Syphilis ○ HIV ○ Chlamydia ○ Herpes
HPV ○ Gonorrhea ○ LGV ○ Syphilis ○
HIV ○ Chlamydia ○ Herpes ○ HPV ○
Gonorrhea ○ LGV ○ Syphilis ○ HIV ○
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LGV ○ Syphilis ○ HIV ○ Chlamydia ○
Herpes ○ HPV ○ Gonorrhea ○ LGV ○
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Canadian Guidelines on Sexually Transmitted Infections

2006 EDITION

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Revised edition of the 1998 *Canadian STD Guidelines*.

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Guidelines presented in this document reflect the views of the Expert Working Group on Canadian Guidelines for Sexually Transmitted Infections. They should be construed not as rules but rather as recommendations.

PREFACE

In March 2003, the Community Acquired Infections Division, Public Health Agency of Canada (PHAC) (then part of Health Canada), brought together an Expert Working Group (EWG) on sexually transmitted infections (STIs) from across Canada to begin planning the revision of the *1998 Canadian STD Guidelines*. STI experts from the fields of medicine, nursing, laboratory, public health and research voluntarily participated as authors, reviewers and EWG members in an effort to develop updated, evidence-based recommendations for the prevention, diagnosis, treatment and management of STIs in Canada. The content of the *Canadian Guidelines on Sexually Transmitted Infections 2006 Edition* reflects emerging issues and highlights changes in the STI literature since the release of the 1998 guidelines.

These guidelines were created as a resource for clinical and public health professionals — especially nurses and physicians — for the prevention and management of STIs across a diverse patient population, including neonates, children, adolescents and adults.

While this document addresses key issues related to the prevention, diagnosis, treatment and management of the most common STIs, it is beyond the scope of these guidelines to provide comprehensive recommendations for the treatment and management of HIV and viral hepatitis C. When confronted with these infections, either as a primary infection or a co-infection, we suggest that you refer to alternate resources (see below for suggestions), including colleagues experienced in the area.

- Strader DB, Wright T, Thomas DL, Seeff LB. AASLD practice guideline: diagnosis, management, and treatment of hepatitis C. *Hepatology* 2004;39:1147–1171.

- U.S. Department of Health and Human Services, Panel on Clinical Practices for Treatment of HIV Infection. *Guidelines for the Use of Antiretroviral Agents in HIV-1–infected Adults and Adolescents*. Available at: AIDSinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf. Accessed February 6, 2006.

The EWG and PHAC acknowledge that the advice and recommendations set out in this statement are based upon the best current available scientific knowledge and medical practices, and they are disseminating this document to clinical and public health professionals for information purposes. Persons administering or using drugs, vaccines or other products should also be aware of the contents of the individual product monograph(s) for those products, or other similarly approved standards or instructions for use provided by the licensed manufacturer(s). Recommendations for use and other information set out in these guidelines may differ from that set out in product monograph(s) or other similarly approved standards or instructions for use. Manufacturers have sought approval and

provided evidence as to the safety and efficacy of their products only when used in accordance with the product monograph(s) or other similarly approved standards or instructions for use.

Practitioners should report adverse drug reactions to the Canadian Adverse Drug Reaction Monitoring Program (CADRMP). For specifications and standards of reporting, consult Health Canada's CADRMP guidelines.

While these guidelines have been based on current evidence and clinical practice, the prevention, diagnosis, treatment and management of STIs is an evolving field. The EWG and PHAC, in producing these recommendations, will regularly update this information. Readers are encouraged to consult the STIs page of the PHAC website for the latest chapter update(s).

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TABLE OF CONTENTS

INTRODUCTION

The Process Underlying the Creation of the *Canadian Guidelines on Sexually Transmitted Infections, 2006 Edition*

The process used to create the *Canadian Guidelines on Sexually Transmitted Infections 2006 Edition* was developed by the 14-member expert working group (EWG) (chaired by Dr. Tom Wong from the Public Health Agency of Canada [PHAC]) and by the Sexual Health and Sexually Transmitted Infections (STI) Section, PHAC. Chapters were written by STI experts from across Canada on a voluntary basis. To facilitate the evidence-based revision, PHAC conducted literature reviews on all chapters and provided additional literature assistance as requested by the authors during chapter writing. Each of the 27 chapters underwent a minimum of four rounds of blinded expert review, three within the EWG and one with at least two external reviewers. Final approval of each chapter by the EWG was required before the chapter was considered complete. In order to ensure the integrity and impartiality of the process and the recommendations in the final document, all EWG members and chapter authors have signed a conflict of interest and disclosure form.

This edition has been enhanced to include references throughout each chapter, as well as level of recommendation and quality of evidence indicators for the treatment recommendations. The indicators used reflect a combination of the methodologies from the U.S. Preventive Services Task Force and the Canadian Task Force on Preventive Health Care and have been modified and simplified for use in these guidelines as outlined in Tables 1 and 2.

Table 1. Levels of recommendation (Modified from Harris RP, et al.[1])

Recommendation: A	Strongly recommends that clinicians routinely provide the treatment to eligible patients. **Good evidence** that the treatment improves important health outcomes and concludes that benefits substantially outweigh harms.
Recommendation: B	Recommends that clinicians routinely provide the treatment to eligible patients. At least **fair evidence** that the treatment improves important health outcomes and concludes that benefits outweigh harms.
Recommendation: C	No recommendation for or against routine provision of the treatment. At least **fair evidence** that the treatment can improve health outcomes but concludes that the balance of the benefits and harms is **too close to justify a general recommendation**.
Recommendation: D	Recommends against routinely providing the treatment to asymptomatic patients. At least fair evidence that the treatment is **ineffective** or that harms outweigh benefits.
Recommendation: I	**Evidence is insufficient** to recommend for or against routinely providing the treatment. Evidence that the treatment is effective is **lacking, of poor quality or conflicting,** and the balance of benefits and harms cannot be determined.

Table 2. Quality of evidence (Modified from Harris RP, et al[1] and Gross PA, et al[2])

I	Evidence from at least one properly randomized, controlled trial.
II	Evidence from at least one well-designed clinical trial without randomization, from cohort or case-control analytic studies (preferably from more than one centre), from multiple time-series studies or from dramatic results in uncontrolled experiments.
III	Evidence from opinions of respected authorities based on clinical experience, descriptive studies or reports of expert committees.

NEW TERMINOLOGY AND CHAPTERS

The *Canadian Guidelines on Sexually Transmitted Infections 2006 Edition* reflects the change in terminology from sexually transmitted disease (STD) to STI, which has been adopted to encompass both symptomatic and asymptomatic patient presentation. This shift helps legitimize the need for thorough patient assessment and screening of those with identified risk, regardless of symptomatology.

Each chapter belongs to one of five sections: Primary Care and Sexually Transmitted Infections, Laboratory Diagnosis of Sexually Transmitted Infections, Management and Treatment of Specific Syndromes, Management and Treatment of Specific Infections and Specific Populations.

The *Primary Prevention of STD* and *Clinical Approach to the Diagnosis and Management of STD* chapters from the 1998 guidelines have been combined into one chapter for the current revision, titled *Primary Care and Sexually Transmitted Infections*. Chapters from the 1998 guidelines that have been incorporated into other sections of the current revision include *Cervicitis, Persons with Repeated STD* and *Youth and Street Youth*.

New chapters have been added to the Management and Treatment of Specific Infections section *(Chancroid, Lymphogranuloma Venereum)* and to the Specific Populations section *(Immigrants and Refugees, Inmates and Offenders, Sex Workers, Men Who Have Sex with Men/Women Who Have Sex with Women* and *Substance Use)* of this edition.

NEED TO STRENGTHEN PREVENTION

In Canada, there are three nationally reportable STIs: chlamydia, gonorrhea and infectious syphilis. Since 1997, there has been a steady increase in the rates of all three infections. This phenomenon is not unique to Canada; other countries, including the U.S. and the U.K., have reported similar trends.[3,4] Targeted enhanced surveillance and research are required to determine the factors that may be playing a role in these trends. Some of the possible factors may include the following:

- Nucleic acid amplification tests (NAATs) have been introduced.
- Some people may have developed safer-sex burnout.
- There have been innovations in HIV therapy (e.g., highly active antiretroviral therapy), leading to related treatment optimism.
- Youth awareness of risks and knowledge of risk reduction behaviours remain less than optimal.[5]
- Sex is occurring at an early age, with a high rate of serially monogamous relationships.
- Sex is continuing later in life.

- The transmission risks of STIs associated with sexual activity (vaginal, anal and oral) are not well understood by the public.
- "Party drugs," such as ecstasy and crystal meth, are being increasingly linked to unsafe sexual behaviours.[6]
- Anonymous partnering venues, such as the Internet, are expanding.

By being aware of trends in STIs, risk factors and affected populations, primary care providers and public health practitioners can be strategically placed to apply relevant and complementary individual and community-based education and patient services.

The prevention and control of STIs cannot be approached with a narrow focus. The appropriate medical management of identified cases of STIs is but one piece of the puzzle. Both primary and secondary prevention activities are paramount to reducing the incidence (newly acquired infections) and prevalence (number of cases) of STIs. Primary prevention aims to prevent exposure by identifying at-risk individuals and performing thorough assessments, patient-centred counselling and education.[7] Secondary prevention involves reducing the prevalence of STIs through the detection of infections in at-risk populations, counselling, conducting partner notification and treating infected individuals and contacts in a timely manner, thus preventing and/or limiting further spread.[7]

Both the burden of disease and potential complications associated with STIs are relevant and significant considerations for health professionals and decision makers. The presence of an acute infection can increase the risk of co-infection: for example, an ulcer from an infection such as syphilis can significantly increase the risk of acquiring and transmitting an HIV infection. The sequelae for women from untreated infections such as chlamydia and gonorrhea can include pelvic inflammatory disease, chronic pelvic pain, ectopic pregnancy and infertility. In recent years, there has also been increasing evidence to support the role of persistent human papillomavirus (HPV) infections in cervical dysplasia and carcinoma.

As we strive to attend to the physiological needs of patients, we must also be prepared to attend to their psychological needs as well. Chronic viral STIs can have long-standing negative impacts on a patient's psychosocial well-being. The many potential impacts and sequelae of STIs highlight the need for strengthened prevention efforts.

FUTURE DEVELOPMENTS

As within many areas in the health sector, innovation and development are part of the growing body of knowledge and tools used in the prevention, treatment and management of disease and infection. We recommend consulting a variety of mechanisms/sources to maintain and enhance your clinical practice.

Two future developments with significant potential for impact on the field of STIs are the upcoming HPV and HSV vaccines. The latest data on these two developments are outlined below. As these are evolving areas of inquiry, please consult the STI section of the PHAC website for the latest available information.

HPV vaccine

Preliminary data on virus-like particle vaccines for HPV prevention demonstrate positive results in terms of both safety and short-term efficacy. As of 2005, two candidate vaccines are well into phase 3 trials. Both candidate vaccines include protection against HPV-16 and HPV-18, which cause 70% of cervical cancers.[8] One of the candidate products also includes protection against HPV-6 and HPV-11 antigens, which cause 90% of external genital warts.[9] Therapeutic vaccines have also been studied, but the initial results have not been favourable.

HSV vaccine

Preliminary data about a viral glycoprotein-based vaccine against HSV type 2 has shown good results in terms of safety. It provides short-term protection for HSV type 1-negative women but no protection has been found in men.[10] Therapeutic vaccines have also been studied, but results to date have demonstrated a lack of effect compared to placebo.

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PRIMARY CARE AND SEXUALLY TRANSMITTED INFECTIONS

PREVENTION, DIAGNOSIS AND CLINICAL MANAGEMENT OF SEXUALLY TRANSMITTED INFECTIONS IN THE PRIMARY CARE SETTING

It is important for practitioners to recognize that sexually transmitted infection (STI) risks will vary from person to person and should be viewed as dynamic across the lifespan.

- Only through proper assessment can a patient's risk for STIs be identified.
- Assumptions and inferences about patient STI risk may prove inaccurate.
- Sexually inactive individuals can be made aware of STI risks in the course of routine care.

Primary care providers can incorporate STI primary and secondary prevention in the course of routine patient care by doing the following:

- Assessing and discussing STI risk.
- Informing patients about signs and symptoms of STIs (and lack thereof).
- Helping patients recognize and minimize STI risk.
- Offering patient-centred counselling.
- Offering hepatitis A virus (HAV) and hepatitis B virus (HBV) immunization when indicated.
- Offering STI screening and testing.
- Appropriately treating, following up and counselling infected patients and their partners.

This chapter provides an overview of best practices for the prevention and clinical management of STIs in primary care settings. It includes recommendations for the assessment, counselling, screening, diagnosis and management of STIs, including partner notification and public health reporting.

Effective prevention and management of STIs requires the following elements on the part of the health care practitioner:

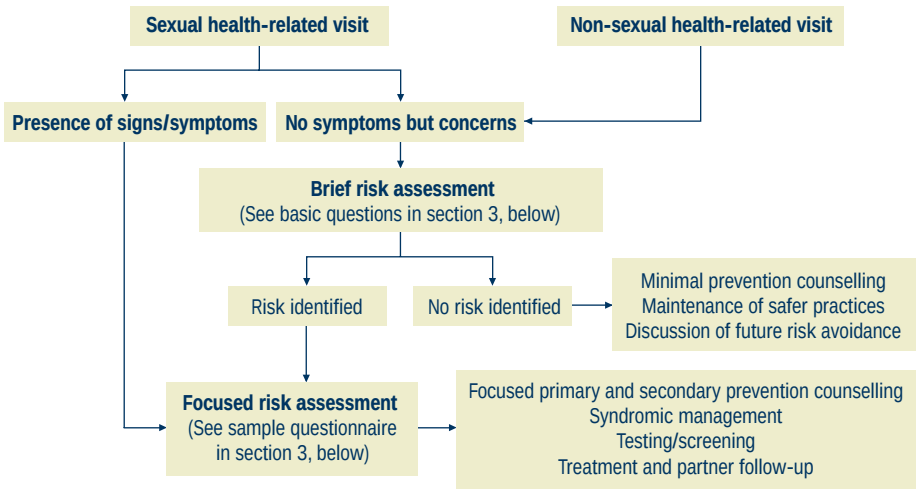
1. Assessing the reason for a consultation.
2. Knowing about STI risk factors and epidemiology.
3. Performing a brief patient history and STI risk assessment.
4. Providing patient-centred education and counselling.
5. Performing a physical examination.
6. Selecting appropriate screening/testing.
7. Diagnosing by syndrome or by organism and post-test counselling.
8. Treating.
9. Reporting to public health and partner notification.
10. Managing co-morbidity and associated risks.
11. Following up.

Each of these elements is outlined in more detail below.

1. Assessing the Reason for a Consultation

Patients may seek medical attention for issues unrelated to sexual health, but they may be at risk for STIs and benefit from interventions to address identified risk factors. For example, consultation for contraception often has implications for STI prevention counselling and STI screening; management of contraception and management of STI risk are closely related. When patients present for contraceptive advice, it can be an ideal time to assess and discuss STI risk. The type of STI risk a patient may encounter also has implications for appropriate contraceptive choice.

Figure 1. STI risk assessment in primary care settings



In some cases, patients may consult to inquire about signs or symptoms related to a possible STI, to request STI testing or to discuss prevention issues. Identifying a person who has STI concerns, who is at risk for an STI or who has an STI provides an opportunity for discussing barriers to risk reduction and means to overcome them.

2. Knowing about STI Risk Factors and Epidemiology

Identifying the index of suspicion of STI infection in a patient requires the health care practitioner to understand the epidemiologic trends of STIs, as well as the risk factors associated with STI transmission and infection.

Summarized in Table 1 are the key epidemiologic trends for bacterial and viral STIs in Canada, as well as patient risk factors for STIs.

Table 1. Epidemiology of STIs in Canada

Infection	How common in clinical practice?	Trends in incidence	Most affected
Chlamydia	• Most commonly diagnosed and reported bacterial STI • Cases reported in Canada in 2002: 56,241 • Cases reported in Canada in 2004: 63,000 (preliminary data)*	• Steadily increasing in Canada since 1997	• Young women aged 15–24 • Young men aged 20–29
Gonorrhea	• Second most commonly diagnosed and reported bacterial STI • Cases reported in Canada in 2002: 7,367 • Cases reported in Canada in 2004: 9,200 (preliminary data)*	• From 1997–2004 (preliminary data),* rate has increased by approximately 94% • Quinolone resistance has increased from <1% in the early 1990s to 6.2% in 2004 (national rate)†	• Males account for approximately $^2/_3$ of reported cases • Increase in MSM • Young men aged 20–29 • Young women aged 15–24
Infectious syphilis	• Previously rare in Canada • Cases reported in Canada in 2002: 463 • Cases reported in Canada in 2004: 1,112 (preliminary data)*	• Dramatic national increases noted since 1997 related to regional outbreaks across Canada	• MSM (HIVpositive and negative) aged 30–39 • Sex workers and their clients • Acquisition in endemic regions

Table 1. Epidemiology of STIs in Canada (continued)

Infection	How common in clinical practice?	Trends in incidence	Most affected
Chancroid	• Exceedingly rare in Canada	• Stable	• Acquisition in endemic regions
Granuloma inguinale	• Exceedingly rare in Canada	• Stable	• Acquisition in endemic regions
Lympho-granuloma venereum	• Previously rare in Canada	• Unknown • Recent outbreaks in Canada have resulted in the development and implementation of an enhanced surveillance system	• MSM • Acquisition in endemic regions
Human papillomavirus	• Very common: 70% of the adult population will have had at least one genital HPV infection over their lifetime	• True incidence not known, as HPV is not a reportable disease	• Adolescents and young adult women and men (but affects women and men of all ages)
Genital herpes (HSV-1 and -2)	• Common	• True incidence not known, as HSV is not a reportable disease • Seroprevalence studies indicate rates of at least 20%	• Very common in both adolescents and adult men and women • Women are more affected than men
HIV	• Rare in general practice • 2,529 cases reported in Canada in 2004	• 20% rise in number of HIV positive test reports in Canada (2000–2004)	• MSM • Acquisition in endemic regions • Injection drug users • Young women aged 15–19

Table 1. Epidemiology of STIs in Canada (continued)

Infection	How common in clinical practice?	Trends in incidence	Most affected
Hepatitis B	• Low to moderate in general practice and varies in different populations • Approximately 700 acute cases per year in Canada	• Acute hepatitis B is twice as high for men than for women • Peak incidence rates are found in the 30–39 age group	• Infants born to HbsAg positive mothers • Injection drug users who share equipment • Persons with multiple sex partners • Acquisition in endemic regions • Sexual and household contacts of an acute or chronic carrier

HbsAg = hepatitis B surface antigen HPV = human papillomavirus HSV = herpes simplex virus
MSM = men who have sex with men STI = sexually transmitted infection
* Preliminary data is subject to change; does not include Nunavut. Surveillance and Epidemiology Section, Community Acquired Infections Division, Public Health Agency of Canada, unpublished data, 2006.
† National Microbiology Laboratory, Public Health Agency of Canada, unpublished data, 2005.
Note: For up-to-date epidemiologic information, consult the Public Health Agency of Canada website:
- www.publichealth.gc.ca/sti
- www.phac-aspc.gc.ca/publicat/aids-sida/haic-vsac1204/index.html
- www.phac-aspc.gc.ca/publicat/ccdr-rmtc/05vol31/31s2/index.html

STI risk factors

The following STI risk factors are associated with increased incidence of STIs:

- Sexual contact with person(s) with a known STI.
- Sexually active youth under 25 years of age.
- A new sexual partner or more than two sexual partners in the past year.
- Serially monogamous individuals who have one partner at present but who have had a series of one-partner relationships over time.
- No contraception or **sole** use of non-barrier methods of contraception (i.e., oral contraceptives, Depo Provera, intrauterine device).
- Injection drug use.
- Other substance use, such as alcohol or chemicals (pot, cocaine, ecstasy, crystal meth), especially if associated with having sex.
- Any individual who is engaging in unsafe sexual practices (i.e., unprotected sex, oral, genital or anal; sex with blood exchange, including sadomasochism; sharing sex toys).
- Sex workers and their clients.
- “Survival sex”: exchanging sex for money, drugs, shelter or food.
- Street involvement, homelessness.
- Anonymous sexual partnering (i.e., Internet, bathhouse, rave party).
- Victims of sexual assault/abuse.
- Previous STI.

3. Performing a Brief Patient History and STI Risk Assessment

General principles

- Information should be requested in a simple, non-judgmental manner, using language understandable to the patient.
- History should enquire about the following:
  - Genital symptoms associated with STIs (discharge, dysuria, abdominal pain, testicular pain, rashes, lesions).
  - Systemic symptoms associated with STIs (fever, weight loss, lymphadenopathy).
  - Personal risk factors and prevention (condom use, vaccination against hepatitis B and, in the case of individuals at risk, hepatitis A).
  - Patient's knowledge of increased risk of STIs.
  - Other pertinent elements of a general history, such as relevant drug treatments, allergies and follow-up of previous problems.
- A brief risk assessment should aim to quickly identify or rule out major risk factors associated with STIs. Use of an STI risk assessment script such as the following may be helpful in rapidly assessing risk:
  - "Part of my job is to assess sexual and reproductive health issues. Of course, everything we talk about is completely confidential. If it is OK with you, I would like to ask you a few questions in this area.
    - Are you sexually active now, or have you been sexually active? This includes oral sex or anal sex, not just vaginal sex.
    - Do you have any symptoms that might make you think that you have an STI? (Do you have any sores on or around your genitals? Does it hurt or burn when you pee? Have you noticed an unusual discharge from your penis, vagina or anus? Do you have pain during sex?)
    - What are you doing to avoid pregnancy? (Do you or your partner use any type of birth control?)
    - What are you doing to avoid STIs including HIV?
    - Do you have any concerns about sexual or relationship violence or abuse?
    - Have you or your partner(s) used injection or other drugs (e.g., crystal meth)?"
  - For women also ask:
    - "When was your last menstrual period?
    - When was your last Pap test?"

Performing a focused risk assessment

Any patient whose current or past history identifies a potential risk factor for STIs should have a more detailed history completed. The focused STI risk assessment questionnaire (Table 2) is intended to serve as a practical guide to assist clinicians in further evaluating an individual patient's risk factors and behaviours, as well as guiding counselling and testing recommendations.

Table 2. STI risk assessment questionnaire[1]

Category and elements	Important questions to guide your assessment
Relationship	
Present situation	• Do you have a regular sexual partner? • If yes, how long have you been with this person?
Identify concerns	• Do you have any concerns about your relationship? • If yes, what are they? (e.g., violence, abuse, coercion)
Sexual risk behaviour	
Number of partners	• When was your last sexual contact? Was that contact with your regular partner or with a different partner? • How many different sexual partners have you had in the past 2 months? In the past year?
Sexual preference, orientation	• Are your partners, men, women or both?
Sexual activities	• Do you perform oral sex (i.e., Do you kiss your partner on the genitals or anus)? • Do you receive oral sex? • Do you have intercourse (i.e., Do you penetrate your partners in the vagina or anus [bum]? Or do your partners penetrate your vagina or anus [bum])?
Personal risk evaluation	• Have any of your sexual encounters been with people from a country other than Canada? If yes, where and when? • How do you meet your sexual partners (when travelling, bathhouse, Internet)? • Do you use condoms, all the time, some of the time, never? • What influences your choice to use protection or not? • If you had to rate your risk for STI, would you say that you are at no risk, low risk, medium risk or high risk? Why?

Table 2. STI risk assessment questionnaire[1] (continued)

Category and elements	Important questions to guide your assessment
STI history	
Previous STI screening	• Have you ever been tested for STI/HIV? If yes, what was your last screening date?
Previous STI	• Have you ever had an STI in the past? If yes, what and when?
Current concern	• When was your sexual contact of concern? • If symptomatic, how long have you had the symptoms that you are experiencing?
Reproductive health history	
Contraception	• Do you and/or your partner use contraception? If yes, what? Any problems? If no, is there a reason?
Known reproductive problems	• Have you had any reproductive health problems? If yes, when? What?
Pap test	• Have you ever had an abnormal Pap test? If yes, when? Result if known.
Pregnancy	• Have you ever been pregnant? If yes, how many times? What was/were the outcome(s) (number of live births, abortions, miscarriages)?
Substance use	
Share equipment for injection	• Do you use alcohol? Drugs? If yes, frequency and type? • If injection drug use, have you ever shared equipment? If yes, what was your last sharing date?
Sex under influence	• Have you had sex while intoxicated? If yes, how often? • Have you had sex while under the influence of alcohol or other substances? What were the consequences? • Do you feel that you need help because of your substance use?
Percutaneous risk other than drug injection	• Do you have tattoos or piercings? If yes, were they done using sterile equipment (i.e., professionally)?

Table 2. STI risk assessment questionnaire[1] (continued)

Category and elements	Important questions to guide your assessment
Psychosocial history	
Sex trade worker or client	• Have you ever traded sex for money, drugs or shelter? • Have you ever paid for sex? If yes, frequency, duration and last event.
Abuse	• Have you ever been forced to have sex? If yes, when and by whom? • Have you ever been sexually abused? Have you ever been physically or mentally abused? If yes, when and by whom?
Housing	• Do you have a home? If no, where do you sleep? • Do you live with anyone?

STI=sexually transmitted infection

4. Providing Patient-Centred Education and Counselling

On completing the risk assessment, a number of topics may be identified where sexual health- or STI-related education may be indicated for a given patient. Below are a number of common counselling topics and recommendations for information to share with patients, as well as some tips on how to approach sexual health education/counselling using a patient-centred approach.

Common counselling topics

Serial monogamy

It is important for practitioners to recognize and address the issue of 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 themselves provide adequate protection from STIs. Consistent condom use and STI testing followed by *mutual* monogamy are far safer strategies than relying on a serially monogamous partners' apparent safety.

For youth contemplating initiation of sexual activity

Many youth will ask for contraceptive information prior to becoming sexually active. Many young women will begin using oral contraception for cycle control as opposed to contraceptive reasons. Both represent excellent opportunities to counsel on safer-sex practices.

- When discussing non-barrier contraceptive options, discussion of safer sex and condom use should occur.
- Promote partner testing prior to becoming sexually active for partners who have already been sexually active.
- Let patients know the benefits of preventive behaviour.

Contraceptive advice

Oral contraceptive prescription is commonly associated with cessation of condom use. It has been documented that prescription of oral contraception is very often associated with the offset of barrier method use and increased incidence of STIs.[2] Individuals in relationships very often move on from initial barrier protection to oral contraception without the benefit of STI testing. Clinicians need to counsel about alternatives to this risky pattern (e.g., testing before cessation of condom use), particularly when prescribing oral contraceptives.

Plan and motivate prevention and risk-reduction strategies

Acceptance of sexuality

- Individuals must accept the fact that they are or might be sexually active before they can plan for STI prevention. Primary care providers, by their actions, can show understanding of patient sexuality by initiating a non-judgmental, two-way dialogue that will help individuals examine the choices they make related to their sexuality. Examining these choices can be useful in helping patients to proactively plan for risk reduction measures appropriate to their specific situation.
- Provide easy-to-apply information:
  - Challenge patients to plan if and how they will discuss STI preventive actions with their partners, or take STI preventive actions unilaterally (e.g., put on a condom), and how they will practice safer sex consistently.
  - Assess whether patients know where they can comfortably obtain condoms in their community, if they know how to use condoms correctly, if they are aware of the signs of STIs and if they know how to seek testing and treatment if needed.

Planning prevention

- Individuals who take STI preventive action need to engage in a number of advance preparations, such as buying condoms, seeking STI/HIV testing and talking about STIs with their health care provider(s). Primary care providers can discuss setting and maintaining personal limits with their patients and identify the most “user-friendly” local STI prevention resources available.
- Health care practitioners can help patients to plan for prevention by openly discussing safer sex using a continuum approach (i.e., masturbation/mutual masturbation, low risk; oral sex, level of risk varies between HIV and other STIs; unprotected vaginal or anal intercourse, high risk for STIs and HIV). This can be useful in helping patients understand the risks associated with various activities,

make informed choices about the initiation and maintenance of STI preventive actions and deal with possible partner resistance.

- Provide easy-to-apply information:
  - Discuss limiting alcohol or drug intake prior to sexual activity, as they decrease inhibitions and could affect decision-making and negotiation skills.
  - Reinforce that it is *not* possible to assess the chances that a partner has an STI on the basis of knowing the partner's sexual history, being in a close relationship with a partner or being monogamous with a partner who has a sexual history and who has not been tested.
  - It is important to tell patients that we do not and cannot routinely test for all STIs (e.g., human papillomavirus [HPV], herpes simplex virus [HSV]), so even if they or their partner's tests are all negative they may still have an asymptomatic STI.

Safer-sex counselling

Safer-sex counselling as a primary or secondary prevention strategy should include the following at minimum:[3]

- STI modes of transmission.
- Risks of various sexual activities (oral, genital, rectal).
- Barrier-method options and availability (male condom, female condom, dental dam).
- Harm-reduction counselling: determining which prevention measures are appropriate and realistic to implement, given the patient's personal sexual situation(s) (e.g., if practicing receptive anal intercourse, always use a condom and extra lubrication, and avoid use of spermicidal condoms).

Statements related to the fact that effective safer-sex practice requires negotiation and is something that should be discussed with partners may be approached by stating: "If you or your partner(s) have ever had another sexual partner, there are a number of options open to you for safer sex. Always using a condom, or getting tested for STI/HIV with your partner followed by mutual monogamy are a few of these options. Do you think any of these might work for you and your partner?"

Proper use of condoms

Reasons for condom failure are most often the result of improper or inconsistent use. For counselling guidelines and instructions on use, see *Appendix A* and *B*.

Efficacy of condoms in STI prevention

- Although latex and polyurethane condoms are effective in preventing the majority of STIs, including HIV, HBV, chlamydia and gonorrhea, they do not provide *complete protection* against HPV or HSV infection.
- Natural skin condoms may be permeable to HBV and HIV.

Discussing alternatives

- An allergy to latex may be an issue for some patients; male or female polyurethane condoms can offer needed protection in these patients.
- The female condom (a polyurethane vaginal pouch) is commercially available and represents an alternative to male condoms or in persons who have a latex allergy for both STI and pregnancy prevention. Female condoms are available in most drug stores and are more expensive than male condoms, approximately $3.00 each. For instructions on use of a female condom see *Appendix B*.

Female condom use for anal intercourse

Some individuals are using the female condom for anal intercourse, although the manufacturer does not provide recommendations for use in this way. What limited studies have been done on the use of female condoms for anal intercourse have found that there tends to be a higher incidence of rectal bleeding and condom slippage in comparison to the male condom.[4]

These studies concluded that modifications, training and research on the clinical significance of safety outcomes are needed for the use of female condoms with anal sex, and redesign of the female condom could increase acceptability and use by men who have sex with men (MSM) and address possible safety concerns.[4,5]

Warning re: nonoxynol-9

Spermicidal lubricated condoms are coated with a lubricant containing nonoxynol-9 (N-9), which may provide added protection against pregnancy. N-9 may increase the risk of infection/transmission of HIV and STIs by causing disruptions and lesions in the genital/anal mucosal lining.[6] N-9 should not be recommended as an effective means of HIV or STI prevention. The best STI and HIV barrier is a latex or polyurethane condom *without* N-9.

- N-9 should never be used rectally. Even low doses used infrequently can cause massive disruption of the rectal mucosal lining, which is likely to increase the risk of infection by HIV and other STIs.
- If N-9 is used as an aid to contraception, its benefit should be carefully considered in light of the increased risk of genital lesions and the resulting potential for an increased risk of HIV transmission.

Motivational interviewing techniques

Motivational interviewing is an intervention strategy that has been used to promote primary and secondary prevention of STIs. Motivational interviewing strategies are well researched clinician-implemented intervention techniques that may be helpful in encouraging patients to practice safer sexual behaviour.[7–9] **Motivational interviewing strategies can be used to enhance safer-sex practices and condom use among patients who may require focused counselling.**[8,9] Table 3 provides an example of a motivational interviewing script.

Table 3. Motivational interviewing script

(Adapted from techniques suggested in Rollnicks, et al.)[9]

"Let me ask you a couple of questions about condoms…"

Health care provider asks:
Q1. "On a scale of 1 to 10, where 1 is "not at all important" and 10 is "very important," ***how important is it*** to you to…***always use condoms***? *If patient responds with a score of 8 or more, proceed to Q3.* *If patient responds with a score of 7 or less, ask:* "Why did you say X and not ***lower***?" (This paradoxical question challenges patients to come up with reasons why it ***is*** important to use condoms.) Q2. "***What would it take*** or what ***would have to happen*** for it to become more important to you to use condoms?" (Patients are the world's foremost experts in what it would take to change their views, and they will tell the clinician what it would take to make condom use more important to them personally. Health care provider and patient can then discuss these responses.) Q3. "On a scale of 1 to 10, how ***confident*** are you that you (or you and your partner) could always use condoms?" *If patient responds with a score of 8 or more, ask about and explore possible barriers that could occur and how patient might deal with them.* *If patient responds with a score of 7 or less, ask:* "Why did you say X and not ***lower***?" (This paradoxical question prompts patients to think about their strengths in managing condom use.) Q4. "***What would it take*** or ***what would have to happen*** for you to become more confident that you (or you and your partner) could always use condoms?" (Patients again are the world's foremost experts in what it would take to change their behaviour, and they will tell the clinician what it would take to do so. Patient and health care provider can use this as a context for problem solving around condom use.)

5. Performing a Physical Examination

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.

Table 4. Components of a physical examination

Components common to both sexes
• General assessment • Search for systemic signs of STIs, such as weight loss, fever, enlarged lymph nodes (palpate inguinal lymph nodes) • Inspect mucocutaneous regions, including pharynx • Inspect external genitalia for cutaneous lesions, inflammation, genital discharge and anatomical irregularities • Perform a perianal inspection • Consider anoscopy (or, if unavailable, digital rectal examination) if patient has practiced receptive anal intercourse *and* has rectal symptoms For prepubertal females and males, see *Sexual Abuse in Peripubertal and Prepubertal Children* chapter
Components specific to adolescent and adult males
• Palpate scrotal contents with attention to the epididymis • When foreskin is present, retract it to inspect the glans • Have the patient or examiner "milk" the urethra to make any discharge more apparent
Components specific to adolescent and adult females
• Be sure to separate labia so as to adequately visualize vaginal orifice • Perform an illuminated speculum examination to visualize the cervix and vaginal walls and to evaluate endocervical and vaginal discharges. Obtain specimens as indicated in the *Laboratory Diagnosis of Sexually Transmitted Infections* chapter. • Perform a bimanual pelvic examination to detect uterine or adnexal masses or tenderness • In certain circumstances, such as primary genital herpes or vaginitis, speculum and bimanual examination may be deferred until the acute symptoms have subsided

6. Selecting Appropriate Screening/Testing

- Selecting the appropriate laboratory tests for patients is a crucial step in the diagnosis and management of STIs. The selection of appropriate laboratory tests and biologic samples and specimens should be based on patient history, risk factors and findings on physical examination.
- Be aware of the "I have been tested" syndrome. There are two dimensions to this syndrome:
  - The false sense of security that individuals at risk may develop after multiple STI screenings with repeat negative results. These individuals may develop a sense that "it can never happen to me." This can be a focus for counselling. (See Providing Patient-Centred Education and Counselling, above.)

  - The individual who has had some form of medical attention (i.e., a physical, been in a hospital, Pap smear, given blood) and thinks they have been tested for STIs. This is an educational opportunity.
- Simply asking a patient if he or she has been screened for STIs is not enough. There is a need to be infection-specific and clarify for the individual that routine blood work at an annual exam does not include syphilis or HIV testing, that a pelvic examination does not include testing for chlamydia and gonorrhea and that a routine urine for culture and sensitivity (C&S) does not screen for chlamydia, etc.

7. Diagnosing by Syndrome or by Organism and Post-test Counselling

- 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 and treatment and post-test counselling provided. (See *Syndromic Management of Sexually Transmitted Infections* chapter for a summary table.)
- When microbiologic results are available, treatment and counselling should be directed at specific pathogens; see appropriate chapter(s).

Post-test counselling

Post-test counselling is an integral part of management of the individual with a newly diagnosed STI and should include, at a minimum, the following:[3]

- Organism- or syndrome-specific advice.
- Safer-sex practices that can remove or reduce the risk of transmitting the STI to a partner or reduce the risk of re-infection in the patient.
- Treatment information and issues that differ as a function of whether the infection is bacterial (curable) versus viral (manageable).
- Case reporting requirements to local public health unit.
- Partner notification either via the index case, the physician or a public health official, and the implications of partners not being tested or treated.

Post-test prevention counselling can also be a very important educational opportunity for individuals who have presented with STI concerns but tested negative for STIs.

Motivational interviewing strategies, as discussed above, can be effective in promoting risk-reduction behaviour change for patients who have tested positive for an STI.[7–9] The difference in motivational interviewing as a primary or secondary prevention strategy is simply in the wording. For example, the health care provider may begin by saying, “I ask all of my patients who are dealing with a sexually transmitted infection a couple of questions. Could you tell me how important it is for *you now* to always use condoms (or always carry out another relevant STI-prevention/harm-reduction strategy)?” (Follow the motivational-interviewing script in Table 3, above.)

8. Treating

Treatment can be curative in the case of bacterial, fungal and parasitic infections or palliative/suppressive in the case of viral STIs. For more specific discussion about particular issues, see *Syndromic Management of Sexually Transmitted Infections* chapter or infection-specific chapters.

Free treatment is available for index cases and their contacts with bacterial STIs in all provinces and territories in Canada.

Patients, whether symptomatic or not, should be told not to share their medications with partners and to complete the full course of their prescribed medication, even if their signs and symptoms resolve before they finish their medication. Patients should also be advised that if vomiting occurs more than 1 hour post-administration, a repeat dose is not required.

Patients diagnosed with a bacterial STI or trichomonal infection should be advised that they and their partners should abstain from unprotected intercourse until 7 days after treatment of both partners is complete (e.g., 7 days after single-dose therapy).

9. Reporting to Public Health and Partner Notification

STI reporting requirements and confidentiality

Patients should be advised of the provincial/territorial public health acts and the *Child Protection Act,* which supersede physician/patient confidentiality and require release of personal information without patient consent for all reportable STIs and in cases where child abuse is suspected.

Those working in agencies receiving personal information are bound by ethical, legal and professional obligations to protect the confidentiality of this information. Patients need to be informed that the information will be reported to authorities only as required by law as noted above but will otherwise remain confidential. This is often a crucial concern for young people who come forward for STI care.

Confidentiality applies to all persons, including infected persons, sexual/needle-sharing partners, all youth who are competent to understand their infection and care, and people who may be involved in cases of child sexual abuse.

Partner notification

Rationale

Partner notification is a secondary prevention process through which sexual partners and other contacts exposed to an STI are identified, located, assessed, counselled, screened and treated. Partner notification not only produces a public health benefit (e.g., disease surveillance and control) but dramatically reduces the risk of reinfection for the original patient.

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 know they have been put at risk and to make informed decisions regarding their health and in some instances their life.

A review of the evidence supports several recommendations related to the partner-notification process.[10] There is good evidence to show that partner notification can be an effective means of finding at-risk and infected persons and that health care provider referral generally ensures that more partners are notified and medically evaluated.[10,11]

Who performs partner notification?

Partner notification may be done by the patient, health care providers or public health authorities. Often, more than one strategy may be used to notify different partners of the same infected person.

- Self- or patient referral: the infected person accepts full responsibility for informing partners of the possibility of exposure to an STI and for referring them to appropriate services.
- Health care provider/public health referral: with the consent of the infected person, the health care provider takes responsibility for confidentially notifying partners of the possibility of their exposure to an STI (without ever naming the index case).
- Contract referral: the health care provider negotiates a time frame with the infected person (usually 24–48 hours) to inform his or her partners of their exposure and to refer them to appropriate services.[11]

Under certain circumstances (i.e., apparently monogamous relationships) the partner may deduce who the index case is by the process of elimination. The health care provider is still required to maintain confidentiality related to the index case, and no information related to the index case can be released to the partner.

If the index case does not wish to notify partners, or if partners have not come forward:

- Explore impediments/barriers to partner notification (see below).
- If needed, report to public health authorities.

Barriers to partner notification

- Actual or feared physical or emotional abuse that may result from partner notification (e.g., conjugal violence): health care provider/public health referral may be the best option in these cases so as to protect the index case. If there is a threat to patient safety, public health officials should be notified of this so that proper safety precautions are taken to protect the index case. Safety always trumps the notification process.
- Fear of losing a partner due to a STI diagnosis (blame/guilt): discuss the asymptomatic nature of STIs and the benefits of asymptomatic partner(s) knowing that they may be infected.
- Feared legal procedures: cases need to be advised that their identity is protected at all times, and unless their records are subpoenaed, no information can be released.
- Fear of re-victimization on the part of sex crime victims: health care provider/public health referral may be the best option for notification of partners in these cases.
- Anonymous partnering is a significant barrier to partner notification: wherever possible, encourage patient referral.

Note:
Actual or suspected child sexual abuse must be reported to your local child protection agency. The *Child Protection Act* supersedes all other acts and requires health professionals to release the names of any named contacts of a minor to the Children's Aid Society for further investigation.

Novel partner-notification practices

With changing trends in STI rates and transmission, research is being conducted to look at the feasibility of alternative methods of partner notification. One such method is the use of expedited patient-initiated treatment of sex partners. The index case is given medication, together with safety information and contraindications, to give to partners for presumptive treatment without assessment to reduce gonorrhea or chlamydia reinfections and to increase the proportion of partners treated. Although still controversial, this method may be beneficial in high-risk and hard-to-reach populations.[11,12]

Practice points to maximize partner notification

- Request a notification form for STIs from the local public health unit or call the communicable disease reporting line for assistance.
- Develop a notification plan, including which partners will be notified by whom.
- See Table 5 for recommendations on partners to notify and the recommended trace back period for reportable and non-reportable STIs.

