heather Street  
Vancouver (British Columbia) V5Z 3L7  
**Tel.: (604) 264-3405 Fax: (604) 264-3499**

## **APPENDIX IV: REFERRAL CENTRES FOR STD IN PREPUBERTAL CHILDREN**

- this list of child and youth abuse treatment centres in Canada is not inclusive; however, it can be used as a reference for obtaining more specific local information.

### **Newfoundland and Labrador**

Protection Team  
Dr. Charles A. Janeway Child Health Centre  
Janeway Place  
St. John's (Newfoundland) A1A 1R8  
**(709) 778-4607**

### **Nova Scotia**

Child Abuse Team  
Izaak Walton Killam Hospital for Children  
5850 University Avenue  
Halifax (Nova Scotia) B3J 3Y9  
**(902) 424-3121**

### **New Brunswick**

Child Protection Consultation Team  
Moncton Hospital  
135 MacBeath Avenue  
Moncton (New Brunswick) E1C 6Z8  
**(506) 857-5331**

Child Protection Team  
Saint John Regional Hospital  
P.O. Box 2100  
Saint John (New Brunswick) E2L 4L2  
**(506) 648-6811**

### **Quebec**

Adolescent Clinic  
Montreal Children's Hospital  
1040 Atwater Street  
Montreal (Quebec) H3Z 1X3  
**(514) 934-4481 or (514) 934-4483**

Comité de prévention de l'enfance  
maltraitée  
Direction de la protection de la jeunesse  
Hôpital Maisonneuve-Rosemont  
5415, boul. de l'Assomption  
Montreal (Quebec) H1T 2M4  
**(514) 252-3400, ext. 3826**

Clinique de pédiatrie socio-juridique  
Hôpital Sainte-Justine  
3175, chemin Côte Ste-Catherine  
Montreal (Quebec) H3T 1C5  
**(514) 345-4866 — 0-11 year-olds**  
**(514) 345-4721 — 12-18 year-olds**

Comité de protection de l'enfance  
Centre hospitalier de l'Université Laval  
2705, boul. Laurier  
Ste-Foy (Quebec) G1V 4G2  
**(418) 656-4141**

Clinique médico-juridique  
Centre hospitalier universitaire de l'Estrie  
Sherbrooke (Quebec) J1H 5N4  
**(819) 346-1110, ext. 14644**

### **Ontario**

Child Abuse Committee  
Peel Memorial Hospital  
20 Lynch Street  
Brampton (Ontario) L6W 2Z8  
**(905) 451-1710**

Child Protection Team  
McMaster University Medical Centre  
P.O. Box 2000, Station A  
Hamilton (Ontario) L8N 3Z5  
**(905) 521-2100**

Child Protection Team  
Hotel Dieu Hospital  
166 Brock Street  
Kingston (Ontario) K7L 5G2  
**(613) 544-3310, ext. 2899**

Gyne/Endo Clinic  
Children's Hospital of Western Ontario  
800 Commissioners Road East  
London (Ontario) M6A 4G5  
**(519) 685-8484**

**Ontario (cont'd)**

Child Abuse Team  
Mississauga Hospital  
100 Queensway West  
Mississauga (Ontario) L5B 1B8  
(905) 848-7100, ext. 2516

Child Protection Program  
Children's Hospital of Eastern Ontario  
401 Smyth Road  
Ottawa (Ontario) K1H 8L1  
(613) 820-6464

Child Abuse Committee  
Sarnia General Hospital  
220 North Milton Street  
Sarnia (Ontario) N7T 6H6  
(519) 464-4500

Child Abuse Team  
Scarborough Centenary Hospital  
2867 Ellesmere Road  
Scarborough (Ontario) M1E 4B9  
(416) 281-7301

Chief of Pediatrics  
St. Joseph's General Hospital  
35 North Algoma Street  
P.O. Box 3251  
Thunder Bay (Ontario) P7B 5G7  
(807) 343-2431

Suspected Child Abuse and Neglect  
Program  
Hospital for Sick Children  
555 University Avenue  
Toronto (Ontario) M5G 1X8  
(416) 813-6275

Child Abuse Team  
North York General Hospital  
4001 Leslie Street  
Willowdale (Ontario) M2K 1E1  
(416) 756-6000

**Manitoba**

Child Protection Centre  
Children's Hospital of Winnipeg  
Health Sciences Centre  
685 William Avenue  
Winnipeg (Manitoba) R3A 1R9  
(204) 787-2811

**Saskatchewan**

Child Abuse Team  
Regina General Hospital  
1440 14<sup>th</sup> Avenue  
Regina (Saskatchewan) S4P 0W5  
(306) 766-4444

Child and Youth Service  
Department of Psychiatry  
University Hospital  
103 Hospital Drive  
Saskatoon (Saskatchewan) S7N 0W8  
(306) 655-1000

**Alberta**

Child Abuse Program  
Alberta Children's Hospital  
1820 Richmond Road SW  
Calgary (Alberta) T2T 6C7  
(403) 229-7886