Table 5. Partner notification reference chart

Infection/syndrome	Reportable	Trace-back period	Who to notify/ evaluate	Special considerations
Chlamydia (LGV and non-LGV serovars)	Yes	60 days	SP/NB	• If no sexual partner(s) in the last 60 days, trace back to last sexual partner • Partner notification is not required in most provinces and territories as a public health measure but is highly recommended for NGU, MPC, PID and epididymitis
Gonorrhea	Yes	60 days	SP/NB	
Chancroid	Yes	14 days	SP	
Non-gonococcal urethritis	No	60 days	SP	
Mucopurulent cervicitis	No	60 days	SP	
Pelvic inflammatory disease	No	60 days	SP	
Epididymitis	No	60 days	SP	
Primary syphilis	Yes	3 months	SP/NB	
Secondary syphilis	Yes	6 months	SP/NB	
Early latent syphilis	Yes	1 year	SP/NB	
Late latent syphilis/ stage undetermined	Yes	Variable	SP/NB/ CMC	
Genital herpes	In some jurisdictions	Current/ future	SP/NB	• Partner notification is not required as a public health measure but is highly recommended

Table 5. Partner notification reference chart (continued)

Infection/syndrome	Reportable	Trace-back period	Who to notify/ evaluate	Special considerations
Trichomoniasis	In some jurisdictions	Current	SP	• No need to test partners; treat as for index case
Human papillomavirus	No	Current/ future	SP	• Partner notification is not required as a public health measure. Patients should be encouraged to notify their sexual partners, but there is no proof that this will lower the risk to the partner
Acute hepatitis B	Yes	Variable	SP/NSP/ HC/ NB/CMC	• All unvaccinated/ non-immune contacts should be notified. May benefit from PEP[13] • Newborns must receive HBIG and vaccine postnatally[13]
Chronic hepatitis B	Yes	Variable	SP/NSP/ HC/ NB/CMC	• All unvaccinated/ non-immune contacts should be notified. May benefit from PEP[13] • Newborns must receive HBIG and vaccine postnatally[13]

Table 5. Partner notification reference chart (continued)

Infection/syndrome	Reportable	Trace-back period	Who to notify/ evaluate	Special considerations
HIV/AIDS	Yes	Variable	SP/NSP/ NB/CMC	• Start with recent sexual and needle-sharing partners; outer limit is onset of risk behaviour or to last known negative test • PEP may be considered by health care providers for individuals who have been or are highly suspected to have been in contact with HIV. PEP, if considered, should be initiated within 72 hours. Please consult with an expert in HIV.

CMC = children of maternal case
HBIG = hepatitis B immune globulin
HC = household contacts
LGV = lymphogranuloma venereum
MPC = mucopurulent cervicitis
NB = newborns of infected mothers
NGU = non-gonococcal urethritis
NSP = needle-sharing partners
PEP = post-exposure prophylaxis
PID = pelvic inflammatory disease
SP = sexual partners

10. Managing Co-morbidity and Associated Risks

Many STIs are transmitted in the context of other medical and social challenges. Recurrent exposure and infection are likely unless underlying issues are dealt with. Specific management for conditions such as drug addiction and mental health conditions must be integrated into the overall multidisciplinary health care plan.

When counselling and testing for STIs, it is important to include HIV pre-test counselling and offer testing. Being infected with an STI (including syphilis, genital herpes, chlamydia, gonorrhea and trichomoniasis) increases the risk of transmission and acquisition of HIV. HIV-infected individuals may be less responsive to STI treatment and require special monitoring post-treatment to ensure treatment effectiveness and to prevent long-term complications arising from inadequately treated STIs.

For individuals diagnosed with chronic viral hepatitis — either HBV or hepatitis C virus (HCV) — co-infection with HIV affects the choice of treatment, the response to treatment and individual patient outcomes. These patients should be referred to a specialist for treatment and management recommendations. Testing for viral hepatitis B and HIV in any chronically infected patient is required to ensure proper management of the infection. In addition, for those infected with HCV, ensuring vaccination against HAV and HBV is essential to prevent co-infection which can further assault the liver, complicate treatment options and compromise response to treatment and patient prognosis.[14]

If lymphogranuloma venereum (LGV) is suspected and linked to a current outbreak in Canada, it is also important to test for HCV, because there is a high rate of LGV-HCV co-infection.

11. Following up

Ideally, follow-up should be conducted by the same health care provider to ensure resolution of symptoms, follow-up testing as indicated and follow-through on partner notification to reduce the likelihood of reinfection. Where this is not possible, patients should be directed to the appropriate community resources, counselled on when to get follow-up (especially if tests were done) and advised of indicators of treatment failure. (See infection-specific chapters for follow-up recommendations.)

For individuals identified at ongoing risk for STIs, recommend screening for gonorrhea, chlamydia, syphilis and HIV at 3-month intervals and reinforce safer sexual practices.

RESOURCES

For a list of provincial and territorial STI contacts see *Appendix D* and for a list of current sexual health/STI/safer-sex resources to assist in counselling and assessing risk see *Appendix C*.

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LABORATORY DIAGNOSIS OF SEXUALLY TRANSMITTED INFECTIONS

A. COLLECTION AND TRANSPORTATION OF SPECIMENS[1]

General Principles

- Swabs, transport systems and types of tests used may vary depending on the agent sought and techniques used by the laboratory.
- Contact the laboratory to obtain further information, especially concerning transport requirements, turn-around time and interpretation of results. See *Appendix E* for a listing of local contact information.
- Laboratories may use a variety of commercial specimen-collection devices. Follow the instructions provided by the manufacturer.
- All specimen-collection and handling procedures should be performed while wearing appropriate protective clothing and following recommended universal precautions.
- Contamination from indigenous commensal flora should be avoided to ensure a representative sampling of organisms involved in the infectious process.
- Adequate volumes of each liquid specimen should be collected.
- Each specimen container should be labelled with the patient's name and identification number, the source of the specimen and the date and time of collection.
- All specimen containers should be leak-proof and transported within a sealable, leak-proof plastic bag that has a separate compartment for paperwork.
- Sexually transmitted pathogens are usually fastidious and fragile; cultures and techniques that detect viable organisms may give false-negative results unless storage and transport conditions are optimal.
- Storage recommendations need to be observed, and transport must be as rapid as possible for the recovery of infectious organisms, with excesses of temperature avoided.

Specimens

For most sexually transmitted infections (STIs), specimens will be collected by health care providers to be packaged and delivered to diagnostic laboratories. There is an effort to produce commercial point-of-care testing kits for in-office testing, but there are none that are approved and validated at this time. Self-collection of urine, vaginal and lesion swabs is currently being evaluated for home collection, but these strategies lack appropriate evaluation, especially for transportation conditions.

1. *Cervix*

- After inserting a speculum to view the cervix, remove overlying vaginal secretions and cervical exudate.
- Insert a sterile swab 1–2 cm into the endocervical canal, rotate 180˚ and withdraw for collection of columnar epithelial cells for diagnosis of *Chlamydia trachomatis* and *Neisseria gonorrhoeae*. The choice of swab should be based on the type of testing being done; consult with the laboratory providing the service.
- Obtain a specimen for *N gonorrhoeae* before taking a specimen for *C trachomatis.*
- If a culture is to be performed for *N gonorrhoeae,* directly inoculate the culture tube or plate, or place the swab in the transport medium. Alternatively, place the swab in a nucleic acid amplification transport tube.
- Exocervical samples are better for herpes simplex virus (HSV) and human papillomavirus (HPV).
- Vaginal swabs may be submitted for culture from women who are menstruating or have had a hysterectomy.

Notes:

- Cervical specimens should not be taken from prepubertal girls, since STIs in this age group involve the vagina, not the cervix. See *Sexual Abuse in Peripubertal and Prepubertal Children* chapter for more information.
- Obtaining several specimens from the cervix does not usually produce discomfort and may be required to perform various tests.

2. *Lesions (vesicles or ulcers)*

a) Vesicles

- Fluid can be obtained by lifting the top of the vesicle and swabbing the lesion.
- An alternative method is to clean the vesicle with a disinfectant and, after drying, piercing into the fluid with a syringe, collecting fluid, capping, sealing the plunger and transporting to the laboratory.

b) Ulcers

- Warn the patient that specimen collection may be painful.
- Swab the lesion bed for culture, polymerase chain reaction (PCR) or direct examination for HSV.
- For direct examination, obtain cellular material by firm swabbing or gentle scraping from the base of the lesion.
- For culture, use the swab and viral transport medium supplied with the collection kit.
- For the detection of *Treponema pallidum*, contact the laboratory to determine the availability of dark-field microscopy or direct fluorescent antibody (DFA) testing. Where available, collect a specimen as follows:
  - Remove scabs or overlying debris.
  - Cleanse the lesion with sterile saline without preservatives and 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, small-bore syringe or directly onto a slide for DFA testing.
- Seal the tube, cap the syringe or immobilize the plunger before transportation.
- Store at 4˚C before transportation and deliver to the laboratory within 24 hours.

• For *Haemophilus ducreyi*, a special medium is required for culture. Obtain a swab from the base of a lesion, avoiding pus, and place into a transport tube.

3. Pharynx

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

Notes:
• There are promising data on the performance of non-culture tests using pharyngeal specimens.
• Smears of pharyngeal swabs are of no value in detecting pharyngeal *N gonorrhoeae* and are not recommended.

4. Rectum

• For blind swabbing, insert 2–3 cm into the anal canal, press laterally to avoid fecal material and, in the case of *C trachomatis* or *N gonorrhoeae*, to obtain columnar epithelial cells.
• If there is visible fecal contamination, discard the swab and obtain another specimen.
• With unlubricated anoscopy using only tap water, fecal contamination can be avoided and specimens can be collected under direct visualization.

Notes:
• Specimens may be obtained blindly or through an anoscope. The latter is preferred for symptomatic patients.
• There are promising data needing confirmation on the use of rectal swabs for *N gonorrhoeae* and *C trachomatis* in nucleic acid amplification tests (NAATs), but at this time neither use is approved.

5. Urethra

- Warn the patient that specimen collection may be painful, that the next urination may be painful, and that increasing fluid intake may help to decrease urine concentration and therefore discomfort.
- 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 a thin, dry swab with a flexible wire shaft. Moistening the swab with water before insertion may help reduce discomfort.
- Introduce the swab slowly (3–4 cm in males; 1–2 cm in females), rotate slowly and withdraw gently.
- The swab can be used to prepare a smear by slowly unrolling the secretions onto a slide; then, directly inoculate the appropriate culture medium or place the swab in a transport medium.
- If a NAAT is used, follow the manufacturer's instructions.

Notes:

- "Milking" the penis three or four times from the base to the glans enhances the ability to detect otherwise inapparent urethral discharge.
- In prepubertal boys and girls, collection of an intraurethral specimen is not recommended; obtain first-void urine specimens for NAATs or a meatal specimen using a thin swab with a flexible wire shaft.

6. Urine (first-void)

- The patient should not have voided for at least 2 hours, but having done so does not preclude testing.
- Provide the patient with a leak-proof container.
- Ask the patient to collect *only* the first 10–20 mL of urine[2] into the container and to cap it tightly.

Note:

Most commercial NAATs for *C trachomatis* and *N gonorrhoeae* are approved for urine testing and are recommended for detecting these organisms in asymptomatic men or women, women without a cervix or those who wish to avoid pelvic examination. A first-void urine (FVU) may be collected at any time and may also be termed a first-catch urine (FCU).

7. Vagina

- Collect pooled vaginal secretions, if present.
- When no vaginal secretions are present, swab the vaginal wall in the posterior fornix to prepare a smear, or place the swab in a transport medium.
- Wet-mount and Gram-stain smears are useful in the diagnosis of microbial vulvovaginitis, candidiasis, bacterial vaginosis, trichomoniasis or desquamative inflammatory vaginitis.

- 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. See *Sexual Abuse in Peripubertal and Prepubertal Children* chapter for more information.
- In very young children, use very thin swabs.

Note:
In the past, vaginal specimens were not recommended for the diagnosis of STIs, except in the management of vulvovaginitis, bacterial vaginosis and child sexual abuse. More recent data show that NAATs for *C trachomatis*, *N gonorrhoeae* and *Trichomonas vaginalis* may identify as many or more infected women using vaginal swabs than cervical swabs, urethral swabs or urine.[3] Check with your laboratory to see if this is an option.

8. Warts and Other HPV Infections

- Scrape the exocervix for superficial epithelial cells.
- Cytobrushes, other collecting devices or swabs can be used to collect cells from the squamo-columnar junction of the cervix.
- Currently commercial and non-commercial assays with specific collection devices are available for HPV DNA detection. Consult with your laboratory.

Note:
Urine samples have not been shown to be as accurate as cervical samples for detecting high-risk HPV.[4]

B. LABORATORY TESTING METHODS

STIs may be diagnosed in the laboratory using (a) culture, (b) microscopy, (c) antigen detection, (d) nucleic acid detection, (e) serology and (f) surrogate markers. The sensitivity and specificity of these different approaches vary according to specimen type and organism assayed. The number of false positives or negatives will be influenced by the prevalence of infection in the population being sampled. NAATs are the most sensitive methods, and culture the most specific. Antigen detection, nucleic acid hybridization, culture and microscopy are less sensitive but may be effective for certain types of patients and specimen types. Since not all diagnostic laboratories perform the same tests, clinical conditions and specimen types should be discussed before collecting the specimen. In some situations, serology is very useful (e.g., syphilis), but in others (e.g., non-LGV *C trachomatis*) it is of no use. Surrogate markers such as leukocyte esterase strip tests, pH or amines point-of-care tests may provide useful screening for some conditions, but are generally insensitive and not very specific.[5,6]

C. LABORATORY DIAGNOSIS OF SPECIFIC INFECTIONS

1. *Chlamydia trachomatis*

- Results are highly dependent on the type of test available,[7] appropriate specimen collection,[8] storage, transport and laboratory expertise.
- Contact the laboratory for specific instructions before submitting specimens, and read and follow test-kit instructions regarding specimen collection, storage and transport.
- NAATs are the most sensitive and specific and should be used whenever possible for urine, urethral, and cervical specimens; blood and mucous can affect NAAT performance.[9]
- Non-invasive specimens such as urine can be used in NAATs, making testing more acceptable to patients.[10]
- Both *C trachomatis* and *N gonorrhoeae* can be detected from a single specimen in some NAATs.[11]
- Because successful treatment rates are high, a test of cure is not usually performed.
- Other assays, such as nucleic acid hybridization and antigen detection, may be used, but they are less sensitive and specific, and positives may need to be confirmed.[12]
- *C trachomatis* IgM serology is useful for diagnosing *C trachomatis* pneumonia in infants under 3 months of age.[13]
- Serology is not useful for the diagnosis of acute genital chlamydial infections (non-LGV only).
- Culture is the preferred method for medico-legal purposes, but NAATs may be suitable, provided that positive results are confirmed using a different set of primers, which may not be readily available in most labs.
- Strains of lymphogranuloma venereum (LGV) have emerged in Europe and North America, mainly in rectal samples (RS) of men who have sex with men (MSM). Existing NAATs are not cleared by the U.S. Food and Drug Administration or Health Canada for use on rectal or oropharyngeal samples, but will record positives that need to be confirmed as LGV by restriction fragment length polymorphism (RFLP) or sequencing techniques. Samples can also be cultured undiluted and at a dilution of 1:10 (to dilute fecal toxicity) using shell vials with and without centrifugation. LGV grows readily to high levels of elementary bodies without centrifugation, while non-LGV strains require centrifugation. As with NAATs, positive cultures need to be confirmed as LGV by RFLP or sequencing. A NAAT or culture can also be used on other samples in the diagnosis of LGV such as bubo aspirates; urine; or rectal, vaginal or urethral swabs. Emphasis should be placed on clinical samples for a definitive diagnosis; however, serology such as microimmunofluorescence (MIF) may be helpful in supporting the diagnosis. For more information on specimen collection and available tests, please contact your local laboratory (See *Lymphogranuloma Venereum* chapter for more information on specimen collection and testing by stage of infection).

2. *Neisseria gonorrhoeae*

- The presence of Gram-negative diplococci inside polymorphonuclear leukocytes (PMNs) is highly predictive for the direct microscopic examination of smears; their presence outside PMNs is not, and confirmation by culture is required.
- The sensitivity and specificity of the Gram stain depends on the type of specimen.[14] Urethral specimens from young adult males have a sensitivity and specificity of 95%; endocervical specimens from adult females have a sensitivity of 45–65% and a specificity of 90%.
- Culture for *N gonorrhoeae* is required for the determination of antimicrobial susceptibility in cases of sexual abuse/assault, as well as in cases of treatment failure.
- Successful culture of specimens requires proper collection and transportation of appropriate specimens or immediate inoculation of medium.[15] Consult with your laboratory.
- NAATs are approved for cervical and urethral swabs and urine; some NAATs are also approved for vaginal swabs.[11] Urine and vaginal swabs are convenient specimens for women without a cervix, and urine may be most convenient for those who may not readily submit to a pelvic examination.
- Urine is a preferred specimen for men if a NAAT is performed.
- A NAAT is not recommended as a test of cure.
- NAAT can be used to detect reinfection, after waiting for at least 2 weeks after completion of therapy.
- For medico-legal purposes, a positive result obtained from NAATs should be confirmed using a different set of primers.
- Serology is not available.

3. *Haemophilus ducreyi* (chancroid)

- Because *H ducreyi* is rare in Canada, consult with your laboratory.
- Culture is the current method of choice, using two media in a biplate.[16]
- Specimens of choice are a calcium alginate or cotton swab from the base of the ulcer or an aspirate if buboes are present.
- There are no useful serologic tests to diagnose *H ducreyi*. Gram stain with Gram-negative coccobacilli in a “school of fish” pattern may be useful.
- If a NAAT is available, a second ulcer swab should be collected into an appropriate transport medium.

4. Herpes simplex virus

- NAATs are being used increasingly for cerebrospinal fluid, vesicle fluid or ulcer swabs.[17] Consult with your laboratory.
- NAATs approach sensitivities and specificities of 100%, with rapid turn-around of results.
- Cultures are easy to perform and can yield positive results within 24 hours from primary or first-episode genital herpes.

- Other methods, such as antigen detection and Tzanck smear cytology, lack accuracy.
- For neonates, gently rub conjunctiva, insert separate swab into mouth (and gently rub around the lips), external ear canal, umbilicus, axillae and groin. Specimens should be collected 24–48 hours after birth.
- Type-specific antibody assays are commercially available and may be useful in some clinical situations (though availability in Canada is currently limited): (a) patients with apparent first-episode genital herpes with a negative culture or NAAT; (b) identification of a seropositive pregnant woman with no history of herpes; (c) counselling HSV serologically discordant couples.[18]

5. *Treponema pallidum* (syphilis)

- Consult with your laboratory on tests available.
- When lesions are present in primary, secondary or early congenital syphilis, clear serous fluid should be collected for dark-field microscopy, enabling observation of morphology and movement of the spirochetes (not reliable for oral or rectal lesions).[19]
- Other non-serological methods involve direct fluorescent antibody tests or NAATs. The latter are very sensitive and specific.[20]
- In cases where pregnant women are suspected of having syphilis, sections of placenta should be collected at birth and sent for DFA testing.
- Serological diagnosis involves initial screening of sera by non-treponemal tests such as the Venereal Disease Research Laboratory (VDRL), rapid plasma reagin (RPR), toluidine red unheated serum test (TRUST) or the reagin screening test (RST).
- Sera positive in non-treponemal tests are retested by treponemal assays such as the *Treponema pallidum* particle agglutination (TP-PA) test, fluorescent treponemal antibody absorption (FTA-ABS) test and microhemagglutination for *Treponema pallidum* (MHA-TP).[21] Several enzyme immunoassays (EIA) have been developed commercially to detect IgG or IgM to specific *T pallidum* antigens and are useful in HIV co-infected patients. See *Syphilis* chapter for information on cerebrospinal fliud examination.

6. Human Immunodeficiency Virus

- HIV diagnostic laboratories in Canada are instructed to use only tests approved by Health Canada.
- Sera are initially screened by EIA and may detect antibodies by 3 weeks after infection, but can take up to 6 months.[22]
- All positives are confirmed using a different EIA or Western blot.
- Qualitative PCR is used to detect small amounts of nucleic acid in babies born to HIV-infected mothers.
- Quantitative PCR (viral load testing) is used to monitor HIV-positive patients prior to and during antiretroviral therapy.[23]
- Genotyping is used to detect the development of drug resistance in selected patients, enabling physicians to choose appropriate antiretroviral drug combinations.[24]

7. Human papillomavirus

- Liquid-based cytology has increased the accuracy of Pap testing, and the HPV signal amplification hybrid capture assay (Digene) can be performed on the same or a separate cervical sample.[25]
- The presence of high-risk HPV in patients with atypical squamous cells of undetermined significance (ASCUS) may enable recommendation for immediate colposcopy.[26]
- Microscopy, culture and antigen detection have no proven utility for the diagnosis of HPV infections.
- NAATs and serology are only for epidemiological purposes at the present time.
- Consult with your laboratory concerning HPV testing, as few laboratories are currently providing this service in Canada.

8. Hepatitis B virus

- Patients acutely infected with HBV will have positive EIA results for hepatitis B surface antigen (HBsAg) and/or anti-hepatitis B core (anti-HBc) IgM tests performed on sera.
- Most patients (90%) develop immunity within 6 months of infection, lose their HBsAg and have it replaced by anti-HBc IgG and anti-hepatitis B surface antibodies (anti-HBs).[27]
- Patients chronically infected will demonstrate HBsAg persistence for 6 months or more.
- The presence of hepatitis B e antigen (HBeAg) in acutely or chronically infected individuals indicates greater infectivity for contacts and for babies born to positive mothers.[28] These antigens may eventually be replaced by antibodies (anti-HBe).
- Quantitative PCR assays to detect viral DNA are available to monitor response to treatment.[29,30]

9. Hepatitis A virus

- The presence of hepatitis A virus (HAV) IgM antibodies, which may be present for 3 months, is diagnostic of acute infection.[31]
- HAV IgG antibody testing can demonstrate immunity.

10. *Trichomonas vaginalis*

- The vaginal pH is >4.5, and the whiff test is usually negative (the withdrawn speculum does not have an abnormal odour).[32]
- Because of the low sensitivity of direct microscopy, culture may be used, where available, to isolate the parasite from urethral swabs, urine sediments, prostate fluid and vaginal specimens.[33]

11. *Candida albicans*

- The vaginal pH is normal (<4.5), and the whiff test is negative.[34]
- Wet-mount preparation with 10% KOH shows budding yeast and/or branching pseudohyphae.

12. Bacterial vaginosis

- The vaginal pH is >4.5, and the whiff test is positive.[35]
- Gram stain demonstrates a shift in vaginal flora, with a decrease in large Gram-positive rods (lactobacilli) and an increase in small Gram-variable coccobacilli and clue cells (vaginal epithelial cells covered with numerous coccobacilli).

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MANAGEMENT AND TREATMENT OF SPECIFIC SYNDROMES

SYNDROMIC MANAGEMENT OF SEXUALLY TRANSMITTED INFECTIONS

Diagnosis of a syndrome according to standard criteria predicts the likelihood that a specific pathogen or pathogens is/are present and thus facilitates initiation of appropriate empiric treatment at the first visit rather than deferring treatment until there is microbiological confirmation. In the context of variable access to laboratory testing and variable rates of follow-up, the syndromic approach takes on greater relevance in controlling transmission and negative sequelae. See Table 1, below, for the management of sexually transmitted infection (STI) syndromes.

While the syndromic approach is an important tool in the control of STIs and their sequelae, management by syndrome alone is inadequate because infections with important pathogens such as *Chlamydia trachomatis* and *Neisseria gonorrhoeae* may be present without any symptoms or findings. Although an infection may be suspected because of disease in a partner or the presence of another STI, the infection may be diagnosed only by using a specific laboratory test. Thus, in managing STIs, diagnosis by syndrome and laboratory diagnosis by testing for specific organisms are both important and complementary. Consult the chapters of the *Management and Treatment of Specific Infections* section for details on the diagnosis, treatment and management of specific infections.

Table 1. Syndromic approach to the management of sexually transmitted infections

(Patients may present with more than one STI; this table provides an outline of investigations and relevant chapters where more in-depth information can be found. In many cases, screening for other STIs should be carried out.)

Syndrome	Signs and symptoms	Etiology	Specimens and testing	Microscopy results and clinical findings	Next steps/ special considerations
Asymptomatic and at risk for STIs (see *Primary Care and Sexually Transmitted Infections* chapter).	None	*Neisseria gonorrhoeae* *Chlamydia trachomatis* *Treponema pallidum* Herpes simplex virus type 1 or 2 Human papilloma-virus HIV Viral hepatitis	First-catch urine Urethral swab Cervical swab for: *C trachomatis* *N gonorrhoeae*		If testing is done by methods other than NAAT and sexual contact occurred <1 week prior to testing, tests may be falsely negative
			Serology for: Syphilis HIV		Typical window period for syphilis is 6 weeks Typical window period for HIV is 3 months
			Hepatitis A (particularly with oral-anal contact) Hepatitis B (if no history of vaccine) Hepatitis C (particularly in IDU)		If non-immune for hepatitis A and B, consider immunization For chronic viral hepatitis, consult a colleague experienced in this area
			Pap testing if indicated (as per local or provincial/ territorial recommendations)	An abnormal Pap test result (e.g., ASCUS, LSILs) is not diagnostic of HPV	Follow up as per recommendations of province/territory

ASCUS = atypical squamous cells of undetermined significance
bHCG = beta human chorionic gonadotropin
DFA = direct fluorescent antibody
EIA = enzyme immunoassay
FTA-ABS = fluorescent treponemal antibody absorbed
HPF = high-power field
HPV = human papillomavirus
HSV = herpes simplex virus
IDU = injection drug use
LGV = lymphogranuloma venereum
LSIL = low-grade squamous intraepithelial lesions
MHA-TP = microhemagglutination-*Treponema pallidum*
MSM = men who have sex with men
NAAT = nucleic acid amplification test
PMN = polymorphonuclear leukocytes
RPR = rapid plasma reagin
RUQ = right upper quadrant
STI = sexually transmitted infection
VDRL = venereal disease research laboratory

Table 1. Syndromic approach to the management of sexually transmitted infections (continued)

Syndrome	Signs and symptoms	Etiology	Specimens and testing	Microscopy results and clinical findings	Next steps/ special considerations
Urethritis	Urethral discharge Burning on urination Irritation in the distal urethra or meatus Meatal erythema	Possible causes: *N gonorrhoeae* *C trachomatis* *Trichomonas vaginalis* Herpes simplex virus *Mycoplasma genitalium* *Ureaplasma urealyticum*	Urethral swab for Gram stain and culture for gonorrhea (NAAT may also be used where available) and First-catch urine for *C trachomatis* (NAAT)	Presence of ≥5 PMNs per HPF and absence of Gram-negative diplococci (likely Non-Gonococcal Urethritis)	See urethritis treatment flow chart in the *Urethritis* chapter for treatment and management recommendations
				Presence of ≥5 PMNs per HPF AND Gram-negative intracellular or extracellular diplococci OR Gram-negative intracellular diplococci alone.	See *Gonococcal Infections* chapter for treatment recommendations
				Presence of Gram-negative extracellular diplococci alone requires further testing.	See Table 5 in *Gonococcal Infections* chapter
				Where microscopy results are not immediately available	Treat as per recommendations for chlamydia and gonorrhea. If patient treated for gonorrhea and chlamydia and symptoms persist consider other causes or resistance in the case of gonorrhea (see *Gonococcal Infections* chapter)

Table 1. Syndromic approach to the management of sexually transmitted infections (continued)

Syndrome	Signs and symptoms	Etiology	Specimens and testing	Microscopy results and clinical findings	Next steps/ special considerations
Cervicitis (females)	Mucopurulent cervical discharge Cervical friability Vaginal discharge Strawberry cervix	Possible causes: *N gonorrhoeae* *C trachomatis* *Trichomonas vaginalis* HSV	Cervical swab for Gram stain, *N gonorrhoeae* culture and *C trachomatis* (NAAT or culture)	On Gram stain, presence of ≥20 PMNs per HPF with mucopurulent discharge and/or cervical friability	See *Chlamydial Infections* chapter for treatment recommendations unless gonorrhea is suspected; then, see *Gonococcal Infections* chapter; although not a sensitive test, Gram stain may be helpful in diagnosing mucopurulent cervicitis and gonorrhea in symptomatic females
			Swab of cervical lesions for HSV		If HSV is suspected or detected see *Genital Herpes Simplex Virus Infections* chapter for treatment recommendations
			Vaginal swab for wet mount	Trichomonads	See *Vaginal Discharge* chapter for treatment recommendations
				Where microscopy results are not immediately available	Treat as per recommendations for chlamydia and gonorrhea

Table 1. Syndromic approach to the management of sexually transmitted infections (continued)

Syndrome	Signs and symptoms	Etiology	Specimens and testing	Microscopy results and clinical findings	Next steps/ special considerations
Genital ulcer disease	Ulcers (erosive or pustular) Vesicles Papules Inguinal lymphadenopathy	Most common: Herpes simplex virus 1 or 2 *T pallidum* *C trachomatis* (LGV serovars L1, L2 or L3) *Haemophilus ducreyi* *Klebsiella granulomatis*	Routine: Swab of lesion for culture (herpes)	*Herpes* Painful lesions Grouped vesicles Erythematous base Fever and malaise	Consider genital herpes and empiric treatment for either primary or suspected recurrent infection (see *Genital Herpes Simplex Virus Infections* chapter for treatment recommendations)
			Swab of serous fluid from lesion for darkfield microscopy or DFA for syphilis. Check with laboratory re: availability and Serology for syphilis to include both non-treponemal (RPR/VDRL/EIA) and treponemal-specific tests (MHA-TP and FTA-ABS)	*Syphilis* Non-painful lesions Indurated with serous exudate Single lesion in over 70% of cases	Consider primary syphilis. Empiric treatment should be considered if follow-up is uncertain
			Non-routine: If indicated through patient history Swab of lesion for non-LGV *C trachomatis* for culture (MSM, travel) or consider serology for *C trachomatis*	If initial *C trachomatis* testing is positive, serovar-specific testing is required to confirm a diagnosis of LGV. See *Lymphogranuloma Venereum* chapter	If LGV is suspected, treat empirically according to the recommendations in *Lymphogranuloma Venereum* chapter
			Consider testing for chancroid and granuloma inguinale (link to travel); consult laboratory for availability		See *Genital Ulcer Disease* chapter for treatment recommendations

Table 1. Syndromic approach to the management of sexually transmitted infections (continued)

Syndrome	Signs and symptoms	Etiology	Specimens and testing	Microscopy results and clinical findings	Next steps/ special considerations
Epididymitis	Unilateral testicular pain/ swelling May have erythema and edema of the overlying skin With or without urethral discharge Fever	Most common (varies with age): *C trachomatis* *N gonorrhoeae* Coliforms Pseudomonads	First-catch urine for NAAT (*C trachomatis*); may be used for gonorrhea where available Midstream urine for culture and sensitivity (enteric organisms, coliforms) Urethral swab for Gram stain and gonorrhea culture	Palpable swelling of the epididymis	For empiric treatment recommendations, see *Epididymitis* chapter
				Gram stain: presence of ≥5 PMNs per HPF and/or Gram-negative intracellular diplococci	See *Epididymitis* chapter for treatment recommendations for epididymitis likely caused by chlamydial or gonococcal infections
				Gram stain: absence of PMNs and Gram-negative intracellular diplococci	See *Epididymitis* chapter for treatment of organisms other than chlamydia or gonorrhea
			Doppler ultrasound if testicular torsion is suspected		If symptom onset is rapid, testicular torsion needs to be considered, as this is a surgical emergency

Table 1. Syndromic approach to the management of sexually transmitted infections (continued)

Syndrome	Signs and symptoms	Etiology	Specimens and testing	Microscopy results and clinical findings	Next steps/ special considerations
Pelvic inflammatory disease	Lower abdominal pain Deep dyspareunia Abnormal bleeding Fever	*C trachomatis* *N gonorrhoeae* Genital-tract mycoplasms Other aerobic or anaerobic bacterial species	Cervical swab for Gram stain and gonorrhea culture Cervical swab for *C trachomatis* (NAAT or culture) Vaginal swab for culture, Gram stain, PH test, whiff test and wet mount Urine ± serum bHCG to rule out ectopic pregnancy Other serological tests: ESR C-reactive protein	On bimanual exam: Cervical motion tenderness Adenexal tenderness Adenexal masses Other findings: RUQ pain Cervicitis Fever	For empiric treatment recommendations and definitive diagnostic criteria, see *Pelvic Inflammatory Disease* chapter Ensure treatment is appropriate to results of clinical findings and Gram stain, wet mount, PH test and whiff test, see *Pelvic Inflammatory Disease* chapter

Table 1. Syndromic approach to the management of sexually transmitted infections (continued)

Syndrome	Signs and symptoms	Etiology	Specimens and testing	Microscopy results and clinical findings	Next steps/ special considerations
Vaginal discharge and low risk for STIs (for risk factors see *Primary Care and Sexually Transmitted Infections* chapter)	Vaginal discharge Vaginal odour Vaginal/ vulvar pruritis Vaginal/ vulvar erythema Dysuria	Most common: Bacterial vaginosis Vulvovaginal candidiasis Trichomo-niasis	Vaginal swab for pH test and Gram stain Vaginal swab for wet mount/amine odour	On examination: Watery white/ grey copious discharge On microscopy: Predominance of Gram-negative curved bacilli and coccobacilli and presence of clue cells, vaginal pH > 4.5, whiff test positive	Treat for bacterial vaginosis. See *Vaginal Discharge* chapter for recommendations
				On examination: Clumpy white, curdy discharge On microscopy: Budding yeast, pseudohyphea and, if able to test, vaginal pH <4.5, whiff test negative	Treat for candidiasis. See *Vaginal Discharge* chapter for recommendations
				On examination: Frothy white or yellow discharge On microscopy: Motile flagellated protozoa (tricho-monads) and, if able to test, vaginal pH >4.5, whiff test negative	Treat for trichomo-niasis.See *Vaginal Discharge* chapter for recommendations Treat sexual partner(s)
					For low-risk individu-als where no testing/ microscopy is available or follow-up is not assured, treat accord-ing to clinical picture

Table 1. Syndromic approach to the management of sexually transmitted infections (continued)

Syndrome	Signs and symptoms	Etiology	Specimens and testing	Microscopy results and clinical findings	Next steps/ special considerations
Vaginal discharge and high risk for STIs (for risk factors see *Primary Care and Sexually Transmitted Infections* chapter)	Vaginal discharge Vaginal odour Vaginal/ vulvar pruritis Vaginal/ vulvar erythema Dysuria	Most common: Bacterial vaginosis Vulvovaginal candidiasis Trichomo-niasis	As above, plus cervical swab for gonorrhea culture Cervical swab for *C trachomatis* (NAAT or culture) For women without a cervix, see *Gono-coccal Infections* and *Chlamydial Infections* chapters for specimen collection recommendations	As above	As above For high-risk individuals where no testing/microscopy is available or follow-up is not assured, treat for bacterial vaginosis, Vulvovaginal candidiasis, trichomonas, chlamydia and gonorrhea

Table 1. Syndromic approach to the management of sexually transmitted infections (continued)

Syndrome	Signs and symptoms	Etiology	Specimens and testing	Microscopy results and clinical findings	Next steps/ special considerations
Intestinal syndromes: Proctitis Proctocolitis Enteritis	Varies according to specific syndrome: Mucopurulent rectal discharge Anorectal pain Constipation Bloody stools Diarrhea Nausea Abdominal pain/cramps Bloating Fever	Varies according to specific syndrome: *N gonorrhoeae* *C trachomatis* (LGV and non-LGV serovars) *T pallidum* Herpes simplex virus *Entamoeba histolytica* *Campylobacter* spp. *Salmonella* spp. *Shigella* spp. *Giardia lamblia*	Specimen collection should be adapted to the clinical presentation and patient history By anoscopic exam routinely obtain: Rectal swab for gonorrhea culture and chlamydia culture or NAAT (NAAT is not approved for rectal specimens at this time) If chlamydia-positive: send for LGV serovar testing; see *Lymphogranuloma Venereum* chapter If lesions are present: Syphilis serology Swab for herpes culture Stool for culture and ova and parasites	On examination: Mucopurulent and/or bloody rectal discharge	Treat for gonorrhea and chlamydia as per the recommendations in the *Sexually Transmitted Intestinal and Enteric Infections* chapter If LGV is suspected, treat empirically as per the *Lymphogranuloma Venereum* chapter
				On examination: Anal lesion	If syphilis is suspected and follow-up is not assured, treat empirically as per the *Syphilis* chapter If HSV is suspected, see *Genital Herpes Simplex Virus Infections* chapter to determine whether treatment is warranted
				History and symptoms suggestive of enteric pathogens	See *Sexually Transmitted Intestinal and Enteric Infections* chapter for possible causative organisms

Table 1. Syndromic approach to the management of sexually transmitted infections (continued)

Syndrome	Signs and symptoms	Etiology	Specimens and testing	Microscopy results and clinical findings	Next steps/ special considerations
Papular genital lesions	Growths in anal/genital region or on mucous membranes Multiple and/or polymorphic Asymmetrical Non-inflammatory May be accompanied by: Pruritis Bleeding/ obstruction, depending on location (i.e., urethra or vagina)	Human papillomavirus *Molluscum contagiosum* Skin tags Carcinoma Normal variations	Visual examination and anal and/or vaginal exam as required by history/findings Pap testing if indicated as per local or provincial/ territorial recommendations	Multiple or single cauliflower-like lesions (condyloma accuminata) Externally	Treat as per the recommendations in the *Genital Human Papillomavirus Infections* chapter
				Internally anal/vaginal or cervical	Refer to a specialist for consultation and treatment
				Flat, asymmetric lesions (condyloma lata)	Sign of secondary syphilis; see *Syphilis* chapter for treatment recommendations
				Round, flat, umbilicated papule (*Molluscum contagiosum*)	May heal spontaneously with or without treatment. Can be treated with liquid nitrogen
				Symmetrical papular genital lesions Coronal sulcus (pearly penile papules) Vestibular papillae (micropapillomatis labialis)	Normal findings; no need for treatment
				Chronic lesion, ulceration or irregular pigmentation (may be indicative of cancerous lesion)	Refer to a specialist for consultation and treatment

EPIDIDYMITIS

Definition

- Epididymitis can be defined as inflammation of the epididymis manifested by a relative 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.
- The term epididymo-orchitis is primarily used when inflammation occurs in both the epididymis and the testes together.[1]

Etiology[2]

- Before tests for detecting *Chlamydia trachomatis* were available, the cause of most cases of acute epididymitis was unknown. Subsequent studies have shown that epididymitis is primarily an infective condition.
- In men less than 35 years of age, sexually transmitted infection (STI) accounts for ⅔ of epididymitis (47% *Chlamydia trachomatis* and 20% *Neisseria gonorrhoeae*). In men over 35 years of age, 75% of cases can be attributed to coliforms or pseudomonas. Isolation of *Chlamydia trachomatis* or *Neisseria gonorrhoeae* is unusual.
- The determination of the possible etiologic agent should always be based on the evaluation of the risk of the individual having acquired a sexually transmitted agent.
- In children and young adults, it is important to consider non-infectious causes of scrotal swelling, such as trauma, torsion of the testicle and tumour. Torsion of the testicle, which has a high risk of testicular infarction if treatment is delayed, is a surgical emergency and should be suspected when the onset of scrotal pain is sudden.

Table 1. Microbial etiology and predisposing factors in acute epididymitis[3]

Age group	Etiology and predisposing factors
Prepubertal children	• Usual etiology: coliforms, *P aeruginosa* • Unusual etiology: hematogenous spread from primary infected site • Predisposing factors: underlying genitourinary pathology
Men under 35	• Usual etiology: *C trachomatis, N gonorrhoeae* • Unusual etiology: coliforms or *P aeruginosa, Mycobacterium tuberculosis* • Predisposing factors: sexually transmitted urethritis
Men over 35	• Usual etiology: coliforms or *P aeruginosa* • Unusual etiology: *N gonorrhoeae, C trachomatis, Mycobacterium tuberculosis* • Predisposing factors: underlying structural pathology or chronic bacterial prostatitis

Epidemiology

- Accurate data on acute epididymitis are lacking. Therefore, the incidence of this condition in the general population is unknown. In a large retrospective study, 49% of cases were in those 20–29 years old, with 70% of cases in those aged 20–39 years.[4]
- In adolescents with epididymitis, sexual behaviour should be ascertained as the cause may be a sexually transmitted infection.
- Coliforms may be a frequent cause of acute epididymitis in sexually active men in all age groups who practice unprotected insertive anal intercourse.

Prevention

- At the time of diagnosis of a suspected sexually acquired epididymitis, safer sex practices should be reviewed.
- Appropriate information should be provided concerning the level of protection provided by barrier methods such as male condoms.
- Patient and contact(s) should abstain from unprotected intercourse until treatment of both patient and contact(s) is complete, or for 7 days in the case of single dose treatment of partners.

Manifestations[5,6]

- Patients with acute epididymitis usually present with unilateral testicular pain and tenderness.
- The onset of pain is generally gradual.
- In sexually transmitted epididymitis, symptoms of urethritis or a urethral discharge may be present. However, urethritis is often asymptomatic.
- ***Testicular torsion should be considered in all cases, as it is a surgical emergency***. Torsion is more likely if onset of pain is sudden and the pain is severe. Torsion is more frequent in men less than 20 years of age, but can occur at any age.

Signs of acute epididymitis may include any of the following:

- Tenderness to palpation on the affected side.
- Palpable swelling of the epididymis.
- Urethral discharge.
- Hydrocele.
- Erythema and/or edema of the scrotum on the affected side.
- Fever.

Diagnosis5

- If diagnosis is questionable, a specialist should be consulted immediately because in the case of testicular torsion, testicular viability may be compromised.
- Evaluation for epididymitis should include the following:
  - Urethral swab for Gram stain.
  - Collection of specimens for identification of *N gonorrhoeae* and *C trachomatis* (intraurethral exudate or urine according to available laboratory techniques).
  - Microscopy and culture of mid-stream urine.
- If it can be arranged without delay, a Doppler ultrasound may be useful to help differentiate epididymitis from testicular torsion.
- There is no role for epididymal aspiration in routine clinical practice. It may be useful in recurrent infection that fails to respond to therapy or in patients with suspected abscess formation.

Management and Treatment

See Table 2, below, for published treatment recommendations for acute Epididymitis.

***Table 2. Recommended regimens for the treatment of acute epididymitis*[5–10]**

Epididymitis most likely caused by chlamydial or gonococcal infections	**Doxycycline** 100 mg PO bid for 10–14 days *[A-I]* PLUS **Ceftriaxone** 250 mg IM in a single dose *[A-I]* OR **Ciprofloxacin** 500 mg PO in a single dose *[A-I]* (unless not recommended due to quinolone resistance*)
Epididymitis most likely caused by enteric organisms	**Ofloxacin** 200 mg PO bid for 14 days *[A-I]*

* Quinolones are not recommended if the case or contact are from, or are epidemiologically linked to any area with rates of quinolone-resistant *N gonorrhoeae* > 3 – 5%
- Asia
- Pacific Islands (including Hawaii)
- India
- Israel
- Australia
- United Kingdom
- Regions of the United States (check with the U.S. Centers for Disease Control and Prevention for rates of quinolone resistance by geographic area)
- Men who have sex with men with contact or epidemiologically linked to the United States
- Areas in Canada experiencing high rates of quinolone resistance; current numbers provided by the National Microbiology Laboratory place Quebec, Ontario, Alberta and British Columbia above the 3% threshold for quinolone resistance. Please check with your local public health officials to learn about quinolone resistance in your area. In Alberta all ciprofloxacin resistant cases in 2004–05 were in MSM or linked to travel outside of Alberta, therefore ciprofloxacin remains a recommended agent for the treatment of gonorrhea in Alberta except in these situations (source: Alberta Health and Wellness STD Services). For data on national quinolone resistance in Canada, please visit the Public Health Agency of Canada website (www.phac-aspc.gc.ca). For more information see *Gonococcal Infections* chapter.

Consideration for Other STIs

- Depending on sexual history, gonococcal and/or chlamydial infections should be considered as the etiology of acute epididymitis in all sexually active men with acute epididymitis, especially those under the age of 35.
- Consideration for testing for other STIs, including HIV, should be made according to the patient's sexual history and the presence of risk factors for specific infections.

Reporting and Partner Notification

- Patients with conditions that are reportable 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, and they are presumed to have sexually acquired epididymitis, all sexual partners within 60 days prior to symptom onset or date of diagnosis where asymptomatic should be clinically evaluated and treated with an appropriate regimen.

Follow-up

- Follow-up should be arranged to evaluate the response to treatment. If a recommended regimen has been given and correctly taken, symptoms and signs have disappeared and there is no re-exposure to an untreated sexual partner, then repeat diagnostic testing for *N gonorrhoeae* and *C trachomatis* is not routinely recommended.

Special Considerations

- Rare causes of clinical sterile acute epididymitis include amiodarone therapy, vasculitis, polyarteritis nodosa, Behçet disease and Henoch-Schönlein purpura and a proportion of cases remains idiopathic.
- A condition described as "chronic epididymitis" has been recently characterized in the literature.[11] Although defined by the author as the presence of "symptoms of discomfort and/or pain at least 3 months in duration in the scrotum, testicle or epididymis localized to one or each epididymis on clinical examination," there is no clear natural history of the condition. The authors conclude that further studies on the epidemiology, etiology and pathogenesis of this condition are needed.

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GENITAL ULCER DISEASE (GUD)

Etiology

Definition

- Ulcerative, erosive, pustular or vesicular genital lesion(s), with or without regional lymphadenopathy, caused by a number of sexually transmitted infections (STIs) and non-STI-related conditions.

STIs

- For most young, sexually active patients with genital ulcer disease (GUD), etiology is related to an STI. Most often it is due to herpes simplex virus type 1 or 2 (HSV-1 or HSV-2), causing genital herpes.[1] More than one etiology may be found if a careful evaluation is conducted.[2] Other STI causes of GUD are as follows:
  - *Treponema pallidum* spp., causing primary syphilis.
  - *Haemophilus ducreyi*, causing chancroid.
  - *Chlamydia trachomatis* serotype L1, 2 or 3, causing lymphogranuloma venereum (LGV).
  - *Klebsiella granulomatis*, causing granuloma inguinale (donovanosis).

Non-STI-related infections or conditions

- Non-STI-related infections or conditions causing GUD may also be seen (see Differential diagnosis, below).
- Even after a complete diagnostic evaluation, at least 25% of patients with GUD have no laboratory-confirmed diagnosis.[3]

Epidemiology

- The cause of GUD can be related to a number of factors, such as geographical area where sexual intercourse has taken place; socioeconomic factors; gender of sexual partners; number of partners; HIV status and local prevalence; drug use; commercial sex; and circumcision.[4]
- GUD constitutes at most 5% of visits to physicians for a possible STI.[5]
- About 70–80% of genital ulcers are due to HSV-1 or HSV-2.
- Genital ulcers in sexually active persons can be associated with two or more pathogens.[2]
- Women and men with GUD are at increased risk of acquiring and transmitting HIV.[6]
- Syphilis and LGV are rare causes of GUD in Canada, but should be considered in persons having sex while travelling to endemic areas or among men who have sex with men (MSM). When identified, the potential for a localized discrete outbreak exists. Rarely, granuloma inguinale and chancroid should also be considered.

- Syphilis incidence is increasing in Canada, with regional outbreaks of infectious syphilis occurring in recent years, including Vancouver, the Yukon, Calgary, Edmonton, Toronto, Ottawa, Montreal and Halifax.[7–9]
- Chancroid has been sporadically associated with focal urban epidemics in North America, particularly among cocaine users. Sex workers are the usual reservoir.
- Rectal LGV outbreaks are now occurring among MSM in Europe, with recent reports of cases in North America. Co-infection with HIV and hepatitis C virus are seen at a high rate,[10–11] including in Canada.[12]
- HIV infection increases the transmission of STI genital ulcers, and the reverse is also true.[13]

Risk factors

- The following are risk factors for STI-related GUD:[14]
  - Sexual contact with:
    - MSM.
    - A person with GUD.
    - A new partner.
    - A partner who is from or has travelled to an endemic area.
    - Sex workers and their clients.
    - An anonymous sexual contact (e.g., from the Internet, bathhouse, rave/circuit party).
    - A partner or index case who is HIV-positive.
  - Travel to endemic areas.
  - Living in region(s) in Canada experiencing outbreaks (e.g., syphilis).
  - Previous genital lesions or STI.
  - Drug use by self and/or partner.

Prevention

- Sexual activity of any mucosal type — oral, anal or genital — can be associated with sexually transmitted ulcers. Patients presenting with concerns about STIs and/or birth control should be given information on the efficacy of barrier methods in preventing STI/HIV transmission and provided safer-sex counselling (see *Primary Care and Sexually Transmitted Infections* chapter).
- Identify barriers to prevention practices and the means to overcome them (see *Primary Care and Sexually Transmitted Infections* chapter).
- In the case of bacterial GUD caused by an STI, patients and contacts should abstain from unprotected intercourse until treatment of both partners is complete. For genital herpes, see *Genital Herpes Simplex Virus Infections* chapter.

Manifestations

- Diagnosis is often inadequate when based solely on history and physical examination, because of the lack of sensitivity and specificity of lesion(s), even in so-called "classic" cases.[3]
- Concurrent infection with HIV can change the clinical features of genital ulcers; the therapeutic regimen may also be different.

Table 1. Manifestations

STI	Site	Appearance	Other signs/ symptoms
Herpes simplex virus[15]	• For both sexes, anywhere in the "boxer short" area • Men: glans, prepuce, penile shaft, anus, rectum (for MSM) • Women: cervix, vulva, vagina, perineum, legs and buttocks	• Grouped vesicles evolving toward superficial circular ulcers on an erythematous base • Smooth margin and base • Enlarged, nonfluctuant and tender inguinal lymph nodes most common in primary infection	• Ulcers usually painful and/or pruritic • Genital pain • Constitutional symptoms, such as fever, malaise and pharyngitis, are common with primary infection
Primary syphilis (see *Syphilis* chapter)	• At site of inoculation, although most individuals with syphilis fail to notice primary chancre[16]	• Papule evolving to a painless chancre • Indurated with serous exudates • Single ulcer in 70% of cases • Smooth margin and base	• Firm, enlarged, non-fluctuant, non-tender lymphadeno-pathy is common
Chancroid	• At site of inoculation	• Single or multiple necrotizing and painful ulcers • Two or more in 50% of cases	• Often painful swelling and suppuration of regional lymph nodes, with erythema and edema of overlying skin

Table 1. Manifestations (continued)

STI	Site	Appearance	Other signs/ symptoms
Lymphogranuloma venereum[17]	• At site of inoculation	• Self-limited single painless papule, which may ulcerate, followed some weeks later by tender inguinal and/or femoral lymphadenopathy, mostly unilateral, and/or proctocolitis. Recent outbreaks in MSM have been characterized primarily by proctocolitis • If not treated, fibrosis can lead to fistulas and strictures and/or obstruction of the lymphatic drainage, causing elephantiasis	• Signs/ symptoms of urethritis
Granuloma inguinale	• At site of inoculation	• Single or multiple progressive ulcerative lesions • Highly vascular (beefy red appearance) • Bleeds easily on contact • Two or more in 50% of cases • Hypertrophic, necrotic and sclerotic variants • Relapse can occur 6–18 months after apparently effective therapy	• Painless

MSM = men who have sex with men

Diagnosis

Table 2. Diagnostic features of STI-related GUD

Disease	% of STI-related GUD	Incubation period
Herpes (recurrent genital herpes more frequent than primary genital herpes)	95%	2–7 days for primary genital herpes
Primary syphilis	>1%	3–90 days
Chancroid	<1%	5–14 days
Lymphogranuloma venereum	<1%	3–30 days
Granuloma inguinale	<1%	1–180 days

GUD = genital ulcer disease
STI = sexually transmitted infection

Differential diagnosis

Table 3. Infectious, non-STI-related causes of genital ulcers[18]

Fungal	Viral	Bacterial
• Candida • Deep fungi (rare)	• Cytomegalovirus (rare) • Varicella or herpes zoster virus (rare) • Epstein-Barr virus (rare)	• *Staphylococcus* spp. • *Streptococcus* spp. • *Salmonella* spp. • *Pseudomonas* spp. • Mycobacteria • Parasite (e.g., scabies)

Table 4. Non-infectious skin and mucosal conditions and diseases[19]

Bullous dermatoses	Non-bullous dermatoses	Malignancy
• Non-autoimmune – Contact dermatitis – Erythema multiforme (almost always HSV-related) – Toxic epidermolysis • Auto-immune – Pemphigus – Cicatricial pemphigoid	• Non-specific vulvitis/balanitis • Aphthae or aphthous ulcers, aphthosis • Lichen planus, erosive lichen planus • Lichen sclerosus • Behçet disease • Pyoderma gangrenosum • Fixed drug eruption • Lupus erythematosus • Crohn's disease • Vasculitis	• Squamous-cell carcinoma • Vulvar intraepithelial neoplasia • Less common: – Extramammary Paget's disease – Basal-cell carcinoma – Lymphoma/leukemia – Histiocytosis X

HSV = herpes simplex virus

- Other causes of ulcerative lesions of the skin and mucosa:
  - Trauma (less common)
  - Idiopathic: 12–51% of genital ulcers have no definite cause in research settings. Referral to an expert when no etiology is found may diminish this fraction.[4]

Specimen collection and laboratory diagnosis

- The minimum testing for all cases of GUD should include a viral identification test for HSV and a syphilis serology.
- Inform laboratory in advance when special procedures need to be followed. Consultation with an experienced colleague may be warranted.
- Biopsies, cultures, smears, and serology should be ordered as appropriate for evaluation of all vulvar ulcers.

Herpes simplex virus

- See *Genital Herpes Simplex Virus Infections* chapter.
- Herpes testing is important for all lesions, initial and recurrent, even in classic cases, because of false-positive clinical diagnosis. Retesting following a positive test is almost always of limited value. Typing is important to aid in the discussion of the natural history, help assess partners and help discuss preventative agendas.

- Viral identification
  - Viral identification by either viral culture or nucleic acid amplification test (NAAT), or, if not available, by antigen test.
  - Culture should be carried out on at least three unroofed pustules/vesicles or wet ulcers *unless* HSV infection has been previously confirmed by a laboratory test. The specimen must be transported in a special viral transport medium.
  - NAATs are considered superior, but their availability is limited (see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter).
- Type-specific serology
  - In the presence of a potential case of genital herpes and two negative viral identification tests, or if there is difficulty organizing testing when lesions are present or lesions are rare, type-specific serology can help confirm possible genital herpes cases.[20] If both HSV-1 and HSV-2 serology are negative 12 weeks after the first manifestation, genital herpes is not likely.
  - It should be noted that the availability of type-specific serology is limited in Canada.

T pallidum
- See *Syphilis* chapter.
- Identification: dark-field examination or direct fluorescent antibody test on swab from ulcers. Contact your local laboratory regarding these tests, as they are not widely available.
- Serology
  - Syphilis serology should include a non-treponemal test (e.g., rapid plasma reagin [RPR], Venereal Disease Research Laboratory [VDRL]) or treponemal-specific enzyme immunoassay (EIA). As treponemal tests are far more sensitive in primary syphilis than non-treponemal tests, many authorities advocate proceeding directly to treponemal tests when primary syphilis is suspected.
  - If non-treponemal syphilis serology is found, positive confirmation by treponemal-specific test (e.g., *Treponema pallidum* particle agglutination [TP-PA], microhemagglutination for *Treponema pallidum* [MHA-TP] or fluorescent treponemal antibody absorption [FTA-ABS]) should be sought if not already ordered (see *Syphilis* chapter).
  - Serologic tests should be repeated 2–4 weeks after the original negative test if syphilis is a possibility.
  - Dark-field examination or fluorescent antibody for *T pallidum* of lesions, if available.

Other causes
- If history, risk factors and physical findings warrant testing for other less common causes of GUD, special laboratory tests may be needed to properly assess the etiology of ulcerative disease. Consider testing for chancroid, LGV and granuloma inguinale.

- *H ducreyi* (chancroid)
  - See *Chancroid* chapter.
  - Bacterial culture on specific culture medium (special arrangement to be made in advance).
  - NAAT where available (e.g., polymerase chain reaction [PCR]).
  - Gram stain may also be useful (see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter).
- *C trachomatis* serovar L1, L2 or L3 (LGV)
  - *See Lymphogranuloma Venereum* chapter
  - Identification of *C trachomatis* by culture, NAAT or serology, followed by confirmation of LGV serovars through DNA sequencing or restriction fragment length polymorphism (RFLP).
- *Klebsiella granulomatis* (granuloma inguinale)
  - Identification of dark-staining Donovan bodies on crushed or biopsy specimen.

Caution

- Except for genital herpes, most Canadian clinicians have limited experience with STI-related genital ulcers. Early referral to a colleague experienced in this area should be considered, particularly if the case involves the following:
  - Travel.
  - MSM.
  - HIV-infected individuals.
  - Immunocompromised patients.
  - Systemic disease.
- Atypical and/or non-healing lesions may require a biopsy and should be referred to a colleague experienced in this area.[21]

Management[22]

If test results are not yet available

- Treatment considerations:
  - Empiric treatment for chancroid, LGV and syphilis should be discussed with a local expert or public health official only if follow-up is uncertain and if risk factors for these diseases are present.
  - Treatment at the time of presentation should be considered for genital herpes for almost all cases of GUD, especially if the symptoms are typical.
- See *Chancroid*, *Lymphogranuloma Venereum* and *Syphilis* chapters for more information.

If results are available for RPR, VDRL, TP-PA, MHA-TP/dark-field examination/ fluorescent antibody test

- Positive (motile corkscrew spirochetes present): treat for syphilis (see *Syphilis* chapter).

- Dark-field examinations, fluorescent antibody tests and tests for HSV infection and *H ducreyi* are negative or not performed: treat as syphilis if there is a recent history of contact with infectious syphilis or clinical suspicion is strong and follow-up cannot be ensured.
- Otherwise:
  - Consider therapy for HSV if laboratory tests are negative and presentation is typical of HSV infection (see *Genital Herpes Simplex Virus Infections* chapter).
  - Treat for chancroid if presentation suggests chancroid (see *Chancroid* chapter).

Treatment[23]

- For treatment recommendations for syphilis, HSV, chancroid and LGV, see appropriate chapters.
- Treatment of ulcerative STIs in HIV co-infected patients may represent a challenge.[24] See relevant chapters on treatment of specific infections, or, if not experienced in this area, consult an experienced colleague.

Granuloma inguinale[3,25–29]

- Preferred:
  - Doxycycline 100 mg PO bid for 21 days (based on studies of older preparations of tetracyclines) *[C-III]*.
  - Trimethoprim-sulfamethoxazole double strength PO bid for 21 days *[C-III]*.

- Alternatives:
  - Ciprofloxacin 750 mg PO bid for 21 days *[C-III]*.
  - Erythromycin 500 mg qid for 21 days *[C-III]*.
  - Azithromycin 500 mg daily or 1 g weekly for a minimum of 21 days *[C-III]*.

Consideration for Other STIs

- See *Primary Care and Sexually Transmitted Infections* chapter.
- Obtain specimen(s) for the diagnosis of chlamydial and gonococcal infections and other STIs when appropriate (including LGV, chancroid and granuloma inguinale if there has been travel to regions where these infections are endemic).
- HIV testing and counselling are recommended (see *Human Immunodeficiency Virus Infections* chapter). Patients with syphilis, LGV and chancroid are at especially high risk for concurrent HIV infection.[3] Timing of HIV testing is important, as genital ulceration is a marker for HIV risk. Baseline testing at the initial visit and repeat HIV testing in 12 weeks should be considered.
- Immunization against hepatitis B in those with no immunity against this virus is also recommended (see *Hepatitis B Virus Infections* chapter).

Reporting and Partner Notification

- Conditions that are reportable according to provincial and territorial laws and regulations must be reported to the local public health authority (see chapters of specific infections for reporting requirements).
- Partner notification is vitally important for the rare bacterial ulcerative conditions discussed in this section in order to prevent an outbreak.
- When treatment is indicated for a diagnosis of syphilis, chancroid, LGV or granuloma inguinale, all partners who have had sexual contact with the index case should be located, clinically evaluated and treated appropriately.[3] For more information on partner notification and treatment by infection, see *Chancroid*, *Lymphogranuloma Venereum* and *Syphilis* chapters.
- Local public health authorities are available to assist with partner notification and appropriate referral for clinical evaluation, testing, treatment and health education.

Follow-up

- A follow-up visit should be arranged for re-evaluation.
  - For chancroid and granuloma inguinale, if the patient is compliant with the prescribed treatment, symptoms resolve *and* there is no risk of re-exposure to an untreated partner, repeat diagnostic testing is not routinely recommended.
  - For LGV, see *Lymphogranuloma Venereum* chapter.
  - For genital HSV infection, no test of cure is necessary.
  - For syphilis, see *Syphilis* chapter.
- Timing for HIV testing should be considered at this stage. Most patients presenting with an acute genital ulcer will be too early in the window to have reactive serology related to an HIV infection.

Special Considerations

Children

- Sexual abuse must be considered when GUD is found in children beyond the neonatal period. Consultation with a colleague experienced in such cases should be sought (see *Sexual Abuse in Peripubertal and Prepubertal Children* chapter).
- Reporting sexual abuse:
  Sexual abuse of children must be reported to the local child protection agency. Local public health authorities may be helpful in evaluating both the source of the infection and potential transmission in the community.
- Whenever possible, it is strongly recommended that the child be evaluated at or in conjunction with a referral centre (see Appendix F and G).

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PELVIC INFLAMMATORY DISEASE (PID)

Etiology

- There are multiple causes of lower abdominal pain in women, including gynecologic disease or dysfunction (complications of pregnancy, acute infections, endometriosis, adnexal disorders, menstrual disorders), as well as gastrointestinal (appendicitis, gastroenteritis, inflammatory bowel disease), genitourinary (cystitis, pyelonephritis, nephrolithiasis), musculoskeletal and neurologic causes.
- The most common infectious cause of lower abdominal pain in women is pelvic inflammatory disease (PID).[1]
- PID is a polymicrobial infection with multiple microbial etiologies.
- Most cases of PID are associated with more than one organism.
- Pathogens can be categorized as sexually transmitted or endogenous organisms.

Table 1. Microbial causes

Sexually transmitted organisms	• *Chlamydia trachomatis* • *Neisseria gonorrhoeae* • Viruses and protozoa (rare) – Herpes simplex virus – *Trichomonas vaginalis*
Endogenous organisms	• Genital-tract mycoplasmas – *Mycoplasma genitalium* – *Mycoplasma hominis* – *Ureaplasma urealyticum*
Anaerobic bacteria	• *Bacteroides* spp. • *Peptostreptococcus* spp. • *Prevotella* spp.
Facultative (aerobic) bacteria	• *Escherichia coli* • *Gardnerella vaginalis* • *Haemophilus influenzae* • *Streptococcus* spp.

Definition

- PID is an infection of the female upper genital tract involving any combination of the endometrium, fallopian tubes, pelvic peritoneum and contiguous structures.

Epidemiology

- PID is a very significant public health problem.
- Up to ⅔ of cases go unrecognized, and underreporting is common.
- There are approximately 100,000 cases of symptomatic PID annually in Canada, although PID is not nationally reportable, so exact numbers are unknown.
- It is estimated that 10–15% of women of reproductive age have had one episode of PID.[2]
- In recent years, hospitalization rates for PID have declined (118/100,000 women in 1995 and 55/100,000 women in 2001, data from Health Canada) because increasing numbers of patients are treated as outpatients, but the number of patient visits to physician offices for PID has remained stable.
- The incidence of long-term sequelae of PID (tubal factor infertility, ectopic pregnancy, chronic pelvic pain) is directly related to the number of episodes of PID.[3]
- In jurisdictions with long-standing chlamydia control programs, PID rates and ectopic pregnancy rates have declined.

Prevention

- At the community level, health promotion and education programs are essential to promote screening for sexually transmitted infections (STIs).
- Health care providers must assume responsibility for primary prevention activities, such as risk-reduction counselling and patient education.
- At the time of diagnosis of infection, health care providers should reinforce prevention and safer-sex practices. They should also identify barriers to prevention practices and ways to overcome them.
- Patients and contacts must be counselled to abstain from unprotected sexual contact until treatment of both partners is complete.

Manifestations and Diagnosis

- Abdominal pain may be a clinical feature of many disorders, and the symptoms of PID may overlap with other gynecologic disorders or disorders of the gastrointestinal, urinary and musculoskeletal systems.
- There is no single historical, physical or laboratory finding that is both sensitive and specific for a diagnosis of PID.[4]
- Only ⅓ of women with acute PID have a temperature above 38°C.[5]
- Common findings on physical examination of patients with acute PID include bilateral lower abdominal, uterine, adnexal and cervical motion tenderness, but these findings may be present with a variety of other conditions as well.
- The clinical diagnosis of PID is imprecise, and clinicians must have a high index of suspicion.

Table 2. Criteria for diagnosis

Minimum diagnostic criteria	Additional diagnostic criteria	Definitive diagnostic criteria
• Lower abdominal tenderness • Adnexal tenderness • Cervical motion tenderness	• Oral temperature >38.3°C • Presence of white blood cells on saline microscopy of vaginal secretions/wet mount • Elevated erythrocyte sedimentation rate • Elevated C-reactive protein • Laboratory documentation of cervical infection with *Neisseria gonorrhoeae* or *Chlamydia trachomatis*	• Endometrial biopsy with histopathologic evidence of endometritis (at least 1 plasma cell per x120 field and at least 5 neutrophils per x400 field) • Transvaginal sonography or other imaging techniques showing thickened fluid-filled tubes, with or without free pelvic fluid or tubo-ovarian complex • Gold standard: Laparoscopy demonstrating abnormalities consistent with PID, such as fallopian tube erythema and/or mucopurulent exudates

PID = pelvic inflammatory disease

Physical examination and specimen collection

- A complete abdominal and pelvic examination should be performed in any patient with lower abdominal pain.
- Pelvic examination should include speculum and bimanual examinations.
- The external genital area, vagina and cervix must all be inspected.
- Stat serum beta HCG to rule out ectopic pregnancy.
- With the aid of a speculum, endocervical swabs should be obtained for diagnostic tests for *Neisseria gonorrhoeae* and *Chlamydia trachomatis*.
- Cervical lesions should be sampled with swabs for diagnostic tests for herpes simplex virus, if suspected.
- Vaginal swabs should be obtained for culture; pH testing; amine odour whiff testing; normal saline and potassium hydroxide wet preparations; and Gram stain. Clinical assessment for bacterial vaginosis includes three of four Amsel criteria (vaginal discharge, elevated pH, amine odour whiff test and clue cells on microscopy).[6] An aerobic and anaerobic culture may assist with the detection of unusual vaginal pathogens, such as Group A streptococcus.

Laboratory diagnosis

- Negative laboratory results do not rule out a diagnosis of PID.
- A normal ultrasound study does not rule out a diagnosis of PID.
- Ultrasound may aid in the diagnosis, especially if tubo-ovarian abscess is suspected.

- A pregnancy test can be helpful to exclude ectopic pregnancy from the differential diagnosis.
- Detection of Gram-negative intracellular diplococci on a stained smear of endocervical secretions; positive results of a diagnostic test for *N gonorrhoeae* or *C trachomatis*; or both.
- Detection of *N gonorrhoeae* or *C trachomatis* may be enhanced by using nucleic acid amplification tests, such as ligase chain reaction or polymerase chain reaction.
- Other tests that may be helpful in the diagnosis of acute PID include complete blood count, erythrocyte sedimentation rate, C-reactive protein and endometrial biopsy.

Management

- Early diagnosis and treatment are crucial to the maintenance of fertility.
- Antibiotic therapy can be administered orally or parenterally, and in inpatient or outpatient settings.
- Data suggest that efficacy and long-term complication rates are not significantly different between parenteral and oral therapy or inpatient and outpatient treatment.[7]
- Individuals treated as outpatients need careful follow-up and should be re-evaluated 2–3 days after therapy is initiated.
- If no clinical improvement has occurred, hospital admission for parenteral therapy, observation and consideration for laparoscopy is required; consultation with colleagues experienced in the care of these patients should be considered.

Table 3. Criteria for hospitalization

- Surgical emergencies such as appendicitis cannot be excluded.
- The patient is pregnant.
- The patient does not respond clinically to oral antimicrobial therapy.
- The patient is unable to follow or tolerate an outpatient oral regimen.
- The patient has severe illness, nausea and vomiting, or high fever.
- The patient has a tubo-ovarian abscess.

Consider hospitalization for observed oral or parenteral therapy in the following cases:

- HIV infection
- Youth/adolescents (particularly if compliance is an issue)

Treatment

- Goals of treatment are to control the acute infection and to prevent long-term sequelae such as infertility, ectopic pregnancy and chronic pelvic pain.
- Treatment regimens must provide empiric broad-spectrum coverage of likely etiologic pathogens and take into account the polymicrobial nature of PID.
- Treatment regimens must provide coverage for *N gonorrhoeae*, *C trachomatis*, anaerobic bacteria, Gram-negative facultative bacteria and streptococci. [8]
- Discontinuation of parenteral therapy may be considered 24 hours after a patient improves clinically.[8]
- Oral step-down therapy should then begin and continue for a total of 14 days of treatment.[8]
- If recovery does not occur, other differential diagnoses must be entertained and a laparoscopy considered.

Table 4. Recommended parenteral treatment regimens

Regimen A[9] *[A-I]*	• Cefotetan 2 g IV every 12 hours PLUS doxycycline 100 mg IV or PO every 12 hours OR • Cefoxitin 2 g IV every 6 hours PLUS doxycycline 100 mg IV or PO every 12 hours – Parenteral therapy may be discontinued 24 hours after a patient improves clinically, and oral therapy with doxycycline (100 mg bid) should continue for a total of 14 days – Most authorities recommend administering doxycycline in oral form even in hospitalized patients, because IV administration is painful and more costly, and because oral and IV administration provide similar bioavailability
Regimen B *[A-I]*	• Clindamycin 900 mg IV every 8 hours PLUS • Gentamicin* loading dose IV or IM (2 mg/kg of body weight), followed by a maintenance dose (1.5 mg/kg) every 8 hours. Once-daily dosing may be substituted (5mg/kg of body weight IV every 24 hours) – Parenteral therapy may be discontinued 24 hours after a patient improves clinically, and oral therapy with doxycycline (100 mg bid) or clindamycin (450 mg PO qid) should continue for a total of 14 days

Table 4. Recommended parenteral treatment regimens (continued)

Alternative regimens[10] *[A-II]*	• Ofloxacin 400 mg IV every 12 hours ± metronidazole 500 mg IV every 8 hours OR • Levofloxacin 500 mg IV once daily ± metronidazole 500 mg IV every 8 hours OR • Ampicillin/sulbactam 3 g IV every 6 hours PLUS doxycycline 100 mg IV or PO every 12 hours OR • Ciprofloxacin 200 mg IV every 12 hours PLUS doxycycline 100 mg IV or PO every 12 hours PLUS metronidazole 500 mg IV every 8 hours – Because ciprofloxacin has poor coverage against *C trachomatis*, it is recommended that doxycycline be added routinely – Because of concerns regarding the anaerobic coverage of both quinolones, metronidazole should be included with each regimen

* These recommendations apply for those patients with normal renal function; gentamicin dosage should be adjusted in cases of renal impairment. Renal function and gentamicin levels should be monitored during treatment.

Notes:

The use of ofloxacin, ciprofloxacin, levofloxacin, and doxycycline is contraindicated for pregnant and lactating women. Pregnant women should not be treated with quinolones or tetracyclines.

Table 5. Recommended outpatient treatment regimens

Regimen A[11] *[A-II]*	• Ofloxacin 400 mg PO bid for 14 days ± metronidazole 500 mg PO bid for 14 days *[A-I]* OR • Levofloxacin 500 mg PO qd ± metronidazole 500 mg PO bid for 14 days *[B-II]* – Metronidazole is added to provide anaerobic coverage – Preliminary data suggest that oral levofloxacin is as effective as oral ofloxacin, with the advantage of once-daily dosing[9]
Regimen B[12] *[A-II]*	• Ceftriaxone 250 mg IM qd PLUS doxycycline 100 mg PO bid for 14 days OR • Cefoxitin 2 g IM PLUS probenecid 1 g PO in a single dose concurrently once PLUS doxycycline 100 mg PO bid for 14 days OR • Other parenteral third-generation cephalosporin (e.g., ceftizoxime or cefotaxime) PLUS doxycycline 100 mg PO bid for 14 days – Many authorities recommend the addition of metronidazole 500 mg PO bid for 14 days to this regimen for additional anaerobic coverage and the treatment of bacterial vaginosis *[B-III]*

Consideration for Other STIs

- Individuals infected with one STI are at risk of concurrent infection with one or more other STIs.
- Following a diagnosis of PID, testing and counselling should be performed for other infections, including HIV and syphilis.
- Immunization against hepatitis B is recommended if not already immune.

Reporting and Partner Notification

- Patients with conditions that are notifiable according to provincial and territorial laws and regulations should be reported to local public health authorities.
- The management of women with PID is considered inadequate unless their sexual partners are also evaluated and treated.
- Evaluation should occur if there was sexual contact with the patient during the 60 days prior to symptom onset or date of diagnosis where asymptomatic.
- After evaluation, sexual partners should be treated empirically with regimens effective against both gonorrhea and chlamydia.
- Local public health authorities are available to assist with partner notification and appropriate referral for clinical evaluation, testing, treatment and health education when the causative organism is identified as a reportable STI.

Follow-up

- Pain and tenderness resulting from acute PID should begin to resolve within 48–72 hours of initiating antibiotics.[13]
- If no improvement is observed, further work-up is essential.
- Individuals treated as outpatients need careful follow-up and should be re-evaluated 2–3 days after treatment is initiated.
- If no clinical improvement has occurred, hospital admission for parenteral therapy and observation is required.
- Following a diagnosis of PID, patients should be informed that they are at risk of both short-term consequences such as Fitz-Hugh-Curtis syndrome (perihepatitis) and tubo-ovarian abscess, and long-term sequelae, including infertility, ectopic pregnancy and chronic pelvic pain.

Special Considerations

Pregnancy

- PID is uncommon in pregnancy, especially after the first trimester.
- Pregnant patients with suspected PID should be hospitalized for evaluation and treatment with parenteral therapy because of an increased risk of adverse outcomes for both the mother and the pregnancy.
- There is a large differential diagnosis of acute abdominal pain in pregnancy, and consultation with an expert should be sought.

HIV infection

- HIV-positive women with PID may represent a subgroup of patients with a more difficult clinical course.
- Some studies have suggested that HIV-positive women with PID have longer hospital stays and are at higher risk for the development of tubo-ovarian abscesses and are more likely to require surgical intervention.[14,15]
- These women should be followed closely and managed aggressively, and consideration should be given to hospitalization.
- Consultation with a colleague experienced in HIV care is recommended.

Adolescents

- Consideration should be given to hospitalization for adolescents with suspected PID if poor compliance is expected to be an issue.

Patients with an intrauterine contraceptive device in situ

- In patients with an intrauterine device (IUD) in situ, the device should not be removed until after therapy has been initiated and at least two doses of antibiotics have been given.

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PROSTATITIS

Prostatitis is generally not considered a sexually transmitted infection (STI). It is included here to assist health care providers in the management of men who present with urogenital symptoms.

Definition

Providing a global definition of prostatitis is difficult because each prostatitis syndrome has its own features. One definition, provided by J.N. Krieger, is as follows: "Prostatitis is the diagnosis given to a large group of men who present with a variety of complaints referable to the lower genital tract and perineum."[1]

In 1995, a classification for prostatitis syndromes was first proposed by the U.S. National Institute of Health, National Institute of Diabetes and Digestive and Kidney Diseases (NIH-NIDDK), it was subsequently published in 1998. A consensus meeting of the National Institutes of Health Chronic Prostatitis Collaborative Research Network held in March 2002 reconfirmed the urology research community's approval of this classification system.[2] Table 1 compares the NIH-NIDDK classification system with the traditional classification system.

Table 1. NIH-NIDDK classification of prostatitis syndromes

NIH-NIDDK classification	Traditional classification	Features
Category I: acute bacterial prostatitis	*Acute bacterial prostatitis*	Acute bacterial infection of the prostate gland
Category II: chronic bacterial prostatitis	*Chronic bacterial prostatitis*	Chronic infection of the prostate characterized by recurrent urinary tract infections
Category III: chronic prostatitis / chronic pelvic pain syndrome (CP/CPPS)		Symptoms of discomfort or pain in the pelvic region for at least 3 months in the absence of uropathogenic bacteria cultured by standard techniques
Category IIIA: inflammatory chronic pelvic pain syndrome	*Chronic non-bacterial prostatitis*	Significant number of leukocytes in EPS, VB3 or semen

Table 1. NIH-NIDDK classification of prostatitis syndromes (continued)

NIH-NIDDK classification	Traditional classification	Features
Category IIIB: non-inflammatory chronic pelvic pain syndrome	*Prostatodynia*	No evidence of significant leukocytes found in EPS, VB3 or semen
Category IV: asymptomatic inflammatory prostatitis	*None*	Leukocytes in EPS, VB3, semen or prostate tissue during evaluation for other disorders in men without symptoms of prostatitis

EPS = expressed prostatic secretions specimen (see Diagnosis section, below)
VB3 = voided bladder 3 specimen (see Diagnosis section, below)

There are three major differences between the traditional and the NIH-NIDDK approaches to the classification of prostatitis syndrome:[3]

- The new clinical classification includes a systematic evaluation of specific symptoms characteristic of prostatitis, usually done using the NIH — Chronic Prostatitis Symptom Index (see Table 2). This symptom index is meant to be evaluative rather than discriminative in focus, it is not meant to be used as a screening or diagnostic tool. Rather, it is meant to provide a valid index of symptom severity and impact on quality of life for men with chronic prostatitis.
- The difference between inflammatory and non-inflammatory CP/CPPS is substantially different from the distinction between the traditional approach of nonbacterial prostatitis and prostatodynia.
- The new concepts have provided a critical framework for the development of research into the causes, evaluation and treatment of prostatitis syndromes.

Table 2. NIH-Chronic Prostatitis Symptom Index (NIH-CPSI)[4]

PAIN OR DISCOMFORT		
1. In the last week, have you experienced any pain or discomfort in the following areas?		Yes / No
	a. Area between rectum and testicles (perineum)	☐ (1) ☐ (0)
	b. Testicles	☐ (1) ☐ (0)
	c. Tip of the penis (not related to urination)	☐ (1) ☐ (0)
	d. Below your waist, in your pubic or bladder area	☐ (1) ☐ (0)
2. In the last week, have you experienced:	a. Pain or burning during urination?	☐ (1) ☐ (0)
	b. Pain or discomfort during or after sexual climax (ejaculation)?	☐ (1) ☐ (0)
3. How often have you had pain or discomfort in any of these areas over the last week?	☐ (0) Never ☐ (1) Rarely ☐ (2) Sometimes	☐ (3) Often ☐ (4) Usually ☐ (5) Always
4. Which number best describes your average pain or discomfort on the days that you had it, over the last week?	☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 No Pain … Pain as bad as you can imagine	
URINATION		
5. How often have you had a sensation of not emptying your bladder completely after you finished urinating over the last week?	☐ (0) Not at all ☐ (1) Less than 1 time in 5 ☐ (2) Less than half the time	☐ (3) About half the time ☐ (4) More than half the time ☐ (5) Almost always
6. How often have you had to urinate again less than 2 hours after you finished urinating over the last week?	☐ (0) Not at all ☐ (1) Less than 1 time in 5 ☐ (2) Less than half the time	☐ (3) About half the time ☐ (4) More than half the time ☐ (5) Almost always

Table 2. NIH-Chronic Prostatitis Symptom Index (NIH-CPSI)[4] (continued)

IMPACT OF SYMPTOMS			
7. How much have your symptoms kept you from doing the kind of things you would usually do over the last week?	☐ (0) None ☐ (1) Only a little	☐ (2) Some ☐ (3) A lot	
8. How much did you think about your symptoms over the last week?	☐ (0) None	☐ (1) Only a little	☐ (2) Some
QUALITY OF LIFE			
9. If you were to spend the rest of your life with your symptoms just the way they have been during the last week, how would you feel about that?	☐ (0) Delighted ☐ (1) Pleased ☐ (2) Mostly satisfied ☐ (3) Mixed (equally satisfied and dissatisfied)	☐ (4) Mostly dissatisfied ☐ (5) Unhappy ☐ (6) Terrible	

Scoring the NIH-Chronic Prostatitis Symptom Index Domains		
Pain:	total of items 1a, 1b, 1c, 1d, 2a, 2b, 3 and 4	= _____(0–21)
Urinary symptoms:	total of items 5 and 6	= _____(0–10)
Quality of life impact:	total of items 7, 8 and 9	= _____(0–12)

Etiology

Table 3 presents recent understanding of the etiologic agents involved in the different prostatitis syndromes.[5]

Table 3. Etiologic agents of the different prostatitis syndrome

Prostatitis syndrome	Etiologic agents
Category I: acute bacterial prostatitis	Most frequent: *Escherichia coli* followed by species of *Proteus*, *Providentia* Less common: *Klebsiella*, *Pseudomonas*, *Serratia* and *Enterobacter* Minor importance: *Enterococci* Role of Gram-positive bacteria is debated but believed to rarely cause bacterial prostatitis
Category II: chronic bacterial prostatitis	Predominant agents are the same as for Category I
Category IIIA: inflammatory chronic pelvic pain syndrome	Cause not known Infection with *Chlamydia trachomatis*, *Mycoplasma hominus*, *Ureaplasma urealyticum*, *Trichomonas vaginalis* or a viral agent may cause this type of prostatitis syndrome, but most studies do not support this view
Category III B: non-inflammatory chronic pelvic pain syndrome	Cause not known Suggested explanations for this syndrome include a dyssynergia between bladder detrusor and internal sphincter muscles (stress prostatitis) or “pelvic floor tension myalgia”
Category IV: asymptomatic inflammatory prostatitis	Cause not known

Epidemiology

By some estimates, up to 50% of men experience symptoms of prostatitis at some time in their lives. Many men remain symptomatic for prolonged periods.[1]

Table 4 summarizes some epidemiological characteristics as well as relative frequency of prostatitis syndromes.