Department of Pediatrics  
University of Alberta Hospital  
2C-300 Walter McKenzie Health Centre  
University of Alberta  
Edmonton (Alberta) T6G 2B7  
(780) 407-6370

**British Columbia**

Child Protection Services  
Royal Columbian Hospital  
330 East Columbian Street  
New Westminster (British Columbia) V3L 3W7  
(604) 520-4253

Children's Hospital  
4480 Oak Street  
Vancouver (British Columbia) V6H 3V4  
(604) 875-2345

Sexual Assault Assessment Project  
Department of Family Practice  
University of British Columbia  
5804 Fairview Avenue  
Vancouver (British Columbia) V6T 1Z3  
(604) 822-5431

Suspected Child Abuse and Neglect Team  
Victoria General Hospital  
35 Helmcken Road  
Victoria (British Columbia) V8Z 6R5  
(250) 727-4212

**Northwest Territories**

Director, Population Health  
Department of Health and Social Services  
Government of the Northwest Territories  
6th Floor, Centre Square Tower  
P.O. Box 1320  
Yellowknife (Northwest Territories) X1A 2L9  
**(867) 920-3231 Fax: (867) 873-0442**

**Nunavut–Northwest Territories**

Chief Medical Health Officer  
Department of Health and Social Services  
Government of Nunavut  
P.O. Box 800  
Iqaluit (Northwest Territories) X0A 0H0  
**(867) 975-5700 Fax: (867) 975-5705**

**Yukon**

Communicable Disease Officer  
Yukon Communicable Disease Control  
Department of Health and Social Services  
Yukon Territorial Government  
No. 4 Hospital Road  
Whitehorse (Yukon Territory) Y1A 3H8  
**(867) 667-8369 Fax: (867) 667-8349**



## APPENDIX V: 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.

### Newfoundland and Labrador

Director  
Disease Control and Epidemiology Division  
Department of Health and  
Community Services  
P.O. Box 8700  
St. John's (Newfoundland) A1B 4J6  
**Tel.: (709) 729-3430 Fax: (709) 729-5824**

### Prince Edward Island

Provincial Epidemiologist  
Department of Health  
P.O. Box 2000, Jones Building  
Charlottetown (Prince Edward Island)  
C1A 7N8  
**Tel.: (902) 368-4996 Fax: (902) 368-4969**

### Nova Scotia

Provincial Medical Officer of Health  
Department of Health  
P.O. Box 488  
Halifax (Nova Scotia) B3J 2R8  
**Tel.: (902) 424-8698 Fax: (902) 424-0506**

### New Brunswick

Provincial Epidemiologist  
Department of Health and Community  
Services  
P.O. Box 5100, Carleton Place  
Fredericton (New Brunswick) E3B 5G8  
**Tel.: (506) 453-3092 Fax: (506) 453-2780**

### Quebec

Direction  
Protection de la santé publique  
Ministère de la santé et des services sociaux  
1075, chemin Ste-Foy  
Quebec (Quebec) G1S 2M1  
**Tel.: (418) 643-6390 Fax: (418) 528-2651**

### Ontario

Public Health Branch  
Ontario Ministry of Health  
5700 Young Street  
North York (Ontario) M2M 4K5  
**Tel.: (416) 327-7429 Fax: (416) 327-7439**

### Manitoba

Communicable Disease Control Unit  
Manitoba Health  
4066 - 300 Carlton Street  
Winnipeg (Manitoba) R3B 3M9  
**Tel.: (204) 788-6728 Fax: (204) 948-2040**

### Saskatchewan

Deputy Chief Medical Health Officer  
Population Health Branch  
Saskatchewan Health  
3475 Albert Street  
Regina (Saskatchewan) S4S 6X6  
**Tel.: (306) 787-3220 Fax: (306) 787-3237**

### Alberta

Disease Control and Prevention  
STD Services  
Alberta Health  
23<sup>rd</sup> Floor, Telsus Plaza, North Tower  
10025 Jasper Avenue  
Edmonton (Alberta) T5J 2N3  
**Tel.: (780) 427-2830  
Fax: (780) 422-2892/6663**

### British Columbia

Director  
STD/AIDS Control  
BC Centre for Disease Control Society  
655 West 12<sup>th</sup> Avenue  
Vancouver (British Columbia) V5Z 4R4  
**Tel.: (604) 660-6178 Fax: (604) 775-0808**

**Northwest Territories**

Director  
Population Health  
Department of Health and Social Services  
Government of the Northwest Territories  
6th Floor Centre Square Tower, P.O. Box 1320  
Yellowknife (Northwest Territories) X1A 2L9  
**Tel.: (867) 920-3231 Fax: (867) 873-0442**

**Nunavut–Northwest Territories**

Chief Medical Health Officer  
Department of Health and Social Services  
Government of Nunavut  
P.O. Box 800  
Iqaluit (Northwest Territories) X0A 0H0  
**Tel.: (867) 975-5700 Fax: (867) 975-5705**

**Yukon Territory**

Communicable Disease Officer  
Yukon Communicable Disease Control  
Department of Health and Social Services  
Yukon Territorial Government  
4 Hospital Road  
Whitehorse (Yukon Territory) Y1A 3H8  
**Tel.: (867) 667-8369 Fax: (867) 667-8349**

## APPENDIX VI: PROVINCIAL LABORATORIES

- for more information on laboratory diagnosis of STD consult initially your local facility or your nearest public health laboratory.