Table 4. Epidemiological characteristics of prostatitis syndromes[6]

Prostatitis syndrome	Typical presentation	Approximate percent of all prostatitis syndromes
Category I: acute bacterial prostatitis	Acute illness	1–5%
Category II: chronic bacterial prostatitis	Recurrent urinary tract infection	5–10%
Category IIIA: inflammatory chronic pelvic pain syndrome	Discomfort or pain in the pelvic region for at least 3 months	40–65%
Category IIIB: non-inflammatory chronic pelvic pain syndrome	Discomfort or pain in the pelvic region for at least 3 months	20–40%
Category IV: asymptomatic inflammatory prostatitis	Asymptomatic. Discovered during evaluation for other disorders in men without symptoms of prostatitis.	Unknown

Manifestations[5]

Table 5. Main clinical features of the different prostatitis syndromes

Prostatitis syndrome	Clinical presentation
Category I: acute bacterial prostatitis	• Typically presents with fever, chills and pain in the low back, rectum or perineum, accompanied in most cases by irritative or obstructive genitourinary symptoms • On digital rectal examination, the prostate is warm, firm, swollen and exquisitely tender • **Prostatic massage should be avoided because it is painful and may cause bacteremia**

Table 5. Main clinical features of the different prostatitis syndromes (continued)

Prostatitis syndrome	Clinical presentation
Category II: chronic bacterial prostatitis	• Often presents as relapsing urinary tract infections, even after appropriate antibiotic treatment • Symptoms vary from dysuria or other voiding complaints, to ejaculatory pain, hemospermia or pelvic or genital pain • Some patients may be asymptomatic • Urogenital physical examination is generally unremarkable
Category IIIA: inflammatory chronic pelvic pain syndrome	• Symptoms similar to those of Category II • Typically does not cause cystitis-like dysuria • Chronic pelvic pains (perineal, testicular, penile, lower abdominal and ejaculatory) are most prominent symptoms • Urogenital physical examination is generally unremarkable
Category IIIB: noninflammatory chronic pelvic pain syndrome	• Symptoms similar to those of Category II • Typically does not cause cystitis-like dysuria • Chronic pelvic pains (perineal, testicular, penile, lower abdominal and ejaculatory) are most prominent symptoms • Common complaints include dysuria, hesitancy, interrupted or pulsed flow, diminution in stream size or force, and dribbling • Symptoms may be exacerbated by sexual activity • Urogenital physical examination is generally unremarkable
Category IV: asymptomatic inflammatory prostatitis	• Asymptomatic

Diagnosis[4]

- The gold-standard test for a diagnosis of bacterial prostatitis would be a prostatic biopsy, but this is rarely indicated.
- Examination of expressed prostatic secretions has been the definite test for differentiating the prostatitis syndromes. The procedure is referred to as the "four-glass" localization test (see Table 6).

- Unfortunately, the prostatic localization test has not been properly validated and its limitations are significant. Very few urologists routinely use this test and some suggest it should be confined to research trials.[5]
- A simpler, "two-glass" pre- and post-massage screening test consisting of a urine specimen taken before and after a prostatic massage could be as sensitive and specific as the "four-glass" test[6–10] (same interpretation as Table 6 below for the "four-glass" test: pre-massage specimen is the same as voided bladder 2 specimen [VB2] and the post-massage specimen is the same as voided bladder 3 specimen [VB3]).
- Avoid voided bladder 1 specimen (VB1) in patients with no clinical urethritis and expressed prostatic secretions specimen (EPS), which is difficult to obtain and deal with.

Table 6. Localization cultures ("four-glass" test) for diagnosis of prostatitis syndromes

Technique
• Ensure that the patient has a full bladder at the start of the procedure • Retract the foreskin of uncircumcised men throughout the procedure • Cleanse the glans penis with soap and water or povidone-iodine • Collect first 10 mL of voided urine (VB1) • Discard next 100 mL urine voided, then collect a 10 mL midstream urine specimen (VB2) • Massage prostate and collect any expressed prostatic secretions (EPS) • Collect first 10 mL urine voided after prostatic massage (VB3) • Make sure all specimens are taken immediately to the laboratory for quantitative culture
Interpretation
• All specimens yield less than 10^3 colony-forming units / mL: negative test for bacterial prostatitis • VB3 or EPS yields a colony count of one or more log(s) greater than the VB1**:** chronic bacterial prostatitis • VB1 yields a colony count greater than other specimens: urethritis or specimen contamination • All specimens yield at least 10^3 colony-forming units / mL: not interpretable. In this case, treat the patient for 2 to 3 days with an antibiotic that does not penetrate the prostate but will sterilize bladder urine (such as ampicillin or nitrofurantoin), then repeat procedure

EPS = expressed prostatic secretions specimen
VB1 = voided bladder 1 specimen
VB2 = voided bladder 2 specimen
VB3 = voided bladder 3 specimen

Management and Treatment[5]

Table 7 summarizes the suggested antibiotic regimens for treating acute bacterial prostatitis (Category I) and chronic bacterial prostatitis (Category II).

- Acute bacterial prostatitis responds promptly to most antibiotics.
- Treatment of acute bacterial prostatitis should be for at least 3–4 weeks with an appropriate antimicrobial with excellent tissue penetration in order to avoid complications such as prostatic abscess or chronic bacterial prostatitis.
- Available data do not allow for the recommendation of a specific fluoroquinolone, but only norfloxacin, ciprofloxacin, or ofloxacin are at present approved for the treatment of bacterial prostatitis.
- Most patients with acute prostatitis can be managed with oral antibiotics, though some patients may require IV treatment. If IV treatment is needed, ampicillin/gentamicin is recommended, although both trimethoprim-sulfa and ciprofloxacin may also be given IV (see Table 7). There are other beta-lactam antibiotic regimens that can be used, but listing them is beyond the scope of these guidelines. When IV antibiotic treatment is needed, switch promptly to oral antibiotics when the patient has clinically improved.
- Chronic bacterial prostatitis requires at least 4–6 weeks of appropriate antibiotic therapy.
- For relapse of chronic bacterial prostatitis, a treatment of 3 months may be advisable.
- If there is no response to antibiotic treatment, consider referral for evaluation.

Table 7. Potential regimens for empiric therapy of bacterial prostatitis

Prostatitis syndrome	Antibiotic regimen	Duration
Category I: acute bacterial prostatitis	In some cases, treatment may be given intravenously for the first few days.	
	• Trimethoprim-sulfamethoxazole 160/800 mg PO bid* *[C-II]*	4 weeks
	OR	
	• Ofloxacin 400 mg PO bid *[A-I]*	4 weeks
	OR	
	• Ciprofloxacin 500 mg PO bid *[A-I]*	4 weeks
	OR	
	• Ampicillin 1 g IV every 6 hours PLUS gentamicin 5 mg/kg lean body weight IV/day *[A-I]*†	4 weeks
Category II: chronic bacterial prostatitis	• Trimethoprim-sulfamethoxazole 160/800 mg PO bid* *[C-II]*	6–12 weeks
	OR	
	• Ofloxacin 400 mg PO bid *[A-I]*	6–12 weeks
	OR	
	• Ciprofloxacin 500 mg PO bid *[A-I]*	6–12 weeks
	OR	
	• Doxycycline 100 mg PO bid* *[I-III]*	6–12 weeks

* Not an approved indication by the U.S. Food and Drug Administration.

† This is the recommended gentamicin dose for patients with normal renal function; needs to be adjusted with renal impairment. Renal function and gentamicin levels should be monitored during therapy. Antibiotics should be stepped down promptly to oral therapy when the patient has clinically improved.

Table 8. Treatment regimens for non-bacterial prostatitis and chronic pelvic pain syndrome (Category IIIA and Category IIIB)

Treatment for *Category IIIA* (inflammatory non-bacterial prostatitis) is not well defined
• Occasional successes have been reported with antibiotic therapy. • A single 4-week course of antibiotic therapy with an appropriate agent may be defensible. • Repeated or prolonged antibiotic courses should be avoided. • Other measures have been suggested, but few are evidence-based (NSAIDs, alpha-blockers, finasteride [Proscar], allopurinol, nutritional supplements, lifestyle changes and prostatic massage). • Persistent or severe voiding symptoms, especially in older patients, should be evaluated for interstitial cystitis or carcinoma of the bladder.[11]
Treatment for *Category IIIB* (non-inflammatory chronic pelvic pain syndrome) is even more empirical than for Category IIIA
• In addition to those listed for Category IIIA, suggested approaches include muscle relaxants, analgesics, alpha-blockers, physiotherapy, neuromodulators, biofeedback, sitz baths, relaxation exercises and psychotherapy.

Consideration for Other STIs

- Evaluation for possible sexually transmitted infections should be made when appropriate, especially in younger sexually active patients, and patients with primarily urethral symptomatology or urethral discharge.
- When investigation reveals a **VB1** specimen colony count greater than all other specimens (see Diagnosis section, above), consider urethritis as a possible diagnosis and investigate appropriately.

Reporting and Partner Notification

- Because prostatitis syndromes are not typically caused by a sexually transmitted pathogen, sexual partners of patients with prostatitis do not usually require evaluation or treatment.
- When investigation reveals a condition that is notifiable according to provincial and territorial laws and regulations, patients should be reported to the local public health authority.

Follow-up

- Appropriate follow-up should be arranged depending on the proven or presumed diagnosis or on the need to further investigate certain patients according to clinical presentation.

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SEXUALLY TRANSMITTED INTESTINAL AND ENTERIC INFECTIONS

Etiology[1]

- Sexually transmitted intestinal syndromes involve a wide variety of pathogens at different sites of the gastrointestinal tract.
- The diversity of sexually transmissible pathogens responsible for intestinal disease remains a challenge for the clinician.
- Polymicrobial infection often occurs, causing an overlap of symptoms.
- Infections of the anus and rectum are often sexually transmitted and typically occur in men and women who engage in unprotected receptive anal intercourse.
- Sexually transmitted infections (STIs) must always be considered, but trauma and foreign bodies may result in findings suggestive of proctitis or proctocolitis.
- Some anorectal infections in women are secondary to the contiguous spread of the pathogens from the genitalia.
- Infections with pathogens traditionally associated with food- or water-borne acquisition are known to occur via sexual transmission, most often via the fecal-oral route.
- Infections are often more severe in persons infected with HIV, and the list of potential causes is greater.
- In persons with advanced HIV infection, consider cryptosporidium and microsporidium.

Definitions

- Proctitis: Inflammation limited to the rectal mucosa, not extending beyond 10–12 cm of the anal verge. Transmission of the involved pathogens is usually due to direct inoculation into the rectum during anal intercourse.
- Proctocolitis: Inflammation of the rectal mucosa and of the colon extending above 10–12 cm of the anal verge; generally has an infectious etiology different from proctitis. Transmission is usually fecal-oral.
- Enteritis: Inflammation of the duodenum, jejunum and/or ileum. Transmission is usually fecal-oral.

Table 1 lists the pathogens involved in the common sexually transmitted gastrointestinal syndromes and their modes of acquisition.

Table 1. Common sexually transmitted gastrointestinal syndromes[1]

Syndrome	Pathogen(s)	Mode of acquisition
Proctitis	• *Neisseria gonorrhoeae* • *Chlamydia trachomatis* (LGV and non-LGV serovars) • *Treponema pallidum* • Herpes simplex virus	Receptive anal intercourse in the majority of cases
Proctocolitis	• *Entamoeba histolytica* • *Campylobacter* species • *Salmonella* species • *Shigella* species • *C trachomatis* (LGV serovars)	Direct or indirect fecal-oral contact
Enteritis	• *Giardia lamblia*	Direct or indirect fecal-oral contact

LGV = lymphogranuloma venereum

Epidemiology[2]

- Sexual practices of individuals often involve direct or indirect contact with the rectal mucosal membranes (i.e., sharing sex toys).
- Sexually transmitted intestinal syndromes occur commonly in men who have sex with men who engage in unprotected anal intercourse or oral-anal and oral-genital sexual activities.
- Heterosexual men and women can also be at risk for acquiring enteric infections by oral-anal sexual activities.
- Women can acquire sexually transmitted anorectal pathogens by unprotected anal intercourse.
- Unprotected anal intercourse is being reported more frequently among several subpopulations, such as sexually active adolescents and street youth.

Prevention

- Since anal intercourse is the main mode of sexual transmission for pathogens that cause proctitis, clinicians should identify barriers to prevention practices and discuss means to overcome them.
- Since oral-anal sexual activities are the main mode of acquisition for sexually transmitted proctocolitis and enteritis, the risks of fecal-oral contamination should be discussed, particularly with sex workers and men who have sex with men.

Manifestations

- Typical presenting symptoms of the different sexually transmitted intestinal syndromes are listed in Table 2.
- Asymptomatic infections are also prevalent.
- Clinicians should routinely inquire about specific sexual activities, regardless of the patient's reported sexual preference (see Primary Care and Sexually Transmitted Infections chapter).

Table 2. Possible symptoms of sexually transmitted intestinal syndromes

Syndrome	List of possible symptoms
Proctitis	• Anorectal pain • Tenesmus • Constipation • Hematochezia (bloody stools) • Mucopurulent discharge
Proctocolitis	• Proctitis symptoms • Diarrhea • Cramps • Abdominal pain • Fever
Enteritis	• Diarrhea • Cramps • Bloating • Nausea

Diagnosis

- If a symptomatic patient reports any anorectal sexual activities, anoscopic evaluation should be a routine part of the physical examination.
- Specimen collection should be adapted to the clinical presentation and history, including possible exposure to lymphogranuloma venereum (LGV) (see *Lymphogranuloma Venereum* chapter). For example, in some cases of enteric infections, evaluation for sexually transmitted pathogens might not be relevant.
- Anoscopic examination for proctitis:
  - Obtain rectal swabs for culture, preferably under direct vision through an anoscope, for appropriate diagnostic testing for *N gonorrhoeae, C trachomatis* (further testing is required for positive cultures to differentiate between Chlamydia and LGV infections), and herpes simplex virus.

  - A specimen from the lesions should also be collected for a diagnostic test for HSV.
  - Syphilis serology should also be performed in all patients (see *Syphilis* chapter).
  - Although nucleic acid amplification tests (NAATs) are available for detection of gonococcal and chlamydial infections in urogenital specimens, they have not been extensively studied for rectal specimens.
- If indicated by clinical presentation and/or history, collect stool specimen for culture for enteric pathogens and examination for ova and parasites.

Management and Treatment

- Treatment of sexually transmitted intestinal infections should be based on physical findings.
- A high index of suspicion concerning the different etiological agents should be maintained by the clinician.
- Most often, treatment of suspected proctitis will be empirical and should not await test results.

Table 3. Recommended treatment regimens according to suspected or proven diagnosis[2]

Suspected or proven diagnosis	Recommended treatment regimens*
If an anorectal exudate is found on examination, treat for proctitis due to *N gonorrhoeae*† and *C trachomatis* (see *Gonococcal Infections* chapter, and *Chlamydial Infections* chapter, for alternative treatment recommendations; see *Lymphogranuloma Venereum* chapter for treatment recommendations for LGV serovars of *C trachomatis*)	• Cefixime 400 mg PO in a single dose *[A-I]* OR • Ciprofloxacin 500 mg PO in a single dose (unless not recommended due to quinolone resistance: see *Gonococcal Infections* chapter) *[A-I]* OR • Ofloxacin 400 mg PO in a single dose (unless not recommended due to quinolone resistance: see *Gonococcal Infections* chapter) *[A-I]* PLUS • Doxycycline 100 mg PO twice a day for 7–10 days *[A-I]* OR • Azithromycin 1 g PO in a single dose if poor compliance is expected *[A-I]*
If patient is suspected or proven to have HSV infection	Treat with antiviral regimens according to genital HSV infection recommendations (see *Herpes Simplex Virus Infections* chapter)

Table 3. Recommended treatment regimens according to suspected or proven diagnosis[2] (continued)

Suspected or proven diagnosis	Recommended treatment regimens*
If patient is suspected or proven to have *T pallidum* infection	• Benzathine penicillin 2.4 million units IM in a single dose (primary and secondary syphilis) *[A-I]* OR • Treat according to syphilis treatment recommendations for other suspected stages of syphilis or in HIV-infected individuals (see *Syphilis* chapter)
If patient is suspected or proven to have an enteric pathogen other than those listed above	Treat according to the specific pathogen management and treatment recommendations

HSV = herpes simplex virus
LGV = lymphogranuloma venereum
* For references associated with the treatment recommendations, see *Chlamydial Infections*, *Gonococcal Infections*, *Genital Herpes Simplex Virus Infections* and *Lymphogranuloma Venereum* chapters.
† Other broad-spectrum quinolones may be effective but not recommended as first line agents because of their cost.

Consideration for Other STIs

- Proctitis is associated with specific high-risk sexual activities; therefore, patients presenting with symptoms should be evaluated for other STIs.
- Counselling and testing for HIV are recommended.
- Screening for hepatitis B markers may be considered in certain high-risk individuals before considering immunization.
- Immunization against hepatitis A and B is recommended.
- Serologic testing for syphilis should be strongly considered in all individuals presenting with proctitis.

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 proctitis is indicated, all partners who have had sexual contact with the index case within 60 days prior to onset of symptoms or date of diagnosis where asymptomatic should 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.

Follow-up

- Follow-up should be arranged for every patient. If a recommended treatment regimen has been given and properly taken, symptoms and signs have disappeared and there has been no re-exposure to any untreated partner, then repeat diagnostic testing for *N gonorrhoeae* and *C trachomatis* is not routinely recommended.
- In cases of confirmed syphilis, appropriate serological follow-up according to syphilis recommendations should be carried out.

Special Considerations

- Despite movement toward more social consciousness and awareness of STIs and diversity in sexual practices, real and perceived prejudice on the part of some clinicians against anorectal activities may contribute to a reluctance to seek medical care or to disclose sexual behaviours.

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URETHRITIS

Etiology[1]

- Important causes to consider:
  - *Neisseria gonorrhoeae*
  - *Chlamydia trachomatis*
- Other possible causes:
  - *Trichomonas vaginalis*[2]
  - Herpes simplex virus[3]
  - *Mycoplasma genitalium*[4,5]
  - *Ureaplasma urealyticum*[1]
- Other, less common considerations include the following:
  - Adenovirus[6,7]
  - *Candida albicans*[8]

Definition

- Clinical syndrome:
  - Inflammation of the urethra, with or without urethral discharge.
  - Discharge, if present, can be mucoid, mucopurulent or purulent.
  - May also be manifested by dysuria, urethral pruritis or meatal erythema.
- Microscopic definition: presence of ≥5 polymorphonuclear leukocytes (PMNs) per oil immersion field (x1000) in five non-adjacent, randomly selected fields on a smear.[9]
- Non-gonococcal urethritis (NGU) refers to urethritis not caused by *N gonorrhoeae.*

Epidemiology

- Limited data are available on the incidence or prevalence of urethritis.

Natural history

- Symptoms of gonococcal urethritis develop 2–6 days after acquisition.
- Symptoms of NGU develop 1–5 weeks after acquisition (usually at 2–3 weeks).
- Up to 25% of infections, especially NGU, can be asymptomatic.[10]

Prevention

- Use clinical evaluation as an opportunity to review safer sexual practices, explore barriers to adopting these practices and problem-solve to overcome such barriers in the future.
- Advise on consistent condom use.
- Advise patient to abstain from unprotected intercourse until 7 days after initiating treatment.

Manifestations

- Urethral discharge.
- Dysuria.
- Urethral itching or meatal erythema.
- Often asymptomatic.
- Although urinary frequency, hematuria and urgency can, on rare occasions, occur with urethritis, the presence of any of these symptoms requires more extensive evaluation.

Diagnosis

Specimen collection

- Discharge: obtain sample by having patient milk penis three to four times from base to glans.[11]
- Endourethral swab: pass swab 2 cm into the urethra, rotate and remove for Gram stain and testing.
- Urine sample: obtain first 10–20 mL of first-catch urine, any time of day, but preferably after having not voided for at least 2 hours.[12]

Laboratory diagnosis

- Testing for both gonorrhea and chlamydia is recommended (see *Chlamydial Infections* and *Gonococcal Infections* chapters for more information on testing).
- Obtain the following:
  - Gram stain of discharge or endourethral specimen for PMNs and Gram-negative diplococci (if available).
  - If nucleic acid amplification tests (NAATs) are available:
    - NAAT of urine for *C trachomatis*[13,14] and culture of endourethral swab for *N gonorrhoeae*.
  - If NAAT is unavailable:
    - Direct fluorescent antibody (DFA), enzyme immunoassay (EIA), or culture for *C trachomatis*[14] and culture of endourethral swab for *N gonorrhoeae*.
- Although NAATs for gonorrhea may be considered in cases where transport and storage conditions are not conducive to maintaining the viability of *N gonorrhoeae* or obtaining a swab is not possible, culture is the preferred method, because it allows for antimicrobial susceptibility testing.

Caution:

- Presence of the following symptoms suggest an alternative diagnosis:
  - Hematuria.
  - Fever, chills.
  - Frequency, nocturia, urgency.
  - Perineal pain, scrotal masses.
  - Difficulties initiating and maintaining stream.
  - Lymphadenopathy.

Management and Treatment (see Figure 2)

- Gonococcal urethritis: Cefixime 400 mg PO in a single dose PLUS EITHER doxycycline 100 mg PO bid for 7 days[15] *[A-I]* OR azithromycin 1 g PO in a single dose if poor compliance is expected *[A-I]*.
- Non-gonococcal urethritis: doxycycline 100 mg PO bid for 7 days[16–18] *[A-I]* OR azithromycin 1 g PO in a single dose if poor compliance is expected *[A-I]*.
- Alternative regimens are available for gonococcal infections/chlamydial infections (see *Gonococcal Infections and Chlamydial Infections* chapters).
- Single-dose regimens offer improved compliance and are especially useful in certain populations such as street youth, but they are also the most expensive.
- Resolution of symptoms can take up to 7 days after therapy has been completed.
- Patients should abstain from unprotected intercourse until 7 days after initiating treatment.
- Asymptomatic infections in men are common and should be treated.

Consideration for Other STIs

- Obtain serology for syphilis.
- Review immunization status for hepatitis B; offer vaccination if the patient is not protected and testing if the patient is at high risk.
- Offer HIV testing and counselling.
- In men who have sex with men, consider hepatitis A vaccine.

Reporting and Partner Notification

- Urethritis caused by certain agents (e.g., *C trachomatis*, *N gonorrhoeae*) is a notifiable communicable disease for provinces and territories. All conditions and diseases that are notifiable should be reported to public health departments in accordance with local regulations and laws.
- All sexual partners of the index case from 60 days prior to symptom onset or date of diagnosis where asymptomatic should be identified and receive a clinical evaluation, including appropriate screening tests and appropriate prophylactic treatment, regardless of findings on clinical examination.
- Where possible, encourage the use of public health authorities or treating physician to conduct contact tracing in order to increase the number of partners contacted.[19]

Follow-up

- If treatment is taken and symptoms resolve, test of cure is not routinely recommended.
- If symptoms persist or recur after completed therapy (1 week after initiation of therapy), the patient should be re-evaluated.

- Symptoms alone are not sufficient for retreatment in the absence of laboratory findings or clinical signs.
- If a test of cure is indicated and a NAAT is being used for follow-up testing, testing should not be conducted until 3 weeks after treatment to avoid a false positive.

Special Considerations

Recurrent or persistent urethritis

- Often a difficult problem.
- Must reconfirm the presence of urethritis using smear and Gram stain.
- Critical to differentiate urethritis from functional complaints.
- Important to inform patient at the start of care for recurrent urethritis that it can be a difficult clinical problem to address, but that symptoms often resolve.
- If there is a microbiologically or clinically documented failure with persistent urethritis, consider the following:
  - Re-exposure to untreated partner.
  - Infection acquired from new partner.
  - Medication not taken correctly/not completed.
  - Infection with other pathogens.
  - Presence of resistant organisms.[20]
  - Other causes (e.g., urinary tract infection, prostatitis, phimosis, chemical irritation, urethral strictures, tumours).
- Consider:
  - Repeat specimens (urine and endourethral) for Gram stain, culture and NAAT for *N gonorrhoeae* and *C trachomatis*.
  - Endourethral swab or urine for *T vaginalis*.[2,21]
  - Endourethral swab or urine for herpes simplex virus culture, although usually associated with lesion.[3,22]
  - Endourethral specimen or first-void urine for culture for *U urealyticum* and *M genitalium*[5] (usually at specialized laboratory).
  - Urology or infectious diseases consultation if unresolved.
  - Determine whether other underlying etiologies, such as anxiety, contribute to symptoms.

Children with urethritis

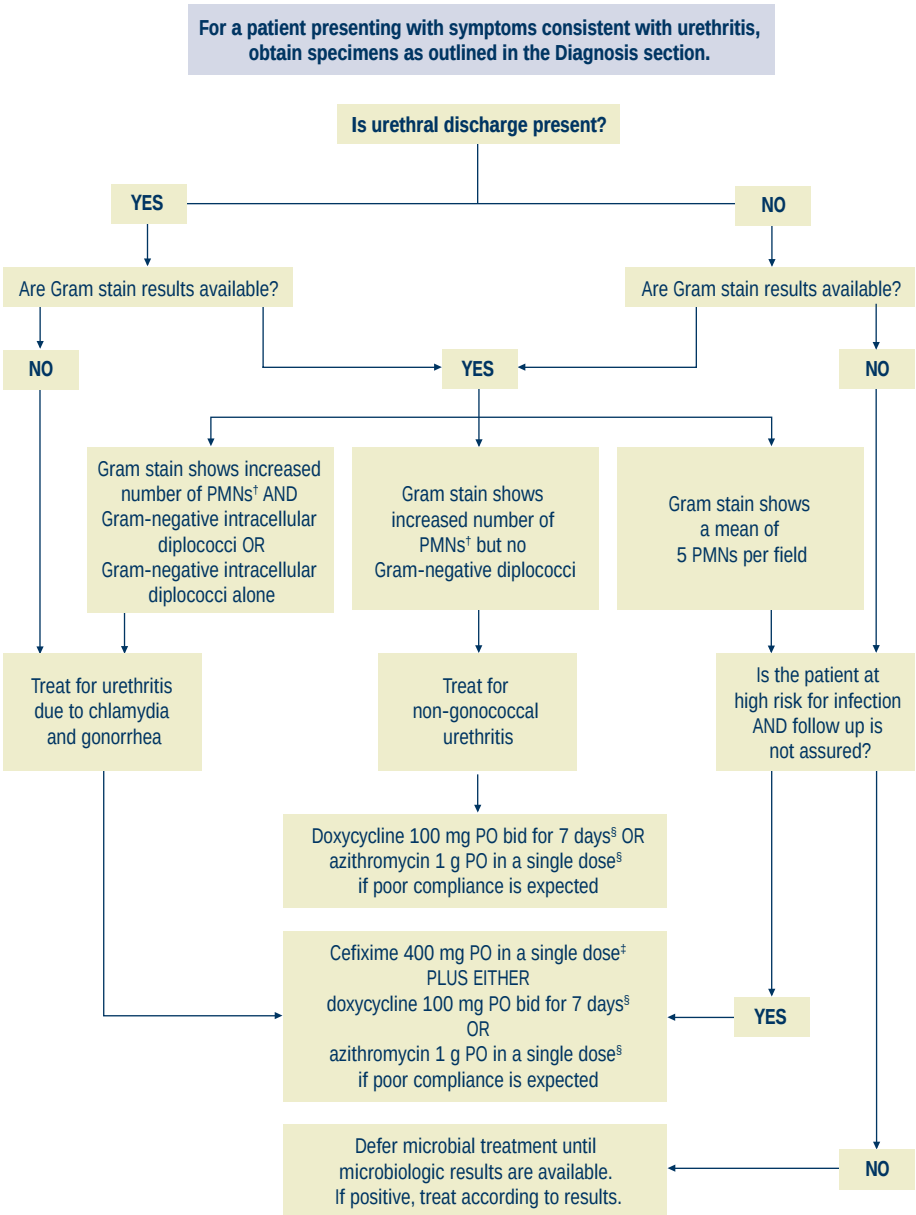
- Sexual abuse must be considered if there are symptoms of unexplained pyuria in prepubertal boys or young males who are not sexually active (see *Sexual Abuse in Peripubertal and Prepubertal Children* chapter).
- Practitioners need to follow provincial guidelines for reporting any suspected cases of child sexual abuse to appropriate authorities.
- Young men and women with urethritis may be erroneously diagnosed with urinary tract infections.

- In addition to symptoms present in adults, children with urethritis can also demonstrate the following:
  - Abdominal pain.
  - Unwillingness to void.
  - Enuresis.
- For treatment regimens in children, see *Gonococcal Infections* and *Chlamydial Infections* chapters.
- Repeat testing should be offered to all children.

Urethritis in women

- Urethritis caused by *N gonorrhoeae* and *C trachomatis* in women can occur without cervicitis.
- Dysuria and urinary frequency may be symptoms of urethritis and thus may mimic cystitis.
- Specimens for *C trachomatis* and *N gonorrhoeae* in women should be obtained from both urine and endocervical specimens.

Figure 2. Urethritis treatment flow chart*



PMN = polymorphonuclear leukocytes

* Treatment flow chart only. Specimens to be collected and sent for laboratory testing as outlined in the Diagnosis section.

† A mean of ≥5 PMNs per field (x 1000) in five non-adjacent fields.

‡ For alternative regimens, see *Gonococcal Infections* chapter.

§ For alternative regimens, see *Chlamydial Infections* chapter.

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VAGINAL DISCHARGE (BACTERIAL VAGINOSIS, VULVOVAGINAL CANDIDIASIS, TRICHOMONIASIS)

Etiology

- The three infections most commonly associated with vaginal discharge in adult women are:
  - *Bacterial vaginosis* (BV)
  - *Vulvovaginal candidiasis* (VVC)
  - *Trichomoniasis*

- On occasion, vaginal discharge may be seen in cervicitis caused by *Neisseria gonorrhoeae* or *Chlamydia trachomatis*.
- Non-infectious causes of vaginal discharge include the following:
  - Excessive physiologic secretions
  - Desquamative inflammatory vaginitis
  - Atrophic vaginitis (scant discharge)
  - Foreign bodies
- Non-infectious causes of vulvovaginal pruritis without discharge should also be considered:
  - Irritant or allergic dermatitis (e.g., latex, soaps, perfumes)
  - Skin disorders, such as the following:
    - Lichen sclerosus (may increase the risk of vulvar cancer)
    - Squamous cell hyperplasia
    - Lichen planus
    - Psoriasis

Bacterial vaginosis

- Most common cause of vaginal discharge.
- Characterized by an overgrowth of genital tract organisms (e.g., *Gardenerella*, *Prevotella*, *Mobiluncus* spp.) and a depletion of lactobacilli.
- Not usually considered sexually transmitted.

Vulvovaginal candidiasis

- Approximately 90% of cases caused by *Candida albicans*; remainder caused by other *Candida* spp. (e.g., *C glabrata*) or *Saccharomyces cerevisiae*.
- Not usually considered sexually transmitted.

Trichomoniasis

- Caused by *Trichomonas vaginalis*, a protozoa.
- Sexually transmitted.

Epidemiology

- Vaginal complaints are common in primary care and are among the most common reasons for gynecological consultation.

Bacterial vaginosis

- Prevalence has been estimated at 10–30% of pregnant women and 10% of family practice patients.[1,2]
- BV during pregnancy is associated with premature rupture of the membranes, chorioamnionitis, preterm labour, preterm birth and post-cesarean delivery endometritis.[3]
- The presence of BV during an invasive procedure, such as placement of an intrauterine device (IUD), endometrial biopsy or uterine curettage, has been associated with post-procedure pelvic inflammatory disease and vaginal cuff cellulitis.[4,5]
- Presence of BV is associated with increased acquisition of HIV.[6,7]

Vulvovaginal candidiasis

- Approximately 75% of women will experience at least one episode of VVC during their lifetime, and 5–10% will have more than one episode.[8]
- The incidence of recurrent VVC (four or more symptomatic episodes of VVC a year) has been estimated at 5% of women of reproductive age.[8]
- Among HIV-positive women, lower CD4 counts and high viral loads are associated with persistent *Candida* colonization and an increased incidence of VVC.[9–12]

Trichomoniasis

- The prevalence of trichomoniasis has not been well determined. In one study in a U.S. sexually transmitted infection (STI) clinic, the prevalence was estimated to range from 10–35%; however, these data are not likely to be generalizable.[13] Among men attending STI clinics, the prevalence has been estimated at 3–20%.[13]
- Trichomoniasis is associated with an increased risk of HIV acquisition and transmission in women. [13-15]

Prevention

- Predisposing factors for BV and VVC are listed in Table 1.
- Trichomoniasis is sexually transmitted and can be prevented by practicing safer-sex.

Manifestations and Diagnosis

- The symptoms and signs associated with these infections are not specific (see Table 1).
- Definitive diagnosis is based on laboratory testing.[16]

Table 1. Diagnostic features and laboratory diagnosis

	Bacterial vaginosis	Candidiasis	Trichomoniasis
Sexual transmission	• Not usually considered sexually transmitted	• Not usually considered sexually transmitted	• Sexually transmitted
Predisposing factors	• Often absent • More common if sexually active • New sexual partner • IUD use	• Often absent • More common if sexually active • Current or recent antibiotic use • Pregnancy • Corticosteroids • Poorly controlled diabetes • Immunocompromised	• Multiple partners
Symptoms	• Vaginal discharge • Fishy odour • 50% asymptomatic	• Vaginal discharge • Itch • External dysuria • Superficial dyspareunia • Up to 20% asymptomatic	• Vaginal discharge • Itch • Dysuria • 10–50% asymptomatic
Signs	• White or grey, thin, copious discharge	• White, clumpy, curdy discharge • Erythema and edema of vagina and vulva	• Off-white or yellow, frothy discharge • Erythema of vulva and cervix ("strawberry cervix")
Vaginal pH	• >4.5	• <4.5	• >4.5
Wet mount	• PMNs • Clue cells*	• Budding yeast • Pseudohyphae	• Motile flagellated protozoa (38–82% sensitivity)†

Table 1. Diagnostic features and laboratory diagnosis (continued)

	Bacterial vaginosis	Candidiasis	Trichomoniasis
Gram stain	• Clue cells* Decreased normal flora • Predominant Gram-negative curved bacilli and coccobacilli	• PMNs • Budding yeast • Pseudohyphae	• PMNs • Trichomonads
Whiff test	• Positive	• Negative	• Negative
Preferred treatment (see Tables 3–9)	• Metronidazole • Clindamycin	• Antifungals	• Metronidazole • Treat partner

IUD=intrauterine device
PMN=polymorphonuclear leukocytes
*Clue cells are vaginal epithelial cells covered with numerous coccobacilli.
†Culture is more sensitive than microscopy for *T vaginalis*.

Specimen collection

- Speculum examination.
- Rule out cervicitis.
- Collect a sample of the discharge from the vaginal wall for microscopy (if microscopy is not available on-site, see Figure 1 for syndromic management).
- Although not a sensitive test, Gram stain may be helpful in diagnosing mucopurulent cervicitis (MPC) and gonorrhea in symptomatic females.
- A negative wet mount does not rule out an infectious cause of vaginitis.
- Culture is rarely needed in acute cases of vaginitis.

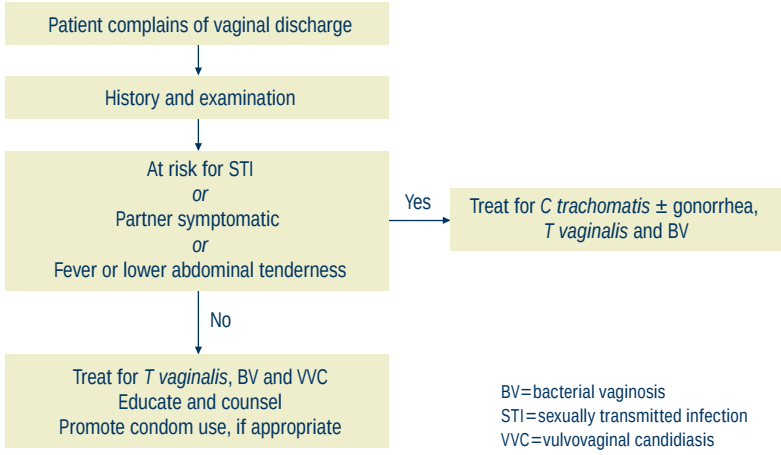
Table 2. Specimen collection

Test	Procedure	Normal result
pH test	• Use narrow-range pH paper	pH ≤4.5
Wet mount	• Place a drop of vaginal discharge on a slide; mix with a drop of 0.9% saline*; apply a cover slip; examine immediately under a microscope at low and high power • Examine for leukocytes, clue cells, lactobacilli, yeast and trichomonads	Epithelial cells and rare white blood cells
Whiff test/ KOH slide (optional)	• Place a drop of discharge on a slide; mix with a drop of 10% KOH; an amine (fishy) odour after applying the KOH is a positive test; apply a cover slip; examine under a microscope at low and high power • Examine for yeast	Negative
Gram stain		Predominantly large Gram-positive bacilli

* While KOH destroys cellular debris and allows one to more clearly detect yeast cells and hyphae, it also destroys the epithelial cells in clue cells needed to diagnose BV and lyses trichomonads. Therefore, for vaginitis, saline is necessary.

Figure 1. Syndromic management of vaginal discharge

For situations where on-site microscopy is not available, the World Health Organization has developed an algorithm for management of vaginal discharge.[17]



Consideration for Other STIs

- In a case of trichomoniasis, other STIs must be considered. If appropriate, based on the patient's and partner's risk factors (and immunization status in the case of hepatitis B), specimens can be taken for the following:
  - Gonorrhea and chlamydia
  - Syphilis
  - HIV
  - Hepatitis B

Bacterial Vaginosis

Management and Treatment

Table 3. Treatment of bacterial vaginosis

Asymptomatic	Symptomatic
Treatment is unnecessary except in cases of: • High-risk pregnancy (history of preterm delivery) • Prior to IUD insertion • Prior to gynecologic surgery, therapeutic abortion or upper tract instrumentation	*Preferred* • Metronidazole 500 mg PO bid for 7 days • Metronidazole gel 0.75%, one applicator (5 g) once a day intravaginally for 5 days • Clindamycin cream 2%, one applicator (5 g) intravaginally once a day for 7 days *Alternatives* • Metronidazole 2 g PO in a single dose • Clindamycin 300 mg PO bid for 7 days
• For therapy with metronidazole, a 7 day oral course and a 5 day course of gel are equally efficacious (cure rate 75–85%).[18–20] A single oral dose also has a cure rate of 85% but a higher relapse rate at 1 month (35–50% vs. 20–33%) *[A-I]*[21] • In one study, clindamycin cream was equivalent to both metronidazole regimens (cure rate of 75–86%) *[A-I]*[20]	

IUD = intrauterine device

Notes:

- Patients should not drink alcohol during and for 24 hours after oral therapy with metronidazole because of a possible disulfiram (antabuse) reaction.
- Clindamycin cream is oil-based and may cause latex condoms or diaphragms to fail.

Recurrent bacterial vaginosis

- 15–30% of patients develop a recurrence in the first 1–3 months after treatment.[22]
- Reconfirm diagnosis.

Table 4. Treatment of recurrent bacterial vaginosis

- Metronidazole 500 mg PO bid for 10–14 days *[B-III]*[22,23]
- Metronidazole gel 0.75%, one applicator (5 g) once a day intravaginally for 10 days, followed by suppressive therapy of metronidazole gel twice a week for 4–6 months *[B-III]*[24]

Note:

- Patients should not drink alcohol during and for 24 hours after oral therapy with metronidazole because of a possible disulfiram (antabuse) reaction.

Reporting and Partner Notification

- Bacterial vaginosis is not a reportable disease.
- Treatment of male sexual partners is not indicated and does not prevent recurrence.

Follow-up

- No follow-up is necessary unless the patient is pregnant or symptoms recur.

Special Considerations

Pregnancy

- BV during pregnancy is associated with premature rupture of the membranes, chorioamnionitis, preterm labour, preterm birth and post-cesarean delivery endometritis.
- Routine screening for BV during pregnancy is not recommended, although evidence is available to support screening and treatment at 12–16 weeks in high-risk pregnancies (see *Pregnancy* chapter). However, symptomatic women should be tested and treated.
- Treatment of asymptomatic BV in women with a previous preterm birth may reduce the risk of preterm prelabour rupture of the membranes and low birth weight *[B-I]*.[25,26] Treat with oral antibiotics: oral metronidazole and clindamycin are not contraindicated during pregnancy or breastfeeding.[26–31] Topical antibiotics have no effect on preterm birth, though topical clindamycin treatment has been associated with adverse outcomes in the newborn when used in pregnancy (see *Pregnancy* chapter).
- Testing should be repeated after 1 month to ensure that therapy was effective.

HIV

- The same therapy is recommended for HIV-positive as for HIV-negative patients.

Vulvovaginal Candidiasis

Management and Treatment

Uncomplicated vulvovaginal candidiasis

Table 5. Treatment of uncomplicated vulvovaginal candidiasis

Asymptomatic	Symptomatic
Treatment is unnecessary	• Intravaginal, over-the-counter azole ovules and creams (e.g., clotrimazole, miconazole)
	• Fluconazole 150 mg PO in a single dose. *Contraindicated in pregnancy*
• Topical and oral azoles are equally effective *[A-I]*.[32] Efficacy estimated at 80–90%[32] • In most cases, expect resolution of symptoms in 2–3 days	

Note:
- Oil-based ovules and creams may cause latex condoms or diaphragms to fail.

Complicated vulvovaginal candidiasis

- Defined as recurrent VVC, severe VVC, a non-*albicans* species or occurring in a compromised host.

Recurrent VVC (RVVC)

- Four or more episodes of VVC in a 12 month period.
- Confirm the diagnosis of RVVC by obtaining a vaginal culture and full identification of the isolated species, which should be used to guide therapy. Non-*albicans Candida* species are found in 10–20% of patients with RVVC.[33] Conventional antifungal therapy is not as effective against some of these species (see Table 8).
- Treatment requires induction, usually followed by a 6-month maintenance regimen (see Table 6).
- For patients prone to RVVC who require a course of antibiotics, prophylactic topical or oral azoles, such as fluconazole 150 mg PO, can be given at the start of the antibiotic course and once a week during the duration of the course *[B-III]*.[8]

Table 6. Treatment of recurrent vulvovaginal candidiasis

Induction treatment

- Fluconazole 150 mg PO once every 72 hours for three doses *[A-I]*.[34] Efficacy 92%.
  Contraindicated in pregnancy
- Topical azole for 10–14 days *[B-II]*[35–38]
- Boric acid 300–600 mg gelatin capsule intravaginally once a day for 14 days *[B-II]*.[39,40]
  Less mucosal irritation experienced when 300 mg used.[40] Efficacy approximately 80%.[40]
  Contraindicated in pregnancy

Notes:
- Each individual episode of RVVC caused by *C albicans* usually responds to a course of oral or topical azoles, with a longer course usually more effective than a shorter one.[36]
- Without maintenance therapy, VVC recurs in 50% of patients within 3 months.
- Start maintenance therapy as soon as initial treatment has been completed.

Maintenance treatment

- Fluconazole 150 mg PO once a week *[A-I]*.[34] Recurrence occurred in 10% while receiving therapy
- Ketoconazole 100 mg PO once a day *[A-I]*.[41] Recurrence occurred in 5% while receiving therapy. Patients receiving long-term ketoconazole should be monitored for hepatotoxicity (incidence 1 in 12,000)
- Itraconazole 200–400 mg PO once a month *[A-I]*.[42,43] Recurrence occurred in 36% while receiving therapy[43]
- Clotrimazole 500 mg intravaginally once a month *[A-I]*[44]
- Boric acid 300 mg capsule intravaginally for 5 days each month beginning the first day of the menstrual cycle *[B-II]*.[40] Recurrence occurred in 30% while receiving therapy[40]

Notes:
- Duration of maintenance therapy is a minimum of 6 months. After 6 months, discontinue therapy and observe.
- Relapse rate is high, with approximately 60% of women relapsing within 1–2 months of discontinuing maintenance therapy.[8,36]
- If recurrence occurs, treat the episode and then reintroduce a maintenance regimen.
- Fluconazole and boric acid are contraindicated in pregnancy.
- Oil-based ovules and creams may cause latex condoms or diaphragms to fail.

RVVC = recurrent vulvovaginal candidiasis
VVC = vulvovaginal candidiasis

Severe VVC

- Extensive vulvar erythema, edema, excoriation or fissure formation.

Table 7. Treatment of severe vulvovaginal candidiasis

- Fluconazole 150 mg PO once every 72 hours for two doses *[A-I]*.[33] *Contraindicated in pregnancy*
- Topical azole for 10–14 days *[B-III]* [8,35,37,38]

Note:

- Oil-based ovules and creams may cause latex condoms or diaphragms to fail.

Non-albicans VVC

- Most commonly due to *C glabrata*, which is 10- to 100-fold less susceptible to azoles than *C albicans*.[8]

Table 8. Treatment of non-*albicans *vulvovaginal candidiasis

Initial treatment

- Boric acid 600 mg capsule intravaginally once a day for 14 days *[B-II]*.[38,39,45,46] Efficacy 64–81%. Vaginal burning reported in <10%
- Flucytosine cream 5 g intravaginally once a day for 14 days *[B-II]*.[46,47] Efficacy 90%
- Amphotericin B 50 mg suppository intravaginally once a day for 14 days *[B-III]*.[48] Efficacy 80% (10 patients). Mild external irritation reported in 10%
- Flucytosine 1 g PLUS amphotericin B 100 mg (combined in a lubricating jelly) administered intravaginally once a day for 14 days *[B-III]*.[49,50] Efficacy 100% (4 patients)

If symptoms recur

- Retreat with boric acid 600 mg capsule intravaginally once a day for 14 days followed by: alternate-day boric acid for several weeks or 100,000 units of nystatin vaginal suppositories once a day for 3–6 months *[B-III]* [8]

Note:

- No safety data available for long-term use of boric acid.[51]

Compromised host

- Corticosteroids, uncontrolled diabetes.
- *C glabrata* and other non-*albicans* species are isolated more frequently in women with diabetes than in those without.
- Treat with a longer (10–14 day) course of an intravaginal azole *[B-III]* or boric acid 600 mg capsule intravaginally once a day for 14 days *[B-II]*.[37,38]

Reporting and Partner Notification

- Vulvovaginal candidiasis is not a reportable disease.
- Routine screening and treatment of male partners is not indicated.[52–54] However, male sexual partners should be treated if *Candida* balanitis is present. Use a topical azole cream twice a day for 7 days.

Follow-up

- No follow-up necessary unless symptoms persist or recur.
- Consider culture and sensitivity of yeast if not responding to appropriate therapy or if infection recurs.

Special Considerations

Pregnancy

- Only topical azoles are recommended for treatment of vulvovaginal candidiasis during pregnancy. Treatment for 7 days may be necessary.[55]

HIV

- The treatment of candidiasis is the same in HIV-positive as it is in HIV-negative individuals.
- Vaginal candidiasis is often recurrent and more severe in HIV-positive women and, in some cases, will require more aggressive and long-term therapy.

Trichomoniasis

Management and Treatment

Table 9. Treatment of trichomoniasis

- Metronidazole 2 g PO in a single dose *[A-I]*[56]
- Metronidazole 500 mg PO bid for 7 days *[A-I]*[56]

- Efficacy 82–88% for both regimens; increases to 95% if partner also treated[56]
- Intravaginal metronidazole gel is not effective

Note:

- Patients should not drink alcohol during and for 24 hours after oral therapy with metronidazole because of a possible disulfiram (antabuse) reaction.

Reporting and Partner Notification

- Trichomoniasis is a reportable disease in some jurisdictions.
- Partners should be treated for trichomoniasis, regardless of symptoms (it is not necessary to screen partners for trichomonas). The majority of men infected with *T vaginalis* are asymptomatic, but some may have mild urethritis. Treat sexual partners with the same therapy as recommended for the case.

Follow-up

- No follow-up necessary unless symptoms recur; usually due to reinfection.
- Prevalence of metronidazole-resistant *T vaginalis* estimated at 5%. Usually responds to high-dose metronidazole.[57]

Special Considerations

Pregnancy

- Trichomoniasis may be associated with premature rupture of the membranes, preterm birth and low birth weight.
- Symptomatic pregnant women should be treated with metronidazole 2 g PO in a single dose for symptom relief *[A-I]*. An alternative treatment is metronidazole 500 mg PO bid for 7 days *[A-I]*. It is not known whether treatment will improve pregnancy outcomes.[58,59]
- It is not recommended that asymptomatic pregnant women be treated *[D-I]*.[60]
- Metronidazole is not contraindicated during pregnancy or breastfeeding.[26–31]

HIV

- The same therapy is recommended for HIV-positive as for HIV-negative patients.

The Use of Live *Lactobacilli* to Restore Normal Vaginal Flora

- *Lactobacilli* preparations are commonly used in the treatment of BV and VVC. One small randomized trial in healthy women showed that the use of oral *Lactobacilli* was safe and resulted in increased vaginal *Lactobacilli* and decreased yeast as compared to the placebo group.[61] However, in a more recent, well-conducted randomized, controlled trial of 278 women, oral and vaginal *L rhamnosus* was ineffective in the prevention of post-antibiotic VVC.[62]
- Two randomized, controlled trials have studied the use of a topical *L acidophilus*–low dose estriol combination, one in the management of BV, the other for several infections (BV, VVC, trichomoniasis).[63,64] Both showed a statistically significant greater reduction in symptoms and microscopic restoration of normal flora than the placebo group.

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MANAGEMENT AND TREATMENT OF SPECIFIC INFECTIONS

CHANCROID

Etiology

- Genital ulcer disease (GUD) due to *Haemophilus ducreyi* or chancroid. *H ducreyi* is a fastidious Gram-negative rod.

Epidemiology

- Chancroid has been widespread in areas of the world where sexually transmitted infection (STI) control is inadequate. Vulnerable females (particularly sex workers with limited access to care) who have multiple partners in spite of genital ulceration are the usual reservoir. Chancroid can only remain endemic in this context.[1,2]
- Reintroduction into societies in which chancroid has been eliminated occasionally occurs with travel. Clusters can occur around an index case (has been described in Canada).[1]
- It is readily eliminated with control activities directed toward sex workers, treatment of men with genital ulcers and enhanced attention to STI-control efforts.
- Chancroid is transmitted only by individuals with ulcerations; no latent reservoir of transmissible chancroid without active disease is known.
- The attack rate following intercourse with contacts who have not used protection is substantial (probably >50% of exposed men or women); incubation period is 5–14 days.
- In endemic areas, as many as 10% of chancroid patients may have concomitant herpes simplex virus (HSV) infection. *Treponema pallidum* may also co-exist with *H ducreyi*.
- Chancroid gained significance as an important STI when its role in the transmission of HIV became apparent during the 1980s.[3]
  - Accelerated increases in HIV prevalence have occurred in societies in which chancroid was endemic.
  - The risk of HIV transmission increases by 10–50-fold following sexual exposure to an individual with concomitant *H ducreyi* and HIV infection.[2,3] As a result, extensive research has been directed toward *H ducreyi* and chancroid.[4]
- Control can be achieved in most societies with limited infrastructure and resources.[2]
  - Has been essentially eliminated during the past decade from many areas of the world in which it was previously endemic, including much of eastern and southern Africa.[2]
  - Importation into other countries where it has already been eliminated will likely occur with reduced frequency.

Prevention

- Conventional STI-control measures are very effective: reducing the number of partners, the promotion and use of condoms for all high-risk sexual activities and early diagnosis in countries where chancroid is endemic.
- Female sex workers need to be trained to recognize genital ulceration and should have access to medical care.
- In an outbreak, microbiological diagnosis, enhanced education of sex workers and clients, and syndromic treatment of ulcers have together been very successful at limiting spread and eliminating *H ducreyi* infection locally.[2]
- Male circumcision also reduces susceptibility to *H ducreyi* infection; chancroid has been shown not to spread in populations where all men are circumcised.

Manifestations

- A papule develops following exposure, and this rapidly progresses to one or more pustular lesions. These rupture to form painful, purulent, shallow ulcers with a granulomatous base that readily bleeds.
  - In males, lesions occur on the prepuce, coronal sulcus and shaft of the penis.
  - In females, lesions can occur widely on the external genitalia but are rarely seen in the vagina or on the cervix.
- Multiple ulcers are common, particularly in women.
- Painful inguinal lymphadenitis occurs in 30% of patients, and lymph nodes may suppurate, become fluctuant and spontaneously rupture.
- Chancroid can mimic other genital ulcer diseases, particularly syphilis; however, chancroid lesions are usually painful, and classic primary syphilis chancres are generally painless.
- Chancroid rarely spreads from the genital tract and does not cause systemic disease.[5]

Diagnosis

- Clinical etiologic diagnosis is frequently erroneous; in Canada, careful etiologic investigation of an ulcer should be carried out, since chancroid is not known to be endemic.
  - Should include, wherever possible, culture for *H ducreyi* using specialized culture or transport media; these vary by location (check with your local laboratory for more information).
  - Other causes of GUD should be ruled out by performing either a dark field analysis or direct fluorescent antibody test for *T pallidum* for primary syphilis and a culture for HSV.
  - There are no useful serologic tests for the diagnosis of *H ducreyi*. Gram stain with Gram-negative coccobacilli in a “school of fish” pattern may be useful.
- Culture for *H ducreyi* requires specialized media.[4] In Kenya, the use of both gonococcal and Mueller Hinton agar facilitated the growth of most strains in prospective studies. Specimens should be collected from the base of ulcers into thioglycolate hemin-based transport media, as this can permit bacterial survival

(2–3 days at 4ºC) while the medium is being prepared.[4] *H ducreyi* grow optimally at 32ºC in a humid atmosphere containing 5% carbon dioxide.
- Nucleic acid amplification tests (NAATs) including a multiplex polymerase chain reaction (M-PCR) technique that identifies *H ducreyi*, *T pallidum* and HSV can be used but are not available in most laboratories.

Management

- Syndromic management is used globally for the immediate treatment of GUD at first contact with the health care system; it has been particularly effective at controlling both syphilis and chancroid. Intermittent, careful investigation should be performed in most societies to determine which microbial etiologies require syndromic management.
- Outbreak investigation and control should be routine in all countries in which syphilis and chancroid have been "eliminated." A rapid-response mode should be available to immediately address the appearance of either of these ulcerative diseases, with strategies to achieve effective re-establishment of regions "free" of both *H ducreyi* and *T pallidum*.
- All patients diagnosed with chancroid should undergo testing to rule out co-infection with other STIs, including HIV.

Treatment

- Syndromic treatment for chancroid consists of a single dose of 500 mg of ciprofloxacin, which has a cure rate of >90% *[A-I]*.[6]
- A 1-week course of erythromycin, 500 mg tid, also provides an excellent cure rate of >90%[6] but is associated with poorer compliance *[A-I]*.
- Another macrolide, azithromycin, has cured over 90% of patients when prescribed as a single oral 1 g dose *[A-I]*.[7–9]
- Ceftriaxone 250 mg IM has been successful, but failures have commonly occurred in HIV co-infected individuals *[A-I]*.[7,9,10]
- Treatment failures should be carefully evaluated with regard to both the etiology and the possible co-existence of other pathogens. Buboes should be aspirated or incised to relieve pain and prevent spontaneous rupture.

Reporting and Partner Notification

- All individuals who had sexual exposure to the index patient during the 2 weeks prior to the date of initial symptoms should be treated epidemiologically with a quinolone or another antibacterial known to be effective for index case(s).

Consideration for Other STIs

- Patients suspected of having chancroid should also be considered for the following STIs:
  - Lymphogranuloma venereum
  - HSV
  - Syphilis
  - Donovanosis (granuloma inguinale)

- All patients with presumed chancroid should also be tested for syphilis and HIV infection at presentation and 3 months later. Patients should also be tested appropriately for gonorrhea.
- Immunization for hepatitis B should be offered to non-immune patients.
- The opportunity to provide safer-sex counselling should not be missed.

Follow-up

- Repeat diagnostic testing for the detection of *H ducreyi* 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.

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CHLAMYDIAL INFECTIONS

(For Lymphogranuloma venereum, see Genital Ulcer Disease *and* Lymphogranuloma Venereum *chapters)*

Etiology

- Caused by *Chlamydia trachomatis* serovars D to K.

Epidemiology

- Reported rate in Canada and elsewhere has been increasing since 1997.[1]
- According to preliminary data, approximately 63,000 cases were reported in 2004 (197 per 100,000 population). (Preliminary data is subject to change; does not include Nunavut.)[2]
- Sexually active youth and young adults are disproportionately represented in the case reports for Chlamydia. The reported rate in 2004 was highest in youth/young adults 15 to 24 years of age, accounting for approximately ⅔ of the national reported cases.[2]
- Chlamydia is underdiagnosed because the majority of infected individuals are asymptomatic.[3–8]
- Underscreening is a gap in high-risk males and females. Males, the forgotten reservoir, have infrequent health-maintenance visits.[9–11]
- The usual incubation period from time of exposure to onset of infection is 2–3 weeks, but can be as long as 6 weeks.
- In the absence of treatment, infection persists for many months.
- Individuals infected with *Neisseria gonorrhoeae* are often co-infected with *C trachomatis*.[12,13]
- Risk factors:
  - Sexual contact with a chlamydia-infected person.
  - A new sexual partner or more than two sexual partners in the past year.
  - Previous sexually transmitted infections (STIs).
  - Vulnerable populations (e.g., injection drug users, incarcerated individuals, sex trade workers, street youth etc.) (see Specific Populations section).

Prevention

- Infection and its sequelae can be prevented by:
  - Consistent practice of safer sex (see *Primary Care and Sexually Transmitted Infections* chapter).
  - Identifying barriers to prevention practices and the means to overcome them.
  - Increased acceptance of testing by using a non-invasive urine-based nucleic acid amplification test (NAAT).

- Screening of at-risk groups (as per risk factors listed above).
  - Sexually active females under 25 years of age: evidence is insufficient for or against screening asymptomatic young males, though males with any risk factors (as listed above) should be screened.[7,8,10,14–21]
  - Pregnant women: all pregnant women should be screened at the first prenatal visit. For those who are positive or who are at high risk for reinfection, rescreening in the third trimester is indicated.[22–28]
- Repeat screening of individuals with chlamydia infection after 6 months.[23,29–32]
  - To prevent reinfection, partners need to be assessed, tested, treated and counselled.
  - Patients and contacts should abstain from unprotected intercourse until treatment of both partners is complete (i.e., after completion of a multiple-dose treatment or for 7 days after single-dose therapy).

Manifestations

Table 1. Symptoms and signs[33]

Females	Males	Neonates and infants
• Most often asymptomatic • Vaginal discharge • Dysuria • Lower abdominal pain • Abnormal vaginal bleeding • Dyspareunia • Conjunctivitis • Proctitis (commonly asymptomatic)	• Often asymptomatic • Urethral discharge • Urethral itch • Dysuria • Testicular pain • Conjunctivitis • Proctitis (commonly asymptomatic)	• Conjunctivitis in neonates • Pneumonia in infants <6 months of age

Table 2. Major sequelae

Females	Males
• Pelvic inflammatory disease • Ectopic pregnancy • Infertility • Chronic pelvic pain • Reiter syndrome	• Epididymo-orchitis • Reiter syndrome

Diagnosis

Laboratory diagnosis

(See *Laboratory Diagnosis of Sexually Transmitted Infections* chapter)

- Results are highly dependent on the type of test available; specimen collection and transport; and laboratory expertise. Consult with your local laboratory regarding available tests and their test performance.
- NAATs (e.g., polymerase chain reaction [PCR], transcription-mediated amplification [TMA]) are more sensitive and specific than culture, enzyme immunoassay (EIA) and direct fluorescent antibody assay (DFA). For non–medico-legal purposes, NAATs should be used whenever possible for urine, urethral or cervical specimens. Blood and mucus interfere with NAAT performance and can result in false-negative results: therefore, culture is recommended in such situations. NAATs have not been approved for use in vaginal specimens outside of a research setting. Culture is recommended for throat and rectal specimens, since NAATs have not been adequately evaluated on these specimens.
- Due to its non-invasive nature a urine-based NAAT is ideal for screening asymptomatic persons when a pelvic examination is not warranted for other reasons. However, a physical examination remains essential, and more invasive specimens may be needed for diagnostic purposes in symptomatic individuals.
- Postexposure testing with a NAAT can be done as soon as desired, since it is not necessary to wait for 48 hours after exposure to collect samples as in the case of cultures.
- Both chlamydia and gonorrhea can be detected from a single specimen by some NAATs.
- Culture has been the preferred method for medico-legal purposes. A NAAT may be suitable, provided that positive results are confirmed by a different set of primers, but it may not be available in most laboratories.
- *C trachomatis* IgM serology is useful for diagnosing *C trachomatis* pneumonia in infants under 3 months of age.
- Serology is not useful for the diagnosis of acute genital chlamydial infections.

Specimen collection

- Potential specimen sites:
  - Cervix in pubertal or older females for NAAT.
    - If the cervix has been surgically removed:
      - Send urine for NAAT.
      - Send urethral swab for culture.
      - Send rectal swab for culture.
      - Send vaginal swab for culture.

  - Urethral swab in males for NAAT (preferably not having voided for at least 2 hours, but this does not preclude testing).
  - Urine NAAT, vaginal/rectal swab for culture in prepubertal girls.
  - Urine NAAT for females and males of any age.
    - Any time of day.
    - Initial 10–20 mL of the urine stream (not mid-stream).
    - Preferably not having voided for at least 2 hours, but this does not preclude testing.
  - Endometrial or fimbrial biopsy specimens for NAAT in women undergoing laparoscopy for investigation of pelvic inflammatory disease.
  - Conjunctival swab for culture, EIA or DFA.
  - Nasopharyngeal aspirate for culture in infants <6 months of age.
  - NAATs are not approved for use with rectal or oropharyngeal samples.
- For information on specimen transport, see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter.

Management

- Evaluation should be appropriate for the presenting symptoms, signs and sexual history.
- Treatment for chlamydia is indicated for the following:
  - A positive chlamydia test.
  - Diagnosis of a syndrome compatible with a chlamydial infection, without waiting for the test results of *C trachomatis*.
  - Diagnosis of chlamydial infection in a sexual partner.
  - Empirical co-treatment when a diagnosis of *N gonorrhoeae* is made without waiting for test results of *C trachomatis* due to the significant probability of co-infection (20–42%)[12,13] and the possibility of false-negative results, especially with non-NAAT methods.

Treatment

- Efficacy and use-effectiveness studies evaluating single-dose azithromycin and a 7-day course of doxycycline have demonstrated similarly high cure rates; azithromycin is much more expensive.[34–43]
- Ofloxacin has an efficacy similar to doxycycline and azithromycin, but it is more expensive and must be taken as a multiple-dose course.[44–52]
- Erythromycin is associated with significantly higher gastrointestinal side effects than other regimens.[52–56]
- Drug resistance is rare but may become an emerging issue.[57,58]
- In the absence of a contraindication, the following treatment options are recommended.

Adults (non-pregnant and non-lactating): urethral, endocervical, rectal, conjunctival infection

(For pelvic inflammatory disease, see *Pelvic Inflammatory Disease* chapter; for epididymitis, see *Epididymitis* chapter.)

Table 3. Adults (non-pregnant and non-lactating): urethral, endocervical, rectal, conjunctival infection

Preferred	Alternative
• Doxycycline 100 mg PO bid for 7 days *[A-I]* OR • Azithromycin 1 g PO in a single dose if poor compliance is expected* *[A-I]*	• Ofloxacin 300 mg PO bid for 7 days *[B-II]* OR • Erythromycin 2 g/day PO in divided doses for 7 days† *[B-II]* OR • Erythromycin 1g/day PO in divided doses for 14 days† *[B-I]*

* If vomiting occurs more than 1 hour post-administration, a repeat dose is not required.

† Erythromycin dosages refer to erythromycin base. Equivalent dosages of other formulations may be substituted (with the exception of the estolate formulation which is contraindicated in pregnancy). If erythromycin has been used for treatment, a test of cure should be performed 3–4 weeks after completion of therapy.

Children

- Topical therapy alone for conjunctivitis is NOT adequate and is unnecessary when systemic treatment is used.
- The use of erythromycin in infants under 6 weeks of age has been associated with infantile hypertrophic pyloric stenosis (IHPS).[59–62] The risk of IHPS with other macrolides (e.g., azithromycin, clarithromycin) is unknown. The risks and benefits of using erythromycin in such infants must be explained to parents. When erythromycin is used in such infants, it is important to monitor for signs and symptoms of IHPS. IHPS following erythromycin use should be reported to the Canadian Adverse Drug Reaction Monitoring Program at 1-866-234-2345.
- The need to treat infants under 6 weeks for *C trachomatis* can be avoided by screening pregnant women and treating before delivery.
- Doxycycline is contraindicated in children under 9 years of age.
- Quinolones have been associated with articular damage in young animals. Such joint changes have not been clearly attributable to quinolone use in children. Its safety in children has not been established. Quinolones should not be used in prepubertal patients. Experience in pubertal patients under 18 years of age is limited.

Table 4. Children

First week of life	>1 week to 1 month	>1 month to <9 years	9–18 years
Infants ≤ 2000 g • Erythromycin 20 mg/kg/day PO in divided doses for at least 14 days*† *[B-II]* **Infants >2000 g** • Erythromycin 30 mg/kg/day PO in divided doses for at least 14 days*† *[B-II]*	• Erythromycin 40 mg/kg/day PO in divided doses for at least 14 days*† *[B-II]*	• Azithromycin 12–15 mg/kg (max. 1 g) PO in a single dose *[B-II]* **Alternatives** • Erythromycin 40 mg/kg/day PO in divided doses (max. 500 mg qid for 7 days or 250 mg qid for 14 days)*† *[B-II]* OR • Sulfamethoxazole 75 mg/kg/day PO in divided doses (max. 1 g bid) for 10 days† *[B-II]*	**Preferred** • Doxycycline 5 mg/kg/day PO in divided doses (max. 100 mg bid) for 7 days *[A-I]* OR • Azithromycin 12–15 mg/kg (max. 1 g) PO in a single dose if poor compliance is expected *[A-I]* **Alternatives** • Erythromycin 40 mg/kg/day PO in divided doses (max. 500 mg qid for 7 days or 250 mg qid for 14 days)*† *[B-I]* OR • Sulfamethoxazole 75 mg/kg/day PO in divided doses (max. 1 g bid) for 10 days† *[B-II]*

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

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

Notes:

- Neonates born to infected mothers must be tested for *C trachomatis*. Neonates should be treated if their test results are positive. They should be closely monitored for signs of chlamydial infection (e.g., conjunctivitis, pneumonitis). Prophylaxis is not recommended unless follow-up cannot be guaranteed.
- Test of cure should be performed 3–4 weeks after the completion of treatment in all prepubertal children.

Pregnant women and nursing mothers: urethral, endocervical, rectal infection

- Clinical trials comparing amoxicillin, erythromycin and azithromycin have demonstrated similar microbiological and clinical cure, but maternal gastrointestinal side effects are more common with erythromycin.[63–71]
- To date, there are limited data collected on azithromycin in pregnancy, but it is considered to be safe in this context by many experts.[64–66,68–70]
- Doxycycline and quinolones are contraindicated in pregnancy and in lactating women.
- Clindamycin requires dosing three to four times a day for 10–14 days and does not offer any advantage. In addition, it is even more expensive than azithromycin and is thus not being listed as an option.
- Data on neonatal outcomes are limited.

Table 5. Pregnant women and nursing mothers: urethral, endocervical, rectal infection

- Amoxicillin 500 mg PO tid for 7 days* *[B-I]*

OR

- Erythromycin 2 g/day PO in divided doses for 7 days*† *[B-I]*

OR

- Erythromycin 1g/day PO in divided doses for 14 days*† *[B-I]*

OR

- Azithromycin 1 g PO in a single dose, if poor compliance is expected‡ *[B-I]*

* If erythromycin or amoxicillin has been used for treatment in nursing mothers, test of cure should be performed 3–4 weeks after the completion of treatment.

† Erythromycin dosage refers to the use of erythromycin base. Equivalent dosages of other formulations may be substituted (with the exception of the estolate formulation, which is contraindicated in pregnancy). Gastrointestinal side effects are more severe with erythromycin than with amoxicillin.

‡ If vomiting occurs more than 1 hour post-administration, a repeat dose is not required.

Note: Test of cure should be performed 3–4 weeks after the completion of treatment in all pregnant women.

Considerations for Other STIs

- See *Primary Care and Sexually Transmitted Infections* chapter.
- Obtain specimen(s) for the diagnosis of *N gonorrhoeae*.
- Obtain a blood sample for serologic testing for syphilis (see *Syphilis* chapter).
- HIV testing and counselling are recommended (see *Human Immunodeficiency Virus Infections* chapter).
- Immunization against hepatitis B is recommended in non-immune non-immunized individuals (see *Hepatitis B Virus Infections* chapter).

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 60 days prior to symptom onset or date of diagnosis where asymptomatic should be tested and treated. If there was no partner during this period, then the last partner should be tested and treated.
- Parents of infected neonates (i.e., mother and her sexual partner[s]) and persons implicated in sexual abuse cases must be located, clinically evaluated and treated.
- 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 toward youth/young adults <25 years of age.

Follow-up

- Test of cure for *C trachomatis* is not routinely indicated if a recommended treatment is taken AND symptoms and signs disappear AND there is no re-exposure to an untreated partner except:
  - Where compliance is suboptimal.
  - If an alternative treatment regimen has been used.
  - In all prepubertal children.
  - In all pregnant women.
- Test of cure using a NAAT, if needed, should be performed at 3–4 weeks after the completion of effective treatment to avoid false-positive results due to the presence of non-viable organisms.
- Repeat testing in all individuals with *C trachomatis* infection is recommended 6 months post-treatment, as reinfection risk is high.
- In patients with apparent treatment failure, possibilities include the following:
  - 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.
  - Rarely, resistance is an issue.
- In patients with persistent symptoms, infection with other pathogens and a non-infective etiology should also be considered.

Special Considerations

Children

- Neonates born to infected mothers MUST be tested for *C trachomatis*. Neonates should be treated if test results are positive. They should be closely monitored for signs of chlamydial infection (e.g., conjunctivitis, pneumonitis). Prophylaxis is not recommended unless follow-up cannot be guaranteed.
- 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 *Sexual Abuse in Peripubertal and Prepubertal Children* chapter).
- Follow-up cultures for "test of cure" are indicated approximately 3–4 weeks after completion of therapy in prepubertal children.

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ECTOPARASITIC INFESTATIONS (PUBIC LICE, SCABIES)

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 also be found in chest, armpits, eyelashes or facial hair.
- Transmission occurs through intimate sexual and non-sexual contact.[1]

Prevention

- Patients presenting with concerns about sexually transmitted infections (STIs) and/or prevention of pregnancy should be provided with instructions and encouragement about the consistent practice of safer-sex.
- At the time of diagnosis, review and monitor prevention practices.
- Identify barriers to prevention practices and the means to overcome them.
- See *Primary Care and Sexually Transmitted Infections* chapter.

Manifestations[2]

- 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 a secondary bacterial skin infection.

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 lice. Nits attach to hair and are not loose and flaky.

Specimen collection and laboratory diagnosis

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

Management

- Clothes, bedding and fomites: washing in hot water (50˚C) or dry cleaning kills all stages of lice. Alternatively, place in plastic bags for 1 week.
- Vacuum mattresses.
- Sexual partner(s) within the last month should be treated.
- May re-treat after 1 week if no clinical improvement. Pruritus may be controlled with antihistamines such as hydroxyzine or diphenhydramine, as well as mild topical corticosteroids.[2]

Treatment

- Wash the affected area and apply pediculocide formulation (cream, lotion or shampoo) according to package instructions.
  – Permethrin 1% cream [A-I]
  OR
  – 0.33% pyrethrin-piperonyl butoxide shampoo [A-I]
  OR
  – lindane 1% shampoo *[A-I]*.[2,3]
- May repeat in 3–7 days.

Special Considerations

- Pediculosis of the eyelashes should not be treated with permethrin, pyrethrin or lindane.[2] Recommended treatment: occlusive ophthalmic ointment to the eyelidmargins bid for 10 days.

- Gamma benzene hexachloride (lindane) can cause neurotoxicity. Instructions for use must be carefully followed to minimize risk of toxicity.[3] Contraindicated in children <2 years of age, in pregnancy, in lactating women or in patients with extensive dermatitis.
- Permethrin cream has efficacy similar to lindane 1%, with less toxicity and cure rates greater than 80%.[3]
- Pruritus may persist for several days or weeks after treatment.
- In patients with excoriated or damaged skin, consider dose modification to compensate for increased absorption of topical agents.

(See below for Consideration for Other STIs, Reporting and Partner Notification, and Follow-up.)

Scabies

Etiology/Epidemiology

- Caused by *Sarcoptes scabiei*.
- Incubation period is 3 weeks, but reinfestation provokes immediate symptoms (1–3 days).[1]
- Transmission:
  - Often non-sexual, through close person-to-person contact (e.g., in families and institutions).[4]
  - May be via shared personal articles (clothes, bedding).
  - Sexual transmission does occur; usually need more than brief contact.

Prevention

- Patients presenting with concerns about STIs and/or prevention of pregnancy should be provided with instructions and encouragement about the consistent practice of safer-sex.
- At the time of diagnosis, review and monitor prevention practices.
- Identify barriers to prevention practices and the means to overcome them.
- See *Primary Care and Sexually Transmitted Infections* chapter.

Manifestations

- Intense nocturnal itching.
- Burrows under the skin.
- Lesions affecting hands (finger webs, sides of digits), flexor surfaces of the wrists, axillae, waist, nipple areola, periumbilical area and male genitalia.[5]
- Papules or nodules, which result from itching, often affect the genital area.
- Pyoderma of the penis.
- HIV-infected patients may present atypically with crusted or “exaggerated” scabies called Norwegian scabies.[6]

Diagnosis

- Based on history, index of suspicion and examination.
- Diagnosis is often difficult and therefore delayed.

Specimen collection and laboratory diagnosis

- If necessary, take a skin scraping of a burrow to remove the mite or ova for microscopic examination.[1]
- Burrow ink test: apply fountain pen ink or a washable marker to outside of burrow, wipe skin (with alcohol). Burrows will retain the ink and may be visualized.[2]

Management

- Clothes, bedding and fomites: washing in hot water (50˚C) or dry cleaning kills all stages of the organism. Alternatively, place in plastic bags for 3 days to 1 week.[1]
- Vacuum mattresses.
- All household contacts and recent sexual partner(s) in the last month should be treated.
- Pruritus may persist for several weeks. Pruritus may be controlled with antihistamines and mild topical corticosteroids.

Treatment

- Permethrin 5% cream *[A-I]*.[2,3,7]
  - Apply to the body from the neck down; leave for 8–14 hours; shower and wear clean clothes.

OR

- Gamma benzene hexachloride (lindane) 1% cream or lotion *[A-I]*.[2,3,7,8]
  - Apply to the body from the neck down; leave for 8 hours; shower and wear clean clothes.
  - More potential for toxicity than permethrin.
  - Contraindicated in children <2 years of age, in pregnancy, in lactating women or in patients with extensive dermatitis.
- Alternatives:
  - Crotamiton 10% cream *[A-I]* (less effective than permethrin or lindane).[7,9] This product is available through the Health Canada Special Drug Access Program.
    - Apply nightly for two nights and wash off thoroughly 24 hours after last application.

  OR

  - Sulphur 5% in petroleum *[A-I]* (less effective than permethrin or lindane).[7,9]
- Apply nightly for three nights and wash off thoroughly 24 hours after last application.

Special Considerations

- In pregnancy, permethrin is the only agent that should be used.[2]
- Gamma benzene hexachloride (lindane) can cause neurotoxicity. Instructions for use must be carefully followed to minimize risk of toxicity.[3] Contraindicated in children <2 years of age, in pregnancy, in lactating women or in patients with extensive dermatitis.
- In patients with excoriated or damaged skin, consider dose modification to compensate for increased absorption of topical agents.

Consideration for Other STIs

- See *Primary Care and Sexually Transmitted Infections* chapter.
- Obtain a specimen for the diagnosis of *Chlamydia trachomatis* and *Neisseria gonorrhoeae*.
- Obtain a blood sample for serologic testing for syphilis (see *Syphilis* chapter).
- HIV counselling and testing are recommended (see *Human Immunodeficiency Virus Infections* chapter).
- Immunization against hepatitis B is recommended, unless already immune (see *Hepatitis B Virus Infections* chapter).

Reporting and Partner Notification

- Pubic lice and scabies are not reportable to local public health authorities.
- Partner notification of ectoparasitic infestations is not required.

Follow-up

- Follow-up only if clinically necessary.

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GENITAL HERPES SIMPLEX VIRUS (HSV) INFECTIONS

Etiology

- Herpes simplex virus (HSV) types 1 and 2.[1]

Epidemiology

- The annual incidence in Canada of genital herpes due to HSV-1 and -2 infection is not known (for a review of HSV-1/HSV-2 prevalence and incidence studies worldwide, see Smith and Robinson 2002[2]). In the United States, it is estimated that about 1,640,000 HSV-2 seroconversions occur yearly (730,000 men and 910,000 women, or 8.4 per 1,000 persons).[3]
- Based on the change in prevalence of the serum antibody to HSV-2, HSV-2 increased 30% between 1976 and 1994, from 16.4–21.9% in Americans aged 12 years and older.[4]
- In British Columbia in 1999, the seroprevalence of HSV-2 antibody in leftover serum submitted for antenatal testing revealed a prevalence of 17.3%, ranging from 7.1% in women 15–19 years old to 28.2% in those 40–44 years.[5]
- In attendees at an Alberta sexually transmitted infection (STI) clinic in 1994 and 1995, the seroprevalence of HSV-1 and -2 in leftover sera was 56% and 19%, respectively.[6]
- The incidence and prevalence of HSV-1 genital infection is increasing globally, with marked variation between countries.[7]
- In Norway, a recent study found that 90% of genital initial infections were due to HSV-1.[8]
- In Nova Scotia, 58.1% of 1,790 HSV isolates from genital lesion cultures in women were HSV-1; in men, 36.7% of 468 isolates were HSV-1.[9]
- Females are at higher risk of acquiring genital herpes from a male partner than males are from a female partner. Studies have found that among discordant heterosexual couples with a source partner who had symptomatic recurrent genital HSV-2 infection, the annual transmission rates were 11–17% in couples with male source partners and 3–4% in couples with female source partners.[10,11]
- In one study, transmission in 70% of patients appeared to result from sexual contact during periods of asymptomatic virus shedding.[11]
- Pre-existing seropositivity to HSV-1 reduced the likelihood of acquiring symptomatic genital HSV-2 disease in women by 55–74%,[11,12] although others have not observed such a protective effect.[10,13]

Natural history

- The incubation period averages 6 days.[1]
- Of new HSV-2 infections diagnosed by seroconversion, approximately 60% are asymptomatic and 40% symptomatic. Of the symptomatic cohort, about 80% present with typical genital symptoms and signs, while 20% have atypical presentations, including nonlesional HSV-2 infections such as genital pain

or urethritis, aseptic meningitis and cervicitis, which are well-recognized complications of first episodes of genital HSV infection.[1]
- No intervention, including early initiation of antiviral therapy, prevents the development of latent sacral sensory ganglion infection.[14]
- Recurrences tend to occur in tissues innervated by sacral sensory nerves.
- Recurrences may be preceded by warning signs (prodromal symptoms) a few minutes to several days before lesions appear, such as focal burning, itching (most common), tingling or vague discomfort.[15]
- Recurrences may be associated with the menstrual cycle, emotional stress, illness (especially with fever), sexual intercourse, surgery and certain medication — so-called "trigger factors."[15]
- Initial mean recurrence rates are greater in persons with genital HSV-2 infection than in those with HSV-1: 4% and 1% per year, respectively, with marked interindividual variation.[16]
- The average recurrence rate decreases over time by around 0.8 outbreaks per year, every year (no matter how high the initial outbreak rate was). However, approximately 25% of patients reported more recurrences in year 5 than year 1, evidence again of the substantial interindividual differences in recurrence rates.[17]
- Asymptomatic shedding of HSV can be demonstrated by virus identification through culture or polymerase chain reaction (PCR). HSV DNA can be detected four to five times more frequently by PCR than by culture.[18,19] However, identification of virus by PCR may not be synonymous with infectivity. The following data pertain to shedding demonstrated by isolation of infectious virus:
  - Asymptomatic shedding prevalence is greater in women with HSV-2 genital infection than with HSV-1 (55% vs 29% during a median follow-up of 105 days).[18] A similar difference may exist in men.[19]
  - Asymptomatic shedding of HSV-2 is as common in persons with symptomatic genital infection (while in between outbreaks) as in those with asymptomatic genital infection.[18–20]
  - Asymptomatic shedding occurs on an average of 2% of days for a mean duration of 1.5 days.[18,19] HSV has been isolated from vulva, cervicovaginal and rectal sites in women[20] and from penile and perianal skin, urethra and urine in men.[19]

Prevention

- Patients presenting with concerns about STIs and/or prevention of pregnancy provide clinicians with an important opportunity for instruction and encouragement about consistent safer-sex practices. Given the increase in HSV-1 genital infection, likely due to orogenital sex (perhaps as an alternative to genital intercourse), patients need also to be advised of the inherent risk of genital herpes from such an activity.[21]
- At the time of diagnosis of an STI, review and monitor prevention practices.
- Identify barriers to prevention and the means to overcome them.
- Condom use reduces transmission of genital HSV-2 from infected men to women by 50% and may reduce transmission from infected women to men

to a similar degree.[22] However, condom effectiveness is greatly limited by non-use and may also be limited because of the location of lesions and the risk of transmission during orogenital sex. Other safer-sex practices should be discussed.

- Valacyclovir 500 mg ingested daily by a patient with genital HSV-2 infection has been shown to reduce transmission to a susceptible heterosexual partner by 48%. The effect of condoms and suppressive valacyclovir may be additive.[10]
- Immunization with a glycoprotein D–adjuvanted vaccine has been demonstrated to protect against acquisition of genital HSV disease in women who were seronegative for both HSV-1 and -2, but not for those who were seropositive for HSV-1.[23] It had no protective efficacy in men, regardless of serostatus. Protection against genital HSV disease was 74%, and protection against infection (seroconversion plus symptomatic infection) was 46%. Practitioners should be aware that such a vaccine may become available for use in the next 5–10 years.

Manifestations

- A diagnostic lesion is a cluster of vesicles on an erythematous background.

Initial symptomatic episodes

- Primary
  - First clinically evident episode in an HSV-antibody–negative individual.
  - Five characteristics:[1]
    - Extensive painful vesiculoulcerative genital lesions, including exocervix.
    - Systemic symptoms in 58–62% (fever, myalgia).
    - Tender lymphadenopathy in 80%.
    - Complications: 16–26% develop aseptic meningitis, and 10% to 28% develop extragenital lesions.
    - Protracted course: mean 16.5 (men) to 22.7 (women) days to resolve.
- Non-primary[1]
  - First clinically evident episode in a person who, by testing, is demonstrated to have pre-existing heterologous antibody. Generally the range and severity of symptoms and signs of even the most severe cases are less marked than in those with severe primary infection. This has been attributed to a mitigating effect of pre-existing heterologous immunity in attenuating the severity of disease.
  - Compared to primary genital herpes, non-primary infections are characterized by the following:
    - Less extensive genital lesions.
    - Systemic symptoms in only 16%.
    - Complications uncommon: meningitis in 1% and extragenital lesions in 8%.
    - Duration less prolonged: mean 15.5 days.