### Newfoundland and Labrador

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  
**Tel.: (709) 737-6568 Fax: (709) 737-7070**

### Nova Scotia

Director  
Department of Pathology  
and Laboratory Medicine  
Queen Elizabeth Science Centre  
5788 University Avenue  
Halifax (Nova Scotia) B3H 1V8  
**Tel.: (902) 473-2231 Fax: (902) 473-4432**

### Prince Edward Island

Director  
Division of Laboratories  
Provincial Health Laboratory  
Queen Elizabeth Hospital  
Riverside Drive, P.O. Box 6600  
Charlottetown (Prince Edward Island)  
C1A 8T5  
**Tel.: (902) 894-2300 Fax: (902) 894-2385**

### New Brunswick

Director  
Department of Laboratory Medicine  
400 University Avenue, P.O. Box 2100  
Saint John (New Brunswick) E2L 4L2  
**Tel.: (506) 648-6501 Fax: (506) 648-6576**

### Québec

Directeur scientifique  
Laboratoire de santé publique  
20045, chemin Sainte-Marie ouest  
Sainte-Anne-de-Bellevue (Quebec) H9X 3R5  
**Tel.: (514) 457-2070 Fax: (514) 457-6346**

### Ontario Regional Laboratories

Director  
Laboratory Services Branch  
Ontario Ministry of Health  
P.O. Box 9000, Terminal A  
Toronto (Ontario) M5W 1R5  
**Tel.: (416) 235-5941 Fax: (416) 235-6063**

Director  
Ottawa Public Health Laboratory  
2380 Saint Laurent Blvd.  
Ottawa (Ontario) K1G 6C4  
**Tel.: (613) 736-6800 Fax: (613) 736-6820**

Director  
Peterborough Public Health Laboratory  
99 University Drive, P.O. Box 265  
Peterborough (Ontario) K9J 6Y8  
**Tel.: (705) 743-6811 Fax: (705) 745-1257**

Director  
Kingston Public Health Laboratory  
P.O. Box 240  
Kingston (Ontario) K7L 4V8  
**Tel.: (613) 548-6630 Fax: (613) 548-6636**

Director  
Hamilton Public Health Laboratory  
P.O. Box 2100  
Hamilton (Ontario) L8N 3R5  
**Tel.: (416) 385-5379 Fax: (613) 521-7405**

Director  
Orillia Public Health Laboratory  
P.O. Box 600  
Orillia (Ontario) L3V 6K5  
**Tel.: (705) 325-7449 Fax: (705) 329-6001**

Director  
London Public Health Laboratory  
P.O. Box 5704, Terminal "A"  
London (Ontario) N6A 4L6  
**Tel.: (519) 455-9310 Fax: (519) 455-3363**

**Ontario (cont'd)**

Director  
Sudbury Public Health Laboratory  
2 - 1300 Paris Street  
Sudbury (Ontario) P3E 6H3  
**Tel.: (705) 564-6917 Fax: (705) 564-6918**

Director  
Timmins Public Health Laboratory  
67 Wilson Avenue  
Timmins (Ontario) P4N 2S5  
**Tel.: (705) 267-6633 Fax: (705) 360-2006**

Director  
Windsor Public Health Laboratory  
P.O. Box 1616  
Windsor (Ontario) N9A 6S2  
**Tel.: (519) 969-4341 Fax: (519) 973-1481**

Director  
Thunder Bay Public Health Laboratory  
336 South Syndicate Avenue  
Thunder Bay (Ontario) P7E 1E3  
**Tel.: (807) 622-6449 Fax: (807) 473-3046**

Director  
Sault Sainte-Marie Public Health Laboratory  
P.O. Box 220  
Sault Sainte-Marie (Ontario) P6A 5L6  
**Tel.: (705) 254-7132 Fax: (705) 945-6873**

**Manitoba**

Director  
Cadham Provincial Laboratory  
750 William Avenue, P.O. Box 8450  
Winnipeg (Manitoba) R3C 3Y1  
**Tel.: (204) 945-6123 Fax: (204) 786-4770**

**Saskatchewan**

Director  
Provincial Laboratory  
Saskatchewan Health  
3211 Albert Street  
Regina (Saskatchewan) S4S 5W6  
**Tel.: (306) 787-3129 Fax: (306) 787-1525**

**Alberta**

Director  
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