Recurrent disease[1,24]

- The first clinically evident episode in a person with pre-existing homologous antibody (i.e., culture of HSV-2 from a first outbreak in an individual with demonstratable HSV-2 antibody) may sometimes be confused with a primary infection.[24] This is because overlap occurs in the frequency of local symptoms, fever and size of genital lesions between those with recently acquired genital herpes and those, who, by serologic testing, are determined to have acquired infection remotely but are now experiencing a first outbreak.[24]
- In one study, almost 10% of patients judged to have a first-episode of genital herpes had serologic evidence of remotely acquired HSV-2 infection, indicating that clinical differentiation of primary genital infection and previously acquired infection can be difficult.
- Thus, typing of the virus isolate and type-specific serologic testing are required to differentiate between the two entities: primary/non-primary infection vs. a first lesion due to reactivation of a (long) latent infection acquired previously (see Diagnosis section, below).

Characteristics of recurrent disease

- Due to reactivation of latent sacral sensory ganglion infection.
- Typically, localized small painful genital lesions (mean lesion area 10% of that in primary genital herpes).[1]
- Systemic symptoms in 5–12%.
- Prodromal symptoms in 43–53%, for an average of 1.2–1.5 days.
- Mean duration of lesion 9.3–10.6 days.

Asymptomatic shedding

- See Natural history section, above.

Diagnosis

Specimen collection and laboratory diagnosis

- Culture is the most common method currently used in public health laboratories in Canada to confirm the clinical diagnosis of HSV. It is sensitive (70% from ulcers, 94% from vesicles) and permits identification of HSV type.[25]
- PCR is four times more sensitive than HSV culture and is 100% specific.[26] However, at this time, PCR assays have not yet replaced culture for routine diagnosis of genital herpes in public health laboratories in Canada.
- The Tzanck smear demonstrating diagnostic multinucleated giant cell is 40–68% as sensitive as culture, while direct fluorescent antibody has a sensitivity of 56% compared to culture.[25,27] Neither test can thus be relied on for laboratory confirmation of diagnosis.
- The antibody response to primary infection is characterized by early appearance of IgM, followed subsequently by IgG antibody. IgM antibody usually wanes within a few months of infection;[28] therefore, the presence of IgM antibody is an indirect indication of “recent” infection.

- A primary infection is confirmed by demonstrating an absence of HSV antibody in the acute-phase sample and the presence of antibody in the convalescent blood sample (i.e., seroconversion).
- Most individuals seroconvert within 3–6 weeks; by 12 weeks, more than 70% will have seroconverted.[29,30]
- The advent of testing for type-specific antibody will allow practitioners to establish a diagnosis of primary infection and determine whether the infection is due to HSV-1 or -2. Such information will also permit practitioners to counsel individuals with genital herpes and their partners. Type-specific antibody is best detected by Western blot analysis, although new commercial enzyme immunoassays with improved sensitivity and specificity are available.[31] Enzyme immunoassay test results need not be routinely confirmed by Western blot analysis. At this time, type-specific HSV antibody assays are available only in a few laboratories in Canada (see Special Considerations section, below).
- During recurrent genital HSV infection, no consistent HSV antibody changes occur. Specifically, IgM appears inconsistently, and IgM titres also do not change between acute and convalescent samples.[32]
- Detection of HSV-2 antibody is considered to be accurate for detecting silent genital HSV-2 infection, but detecting HSV-1 antibody is not useful in the same way, because asymptomatic HSV-1 orolabial infection is common.[31]

Management

- Counselling is an important component in management. Genital HSV infection is not curable, but its somatic and psychological morbidity can be ameliorated by sensitive, empathetic, knowledgeable counselling. Thus, all patients who have genital HSV infections and their sexual partner(s) can likely benefit from learning about the chronic aspects of the disease after the acute illness subsides. Explain the natural history of the disease, with emphasis on the potential for recurrent episodes, asymptomatic shedding and sexual transmission. Advise patients that antiviral therapy for recurrent episodes may shorten the duration of lesions, and suppressive antiviral therapy can ameliorate or prevent recurrent outbreaks, with one drug having been demonstrated to reduce transmission.[10]
- The most common psychological patient concerns include the following:
  - Fear of transmission.
  - Fear of being judged or rejected by partner.
  - Loneliness, depression and low self-esteem.
  - Anxiety concerning potential effect on childbearing.
- Patients must inform their sex partner(s) that they have genital herpes. It may be useful to have the partner receive counselling concurrently for information and possible serologic testing for HSV-1 and/or -2 antibody.
- Type-specific serologic testing for HSV-1 and/or -2 antibody can demonstrate whether couples are discordant or concordant for HSV-1 and/or -2 infection. Such information will be useful in counselling couples about the risk of transmission of genital herpes infection.

- It should be emphasized that most transmission of genital herpes occurs in the context of asymptomatic shedding.[11] Therefore, emphasizing the use of condoms and suppressive antiviral drug therapy is important for reducing the risk of transmission.
- Transmission of genital herpes is decreased by the following:
  - Avoidance of contacts with lesions during obvious periods of viral shedding (prodrome to re-epithelialization) from lesions. Advise patients that they should abstain from sexual activity from the onset of prodromal symptoms until the lesions have completely healed.
  - Condom use (see Prevention section, above).[22]
  - Daily suppressive antiviral therapy, which reduces recurrent lesions, asymptomatic viral shedding and transmission.[10]
- Assess patients with genital herpes for other STIs and treat as needed.[33]
- Discuss the risk of neonatal infection with all patients, including men. Women who have genital herpes should be advised to inform the health care providers who care for them during pregnancy about their HSV infection.
- Genital herpes increases the risk of acquisition of HIV twofold.[34]

Treatment[35]

First episode

- Treatment is recommended for clinically important symptoms.
- Analgesia and laxatives may be required. Urinary retention may be an indication for hospitalization.

Table 1. Treatment for first episode

• For severe primary disease, IV acyclovir 5 mg/kg infused over 60 minutes every 8 hours *[A-I]* is optimal, with conversion to oral therapy when substantial improvement has occurred.[36]
• Oral acyclovir 200 mg five times per day for 5–10 days *[A-I]* [37] OR • Famciclovir 250 mg tid for 5 days *[A-I]* [38,39] OR • Valacyclovir 1000 mg bid for 10 days *[A-I]*[40]
• Acyclovir 400 mg tid for 7–10 days is recommended by the U.S. Centers for Disease Control *[A-III]*[24]

Notes:
- Oral acyclovir, famciclovir and valacyclovir are comparably efficacious.
- Acyclovir has been initiated as late as 5–7 days after onset of symptoms with benefit *[A-I]*[37]; famciclovir has been initiated only in patients with symptoms of fewer than 5 days' duration *[A-I]* and valacyclovir in those with fewer than 72 hours of symptoms *[A-I]*.
- Topical acyclovir does not alleviate systemic symptoms and should not be used *[A-I]*.[37]

Recurrent lesions[35]

Table 2. Treatment for recurrent episodes

- Valacyclovir 500 mg bid OR 1 g qd for 3 days *[B-I]* [41]

OR

- Famciclovir 125 mg bid for 5 days *[B-I]* [42]

OR

- Acyclovir 200 mg 5 times/day for 5 days *[C-I]* [43]

- A shorter course of acyclovir 800 mg tid for 2 days appears as efficacious as the approved 5-day regimen *[B-I]*[44]

Notes:

- Valacyclovir, famciclovir and acyclovir are approved for treatment of recurrent genital herpes lesions.
- To be effective, these drugs need to be started as early as possible during the development of a recurrent lesion — preferably fewer than 6 hours (famciclovir) *[B-I]* to 12 hours (valacyclovir) *[B-I]* after the first symptoms appear. Patient-initiated therapy at the onset of prodromal symptoms has been proven effective in a Canadian study.[42] To achieve this end, patients should have medication on hand and be provided with specific information on when to initiate therapy.

Suppressive therapy[35]

- Suppressive therapy is intended for patients with frequently recurring genital herpes, generally for those with recurrences at least every 2 months or 6 times per year. In such patients, suppressive therapy is preferred to episode therapy[45] and improves quality of life.[46]
- For individuals with fewer than 6 recurrences per year or one every 2 months, episode therapy is recommended (see above). However, suppressive therapy will probably be efficacious and may be considered on a case-by-case basis.

Table 3. Suppressive therapy for non-pregnant patients

- Acyclovir 200 mg tid to five times daily OR 400 mg bid *[A-I]*[47–59]

OR

- Famciclovir 250 mg bid *[A-I]*[60,61]

OR

- Valacyclovir 500 mg qd *[A-I]* (for patients with nine or fewer recurrences per year)

OR 1000 mg qd *[A-I]*[57,62] (for patients with more than nine recurrences per year).

Notes:

- Acyclovir, famciclovir and valacyclovir are approved for suppressive therapy in Canada.
- Safety and efficacy data suggest that acyclovir and valacyclovir can be administered for up to 1 year *[A-I]* based on controlled trials[47–59,62] whereas famciclovir has been evaluated only for up to 4 months' *[A-I]* administration.[60,61]

Table 4. Suppressive therapy for pregnant patients

- Acyclovir 200 mg qid *[A-I]* [63,64] OR 400 mg tid *[A-I]* [65,66]
- Both regimens have been evaluated and shown to be efficacious in reducing recurrent disease and the need for cesarean section.
- Both regimens require initiation of suppression with acyclovir 400 mg tid at 36 weeks with termination at parturition *[A-I]* [65,66]

Notes:

- There have been no studies of sufficient power to adequately assess whether suppressive antiviral drug therapy in pregnancy reduces maternal-to-child transmission or neonatal herpes *per se*.
- Acyclovir safety and efficacy have been evaluated in limited numbers of pregnant women *[A-III]*.[63,65]
- Suppressive acyclovir has been demonstrated to reduce recurrence rates, as well as asymptomatic shedding, and thereby obviate the need for cesarean section to prevent neonatal herpes *[A-I]*.[63–66]
- Use of acyclovir suppression does not eliminate the need to observe the neonate carefully for possible HSV infection.

Table 5. Therapy for neonatal herpes

- Acyclovir 45–60 mg/kg/day IV in three equal 8-hourly infusions, each over 60 minutes for 14–21 days *[A-I]* [67]

Note:

- Consultation with a colleague experienced in this area should be sought.

Consideration for Other STIs

- Having HSV can increase the risk of acquiring and transmitting HIV. This increased risk needs to be explained; HIV testing with pre- and post-test counselling should be offered.
- Genital ulcers can also be caused by syphilis, chancroid or lymphogranuloma venereum, and testing for these should be considered.
- Testing for other STIs, including chlamydia and gonorrhea, should be considered.
- Immunization for hepatitis B may be indicated.
- See *Primary Care and Sexually Transmitted Infections* chapter.

Reporting and Partner Notification

- At the time of publication, genital HSV infections were reportable by physicians to local public health authorities in New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland. Neonatal HSV infections are reportable in some provinces only. Whether cases are to be reported on suspicion or after laboratory confirmation also varies.
- Partner notification is not required as a public health measure, in part because of the following:
  - 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 sexual partner(s) from the preceeding 60 days prior to symptom onset or date of diagnosis where asymptomatic 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 indicated, except when there are unusual recurrent symptoms or to determine in vitro susceptibility when resistance is suspected as a cause of therapeutic failure.
- Supportive counselling is an important component of managing patients with genital herpes.

Special Considerations

Neonatal herpes[68,69]

- Recent epidemiologic work on risk factors for neonatal herpes[68] has demonstrated that the greatest risk factor for neonatal HSV infection is new maternal genital HSV-1 or -2 infection without a fully developed maternal immune response by the time of delivery, resulting in an infant born without homologous transplacental HSV type-specific antibody. Four of nine such infants developed neonatal HSV infection. On the other hand, infants delivered vaginally by women with reactivation of genital herpes with genital lesions or asymptomatic HSV genital virus shedding at parturition had a 2% risk of infection (2 of 92 cases). Cesarean delivery was shown definitively to protect against neonatal transmission of HSV. Thus, the opportunity for preventing neonatal HSV relates more to obviating maternal genital infection late in pregnancy than to identifying women with known genital HSV infection. That is, there is reason for reassurance of pregnant women with a history of genital herpes.
- Incidence in Canada for 2000–2003 inclusive is 5.85 per 100,000 live births; 62.5% of these infections were attributed to HSV-1.[70] From 55–80% are due to HSV-2.[71–74]
- Intrauterine infection accounts for 5% of neonatal HSV infection, and postnatal infection (usually HSV-1) for 15%.[72–74]
- Clinically, neonatal infection is classified as skin-eye-mouth (SEM), central nervous system (CNS) or disseminated infection. Mortality is 0%, 15% and 47%, respectively, and abnormal development at 1 year is 2%, 70% and 25%, respectively.[71,72,74] However, overlap occurs, and up to 30% of babies with SEM initially will progress to CNS disease as well.
- In the Canadian study, 63.8% of cases had localized (SEM) disease, while 34.5% had infection that disseminated to the CNS or other organs.[70]
- Vesicular skin lesions may not be observed in 17% with SEM, 32% with CNS and 39% of neonates with disseminated disease.

- Risk of neonatal infection:
  - Is up to 50% if the mother has primary genital HSV infection with lesions at parturition.[73] In approximately 70% of cases the mother has no history of genital herpes.[72,74]
  - Is from 2–8% when vaginal delivery occurs and the mother has a recurrent genital lesion or has asymptomatic genital HSV shedding at parturition.[68,75]
- Median incubation period is 4 days, with a range of 1–28 days.[71,72,74]
- Most neonatal herpes begins after a seemingly healthy neonate has left hospital.
- Acyclovir oral therapy suppresses recurrent genital disease and asymptomatic shedding and thereby has been shown to reduce the need for cesarean delivery (see Treatment section, above).

Laboratories offering HSV type-specific serum antibody testing

- Alberta Provincial Laboratory for Public Health, Edmonton, Alberta (implementation anticipated in 2005).
- National Microbiology Laboratory, Public Health Agency of Canada, Winnipeg, Manitoba.
- Regional Virology & Chlamydia Laboratory, Hamilton, Ontario.
- Children's Hospital of Eastern Ontario Laboratory, Ottawa, Ontario.
- Warnex Inc., Montreal, Quebec.

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GENITAL HUMAN PAPILLOMAVIRUS (HPV) INFECTIONS

This chapter covers the prevention, diagnosis and treatment of human papillomavirus infection. For complete information on the prevention, diagnosis and treatment of cervical cancer, other sources should be used.

Etiology

Definition

- Human papillomavirus (HPV) causes skin or mucosal infections and has a strong affinity for the moist mucosa of the anal, genital and aerodigestive tracts.

Etiology

- More than 130 HPV types have been classified on the basis of DNA sequence, 40 of which can infect the anogenital epithelium. HPV types are classified as high- or low-risk based on the strength of their association with cervical cancer.

Table 1. HPV types

Association with cervical cancer[1]	Genotypes	Most likely clinical conditions
Low-risk	• Most common: 6 and 11 • 40, 42, 43, 44, 54, 61, 70, 72, 81 and CP6108	Condylomata acuminata
Probable high-risk	• 26, 53 and 66	Precancerous or cancerous lesions
High-risk	• Most common: 16 and 18 • 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 73 and 82	Precancerous or cancerous lesions

Epidemiology

- HPV is one of the most common sexually transmitted infections (STIs).[2]
- The incubation period for exophytic warts is 1–8 months.
- 70% of the adult population will have had at least one genital HPV infection over their lifetime.[3]
- Canadian HPV prevalence studies show that HPV infection is very common and that wide variability exists between different populations:
  - In young women, prevalence is reaching 29%.[4,5]
  - In a community health centre in Manitoba where 73% of participants were <30 years, 33% of women were found to be HPV-positive.[6]
  - In women aged 15–49, attending for routine cervical cancer screening in Ontario, the prevalence of high-risk HPV was found to be 12.7%.[7,8]

  - In women aged 13–79, attending for routine cervical cancer screening in Nunavut the prevalence of high-risk HPV was found to be 25.7%.[9]
- HPV infections are often acquired early (15–19 years of age),[10] and the majority (>80%) of these infections clear spontaneously within 18 months.[11]
- HPV infections usually occur in adolescents and young adults, but affect both women and men of all ages.
- Non-oncogenic or low-risk HPV, which can be expressed as exophytic warts, is associated with a low risk for cancer.
- Clinically visible external genital warts (EGWs) (with low-risk HPV) were noted in ~1% of sexually active adults (aged 15–49) in a U.S. population.[12]
- Thirteen high-risk HPV types have been confirmed in the International Agency for Research on Cancer monograph on cervical cancer screening as necessary factors in the etiology of cervical cancer, while other HPV types have been implicated in skin and oral-pharyngeal cancers, as well as with cancers of the anus and penis.[13]
- The average time from acquiring a high-risk genotype of HPV to the detection of cervical cancer is 20 years.[14]
- Infection with one HPV genotype does not protect against infection with other types.[15,16]
- Simultaneous infection with multiple types of HPV has been reported in 5–30% of women with HPV.[17]
- Symptomatic perinatal transmission is infrequent and is usually clinically apparent within 2 years. When it occurs, it is associated with anogenital and vocal-cord lesions in the newborn.[18]

Prevention

- While condoms may not reliably prevent sexual transmission of HPV, they may protect against the HPV types of genital warts,[19] some co-factors of cervical dysplasia and invasive cervical cancer; in addition, they effectively prevent transmission of bacterial STIs.
- Counsel patients with HPV infection about risk reduction, including the following:
  - Natural history of the disease, with emphasis on the differences between HPV genotypes and their potential manifestations.
  - Potential for recurrent episodes.
  - Potential for sexual transmission.
- There are conflicting epidemiologic data on risk factors and co-factors for HPV infection. The only factor that emerges consistently is lifetime number of sex partners. Putative co-factors for cervical cancer include the following:
  - Smoking tobacco and exposure to tobacco smoke.
  - Long-term use of oral contraceptives (>5 years).
  - Higher number of pregnancies.
  - Other STIs (e.g., *Chlamydia trachomatis*, herpes simplex virus-2, HIV).
  - Inadequate diet (especially low antioxidant intake).

  - Immunosuppression (e.g., HIV/AIDS, organ transplant and immunosuppressive drug therapy).
  - Multiple sex partners, sexual intercourse at an early age and sexual intercourse with those infected with HPV.
  - Genetic susceptibility: polymorphisms in certain cell regulatory genes, such as p53.

***Information about HPV*[20–23]**

- Inform women that regular cervical screening for dysplasia and/or HPV infection is effective in reducing rates of cervical cancer.[24–26]
- Counselling for patients with HPV and/or abnormal cervical screening results should include the following:
  - Explanation of the natural history of the disease, with emphasis on the differences between types of HPV and their causal associations (i.e., low-risk types are associated with anogenital warts, and high-risk types are associated with cervical cancer).
  - Discussion of the risk of recurrence.
  - Reduction of the impact of risk and co-factors for progression to dysplasia.
  - Encouragement of patients to examine themselves and seek medical attention if lesions appear.
  - Reassurance that the virus is common, and that it is virtually impossible to determine when or from whom they acquired the virus.
  - Reassurance that the risk of cervical cancer is quite low and that most HPV infections will resolve and clear.
  - Reassurance that only persistent infection with high-risk HPV types may progress to precancerous and cancerous lesions.

Diagnosis

- Most anogenital HPV infections are asymptomatic and subclinical. Of those clinically apparent lesions, most will be asymptomatic.
- The most frequent sites of anogenital HPV infection in females are the cervix, vagina, vulva or anus.
- The most frequent sites of anogenital HPV infection in males are the anus or penis.
- Multiple sites are often involved (e.g., cervix, vagina, vulva etc.).
- The natural history is of fluctuation in size and number of warts and, in most cases, eventual clearance.
- Warts can increase in size and number with pregnancy.
- Intraepithelial lesions on a Pap smear usually indicate cervical involvement. These are classified as one of the following:
  - Low-grade squamous intraepithelial lesions (LSILs): under the old classification system, these were known as condyloma of the cervix, mild to moderate dysplasia or cervical intraepithelial neoplasia (CIN) 1 or CIN2.

  - High-grade squamous intraepithelial lesions (HSILs): under the old classification system, these were known as severe dysplasia, CIN3 or in situ neoplasia.
  - Invasive carcinoma.

External genital warts[27]

- Most EGWs are caused by low-risk HPV infections.
- Typical EGWs present as exophytic fronds or cauliflower-like to papular growths on anogenital skin and/or mucous membranes called condylomata acuminata. They are frequently multiple, asymmetric and polymorphic. They occasionally cause bleeding, pruritus and local discharge.
- Less frequent manifestations of EGWs are slightly elevated lesions, papular or macular lesions with or without keratinization and/or brown/grey/bluish pigmentation, also known as bowenoid papulosis, or warty vulvar intraepithelial neoplasia.

Table 2. Non-HPV lesions to consider in a differential diagnosis

Normal variations	• In both sexes: sebaceous glands • In women: vestibular papillae, also known as micropapillomatosis labialis • In men: pearly penile papules on the coronal sulcus
Pathologic entities	• Infections – Secondary syphilis with condylomata lata – *Molluscum contagiosum* • Diseases of the skin and mucosa – Intradermal nevi – Skin tags – Seborrheic keratoses • Cancer – Intraepithelial neoplasia

Note:
This table does not include manifestations, which are listed above.

Specimen collection and laboratory diagnosis

Cervical cytology (Pap smear or Pap test)

- Two different methods can be used to screen for cervical cancer and its precursors: a glass slide fixed with Cytospray (conventional) or liquid-based cytology (LBC). Access to LBC is limited to only a small number of jurisdictions in Canada at present.
  - LBC for women with an ordinary risk of cervical cancer is more sensitive than the conventional glass-slide smear and produces a lower rate of unusable samples.[28]

- Regular cervical screening is important for all women who are, or have ever been, sexually active. Some North American guidelines recommend starting within 3 years of initiation of penetrative sexual activity,[29] but European guidelines recommend starting at 25 years of age.[30,31]
- Provincial and territorial guidelines for cervical cytology vary across Canada.
- Cervical Cancer Prevention Network guidelines recommend annual Pap smears until two sequential normal Pap smears are obtained, then every 3 years if normal in immunocompetent individuals.[32]
- Immunocompromised persons, especially those who are HIV-positive, require special attention. Please refer to a local expert for optimal management.
- Cervical cancer is more frequent in women who have not had cervical screening at regular intervals[24,25,33] and women who are HIV-positive.[34]
- Many women who develop cervical cancer have had inadequate cytology on previous smears.[35]
- The best specimen collection device is the extended-tip spatula combined with the Cytobrush.[36]
- Results are reported in some jurisdictions using Bethesda 2001 terminology,[37] but this varies by province and territory.

HPV typing

- A meta-analysis of the available literature concluded that HPV DNA testing is better than repeat cytology in women who have atypical squamous cells of undetermined significance (ASCUS) on Pap smears.[38] The Pan Canadian Forum on Cervical Screening has recommended HPV DNA testing for this indication.[39]
- Co-testing using LBC and HPV DNA testing is approved in the U.S. for primary screening, but no such recommendation exists in Canada.
- HPV typing is not useful for EGWs, which are most likely caused by low-risk non-oncogenic types,[2] or in women with LSILs or HSILs, because of the high prevalence of oncogenic types in such cases.[40]
- Access to HPV DNA tests in Canada is limited to a small number of jurisdictions at present.

Colposcopy

- Colposcopy should be performed for the following:
  - Clinically visible growths, warts or suspicious findings on the cervix.
  - Abnormal cervical screening test results, including the following:
    - Repeat ASCUS (especially if HPV detection test is positive)
    - ASCUS — cannot exclude high-grade lesion
    - LSILs
    - HSILs
    - Atypical glandular cells
    - Invasive carcinoma
  - Positive high-risk HPV detection twice in a 6–12 month period, even in the presence of normal cytology.

- Routine colposcopy for women with EGWs is not likely to be beneficial unless other criteria (see above) are present.[41]

Aceto-whitening or aceto-acid testing

- A solution of 5% acetic acid applied to the genital skin or the cervix for 1–3 minutes may lead to whitening of HPV-infected epithelium; however, this test has a high false-positive rate in both female and male patients.
- This test is never recommended for screening of external anogenital warts or subclinical lesions, even for partners of persons with an abnormal Pap smear or EGWs.
- This test should be reserved as an adjunct to colposcopy to increase the visibility of subclinical lesions.

Anoscopy

- Anoscopy should be considered in patients with anal warts.
- Anal cancer is being studied with anal Pap and viral testing as a screening method. Patients with positive results are then managed following clinical evaluation done by high-resolution anoscopy. This may be particularly important for HIV-positive patients.

Urethroscopy

- Urethroscopy can be considered for patients with extensive urethral warts not amenable to other forms of therapy.

Caution

Atypical and/or non-healing warts

- Suspect neoplasia if any of the following are present:
  - Pigmented lesions
  - Bleeding
  - Persistent ulceration
  - Persistent pruritus
  - Recalcitrant lesions
- Patients with suspicious lesions may require a biopsy; refer to a colleague experienced in this area.

Management

- No therapy guarantees eradication of HPV.
- Cell-mediated immunity will eradicate most HPV infections over time in teens and young adults.
- Warts often have a high persistence/recurrence rate, but more than 90% of patients with EGWs experience complete clearance within 2 years, with or without treatment. However, disappearance of warts is not synonymous with HPV eradication.

- Clearance of cervical lesions approaches 90–95%. Successful therapy for cervical abnormalities is often followed by clearance of HPV. HPV testing is being used to help detect residual high-grade disease and recurrent high-grade cervical lesions.[42]

Treatment

EGWs in males and females

- New lesions, with all available treatments, can occur at sites that may have been treated. They can also occur at different sites at a rate of 20–30%.[43]
- All treatments are associated with local skin reactions that can best be addressed by decreasing the intensity of the treatment.
- Rates of efficacy are difficult to determine because of a lack of uniformity in clinical trials.

Table 3. Patient-applied treatments

Treatment	Recurrence rate	Safety issues	Comments
Imiquimod *[A-I]* • Self-applied three times a week (with at least 1 day between applications) for up to 16 weeks • Should be washed off after 6–8 hours	• Recurrence rates are lower (10%) than with any other therapeutic modality[44]	• Should *not* be used in pregnancy	• Mechanism of action is through immune modulation
Podofilox/podophyllotoxin 0.5% solution *[A-I]* • Applied to warts (but not the contiguous skin) every 12 hours for 3 days of each week (4 days off)[45] • Can be repeated for up to 6 weeks only, with the total dose per day not to exceed 0.5 mL	• Recurrence rates are high (60%) • More efficacious, stable and associated with fewer side effects than podophyllin (see Table 4)	• Should *not* be used in pregnancy • Should *not* be used for the treatment of cervical, meatal, vaginal or anal warts	• For self-application under the direction of a physician • Available under two brand names in Canada: Wartec and Condyline

Note:
There has been no study comparing these two treatment options.

Table 4. Office-based treatments

Treatment	Recurrence rate	Safety issues	Comments
Cryotherapy *[A-I]* [46–48] • Liquid nitrogen, carbon dioxide (dry ice or Histofreeze), or nitrous oxide using cryoprobes • Provide sufficient freezing with a rim of 1–2 mm around the lesion	• Good response rates	• Safe for use in pregnancy • Aggressive treatment of genital warts can leave scarring	• Destruction of the skin is usually limited to the epidermis
Podophyllin 10–25% *[A-I]* • Should be applied to the wart and not contiguous skin, and must be washed off in 1–4 hours • May be repeated once or twice at weekly intervals, the total dose not to exceed 1–2 mL per visit		• Should *not* be used in pregnancy; fetal death has been reported • Should *not* be used for the treatment of cervical, meatal, vaginal or anal warts • Frequent local reactions such as erythema, tissue edema, pain, burning, itching, tenderness or bullous reactions are often reported • Systemic toxicity has also been reported	• Should be discarded for a better option, such as patient-based therapies • Should be used only if other therapies cannot be used • Should *never* be left to self-application

Table 4. Office-based treatments

Treatment	Recurrence rate	Safety issues	Comments
Bi- or trichloracetic acid *[A-I]*[47,48] • Repeated weekly for 6–8 weeks • 50–80% solutions in 70% alcohol are most effective • Does not need to be washed off		• Safe for use in pregnancy • Caustic and may produce blisters and ulcerations	• Healthy skin should be protected with Vaseline, 2% Xylocaine ointment or eutectic mixture of lidocaine and prilocaine cream
Electro-fulguration, CO_2 laser ablation, excision[49]	• Good response rates	• Poor depth control may cause excess damage and scarring	• These treatment options are done for more extensive genital, perineal or anal warts

Note:
Topical analgesia with lidocaine or eutectic mixture of lidocaine and prilocaine cream can be used for reduction of pain with office-based therapies.

Extensive, large or resistant external lesions, and internal lesions including vaginal, cervical, anal, urethral and meatal warts

- Patients should be referred to a colleague experienced in this area. CO_2 laser, trichloracetic acid, electroexcision, scissor excision and fulguration may require local or general anesthesia. Low rates of complications are expected if performed by an experienced physician.
- Patients with HIV infection often present with extensive anogenital warts respond poorly to treatment.
- The following treatments are not recommended:
  - Interferon beta (Intron-A)
  - Dinitrochlorobenzene sensitization
  - Cidofovir
  - Retinoic acid
  - Application immunotherapy with autogenous vaccines
  - 5% 5-fluorouracil cream

Male partners of women with abnormal Pap smears

- Since abnormal Pap smears most often represent the reactivation of an oncogenic latent strain, there is no clinical follow-up required for asymptomatic male partners. Previously, these men were subjected to aceto-whitening of the genital area and treatment for subclinical lesions. There are no data to support this *[D-III]*.[41]

Subclinical lesions

- Lesions may be visible only after examination or application of aceto-whitening. No specific management is recommended or necessary for subclinical lesions of the external anogenital skin, as neither recurrences of clinical warts nor transmission to partners is affected *[D-III]*.

Consideration for Other STIs

- See *Primary Care and Sexually Transmitted Infections* chapter.
- In patients with condylomata acuminata, an abnormal cervical smear and STI risk factors, obtain specimen(s) for the diagnosis of chlamydial and gonococcal infections.
- HIV testing and counselling are recommended (see *Human Immunodeficiency Virus Infections* chapter).
- Immunization against hepatitis B is recommended (see *Hepatitis B Virus Infections* chapter).
- Consider obtaining a blood sample for serologic testing for syphilis (see *Syphilis* chapter), especially in the presence of condylomata lata.

Reporting and Partner Notification

- HPV is not a reportable infection in Canada.
- "Standard" partner notification recommendations that apply for other STIs are not useful in reducing transmission of HPV.
- Patients should be encouraged to inform their sex partner(s) that they have or have had genital warts or an abnormal Pap smear, but there is no proof that this will lower the risk to the partner.
- Treatment or referral of asymptomatic partners is not indicated.[41]

Follow-up

- Once genital warts are healed, conduct routine follow-up of women with cervical screening, with or without HPV DNA testing, as recommended by provincial/territorial guidelines.
- Loss to follow-up treatment after abnormal cervical cytology is a significant issue, with rates as high as 40% in some jurisdictions.[50–52]

Special Considerations

Patients with HIV

- Patients with HIV infection require special care. Conjoint follow-up with an experienced colleague may be indicated.

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 when genital warts are present in a child older than 18 months, and particularly in a child older than 2 years of age (see *Sexual Abuse in Peripubertal and Prepubertal Children* chapter).
- Cesarean section is not recommended unless warts obstruct the birth canal.[41] Approximately 50% of cases of condyloma associated with pregnancy spontaneously regress in the first 3 months after delivery.

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GONOCOCCAL INFECTIONS

Etiology

- Caused by *Neisseria gonorrhoeae*.

Epidemiology

- Preliminary data show that there were approximately 9,200 reported cases of gonorrhea in 2004. Most affected are males 20–24 years of age (reported rate of 127.6/100,000) and females 15–19 years (reported rate of 126.7/100,000).[1] (Preliminary data — is subject to change; does not include Nunavut.)
- There has been a gradual but steady increase in gonococcal infections since 1998. It appears that a network of people with high-transmission activities play a key role in current prevalence levels. Case finding and partner notification are critical strategies for controlling this infection.
- The proportion of penicillin-resistant organisms is >1% in most areas of Canada and may reach 15% or higher in certain urban and rural areas.[2]
  - Numbers of isolates resistant to tetracyclines or a combination of penicillin and tetracyclines are high, and these antimicrobial agents should *not* be considered in the treatment of gonorrhea.
  - Quinolone resistance in Canada has been steadily increasing, from 1% in the late 1990s to a rate of 6.2% in 2004.[2–4] This rate reflects samples which have been submitted by individual provinces and territories to the National Microbiology Laboratory (NML). The current rate reported by the NML may not truly reflect the national picture as the submission of samples from individual provinces and territories is voluntary and not standardized across the country. The shift from culture to NAATs has also created difficulty in providing an accurate picture for resistance across Canada as the availability of samples for resistance testing is becoming increasingly limited.
  - Quinolone resistance in certain regions of Canada is significantly higher than the national rate. Please check with your local public health officials to learn about quinolone resistance in your area.
  - Continued monitoring for antimicrobial resistance is important for ensuring high cure rates for this treatable infection.[5,6]
- HIV transmission is enhanced in people with concomitant gonococcal infections.[7]
- People at risk:
  - Those who have had contact with a person with proven infection or a compatible syndrome.
  - Those who have had unprotected sex with a partner originating from an area with high endemicity (there is also a higher risk of resistance in this population).
  - Travellers to an endemic country who have had unprotected sex with a resident of that area (there is also a higher risk of resistance in this population).
  - Sex workers and their sexual partners.

- Sexually active youth <25 years of age with multiple partners.
- Street-involved youth.
- Men who have unprotected sex with men.
- Previous gonorrhea and other STI.

Prevention

- Patients presenting with concerns about sexually transmitted infections (STIs) and/or prevention of pregnancy should be provided with instructions and encouragement about the consistent practice of safer-sex.
- At the time of diagnosis, review and monitor prevention practices.
- Identify barriers to prevention practices and the means to overcome them.
- See *Primary Care and Sexually Transmitted Infections* chapter.
- 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).

Manifestations

Table 1. Manifestations

Neonates and infants	Children	Youth and adults		
		Females	Males	Females and males
• Ophthalmia • Neonatal amniotic fluid infection • Disseminated gonococcal infection	• Urethritis • Vaginitis • Conjunctivitis • Pharyngeal infection • Proctitis • Disseminated gonococcal infection	• Cervicitis • Pelvic inflammatory disease • Urethritis • Perihepatitis • Bartholinitis	• Urethritis • Epididymitis	• Pharyngeal infection • Conjunctivitis • Proctitis • Disseminated gonococcal infection: arthritis, dermatitis, endocarditis, meningitis

***Table 2. Symptoms of genital tract infection with* N gonorrhoeae[8–10]**

Neonates	Females	Males
• Conjunctivitis • Sepsis	• Vaginal discharge • Dysuria • Abnormal vaginal bleeding • Lower abdominal pain • Rectal pain and discharge if proctitis (see *Sexually Transmitted Intestinal and Enteric Infections* chapter) • Deep dyspareunia	• Urethral discharge • Dysuria • Urethral itch • Testicular pain, swelling or symptoms of epididymitis • Rectal pain and discharge if proctitis (see *Sexually Transmitted Intestinal and Enteric Infections* chapter)

Notes:
- Usual incubation period, 2–7 days.
- Many patients are asymptomatic or have symptoms not recognized to be due to *N gonorrhoeae*.
- Contacts are also likely to be asymptomatic.
- Long-term carriage occurs.

Table 3. Major sequelae

Females	Males
• Pelvic inflammatory disease • Infertility • Ectopic pregnancy • Chronic pelvic pain • Reiter syndrome • Disseminated gonococcal infection	• Epididymo-orchitis • Reiter syndrome • Infertility (rare) • Disseminated gonococcal infection

Diagnosis[11]

Laboratory diagnosis

- Cultures obtained less than 48 hours after exposure may be negative.
- If possible, culture is the recommended method, because it allows for antimicrobial susceptibility testing. It is recognized that nucleic acid amplification tests (NAATs)* are the only available method in some jurisdictions. NAATs may be most useful when patients resist pelvic examination or urethral swabbing.[12] In these situations, urine NAATs should be used.

- Culture is especially important in the following cases:
  - Sexual abuse of children (rectal, pharyngeal, vaginal).†
  - Sexual assault.†
  - Treatment failure.
  - Evaluation of pelvic inflammatory disease (PID).
  - Infection acquired overseas or in areas with recognized antimicrobial resistance.
- 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 transport and storage conditions are not conducive to maintaining the viability of *N gonorrhoeae*[13] (see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter).
- NAATs may be considered, but measures should be taken to ensure continued surveillance for antimicrobial resistance. If these tests are used for a test of cure, specimen collection should be delayed for 2–3 weeks post-treatment.[14]

Notes:

* NAATs include polymerase chain reaction, ligase chain reaction, transcription mediated assay and strand displacement amplification.

† When NAATs are used, two different primers should be used in the laboratory (see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter).

Specimen collection[11,13]

Routine specimen sites

- Urethra in young and adult males, with/without meatal discharge (see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter).
  - For prepubertal boys, see *Laboratory Diagnosis of Sexually Transmitted Infections* and *Sexual Abuse in Peripubertal and Prepubertal Children* chapters.
- Cervix in young and adult females (see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter).
- Rectum in females and in men who have sex with men (see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter).
  - Colonization can occur without anal intercourse.[15]
- Vagina in prepubertal girls (see *Laboratory Diagnosis of Sexually Transmitted Infections* and *Sexual Abuse in Peripubertal and Prepubertal Children* chapters).
- Pharynx in those with a history of oral-genital contact (see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter).
- Urine (first 10–20 mL) for NAAT if culture is not available, patient is resistant to pelvic examination or urethral swabbing, or problems exist with storage and transport of specimen.

Table 4. Specimen collection

Site/specimen	Test	Comments
Urethra (intraurethral) (young and adult males)	• Gram stain (for intracellular diplococci) (symptomatic men only)	• Generally diagnostic of gonorrhea
	• Culture	• Confirmation and antimicrobial susceptibility testing
	• Non-culture test (NAAT)	• In cases where culture not practical (does not provide antibiotic susceptibility)
Endocervix/ urethra (young and adult females)	• Gram stain (for intracellular diplococci)	• Sensitivity lower than in male urethral specimens and not routinely recommended
	• Culture	• Confirmation and antimicrobial susceptibility testing
	• Non-culture test (NAAT)	• In cases where culture not practical (does not provide antibiotic susceptibility)
Vagina	• Culture	• Confirmation and antimicrobial susceptibility testing
	• Non-culture test (NAAT)	• In cases where culture not practical (does not provide antibiotic susceptibility)
Pharynx/ conjunctiva/ rectum	• Culture (Gram stain and non-culture tests not suitable for these sites) • NAATs are not approved in Canada for oropharyngeal or rectal use. For conjunctiva and rectum, refer to package insert	• Confirmation and antimicrobial susceptibility testing
Urine (males and females)	• Non-culture test (NAAT)	• Should not be used in cases of treatment failure when antimicrobial susceptibility data are critical

Table 4. Specimen collection (continued)

Site/specimen	Test	Comments
Disseminated infection	• Genital testing • Blood culture • Gram stain and culture of skin lesion • Synovial fluid if arthritis	

NAAT=nucleic acid amplification test

Notes:

- Specimens should be taken for the diagnosis of both gonococcal and chlamydial infections (see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter).
- All suspected treatment failures must be investigated with a culture to ensure the availability of antimicrobial susceptibility data.

Other sites

- If the cervix has been surgically removed, urine and vaginal swabs are convenient specimens; specimens can also be collected from the rectum and urethra.
- Self-obtained vaginal swabs may be suitable for women who refuse pelvic examination.
- Women undergoing laparoscopy for investigation of PID should have intra-abdominal specimens taken (i.e., fallopian tube, cul de sac fluid etc.).
- Urethra in women with urethral syndrome.
- Blood and synovial fluid (in blood culture bottle) in disseminated disease. Synovial fluid should also be examined by Gram stain.
- Epididymal aspirate in men with epididymitis may be considered.
- Conjunctiva for ocular infection.

Note:

For further information on specimen transport, see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter.

Transport

- Contact the laboratory for specific instructions regarding the preferred method of specimen transport to ensure pathogen survival for purposes of culture.
- Transport of gonococcal specimens for culture should be at ambient temperature, *not* 4°C as recommended for other organisms.

Management

- Management choices should be based on the site of infection and laboratory results.
- A diagnosis of gonorrhea should be confirmed by the identification of *N gonorrhoeae* by culture, or if culture is not available, by NAATs. All confirmed or suspected cases *must* be treated.

Table 5. Management: test results available

Gram stain	• Treat for gonococcal and chlamydial infection if Gram-negative intracellular diplococci observed • The presence of Gram-negative diplococci outside PMNs is an equivocal finding that must be confirmed by culture • The presence of PMNs without diplococci does not indicate or exclude gonococcal infection
Culture test	• Treat all positives
NAATs	• A positive test is diagnostic of gonorrhea, and the patient should be treated

NAAT=nucleic acid amplification test
PMN=polymorphonuclear leukocyte

Table 6. Management: test results unavailable

Urethral/cervical mucopurulent discharge observed	• Treat for *N gonorrhoeae* and *C trachomatis*
No urethral/cervical mucopurulent discharge	• Defer therapy until smear/culture/NAAT results available OR • Treat for *N gonorrhoeae* and *C trachomatis* if follow-up uncertain and history and symptoms suggestive, or if partner is infected

NAAT=nucleic acid amplification test

Treatment

- All patients treated for gonorrhea should also be treated for chlamydial infection, unless a chlamydia test result is available and negative.
- Directly observed therapy with single-dose regimens is desirable if poor compliance is expected.
- For PID, see *Pelvic Inflammatory Disease* chapter.
- For epididymitis, see *Epididymitis* chapter.

Youth and adults

Table 7: Urethral, endocervical, rectal, pharyngeal infection (except in pregnant women and nursing mothers)[16–22]

Preferred*	Alternative ONLY if use of quinolones not recommended and cephalosporin allergy OR immediate/anaphylactic penicillin allergy[23]
• Cefixime 400 mg PO in a single dose†ß *[A-I]* OR • Ciprofloxacin 500 mg PO in a single dose‡§ (unless not recommended due to quinolone resistance) *[A-I]* OR • Ofloxacin 400 mg PO in a single dose‡§ (unless not recommended due to quinolone resistance) *[A-I]* OR • Ceftriaxone 125 mg IM in a single dose†¥ß*[A-I]*	• Azithromycin 2 g PO in a single dose¶ *[A-I]* OR • Spectinomycin 2 g IM in a single doseÞ (available only through Special Access Program [SAP]) *[A-I]*

All regimens should be followed by empiric treatment for chlamydial and non-gonococcal infections (see *Chlamydial Infections* and *Urethritis* chapters)

* Other broad-spectrum quinolones are effective but not recommended as first-line agents because of their cost.

† Cefixime and ceftriaxone should not be given to persons with a cephalosporin allergy or a history of immediate and/or anaphylactic reactions to penicillins.

‡ Contraindicated in pregnant and lactating women.

§ Quinolones are not recommended if the case or contact are from, or are epidemiologically linked to, any area with rates of quinolone-resistant *N gonorrhoeae* >3–5%:

- Asia
- Pacific Islands (including Hawaii)
- India
- Israel
- Australia
- United Kingdom
- Regions of the United States (check with the U.S. Centers for Disease Control and Prevention for rates of quinolone resistance by geographic area)
- MSM with contact or epidemiologically linked to the United States
- Areas in Canada experiencing high rates of quinolone resistance; current numbers provided by the National Microbiology Laboratory place Quebec, Ontario, Alberta and British Columbia above the 3% threshold for quinolone resistance (see Epidemiology section, above, for an explanation on national and regional quinolone resistance rates). Please check with your local public health officials to learn about quinolone resistance in your area. In Alberta all ciprofloxacin resistant cases in 2004–05 were in MSM or linked to travel outside of Alberta, therefore ciprofloxacin remains a recommended agent for the treatment of gonorrhea in Alberta except in these situations (source: Alberta Health and Wellness STD Services). For data on national quinolone resistance in Canada, please visit the Public Health Agency of Canada website (www.phac-aspc.gc.ca).

¥ The preferred diluent for ceftriaxone is 1% lidocaine without epinephrine (0.9 mL/250 mg, 0.45 mL/125 mg) to reduce discomfort.

¶ Associated with a significant incidence of gastrointestinal adverse effects. Taking medication with food may minimize adverse effects. Antiemetics may be needed.

Þ Not effective for pharyngeal infection. Test of cure is recommended.

ß Cefixime is preferred over ceftriaxone as a factor of cost and ease of administration.

Table 8. Urethral, endocervical, rectal or pharyngeal infection in pregnant women and nursing mothers[24–26]

Preferred	Alternatives
• Cefixime 400 mg PO in a single dose* *[A-I]*	• Ceftriaxone 125 mg IM in a single dose *† *[A-I]* OR • Spectinomycin 2 g IM in a single dose‡ (available only through SAP) *[A-I]*
All regimens should be followed by empiric treatment for chlamydial and non-gonococcal infections (see *Chlamydial Infections* and *Urethritis* chapters)	

SAP=Special Access Program

* Cefixime and ceftriaxone should not be given to persons with a cephalosporin allergy or a history of immediate and/or anaphylactic reactions to penicillins.

† The preferred diluent for ceftriaxone is 1% lidocaine without epinephrine (0.9 mL/250 mg, 0.45 mL/125 mg) to reduce discomfort.

‡ Not effective for pharyngeal infection. Test of cure is recommended.

Table 9. Gonococcal ophthalmia/disseminated infection (arthritis, meningitis)

Preferred initial therapy
Ceftriaxone 2 g/day IV/IM AND doxycycline/azithromycin while awaiting consultation* *[A-II]*
• Consultation with a colleague experienced in this area is essential • **Hospitalization** is necessary for meningitis and may be necessary for other disseminated infections

* The preferred diluent for IM ceftriaxone is 1% lidocaine without epinephrine (0.9 mL/250 mg, 0.45 mL/125 mg) to reduce discomfort.

Children under 9 years of age[8,27]

Table 10. Urethral, vaginal, rectal, pharyngeal infection

Preferred	Alternative
• Cefixime 8 mg/kg PO in a single dose (maximum 400 mg)*† *[A-II]* OR • Ceftriaxone 125 mg IM in a single dose†‡ *[A-II]*	• Spectinomycin 40 mg/kg IM (maximum 2 g) in a single dose *[A-II]*
• All regimens should be followed by treatment for chlamydial infection. See *Chlamydial Infections* chapter for treatment recommendations for children under 9 years of age.	

* 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*. Because there is limited experience with the use of cefixime in children with gonococcal infections, antimicrobial susceptibility must be ascertained and a follow-up culture ensured. If follow-up cannot be ensured, use ceftriaxone 125 mg IM in place of cefixime.

† Cefixime and ceftriaxone should not be given to persons with a cephalosporin allergy or a history of immediate and/or anaphylactic reactions to penicillins.

‡ The preferred diluent for ceftriaxone is 1% lidocaine without epinephrine (0.9 mL/250 mg, 0.45 mL/125 mg) to reduce discomfort.

Table 11. Disseminated infection

Infection	Preferred treatment
Arthritis	• Ceftriaxone 50 mg/kg IV/IM in a single daily dose for 7 days* *[A-III]*
Meningitis, endocarditis	• Ceftriaxone 25 mg/kg IV/IM every 12 hours for 10–14 days for meningitis, 28 days for endocarditis* *[A-III]*
Gonococcal ophthalmia beyond neonatal period	• Ceftriaxone 50 mg/kg IV/IM in a single dose (maximum 1 g)* *[A-III]*
Hospitalization and consultation with a colleague experienced in this area is essential	

* The preferred diluent for IM ceftriaxone is 1% lidocaine without epinephrine (0.9 mL/250 mg, 0.45 mL/125 mg) to reduce discomfort.

Neonatal infection

Ophthalmia neonatorum

- Hospitalize and institute appropriate infection-control precautions until 24 hours of effective therapy completed.
- Culture eye discharge, blood (cerebrospinal fluid 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 100 mg/kg IV or IM single-dose therapy *[A-II].*
- Consult with a colleague experienced in this area as soon as possible.

Table 12. Neonates born to women infected with gonorrhea

Recommended therapy (must also include therapy for chlamydia for 14 days unless the mother's tests are negative)
Ceftriaxone 125 mg IM in a single dose AND erythromycin in the following dosage schedule*† *[A-III]*: • If ≤7 days old and ≤2000 g: erythromycin 20 mg/kg/day PO in divided doses† *[A-III]* • If ≤7 days old and >2000 g: erythromycin 30 mg/kg/day PO in divided doses† *[A-III]* • If >7 days of age: erythromycin 40 mg/kg/day PO in divided doses† *[A-III]*

* The preferred diluent for 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. The use of erythromycin in infants under 6 weeks of age has been associated with infantile hypertrophic pyloric stenosis (IHPS).[28–31] The risk of IHPS with other macrolides (e.g., azithromycin) is unknown. The risks and benefits of using erythromycin in such infants must be explained to parents. When erythromycin is used, it is important to monitor for symptoms and signs of IHPS. IHPS following erythromycin use should be reported to the Canadian Adverse Drug Reaction Monitoring Program at 1-866-234-2345.

Consideration for Other STIs

- See *Primary Care and Sexually Transmitted Infections* chapter.
- Obtain a specimen for the diagnosis of chlamydial infection.
- Obtain a blood sample for serologic testing of syphilis (see *Syphilis* chapter).
- HIV counselling and testing are recommended (see *Human Immunodeficiency Virus Infections* chapter).
- Immunization against hepatitis B is recommended, if not already immune (see *Hepatitis B Virus Infections* chapter).

Reporting and Partner Notification

- With the changing epidemiology of *N gonorrhoeae*, 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 symptom onset or date of diagnosis where asymptomatic; 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.
- Since co-infections are common, persons treated for gonococcal infections should also be treated for *C trachomatis*, unless concurrent tests for chlamydia are negative.
- Local public health authorities are available to assist with partner notification and with appropriate referral for clinical evaluation, testing, treatment and health education.

Follow-up

- Repeat screening of individuals with gonorrhea after 6 months is recommended.
- 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.
  - 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 is diagnosed.
  - Patient is a child.

Notes:

- Follow-up cultures for test of cure are indicated approximately 4–5 days after the completion of therapy. These should include reculturing of all positive sites.
- NAATs are not recommended for test of cure. However, if this is the only choice, tests should not be done for 3 weeks after treatment to avoid false-positive results due to the presence of non-viable organisms.

Special Considerations

Children

- Neonates 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 *Sexual Abuse in Peripubertal and Prepubertal Children* chapter.

Notes:

- Follow-up cultures for test of cure are indicated approximately 4–5 days after the completion of therapy. These should include reculturing of all positive sites.
- NAAT is not recommended for test of cure. However if this is the only choice, tests should not be done for 3 weeks after treatment to avoid false-positive results due to the presence of non-viable organisms.

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HEPATITIS B VIRUS INFECTIONS

Etiology

- Hepatitis B is a viral disease characterized by infection of the liver by the hepatitis B virus (HBV), a small DNA virus of the family Hepadnaviridae. The virus occurs worldwide, with greatest prevalence in the developing world.

Epidemiology

- Most common cause of sexually transmitted hepatitis.
- Incubation period ranges from days after percutaneous exposure to 4–8 weeks after mucous membrane exposure.
- Incidence of acute hepatitis B in Canada is estimated to be 2.3 per 100,000.[1]
  - Incidence of acute hepatitis B in men is twice as high as in women (3.0/100,000 vs. 1.5/100,000, respectively).
  - Peak incidence rates are found in those aged 30–39 (6.1/100,000).
- Prevalence of hepatitis B in Canada is estimated to be 0.5–1.0%.[2]
- Prevalence of chronic hepatitis B varies in different populations:
  - Immigrants: 7.4%[3]
  - Inuit: 6.9%[4]
  - First Nations: 0.3%[5]
  - Sexually transmitted infection (STI) clinic patients: 0.3%[6]
- Routes of transmission:
  - Percutaneous, principally injection drug users.
  - Sexual: anal > vaginal > oral.
  - Horizontal: household contacts.
  - Vertical: mother to neonate.
- Risk factors for acquisition:[7]
  - Injection drug use (IDU): 34%
  - Multiple heterosexual sex partners: 24%
  - Men who have sex with men (MSM): 7.3%
  - Sex with HBV-infected individuals: 12%
  - Hepatitis B carrier in family: 2.4%
- Prior to donor screening, blood and blood products were important sources of infection in Canada and may still be in countries where the quality of the blood supply is questionable.
- Populations at the highest risk include the following:
  - Infants born to hepatitis B surface antigen (HBsAg)-positive mothers.
  - Injection drug users who share drug injection/preparation equipment.
  - Those with multiple sex partners.
  - Those born in or having sexual contact in areas of high endemicity.
  - Sexual and household contacts of an acute case or chronic carrier.
  - Health care workers and others with occupational blood exposure.
  - Those who are incarcerated or institutionalized.
  - Those infected with HIV or hepatitis C virus (HCV).
  - Those with a previous STI.

Prevention

Primary prevention

- Counselling/education regarding risk behaviours.
- Harm-reduction strategies (needle exchanges, etc.).
- Hepatitis B vaccination (pre-exposure prophylaxis).
  - A school-based universal hepatitis B immunization program aimed at children aged 9–13 was implemented in all provinces and territories in the early 1990s.
  - An infant universal hepatitis B vaccination program is run in some provinces and territories, in addition to the school-based preadolescent immunization program.
  - Hepatitis B immunization should be routinely offered to the following risk groups (if not previously immunized):[8]
    - Children from HBV-endemic areas who may be exposed to HBV via extended family or the community.
    - Populations or communities in which HBV is highly endemic.
    - Residents and staff of institutions for the mentally or developmentally challenged.
    - Sex workers.
    - Hemodialysis patients.
    - People with hemophilia and others receiving repeated infusions of blood or blood products.
    - Household and sexual contacts of acute HBV cases and HBV carriers.
    - Pregnant women.
    - Injection drug users.
    - Staff and inmates of correctional facilities.
    - Travellers to HBV-endemic areas.
    - Those who have recently acquired an STI.
    - Those whose regular sex partner is HBsAg-positive.
    - Those with multiple sex partners.
    - MSM.
    - Those with occupational risk (e.g., health care workers and emergency service workers who may be exposed to blood, blood products or body fluids that may contain the virus).
    - Children in childcare settings in which there is an HBV-infected child.
    - People who are HIV-positive.
    - Sexual partners of any of those listed above.
  - Offer hepatitis B vaccine to all those in the above categories who do not show evidence of immunity *[A-I]* or do not have proof of immunization, and refer those showing evidence of chronic hepatitis B carriage for consideration for treatment with available agents *[A-I]*.[9,10] Some authorities suggest that preimmunization screening is not cost-effective in low-risk populations, particularly adolescents, and recommend immunization without screening tests;[11] with each passing year after the initiation of universal school-based immunization, screening will become increasingly cost-effective as the proportion of those not immunized diminishes.

Secondary prevention (post-exposure prophylaxis)

- Hepatitis B immune globulin (HBIG) can be given to recipients of percutaneous (needlestick) or mucosal exposure up to 7 days after exposure and to sexual contacts within 14 days of exposure (ideally within 48 hours), followed by hepatitis B vaccine.[8]
- For infants born to HBV-infected mothers, the first dose of hepatitis B vaccine should be administered within 12 hours of birth and HBIG immediately after birth (efficacy decreases sharply after 48 hours).[8]
  - See Figure 1 for an algorithm on the approach to a sexual (penile–anal, penile–vaginal or oral–genital) or percutaneous/mucosal exposure to a known hepatitis B carrier or a high-risk source.
  - Postimmunization screening for the antibody to hepatitis B surface antigen (anti-HBs) is generally not recommended, except for the following:[8]
    - Infants born to infected mothers.
    - Sexual partners and household contacts of chronic carriers.
    - Those immunized for occupational exposure.
    - Those who are immunocompromised (i.e., lose their response).
    - Hemodialysis patients.
    - Pregnant women.

Manifestations and diagnosis

- Although HBV is hepatotropic and the liver is the sole site of infection, viremia may lead to clinical manifestations related to immune complex formation.
- All patients being assessed for STIs should be asked about their vaccination history, risk history, previous icteric illness and previous hepatitis testing.
- Acute hepatitis B infection is often not clinically apparent, with 50–70% of adult cases being asymptomatic. Symptomatic cases may be non-specific (fatigue, nausea, vomiting, anorexia, rash, arthralgia). A smaller proportion of cases are icteric; these can be clinically indistinguishable from other viral or toxic causes of hepatitis.
- Chronic hepatitis B can be detected by persistence of HBsAg, may or may not be associated with elevations in hepatic transaminases and is generally asymptomatic until clinical signs of cirrhosis, portal hypertension or hepatocellular carcinoma supervene.
- Hepatitis serologic testing can be done for a number of potential indications:
  - To diagnose acute infection in symptomatic persons.
  - To detect chronic infection in asymptomatic persons.
  - As a preimmunization screen to identify non-immune persons who may benefit from hepatitis B vaccination.
- See Table 1 for serologic markers for hepatitis B.

Table 1. Serologic markers for hepatitis B

Stage	HBsAg	HBeAg	Anti-HBc IgM	Anti-HBc IgG/total	Hepatitis B viral DNA	Anti HBs
Acute (early)	+	+	+	+	+	–
Acute (resolving)	+	–	+	+	–	–
Chronic	+	+/–	–	+	+/–	–
Resolved	–	–	–	+	–	+/–*
Vaccinated	–	–	–	–	–	+*

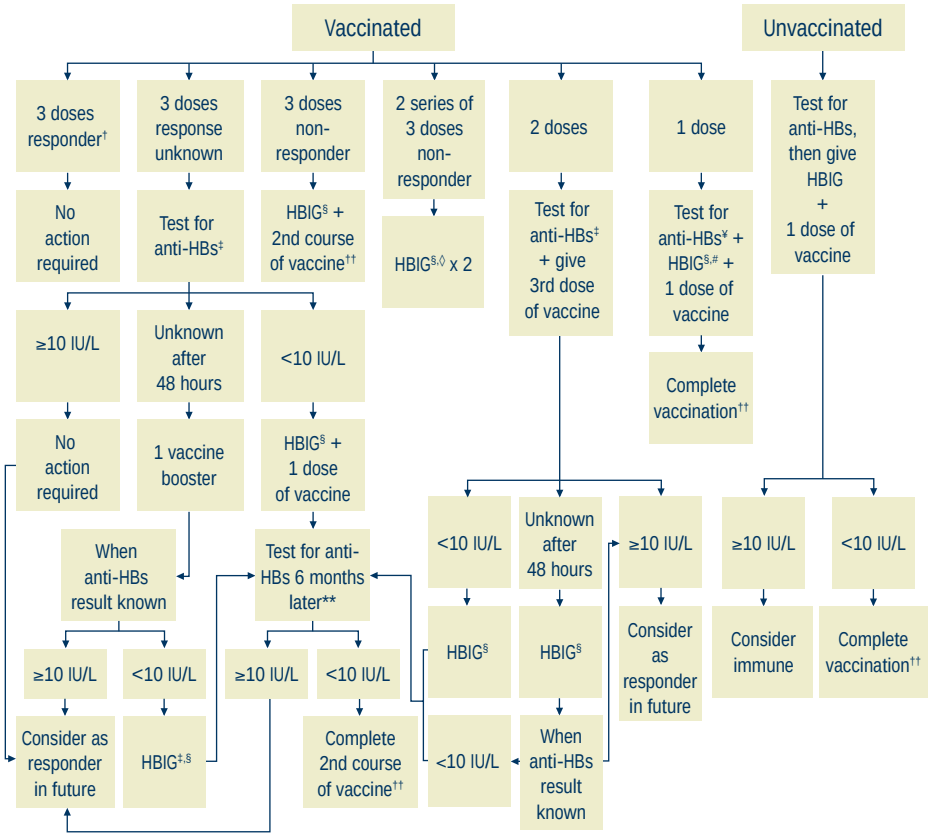
anti-HBc = antibody to hepatitis B core antigen
anti-HBs = antibody to hepatitis B surface antigen
HBeAg = hepatitis B early antigen
HBsAg = hepatitis B surface antigen
* In some patients, anti-HBs may decline over time and become undetectable.

- The choice of serologic testing for suspected acute or chronic cases is determined by the clinical situation and should be supplemented by the addition of liver function testing and hepatic transaminases. For those who are HBsAg-positive, who may be in the window period before development of anti-HBs and anti-HBc antibodies, a positive anti-HBc IgM confirms that this is due to early infection.
- There is controversy surrounding the need to prescreen high-risk individuals before vaccination, as well as the optimal choice of serologic tests for screening. For those at high risk and for whom follow-up cannot be ensured, it is prudent to give the first dose of vaccine on the initial visit after drawing blood for screening serology.
- Evaluating the status of a high-risk person should not delay immunization.

Management

Figure 1. Management of sexual/percutaneous/mucosal exposure to infected (HBsAg-positive) or high-risk* source

(adapted from Canadian Immunization Guide*)*[8]



anti-HBs = antibody to hepatitis B surface antigen
HBIG = hepatitis B immune globulin

* A known source is high-risk if the person comes from a highly endemic region for HBV, has sexual relations with multiple partners, has a partner who is infected with HBV or is at high risk of being so, is in close family contact with an infected person, uses injection drugs or received blood or blood products prior to 1970. Wherever possible, the source should be tested. In the case of an unknown source, background circumstances may provide some indication of the degree of risk (e.g., syringe found in the street, attendance at an STI, detoxification or well-baby clinic).

† Responder known to have ≥10 IU/L anti-HBs. No measures are required if the person has developed an immunity following an infection.

‡ Anti-HBs titre should be determined as soon as possible to avoid needless administration of HBIG and because efficacy is unknown if given after 7 days for percutaneous/mucosal exposures and up to 14 days for sexual exposures.

§ The administration of HBIG can be omitted if the high-risk source can be tested within 48 hours and the result is negative. In that case, see Figure 2.

◊ The second dose of HBIG should be given 1 month after the first.

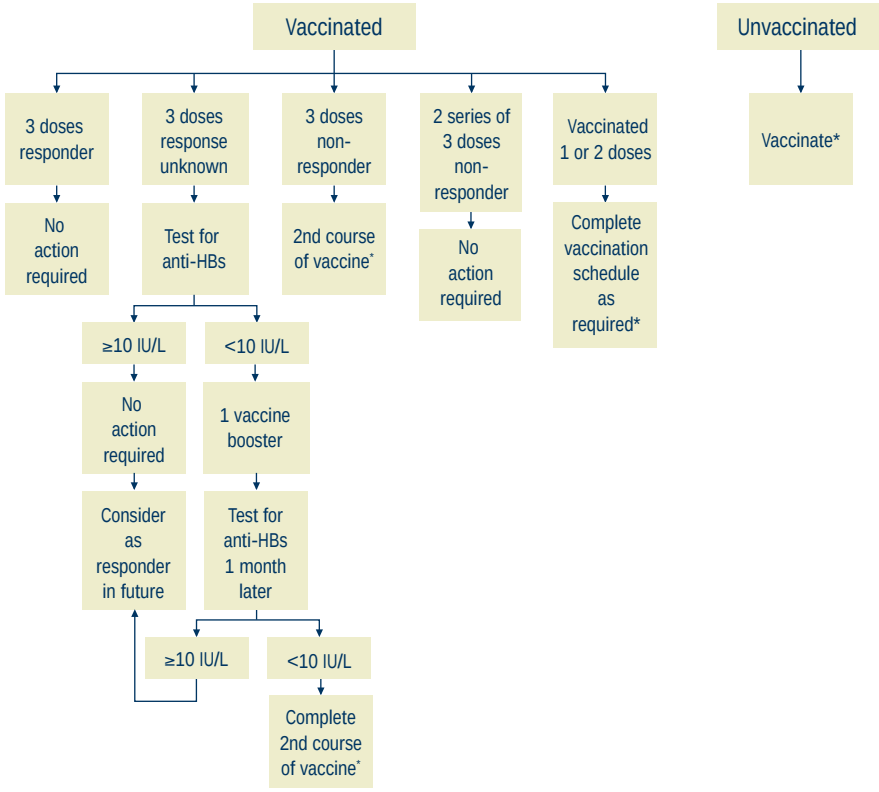
¥ This test does not change the continuation of vaccination, but may reassure the exposed individual about the immediate risk of becoming infected.

If it is possible to quickly obtain an anti-HBs titre confirming ≥10 IU/L, administration of HBIG should be omitted.

** Determination of anti-HBs titre should be delayed for 6 months to allow HBIG antibodies to wane.

†† Test for anti-HBs 1–6 months after the course of vaccine.

Figure 2. Management of sexual/percutaneous/mucosal exposure to uninfected (HBsAg-negative) or low-risk source
(adapted from Canadian Immunization Guide)[8]



anti-HBs = antibody to hepatitis B surface antigen
*Test for anti-HBs 1–6 months after the course of vaccine.

Treatment

- A discussion of the treatment of clinical hepatitis B is beyond the scope of these guidelines. Any patient known to have chronic hepatitis B should be referred to an expert for further management. Those wishing further details on initial workup of the patient with chronic hepatitis B are referred to *Management of Viral Hepatitis: A Canadian Consensus Conference 2003/2004*[12] and *The Management of Chronic Viral Hepatitis: A Canadian Consensus Conference 2004*.[13] Some brief comments can be made:
  - There is no indication for antiviral intervention in acute hepatitis B.
  - Acute cases of hepatitis B should abstain from sexual contact or practice safer-sex until partners and/or relevant contacts have been appropriately screened and/or immunized.
  - In the case of chronic active hepatitis B, there are data to support the efficacy of interferon- α,[9] lamivudine,[10] famciclovir,[14] adefovir,[15] ribavirin[16] and other agents under study. In Canada, most patients are managed with interferon- α and/or lamivudine (3TC) as primary therapeutic modalities *[A-I]*.

Consideration for Other STIs

- Any patient with hepatitis B infection believed to have been acquired sexually should be considered to be at risk for other STIs, including HIV, and should be offered testing for gonorrhea, chlamydia, syphilis and HIV.
- Any patient with hepatitis B infection believed to have been acquired parenterally should be considered to be at risk for HIV and HCV, and should be offered testing for both.
- Concurrent HIV and hepatitis B infection can lead to more rapid progression of liver damage and is more likely to lead to chronic infection and impaired hepatic function, which may limit the therapeutic options for treatment of the HIV co-infection.[17]

Reporting, Partner Notification and Follow-up

- Acute hepatitis B is a reportable infection in all Canadian jurisdictions.
- Partner notification/contact tracing is essential to identify those at risk of acquiring hepatitis B, both to clarify their immune status and to provide vaccine protection to the non-immune. Contacts include the following:
  - Sexual and percutaneous exposures during the period of infectivity.
  - Children of hepatitis B-infected mothers who did not receive HBIG and vaccine at birth.
  - Those living in the household of the index case.

Special Considerations

- Pregnant women with no history of hepatitis B immunization should be screened at their initial prenatal visit for HBsAg. A pregnant woman who has no markers of acute or chronic HBV infection but who is at high risk of acquiring HBV should be offered vaccine at the first opportunity and tested for antibody response.[8] Pregnancy is not a contraindication to immunization.[8] If testing has not been done during pregnancy, it should be done at the time of delivery. Repeat testing before delivery may be considered in uninfected and non-immunized women with continuing high-risk behaviour. Infants born to HBsAg-positive women should receive postexposure prophylaxis.

- Children adopted from areas or family situations in which there is a high prevalence of HBV infection should be screened for HBsAg, and if they are positive, household contacts should be immunized before adoption.

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HUMAN IMMUNODEFICIENCY VIRUS INFECTIONS

Etiology[1,2]

- The human immunodeficiency virus (HIV) has been shown to be the causative agent of acquired immunodeficiency syndrome (AIDS).
- Infection with HIV results in the progressive destruction of CD4+ T lymphocytes. These cells are crucial to the normal function of the human immune system.
- Persons with HIV infection and subsequent immune suppression are, therefore, at risk of developing a variety of clinical AIDS-defining conditions, including opportunistic infections (e.g., *Pneumocystis jiroveci* [formerly *Pneumocystis carinii*] pneumonia, disseminated *Mycobacterium avium* complex [MAC] disease), primary neurologic disease (e.g., AIDS dementia) and malignancy (e.g., lymphoma, Kaposi sarcoma) (see Table 3 for AIDS-defining conditions).

Epidemiology[3,4]

- The HIV/AIDS epidemic is a complex one, with differing rates of infection in specific at-risk populations. The number of Canadians living with HIV infection continues to increase. There has been a 20% rise in the number of positive HIV test reports in Canada in the last 5 years (2000–2004).
- In 2004, men who have sex with men (MSM) still represented the largest number and proportion of positive HIV test reports; however, the heterosexual exposure category represents a growing number and proportion of positive HIV tests, surpassing injection drug use (IDU) as the second largest exposure category.
- Persons migrating to Canada from countries where HIV is endemic also represent an increasing proportion of the positive HIV test reports in the last 3 years. These reports are included in the heterosexual exposure category.
- Women represent an increasing proportion of those with positive HIV test reports, as well as reported AIDS cases in Canada. Over 25% of the positive HIV test reports in 2004 were in women, compared to less than 10% prior to 1995. The largest rise in this group is seen among those aged 15–19 years. Heterosexual exposure and IDU are the two major risk behaviours for HIV infection in women.
- Aboriginal peoples make up a growing percentage of positive HIV test reports and reported AIDS cases. IDU continues to be a key mode of HIV transmission in the Aboriginal community. Nearly 50% of all positive HIV test reports among Aboriginal Canadians were in women (less than 20% of positive HIV test reports among caucasian Canadians were in women). Aboriginal peoples test positive for HIV at a younger age compared to non-Aboriginal persons.[4,5]
- Canadians of African ancestry also make up a growing percentage of positive HIV reports and reported AIDS cases. Heterosexual exposure accounts for more than 80% of positive HIV test reports in this group. Approximately 50% of positive HIV test reports in this group are in women.
- Approximately 30% of people living with HIV infection are unaware of their HIV status. These persons — representing the “hidden epidemic” — are particularly important, because they have not yet taken advantage of services for clinical

assessment, counselling and therapy. They present for medical attention later in the course of their illness and may unknowingly continue to transmit the infection.

- Although the limited data available suggest that HIV prevalence is currently low among Canadian youth, sexual risk behaviour and sexually transmitted infection (STI) data clearly indicate that the potential for HIV transmission remains significant among young Canadians. Data from targeted studies show that street-involved youth, youth who inject drugs and young MSM are particularly vulnerable to HIV infection.
- Rates of HIV infection in Canadian provincial and federal prisons appear to be much higher than in the general population. It is likely that most HIV-positive inmates were engaged in high-risk behaviour prior to imprisonment; however, there is evidence to indicate that some inmates continue to engage in high-risk behaviour after incarceration, including needle-sharing, tattooing and unprotected sex. There is great potential for HIV transmission among inmates, with possible transmission later to the spouses/partners of those released.[6]
- In Canada, blood donors have been screened and tested for HIV infection since 1985. This has resulted in a marked decline in the proportion of transfusion-associated HIV infections. The current estimated risk of infection from blood and blood products is exceedingly low in Canada (approximately one per million units of blood).
- The risk of acquiring HIV infection from a single sexual contact with an HIV-infected person is variable; risk increases with number of exposures and higher viral load in the source person.[7–9] While oral sex is a lower-risk activity than unprotected anal or vaginal intercourse, repeated exposures may increase the risk.[4]
- Sexual transmission (infectiousness or susceptibility) of HIV is enhanced by the presence of other STIs,[10–12] including ulcerative genital infections (e.g., syphilis, genital herpes) and non-ulcerative genital infections (e.g., chlamydia, gonorrhea, trichomoniasis).[13–17] Bacterial vaginosis, although not strictly considered an STI, may also increase sexual transmission of HIV.[18–21]
- The median time from acquiring HIV infection to the diagnosis of AIDS now exceeds 10 years. There has been a marked decline in the number of persons diagnosed with AIDS in Canada. The use of highly active antiretroviral therapy (HAART) is the major factor responsible for this decline.
- The use of HAART has dramatically changed the face of the HIV epidemic.[22] The increased lifespan of persons living with this chronic disease may be leading to a more relaxed attitude and less caution in persons at risk of transmitting and acquiring this infection.[23–25]
- The success of HAART in transforming HIV infection into a chronic disease has increased the total burden of care. This has resulted in an increased incidence of adverse effects from therapy and greater difficulty with long-term adherence to HAART.
- Widespread use of HAART, including issues of non-adherence, has also increased the potential for transmission of drug-resistant virus.

Prevention

- Persons presenting with concerns about HIV infection provide an important opportunity for education and encouragement for the consistent practice of risk reduction. These practices include sexual abstinence, reduced number of sexual partners, proper use of barrier methods and risk reduction with IDU.
- Persons with known risk behaviour(s) should be offered HIV testing, counselling and diagnosis.
- At the time of diagnostic testing for HIV, review and monitor prevention practices.
- Identify barriers to prevention practices and the means to overcome them.
- Discuss the potential use of HAART to not only improve prognosis, but also reduce infectiousness.[26]
- Discuss prompt treatment of any STI to reduce the risk of transmitting or acquiring HIV.[27–31]

Pre- and Post-Test Counselling[32]

- Counselling should be age-appropriate and individualized to the person being tested.
- Testing should be done only after informed consent has been obtained.

Pre-test counselling

- Clarify:
  - The confidentiality of HIV testing, reporting and record handling.
  - The testing options available (i.e., nominal, non-nominal, anonymous) (see Laboratory diagnosis, below).
  - That the test is for antibodies to HIV, not a direct test for the HIV virus or for AIDS.
  - That the majority of persons produce detectable antibodies within 3 months.
  - That an initial positive screening test is automatically followed by a confirmatory test (same blood sample) to rule out a false-positive test. This may mean a delay in the availability of the test result.
  - That the results should not be provided to the patient until confirmatory test results are available.
  - That the test results should be provided in person.
  - That returning for results is preferred, as it provides an opportunity to provide proper post-test counselling.
  - That a negative test may mean the person is not infected, or that it is too soon to detect antibodies.
  - That a positive test means the person is infected with HIV and is infectious to others through unprotected sexual contact, blood, breast milk or tissue/organ donation.

  - That an indeterminate confirmatory test result means that testing should be repeated in 3 months or additional testing performed (e.g., qualitative HIV polymerase chain reaction [PCR], serum p24 antigen; please consult your local laboratory regarding test availability).
  - That HIV is not casually transmitted through sweat, saliva, urine, feces or tears (unless there is visible blood present in any of these).
  - That transmission risks are as follows:
    - Unprotected sexual contact: anal sex (high risk), vaginal sex (high risk), oral sex (low risk).
    - Direct blood-to-blood contact.
    - Sharing needles or syringes (including IDU, tattooing, piercing with shared/unclean equipment).
    - Transmission from mother to child during pregnancy, at birth or via breast milk.
    - Receiving blood or blood products in Canada before November 1985 (elsewhere risk will vary depending on testing of donated blood).
- Discuss:
  - Specific risk behaviours, sexual and otherwise.
  - Availability of therapy to decrease the risk of mother-to-child transmission if the person is pregnant (decreased by ≥80%).
  - Whether future testing will be necessary.
  - Risk-reduction behaviours (see *Primary Care and Sexually Transmitted Infections* chapter):
    - Practice sexual abstinence (will eliminate risk).
    - Ensure consistent use of latex or polyurethane condoms.
    - Avoid casual/anonymous/unprotected sex.
    - Avoid sharing needles, syringes or other IDU equipment.
- Explore:
  - Psychological implications of testing.
  - Coping mechanisms to deal with either result; availability of support systems (personal, community, medical).
- Explain:
  - The need to return for test results and schedule a post-test counselling visit.
  - Public health notification for follow-up if the test is positive and the patient fails to return for results.
  - Post-test counselling procedures.
  - Partner notification and reporting requirements for HIV infection (depends on jurisdiction and availability of anonymous testing).
  - With a positive result, the need for full clinical and laboratory assessments and for discussion regarding antiretroviral therapy and prophylaxis for opportunistic infections.

Post-test counselling[33,34]

- If the test result is **negative**:
  - Interpret as:
    - No infection or "window period" with infection, but no detectable antibodies. Retesting may be required 3 months after last potential exposure to allow for detection of an antibody response. Retesting 6 months after last potential exposure may be required for those presenting with late clinical signs and symptoms of HIV infection or in persons with an impaired immune response.
    - In the case of sexual assault (see *Sexual Abuse in Peripubertal and Prepubertal Children* and *Sexual Assault in Postpubertal Adolescents and Adults* chapters) and occupational exposure (see Occupational transmission, below) baseline testing should be performed, followed by additional testing at 6 weeks, 12 weeks and 6 months.
  - Reinforce risk reduction:
    - Avoid high-risk behaviours.
    - Avoid needle/syringe sharing.
    - Use lubricated latex or polyurethane condoms with sexual activity.
- If the test result is **positive**:
  - Interpret as:
    - Infected with HIV, not diagnostic of AIDS.
    - Explain that a confirmatory test to rule out a false-positive test has been performed.
  - Consider a first priority:
    - Dealing with the issues important to the infected person.
    - Discussing coping and support systems.
    - Discussing and assisting in the partner-notification process (by the infected person or the local public health unit).
    - Providing specific guidance about avoiding HIV transmission:
      - Protect others from sexual secretions, blood and other bodily fluids.
      - Avoid donating blood, organs, tissue, sperm or breast milk.
      - Be aware of infectivity (reinforce mechanisms of transmission, including high- and low-risk behaviours).
    - Discuss disclosure issues:
      - Persons with HIV infection should be informed of the medico-legal requirement to disclose their HIV status to a potential sexual or drug-injecting partner. This is particularly important if they will be engaging in high-risk behaviour(s).[35–37]
      - Persons with HIV infection should inform their family physician and consider informing other health care providers (e.g., dentist).
      - Disclosure in the workplace is usually not mandatory but should be individualized (e.g., where the person with HIV infection has direct patient-care responsibilities).
      - Disclosure to friends or family is not essential but might be considered if there is potential for a positive outcome (e.g., positive family support).

    - Discuss benefits of treatment and follow-up.
  - Deal with soon:
    - Further medical support, immune testing, HIV viral load testing, CD4 count and counselling are required.
    - Discuss use of laboratory testing to make therapeutic decisions.
  - Discuss medical care:
    - Screen for hepatitis B virus (HBV) infection and immunity (see *Hepatitis B Virus Infections* chapter). Screen for hepatitis A virus (HAV) immunity in injection drug users, MSM, individuals with chronic liver disease and hemophiliacs.
    - Screen for hepatitis C virus (HCV) infection.
    - Screen for syphilis and other STIs.
    - Screen for tuberculosis.
    - Refer where required (e.g., HIV specialist).
    - Discuss health-enhancing lifestyle modifications, empowerment.
    - Discuss issues of confidentiality in the health care system, community, at school or at work.
    - Discuss avoidance of activities that increase transmission risk of toxoplasmosis and enteric pathogens.

Transmission

- Transmission of HIV infection occurs essentially through specific exposure to blood and/or body fluids from an HIV-infected person. The most concerning types of exposure include sexual exposure, parenteral blood exposure through IDU or blood transfusion, perinatal mother-to-child transmission and occupational exposure in the health care setting. Strategies for prevention should be aimed at risk reduction in these areas. A high viral load in the infected person increases the potential for transmission.[38]

Sexual transmission

- This is the major route of HIV transmission.[39]
- Sexual activities can be divided according to risk.[40] This ranges from touching and hugging, which carry no risk, to penile–anal and penile–vaginal intercourse without a condom, which carries a high risk. Providers must be aware of and counsel patients according to the implications that specific behaviours can have on the transmission of other blood-borne pathogens and STIs.
- Persons should be counselled that:
  - Only sexual abstinence and “no-risk” activities are guaranteed to prevent transmission.
  - Low-risk activities are preferable to high-risk activities.
  - Male and female condoms made of latex or polyurethane are an effective barrier for preventing HIV transmission. Correct and consistent use of condoms can reduce but not eliminate the risk of HIV transmission.[41–44]

  - The presence of another STI in either the source or the exposed person, particularly ulcerative lesions such as syphilis or genital herpes, increases the potential for sexual transmission of HIV.
- Infected individuals should be strongly urged to inform past, present and future sexual partners about their known HIV-positive status.
- Ongoing counselling and discussion about sexual behaviour is appropriate.

Parenteral transmission

- Risk of parenteral HIV transmission can be divided according to risk.[40] This ranges from the use of sterilized injection equipment, which is considered no-risk, to the use of shared needles, which is considered high-risk. Providers should be aware of and counsel patients according to the implications that specific behaviours can have on the transmission of other blood-borne pathogens.
- Active injection drug users should be encouraged to discontinue drug use by using addiction-treatment services and should be counselled on the health risks associated with IDU.
- If the individual is not ready, willing or able to discontinue IDU, harm-reduction strategies should be stressed, including not sharing injecting equipment and adopting safer modes of drug use.
- Access to sterile injecting equipment, such as needle-exchange programs, should be discussed and encouraged.

Perinatal mother-to-child transmission

- The HIV prevalence rate among pregnant women is approximately 3–5/10,000 in Canada.
- Transmission of HIV infection from the HIV-positive mother to her infant may occur in utero, during childbirth or after childbirth through breastfeeding. Preventing this mode of transmission can, therefore, be achieved by identifying HIV-infected women who are pregnant and using strategies to minimize the risk of mother-to-child transmission.[45]
- Antiretroviral therapy can dramatically reduce perinatal transmission of HIV.
- In all Canadian provinces and territories, HIV testing of pregnant women remains the choice of the woman. Guidelines and/or recommendations for HIV testing of pregnant women have been developed in each province and territory to encourage informed decision-making.
- **All pregnant women** should be offered confidential HIV testing and counselling as part of routine prenatal care.
- In some provinces and territories (Alberta, Newfoundland and Labrador, Northwest Territories, Nunavut), an “opt-out” policy treats HIV screening as a routine prenatal screening test. The pregnant woman is informed that testing will be done, but consent is implied unless she specifically refuses.[4]

- Women who present in labour who have not had prenatal HIV testing or who have been engaging in high-risk behaviour after initial negative prenatal HIV testing should be offered expedited or rapid HIV testing.[45]
- HIV-positive women of childbearing age 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 *Pregnancy* chapter).
- In North America, breastfeeding is contraindicated for HIV-infected mothers.

Occupational transmission[46]

- Transmission of HIV infection in the workplace (occupational exposure) is primarily concerned with the potential for transmission from patient to health care personnel. The potential for transmission from health care personnel to patient and from one health care person to another is not within the scope of this section.
- Occupational exposure to HIV infection may occur in several instances:
  - Percutaneous injury with a sharp object potentially contaminated with blood or other bodily fluid.
  - Mucous membrane exposure to blood or other bodily fluid.
  - Skin exposure to blood or other bodily fluid.
- The average risk of HIV transmission after a percutaneous exposure to HIV-infected blood has been estimated to be approximately 0.3% (3/1,000), and after a mucous membrane exposure, approximately 0.09% (0.9/1,000).[47,48] Although episodes of HIV transmission after non-intact skin exposure have been documented, the average risk for transmission by this route has not been precisely quantified but is estimated to be less than the risk for mucous membrane exposures.[49,50] The risk for transmission after exposure to fluids or tissues other than HIV-infected blood also has not been quantified, but is probably considerably lower than for blood exposures.[51]
- The decision to initiate postexposure prophylaxis (PEP) for HIV infection is based on clinical judgment and should be a joint decision with the exposed health care worker.
- The choice of no PEP vs. a two- or three-drug PEP regimen is based on the index of suspicion after evaluating the following:
  - Source of exposure: the potential for HIV infection (e.g., high-risk activity or HIV-positive source).
  - Type of exposure: the potential for transmission of HIV infection (e.g., hollow-bore needle visibly contaminated with source patient's blood).[52,53]
- PEP should be initiated as soon as possible, as it may be less effective if initiated more than 72 hours after exposure.

Diagnosis

- The diagnosis of HIV infection is based primarily on a positive serologic test. Persons with HIV infection may be totally asymptomatic. Therefore, serologic testing is recommended when there is a high index of suspicion (e.g., high-risk behaviour and/or suspicious clinical symptoms and signs). Persons may also present with specific opportunistic infections or other conditions indicative of underlying immunosuppression.

Risk behaviours

- Multiple sex partners.
- Unprotected sexual activity (i.e., no barrier [condom] protection).
- Sex with an HIV-infected partner.
- Receptive anal/vaginal intercourse.
- Sharing of IDU equipment.
- Acquisition of other STIs, such as HBV or syphilis.

Clinical diagnosis

- The time from initial HIV infection to clinical disease is highly variable, with a median time of approximately 10 years. However some HIV-infected persons experience more rapid progression of disease.
- The person with HIV infection may experience several stages:
  - Primary or acute HIV infection.
  - Chronic asymptomatic HIV infection.
  - Chronic symptomatic HIV infection.

Primary/acute HIV infection

- This is the period from initial infection to development of the full serum antibody profile (i.e., seroconversion).[54–56]
  - High levels of viral replication and plasma viremia.
  - Shedding from mucosal sites.
  - No detectable antibody.
  - Depressed CD4 count.
- Although some patients in this stage are asymptomatic, up to 90% may be symptomatic (i.e., the acute retroviral syndrome).[57] Symptoms generally appear 2–4 weeks after initial infection and are often nonspecific or mild. They are usually self-limited, lasting 1–2 weeks, but may last several months.
- The spectrum of symptoms may include an acute mononucleosis-like illness, fever and skin rash. Meningoencephalitis or aseptic meningitis may occur. Less commonly, AIDS-defining conditions such as *Pneumocystis jirovecii* (formerly *carinii*) pneumonia or oroesophageal candidiasis may occur.

Table 1. Symptoms of acute HIV infection

Symptoms	Frequency
Fever (mean temperature 39.4°C [102.9°F])	>80%
Arthralgia or myalgia, rash, lymphadenopathy, sore throat, fatigue, headache	40–80%
Oral ulcers and/or genital ulcers, >5 kg weight loss, nausea, vomiting or diarrhea	10–40%

- If initial HIV serologic tests are negative or indeterminate, additional testing can be considered. Please consult appropriate resources or colleagues experienced in this area.
- A high index of suspicion in the person with a nonspecific febrile illness and a history of high-risk behaviour is key to making the diagnosis.
- Although the treatment of primary or acute HIV infection is considered optional at this time, these persons may be highly infectious.[58] Detection of primary HIV infection provides an opportunity for counselling and preventing further transmission.

Chronic asymptomatic HIV infection

- This is the stage where viral replication and plasma viremia are more controlled by the immune response. There is a balance between ongoing viral replication and the host immune response represented by the level of CD4+ T cells.
  - Many persons fall into this category.
  - Generalized lymphadenopathy is frequently present.
  - Thrombocytopenia may be present.

Chronic symptomatic HIV infection

- This is the stage where viral replication depletes the CD4+ T cells to the level of profound immunosuppression.[59] See Table 2 for signs and symptoms.

Table 2. Signs and symptoms of chronic symptomatic HIV infection

- Oral hairy leukoplakia
- Unexplained fever (>2 weeks)
- Fatigue or lethargy
- Unexplained weight loss (>10% body weight)
- Chronic diarrhea (>3 weeks)
- Unexplained lymphadenopathy (usually generalized)
- Cervical dysplasia
- Dyspnea and dry cough
- Loss of vision
- Recurrent or chronic mucocutaneous candidiasis (oral, esophageal, vaginal)
- Dysphagia (esophageal candidiasis)
- Red/purple nodular skin or mucosal lesions (Kaposi sarcoma)
- Encephalopathy
- Herpes zoster, especially if severe, multidermatomal or disseminated
- Increased frequency or severity of mucocutaneous herpes simplex virus infection
- Unexplained "anemia of chronic disease"

Table 3. AIDS-defining conditions[60,61]

(Require concurrent positive HIV serology to be diagnostic of AIDS)

- Bacterial pneumonia, recurrent
- Candidiasis (esophageal, bronchi, trachea or lungs)
- Cervical cancer, invasive
- Coccidioidomycosis (disseminated or extrapulmonary)
- Cryptococcosis (extrapulmonary)
- Cryptosporidiosis (chronic intestinal)
- Cytomegalovirus disease (other than liver, spleen, nodes)
- Cytomegalovirus retinitis (with loss of vision)
- Encephalopathy, HIV-related (dementia)
- Herpes simplex virus (chronic ulcers or bronchitis, pneumonitis or esophagitis)
- Isosporiasis, chronic intestinal
- Kaposi sarcoma
- Lymphoma (Burkitt, immunoblastic, primary in brain)
- *Mycobacterium avium* complex or *M kansasii* (disseminated or extrapulmonary)
- *Mycobacterium* of other species (disseminated or extrapulmonary)
- *Mycobacterium tuberculosis* (pulmonary, disseminated or extrapulmonary)
- *Pneumocystis jirovecii* (formerly *carinii*) pneumonia
- Progressive multifocal leukoencephalopathy
- *Salmonella* septicemia, recurrent
- Toxoplasmosis of brain
- Wasting syndrome due to HIV

Laboratory diagnosis — HIV antibody testing

- Any physician or qualified health care provider may order an HIV test. (Check with your local laboratory for the availability of these tests.)
- Testing should be carried out only with the informed consent of the person being tested.
- HIV antibody testing should be offered to any person with identified risk behaviour who has clinical or laboratory clues suggestive of HIV infection, or who requests it.
- Explain clearly the nature of the test, and provide appropriate pre- and post-test counselling.
- Point-of-care rapid tests for HIV antibodies are now more widely available. All reactive screening tests using these kits require confirmatory testing (e.g., Western blot analysis).[62]
- CD4 count and viral load testing should not be used as screening or diagnostic tests.
- p24 antigen testing, although occasionally useful in diagnosis of primary or acute infection, is insensitive for screening purposes.
- There are three options for HIV testing and reporting in Canada: nominal, non-nominal or anonymous. The use and availability of these options varies across the provinces and territories. Your local public health authority will provide information on the options available in your region.[4]
  - Nominal testing: the HIV test is ordered using the name of the person being tested.
  - Non-nominal testing: the HIV test is ordered using a code or the initials of the person being tested. Only the person ordering the test knows the identity of the person being tested and is able to link the result to that person's health care record.
  - Anonymous testing: the HIV test is ordered using a unique non-identifying code. The person(s) ordering the test and providing the result (usually by telephone) do not know the identity of the person being tested. Only the person being tested knows the code, so the test result is not linked to that person's health care record. Although anonymous testing may encourage more persons to have testing, it is not available in all provinces and territories.
- A positive enzyme immunoassay (EIA) screening test requires confirmatory testing (e.g., Western blot analysis) using the same specimen.
- Repeat all initial positive HIV serologic tests using a second blood specimen to rule out laboratory error and confirm the diagnosis.

Management, Treatment and Follow-up[63,64]

- This is an increasingly complex area, with rapid changes in optimal therapy as new research becomes available. Recommendations for a given person should be made in collaboration with a colleague experienced in HIV/AIDS. Your local public health authority will have a listing of these.

Guiding principles

- Asymptomatic infected persons are usually followed at 3–6-month intervals if untreated.
- The follow-up interval may vary if antiretroviral therapy is provided or if the person is symptomatic.
- Routine monitoring of CD4 lymphocyte count and plasma HIV RNA viral load are key in assessing effectiveness of antiretroviral therapy.[65,66]

First visit after positive HIV test

- Conduct a medical history and complete physical examination, including genital and anal inspection.
- Order laboratory tests, including complete blood count with white cell differential, CD4 count, viral load, liver function tests, creatinine kinase, blood glucose, amylase and lipase. Screen for HBV infection and immunity (see *Hepatitis B Virus Infections* chapter). Screen for HAV immunity in injection drug users, MSM and individuals with chronic liver disease and hemophilia. Screen for HCV infection. Screen for toxoplasma (IgG) and syphilis. Tests for other STIs, such as gonorrhea and chlamydia, should also be considered (see Consideration for Other STIs, below).
- For women, cervical screening for dysplasia and/or human papillomavirus (HPV) infection is recommended if not performed within the last 6–12 months. The anal Pap smear for men with a history of anal receptive intercourse and/or a history of anal warts is available only in certain centres.
- Baseline fasting lipids and glucose would be appropriate if considering starting antiretroviral therapy.
- Tuberculin skin testing is essential. A negative test may not rule out latent or active tuberculosis.[67]
  - If past exposure to *Mycobacterium tuberculosis* is indicated (induration ≥5 mm in diameter), the person should be assessed for active tuberculosis.
  - If active tuberculosis is excluded and the person has not previously received therapy to prevent or treat tuberculosis, isoniazid 300 mg once daily for 9–12 months 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.[68]
  - Consultation with a colleague experienced in this area should be sought.

- Immunization (e.g., HAV, HBV) should be discussed according to current guidelines.[69,70] Generally, there is no contraindication to the use of inactivated or component vaccines in HIV-positive persons. The routine childhood immunization schedule should be completed if indicated. Pneumococcal immunization (boosted once only after 5 years) and annual influenza immunization are recommended.
- Influenza and pneumococcal immunization have been associated with transient increases in plasma viral load levels. However, this does not appear to have any significant impact on disease progression, and the benefits are generally felt to outweigh the risks.
- Smoking cessation is an important issue, particularly in persons with other cardiovascular risk factors who will be starting antiretroviral therapy.

Follow-up visits

- Conduct a clinical assessment, including assessment for cardiovascular disease, lipodystrophy, lactic acidosis and diabetes mellitus.
- Conducting an annual anal inspection for the presence of HPV lesions, particularly in MSM, is encouraged.[71,72]
- Take the opportunity for risk-reduction counselling. Sexual and drug-use history should be discussed at each visit.
- If the patient is on therapy, assess adverse effects and adherence.
- CD4 counts and viral load testing should be performed every 3–6 months. Other laboratory tests, including complete blood count with white cell differential, liver function tests, creatinine kinase, amylase, lipase, fasting lipids and blood glucose should also be performed every 3–6 months, depending on drug therapy.
- There are two components to drug treatment: antiretroviral therapy and drugs to prevent or treat opportunistic infections.

Antiretroviral therapy[73]

- This is a rapidly evolving field, and any decision on specific therapy for a given person should be made in collaboration with a colleague experienced in HIV/AIDS. Therapy should be individualized and based on factors such as efficacy, tolerability, potential adverse effects, convenience and drug-drug interactions. Specific details and recommendations for antiretroviral drug therapy are beyond the scope of this chapter.
- The antiretroviral drug classes licensed in Canada so far include the following:
  - Nucleoside reverse transcriptase inhibitors (NRTIs): e.g., zidovudine (AZT), lamivudine (3TC) and stavudine (d4T).
  - Nucleotide reverse transcriptase inhibitor (NtRTI): tenofovir.
  - Non-nucleoside reverse transcriptase inhibitors (NNRTIs): e.g., efavirenz and nevirapine.
  - Protease inhibitors (PIs): e.g., nelfinavir, saquinavir, ritonavir and atazanavir.
  - Fusion inhibitor: enfuvirtide/T20.

- Other types of investigational antiretroviral drugs are presently in development and clinical trials. Immune-based therapy to boost CD4 counts is still in clinical trials.
- Recommendations for antiretroviral therapy are based on clinical status, CD4 count, viral load and patient willingness to undertake therapy (see Table 4). It must be recognized that prolonged therapy is limited by drug toxicity, adherence issues, drug resistance and cost.
- Therapy, when indicated, includes at least three agents (e.g., two NRTIs plus one NNRTI or PI).
- The goal of therapy is to suppress viral replication to the point where plasma HIV RNA is undetectable, with minimal patient toxicity.
- Monotherapy and dual therapy must be avoided, as this has been associated with the emergence of drug resistance.
- Persons must be instructed to take medication regularly, as missed doses and under-dosing may promote drug resistance.
- Significant drug-drug interactions may occur with some antiretroviral drugs.
- Alteration of HAART is usually indicated if there is a failure to achieve or maintain control of viral replication or there is unacceptable toxicity. Resistance testing (genotyping or phenotyping) may be valuable in the selection of the initial or subsequent regimens.

Table 4. Guidelines for starting antiretroviral therapy for the person with chronic HIV infection

Clinical status	CD4 count	Viral load	Therapy
AIDS-defining illness or severe HIV symptoms	Any	Any	Yes
Asymptomatic	<0.2 x 10^9/L (<200/μL)	Any	Yes
Asymptomatic	0.2–0.35 x 10^9/L (200–350/μL)	Any	Offer
Asymptomatic	>0.35 x 10^9/L (>350/μL)	≥100,000 copies/mL	Defer or consider
Asymptomatic	>0.35 x 10^9/L (>350/μL)	<100,000 copies/mL	Defer

Prevention of opportunistic infections[74]

- HIV-infected persons are at increased risk of specific opportunistic infections, depending on their CD4 count.
- It is safe to discontinue prophylactic therapy once CD4 count has increased and remained above a certain level for 3–6 months.

Table 5. Prophylactic therapy for opportunistic infections

CD4 count	Opportunistic infection	Prophylactic therapy
<0.2 x 10^9/L (<200 cells/μL)	*Pneumocystis jiroveci* (formerly *carinii*) pneumonia	• Preferred: trimethoprim-sulfamethoxazole PO once daily or three times per week • Alternate: dapsone PO once daily, atovaquone PO once daily, aerosolized pentamidine once monthly – Also indicated with oral candidiasis or prior *P jiroveci*, regardless of CD4 count
<0.1 x 10^9/L (<100 cells/μL)	*Toxoplasma gondi*	• Same drugs as *P jiroveci*, except for aerosolized pentamidine
<0.05 x 10^9/L (<50 cells/μL)	*Mycobacterium avium* complex	• Preferred: azithromycin PO once weekly • Alternate: clarithromycin PO twice daily, rifabutin PO once daily

- Cytomegalovirus disease:
  - Present guidelines do not recommend primary prophylaxis for cytomegalovirus (CMV) disease. However, persons with CD4 count <0.05 x 10^9/L (<50 cells/μL) are at highest risk of CMV disease. These persons should be aware of the symptoms of CMV disease, in particular CMV retinitis (e.g., visual distortions, floaters). A regular 4–6-monthly funduscopic examination performed by an ophthalmologist may be helpful in early detection of CMV retinitis.
- Other 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.

Consideration for Other STIs

- Persons with risk behaviours for HIV infection should be offered testing for other STIs.
  - Testing from appropriate sites for chlamydia and gonorrhea.
  - Serologic tests for syphilis.
  - Screening for HBV infection and immunity (see *Hepatitis B Virus Infections* chapter); screening for HAV immunity in injection drug users, MSM, individuals with chronic liver disease and hemophilia; screening for HCV infection.
  - Type-specific herpes simplex virus (HSV) serology (HSV-2 infection): if available this may be useful in identifying persons who are potentially more at risk of acquiring or transmitting HIV infection. The increased risk of acquisition or transmission appears to be primarily during symptomatic genital HSV (active genital ulcers).[75–79] However, asymptomatic genital HSV may also be an important factor in HIV acquisition or transmission. Episodes of acute genital HSV have been shown to increase mucosal shedding and plasma levels of HIV.[80–83] Antiviral therapy and suppression of genital HSV reactivation may be an important strategy in minimizing HIV transmission in association with genital HSV infection.[84,85] If genital ulcers are present, see the *Genital Ulcer Disease* chapter for testing recommendations.
- Offer immunization for HBV and HAV if non-immune as per current guidelines.[69]

Reporting and Partner Notification

- HIV infection is reportable in all provinces and territories; such reporting may be nominal or non-nominal, depending on the jurisdiction.
- AIDS is reportable by physicians to local public health authorities in all provinces and territories.
- 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 *Pregnancy* chapter).
- All HIV-positive persons who have previously received or donated blood should be reported in confidence to the local Canadian Blood Services.

Special Considerations

- The increased risk of cervical cancer in HIV-infected women is related to the degree of immunosuppression.[86] Pap smears should be performed at baseline and 6 months later, with subsequent Pap smears at least annually depending on the results of initial smears.[74,87]
- Anal HPV infection with subsequent epithelial changes of anal cancer and its precancerous lesions have been detected in HIV-infected persons, even in the absence of anal intercourse. These changes may be seen despite the use of HAART and immune restoration.[71,72]
- In some centres, anal Pap smears and HPV detection are performed on a regular basis in HIV-positive MSM. Colposcopy and biopsy is performed if indicated. Aggressive therapy of high-grade lesions is warranted.
- It is important to ensure access to psychological counselling for all HIV-infected persons as needed.
- It may be appropriate to provide non-occupational PEP to persons in certain situations (e.g., sexual assault) on a case-by-case basis.[88]
- Some persons may develop acute symptoms, such as fever, arthralgia, myalgia, lymphadenopathy, worsening liver disease or encephalopathy within the first few weeks of starting HAART. This “immune reconstitution syndrome” is associated with the improved immune response to pre-existing co-infection (e.g., with HCV or *mycobacterium avium complex* [MAC]).
- All persons on HAART have the potential to develop a number of adverse effects. These include direct drug-related toxicity (e.g., pancreatitis, peripheral neuropathy, body-fat maldistribution [lipodystrophy] or metabolic abnormalities such as hyperglycemia or hyperlipidemia). Lactic acidosis and liver dysfunction may be more frequent with specific drugs.
- Many persons are also at increased risk of cardiovascular disease related to family history, risk factors such as smoking and drug-induced hyperlipidemia.
- Other issues, such as osteopenia, osteoporosis and hypogonadism, may also become problematic.
- Persons with HIV co-infection may experience a more rapid progression of HCV infection and HBV infection. HBV or HCV co-infection is a risk factor for severe hepatotoxicity during HAART.[89–93]
- HIV co-infection may alter the natural history of syphilis and neurosyphilis, including response to therapy.[94–97]
- Therapeutic drug monitoring is being used to assess therapeutic drug levels in some persons who are adherent but fail an appropriate regimen. This is not yet universally available.
- Discussion of sexual and other risk behaviours should be routinely performed at each visit. The medico-legal implications of infection transmission without disclosure should be reinforced. Referral to local public health authorities should be made in cases where risk behaviours are not being voluntarily controlled.

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LYMPHOGRANULOMA VENEREUM (LGV)

Etiology

- Caused by *Chlamydia trachomatis*, serovars L1, L2, L3.
- LGV can be transmitted through vaginal, anal or oral sexual contact.

Epidemiology

- In general, an uncommonly reported sexually transmitted infection (STI) in Canada.
- Endemic in parts of Africa, Asia, South America and the Caribbean,[1] thought to account for 2–10% of genital ulcer disease in areas of India and Africa.[2]
- A relatively rare disease in industrialized countries; until recently, the majority of cases were acquired in endemic areas.
- However recent outbreaks in men who have sex with men (MSM) starting in the Netherlands in 2003,[3] with reports of cases in Belgium,[4] France,[5] Germany, Sweden,[4] the U.K.,[6] the U.S., [7,8] and Canada.[9]
- LGV is not nationally notifiable in the U.S. or Canada. Since the issuing of LGV alerts, cases have started to surface in the U.S.,[7,8] and in Canada.[9]
- Recent outbreaks among MSM have been associated with concurrent HIV, other STIs, hepatitis C and participation in casual sex gatherings such as "leather scene" parties and high-risk activities such as "fisting."[3,4]
- LGV may enhance the transmission and acquisition of HIV, other STIs and blood-borne pathogens.
- Nationally notifiable *C trachomatis* is not broken down into LGV and non-LGV serovars. As such, the national LGV rate is unknown; however, a national enhanced surveillance system was initiated in February 2005 by the Public Health Agency of Canada in partnership with provincial and territorial public health departments.

Prevention

- Condoms or other barrier methods[10] for vaginal, anal and oral sex.
- Extragenital inoculation is possible;[1] therefore, unprotected oral sex is not a safer-sex activity for the prevention of LGV.
- Minimize or avoid sexual activities associated with mucosal damage: for example, fisting, which could facilitate transmission.[11] Avoid sharing sex toys and clean toys prior to use.
- See *Primary Care and Sexually Transmitted Infections* chapter.

Manifestations

- Unlike other *C trachomatis* serovars (A-K), LGV strains are more invasive, preferentially affecting the lymph tissue.[3]
- Commonly divided into three stages (see Table 1).[1]

Table 1. Manifestations

Primary LGV	• Incubation period of 3–30 days. • Small (1–6 mm), painless papule at site of inoculation (vulva, vagina, penis, rectum, oral cavity, occasionally cervix) that may ulcerate. • Self-limited and may go unnoticed in up to 50% of people.[1]
Secondary LGV	• Begins within 2–6 weeks of primary lesion.[2] • Often accompanied by significant systemic symptoms, such as low-grade fever, chills, malaise, myalgias, arthralgias; occasionally accompanied by arthritis, pneumonitis or hepatitis/perihepatitis; rarely associated with cardiac involvement, aseptic meningitis and ocular inflammatory disease.[2] • Abscesses and draining sinuses are possible (<⅓ of patients). • Involves the lymph nodes and/or anus and rectum.
Secondary LGV causing lymphadenopathy	• Inguinal/femoral is the most common form and is characterized by painful inguinal and/or femoral lymphadenopathy (unilateral in ½ to ⅔ of cases), referred to as buboes. • "Groove sign": inguinal nodes above and femoral nodes below the inguinal ligament (once considered pathognomonic for LGV). • Other lymphadenopathy may occur depending on site of inoculation (e.g., cervical lymphadenopathy following inoculation during oral sex).
Secondary LGV causing anorectal symptoms	• Characterized by acute hemorrhagic proctitis. • Symptoms of proctocolitis. • Bloody, purulent or mucous discharge from the anus, as well as constipation, are common presenting symptoms.[3,9,10,12]
Tertiary LGV (chronic LGV occurring in 10–20% of untreated cases)	• More common in females than males. • Chronic inflammatory lesions lead to scarring. • Lymphatic obstruction causing genital elephantiasis.[1,2,13] • Genital and rectal strictures and fistulae. • Possible extensive destruction of genitalia (esthiomene).

Diagnosis

- The diagnosis of LGV is not always straightforward. The symptoms and signs of LGV significantly overlap with other STIs, other infections, drug reactions and malignancies. The diagnosis is often based on the history and clinical picture and is supported by laboratory testing, although in Canada confirmatory testing for LGV is now readily available in some laboratories (see Laboratory testing, below). For surveillance purposes, only cases positive by LGV confirmatory tests are considered confirmed cases.[9] It may be appropriate, however, for less strict clinical, epidemiologic and laboratory criteria to be used for the clinical management of cases and contacts.

Diagnostic procedures

- Anoscopy/sigmoidoscopy/proctoscopy
  - Pattern similar to ulcerative colitis.
  - Granular or ulcerative proctitis.
- Bubo aspiration
  - Buboes in LGV usually contain a small amount of milky fluid.
  - May require injection of 2–5 mL of sterile saline for aspiration.
  - Buboes should be aspirated through healthy skin.

Laboratory testing

- Routine tests for *C trachomatis* may be positive in patients with LGV, but generally do not include typing to distinguish LGV serovars from non-LGV serovars. Definitive diagnosis of LGV requires serovar-specific (confirmatory) testing using DNA sequencing or restriction fragment length polymorphism (RFLP). Clinicians will therefore need to request that testing be done for LGV specifically, as most laboratories will not automatically perform serovar typing.
- The availability and type of testing for LGV varies by laboratory. Some local laboratories are able to do confirmatory testing for LGV, while others will need to involve the National Microbiology Laboratory (NML) via their provincial laboratory. Please check with your local laboratory for more information on how to collect and transport specimens. Where possible, suspected cases of LGV should have both swab and sera samples submitted for laboratory testing. Serology and confirmatory testing (DNA sequencing and RFLP) are available at the NML.

Table 2. Laboratory testing

Type of test	Test specifics	Differentiate between LGV and non-LGV serovars
Tests for *C trachomatis* (not specific to LGV serovars)		
Culture	Culture for *C trachomatis*	• No • Positive specimens may be sent for RFLP or DNA sequencing to identify LGV serovars
NAAT	PCR, LCR, TMA and SDA	• No • Positive specimens may be sent for RFLP or DNA sequencing to identify LGV serovars
Serology	Testing modalities vary by laboratory: • MIF test for *C trachomatis*: high-titre (titre ≥1:256) • CF test for *C trachomatis*: positive (titre ≥1:64) – MIF is a more specific test for LGV than CF – Cross-reactivity may be an issue with CF	• No • Because of the invasive nature of LGV, serology titres are in general significantly higher in LGV vs. non-LGV *C trachomatis* infections • High-titre serology is suggestive of LGV infection but is not definitive; low-titre serology does not eliminate possibility of past or current LGV infection
LGV-specific tests (confirmatory)		
DNA sequencing	Definitively identifies LGV serovars	• Yes • Samples that test positive for *C trachomatis* with NAAT or culture can be sent for DNA sequencing*
RFLP	Definitively identifies LGV serovars	• Yes • Samples that test positive for *C trachomatis* with NAAT or culture can be sent for RFLP testing*

CF = complement fixation
LGV = lymphogranuloma venereum
NAAT = nucleic acid amplification test
RFLP = restriction fragment length polymorphism
TMA = transcription-mediated amplification
LCR = ligase chain reaction
MIF = microimmunofluorescence
PCR = polymerase chain reaction
SDA = strand displacement amplification

* For laboratories sending samples to NML for confirmatory testing (DNA sequencing or RFLP), please note that it is the original sample that must be submitted to NML. These samples will be tested by PCR for *omp*1, and this PCR product is what must be sent for sequencing by the NML.

Specimen collection

- Table 3 describes types of specimens that may be collected for the laboratory tests described above, for the diagnosis of LGV by stage of infection.

Table 3. Specimen collection

Stage of infection	Sample type	Tests	Comments
Primary	Swab of lesion	Culture or NAAT	Because the invasive nature of LGV has not yet manifested in the primary stage of the infection, serology at this stage is unlikely to be helpful
Secondary and tertiary	Bubo aspirate	Culture or NAAT	Identification of *C trachomatis* in bubo fluid is highly suggestive of LGV, even prior to or without identification of LGV serovars
	Rectal, vaginal, oropharyngeal, or urethral swab	Culture or NAAT	NAAT is not officially approved in Canada for use with rectal or oropharyngeal swabs. Repeat testing is advised to confirm a positive test
	Urine	NAAT	
	Serology	MIF test CF test	See Table 2

CF = complement fixation
LGV = lymphogranuloma venereum
MIF = microimmunofluorescence
NAAT = nucleic acid amplification test

- For samples being sent to the NML, the following storage and shipping recommendations apply:
  - Dry swabs should be stored and shipped frozen.
  - Swabs stored in chlamydia transport media should be kept frozen at –80°C if culture will be done, or at –20°C if culture will not be done.
  - Urine samples should be stored and shipped frozen.
  - See *Laboratory Diagnosis of Sexually Transmitted Infections* chapter for more information on collecting and shipping specimens.

Management

- Treatment with appropriate antibiotic regimen (see Treatment section, below).
- Aspiration of buboes may help symptomatically; however, incision/drainage or excision of nodes is not helpful and may delay healing.

Treatment

- Suspected cases should be treated empirically for LGV while awaiting test results.

Table 4. Treatment of lymphogranuloma venereum

First line	• Doxycycline 100 mg PO bid for 21 days *[B-II]*
Alternative	• Erythromycin 500 mg PO qid for 21 days* *[C-III]*
Possible	• Azithromycin 1g PO once weekly for 3 weeks† *[C-III]*

* Erythromycin dosage refers to the use of erythromycin base. Equivalent dosages of other formulations may be substituted (with the exception of the estolate formulation, which is contraindicated in pregnancy); erythromycin (NOT the estolate formulation) should be used in pregnancy.

† While some experts believe azithromycin to be effective in the treatment of LGV, clinical data are lacking.

Treatment of partners

- Sexual partners from the last 60 days prior to symptom onset or date of diagnosis where asymptomatic should be contacted, tested and treated empirically (regardless of whether signs/symptoms are present) as follows:
  - Azithromycin 1g PO in a single dose *[C-III]*

  OR
  - Doxycycline 100 mg PO bid for 7 days *[C-III]*
- Should test results confirm an LGV infection, treat as recommended for cases above.

Consideration for Other STIs

- Because of rates of co-infection, testing for HIV, syphilis, HSV, gonorrhea, hepatitis B and hepatitis C is recommended in patients with LGV (see chapters on individual infections for more information on testing).
- Testing for chancroid and donovanosis (granuloma inguinale) should also be considered in patients with LGV, especially if there has been travel to regions where these infections are endemic.
- Immunization for hepatitis B should be offered to non-immune patients (see *Hepatitis B Virus Infections* chapter for more information).
- The opportunity to provide safer-sex counselling should not be missed.

Reporting and Partner Notification

- An enhanced surveillance system was initiated by the Public Health Agency of Canada, in partnership with the provinces and territories, in February 2005.
  - LGV should be reported by local public health authorities to the appropriate regional and provincial/territorial authorities, who have, in turn, agreed to report LGV to the Sexual Health and STI Section of the Public Health Agency of Canada.
  - Case definitions for national enhanced surveillance as of August 2005 are as follows.[9]
- Any sexual partners from the last 60 days prior to symptom onset or date of diagnosis where asymptomatic should be contacted, tested and treated (see Treatment section).

Table 5. Case definitions

Probable case	Positive result on culture, NAAT or serologic testing for *C trachomatis* plus the presence of proctitis OR inguinal or femoral lymphadenopathy OR a sexual partner with LGV
Confirmed case	Presence of *C trachomatis* serotype L1, L2, L3 confirmed by DNA sequencing or RFLP

LGV = lymphogranuloma venereum
NAAT = nucleic acid amplification test
RFLP = restriction fragment length polymorphism

Follow-up

- Patients should be followed until chlamydial tests are negative (test of cure) and the patient has clinically recovered.[3] Serology should not be used to monitor treatment response, as the duration of antibody response has not been defined.
  - Test of cure should be performed at 3–4 weeks after the completion of effective treatment to avoid false-positive results due to the presence of non-viable organisms (especially if using NAAT).
- Surgery may be required to repair genital/rectal damage of tertiary LGV.

Special Considerations

- Based on limited data, HIV appears to have little effect on the clinical presentation, although atypical presentations in HIV-positive patients have been rarely reported.[14]
- Disease duration may be prolonged in HIV-positive patients.[14]
- In pregnancy, erythromycin (non-estolate preparations) should be used for the treatment of LGV.

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SYPHILIS

Etiology

- Caused by *Treponema pallidum* subsp. *pallidum*.
- *T pallidum* subsp. *pallidum* causes venereal syphilis, *T pallidum* subsp. *endemicum* causes endemic syphilis (bejel), *T pallidum* subsp. *pertenue* causes yaws and *T carateum* causes pinta.

Epidemiology

- Infectious syphilis (primary, secondary and early latent stages) is the least common of the three nationally reportable sexually transmitted infections (STIs).[1]
- After achieving rates of 0.4–0.6/100,000 from 1994–2000, rates of infectious syphilis rose in 2002 to 1.5/100,000, and preliminary figures for 2004 show projected rates of 3.9/100,000.[1,2] (Preliminary data — is subject to change; does not include Nunavut.)
- Most affected are males 30–39 years (14.5 per 100,000 population in 2004).[1] (Preliminary data — is subject to change; does not include Nunavut.)
- The rate of infectious syphilis is increasing in both males and females, but more so in males. In recent years, localized outbreaks of infectious syphilis have been reported in a number of locations worldwide[3,4] and in Canada, including Vancouver, Yukon, Calgary, Edmonton, Toronto, Ottawa, Montreal and Halifax.[2,5–7]
- Most of the outbreaks have been related to the sex trade and in men who have sex with men (MSM), but some have been in heterosexual persons not fitting into one of these categories. Some large outbreaks among MSM have been associated with the acquisition of anonymous sex partners through the Internet.[8]
- Syphilis, as with other STIs, increases the risk of acquisition and transmission of HIV.

Transmission

- The primary mode of transmission is by vaginal, anal and oral sexual contact.[9]
- Kissing, sharing of needles and injection equipment, blood transfusion and accidental inoculation have rarely been reported as routes of transmission.
- Primary, secondary and early latent stages are considered infectious, with an estimated risk of transmission per partner of around 60%.[10] Early latent syphilis is considered infectious because of the 25% chance of relapse to secondary stage.[11]
- The majority of infants with congenital syphilis are infected in utero, but they can also be infected by contact with an active genital lesion at the time of delivery; the risk of transmission is much greater when the mother has untreated primary, secondary or early latent syphilis in pregnancy than if she has late latent syphilis.[12]

Prevention

- Results of reactive syphilis tests in a pregnant mother and any treatment history should be provided to the primary caregiver of the newborn infant.

Manifestations

Table 1. Manifestations[9]

Stage	Clinical manifestations	Incubation period
Primary	Chancre, regional lymphadenopathy	3 weeks (3–90 days)
Secondary	Rash, fever, malaise, lymphadenopathy, mucus lesions, condyloma lata, alopecia, meningitis, headaches, uveitis, retinitis	2–12 weeks (2 weeks–6 months)
Latent	Asymptomatic	Early: <1 year Late: ≥1 year
Tertiary Cardiovascular syphilis	Aortic aneurysm, aortic regurgitation, coronary artery ostial stenosis	10–30 years
Neurosyphilis	Ranges from asymptomatic to symptomatic with headaches, vertigo, personality changes, dementia, ataxia, presence of Argyll Robertson pupil	<2 years–20 years
Gumma	Tissue destruction of any organ; manifestations depend on site involved	1–46 years (most cases 15 years)
Congenital Early	Fulminant disseminated infection, mucocutaneous lesions, osteochondritis, anemia, hepatosplenomegaly, neurosyphilis	Onset <2 years
Late	Interstitial keratitis, lymphadenopathy, hepatosplenomegaly, bone involvement, anemia, Hutchinson's teeth, neurosyphilis	Persistence >2 years after birth

Diagnosis

Risk factors

A diagnosis of syphilis should be considered in the following individuals:

- Those who have had contact with a known case of syphilis.
- MSM.
- Sex workers.
- Those with street involvement.
- Injection drug users.
- Those with multiple sex partners.

- Those with a history of syphilis, HIV and other STIs.
- Those originating from or having sex with an individual from a country with a high prevalence of syphilis; it should be noted that screening for syphilis (using a non-treponemal test) is routinely performed in all immigration applicants to Canada who are older than 15 years.
- Sexual partners of any of the above.

Symptoms and signs

- Current or past history of lesions or rash (see Manifestations, above).
- A high proportion of individuals fail to recall a primary chancre.[9]
- Signs and symptoms may be modified in the presence of HIV co-infection.[13]

Special considerations in pregnant women

- Given the resurgence of syphilis in Canada, universal screening of pregnant women continues to be important and remains the standard of care in most jurisdictions.
- Screening should ideally be performed in the first trimester and repeated later in pregnancy in women at high risk of acquiring syphilis (see Risk factors, above).

Laboratory diagnosis

- The interpretation of syphilis serology should be made in conjunction with a colleague experienced in this area (see Table 2).
- Every attempt should be made to obtain and document prior history of treatment for syphilis and prior serologic results in order to avoid unnecessary retreatment.

Specimen collection

- Dark-field microscopy, direct or indirect fluorescent antibody tests (DFA/IFA) or polymerase chain reaction (PCR) (for more information on available tests, please contact your local laboratory). To visualize *T pallidum* from chancres of primary syphilis and some lesions of secondary syphilis (e.g., condyloma lata).
- Dark-field microscopy and DFA/IFA are not reliable for oral/rectal lesions, as non-pathogenic treponemes may be present.
- PCR is available only at specialized laboratories, including the National Microbiology Laboratory.

Serology

- Screening for syphilis has traditionally involved the use of non-treponemal tests (NTT) such as rapid plasma reagin (RPR), followed by confirmatory treponemal tests if the NTT is reactive. However, in patients with suspected primary syphilis or late latent syphilis, the NTT may be non-reactive, and it is then appropriate to add a treponemal test to the initial screen or, in the case of primary syphilis, to repeat the NTT after 2–4 weeks. In regions experiencing outbreaks of syphilis, it may be appropriate to screen at baseline with both non-treponemal and treponemal tests.

Table 2. Guide to interpretation of serologic tests for syphilis

Test results on blood or serum			Most likely condition
Non-treponemal test: RPR/VDRL	**Treponemal test: TP-PA**	**Treponemal test: FTA-ABS**	
NR	**NR**	**R**	Primary syphilis with compatible history/clinical findings
R *(dilutions can vary)*	**R**	**R**	• Infectious syphilis (primary, secondary, early latent), especially if titre >1:8 OR • Old treated syphilis (especially if titre <1:8) OR • Follow-up of treated syphilis OR • In persons from endemic countries, yaws (e.g., Caribbean), pinta (e.g., Central America) or bejel
NR	**R**	**R**	• Usually treated syphilis OR • Late latent of unknown duration if no history of confirmed treatment OR • In persons from endemic countries, yaws (e.g., Caribbean), pinta (e.g., Central America) or bejel OR • Early infection (primary syphilis)
R	**NR**	**NR**	Biological false positive* (repeat in 3–4 weeks)

FTA-ABS = fluorescent treponemal antibody absorbed
NR = non-reactive
R = reactive
RPR = rapid plasma reagin
TP-PA = *T pallidum* particle agglutination
VDRL = Venereal Disease Research Laboratory
* Some causes of false-positive serologic tests for syphilis include certain collagen-vascular diseases, pregnancy, injection drug use, etc.

- The introduction of treponemal tests for IgG/IgM antibodies, such as the treponemal enzyme immunoassay (EIA), may provide a more sensitive screening test for syphilis.
- Non-treponemal tests include RPR, Venereal Disease Research Laboratory (VDRL) and the toluidine red unheated serum test (TRUST).
- Non-treponemal antibody titres usually correlate with disease activity and are used to monitor response to treatment and assess for reinfection.
- Treponemal tests include the *T pallidum* particle agglutination (TP-PA), fluorescent treponemal antibody absorbed (FTA-ABS) and EIA to detect IgG and/or IgM antibodies.
- Treponemal tests usually remain reactive for life regardless of treatment, although 15–25% will serorevert if the patient is treated during the primary stage.

Cerebrospinal fluid

- Criteria for cerebrospinal fluid (CSF) examination include the following:
  - Presence of neurologic or ophthalmic symptoms or signs.
  - Congenital syphilis.
  - Previously treated patients who fail to achieve an adequate serologic response to treatment.
  - Tertiary syphilis.[14]
  - HIV patients with neurologic symptoms or signs, late latent syphilis, RPR ≥1:32 dilutions, CD4 <350 cells/μL or treated syphilis with suboptimal decline in VDRL/RPR titre; some experts recommend CSF examination in all cases.[15]
  - Some experts recommend CSF examination in all patients with RPR ≥1:32 dilutions.[15]
- CSF should be tested for cell count and differential, protein, VDRL and/or FTA-ABS.
- CSF-VDRL is highly specific but insensitive.
- CSF FTA-ABS is highly sensitive but non-specific for neurosyphilis; a negative CSF FTA-ABS helps to exclude a diagnosis of neurosyphilis.[14,16–18]
- The diagnosis of neurosyphilis is usually made on a combination of reactive serologic results, abnormalities of CSF cell count or protein or a reactive CSF-VDRL with or without clinical manifestations.

Management

Primary and secondary syphilis

- Attempt to obtain material from primary or secondary lesions for dark-field microscopy and/or DFA/IFA for *T pallidum*.
- Ulcers should also be tested for herpes simplex virus and/or chancroid (if epidemiologically appropriate) and/or lymphogranuloma venereum (if epidemiologically appropriate).

- Serology should include both treponemal and non-treponemal tests. Note that both non-treponemal and treponemal tests may be negative in early primary syphilis. Serology should be repeated in 2–4 weeks if they are dark-field or DFA/IFA negative and/or no treatment has been given. If follow-up cannot be assured, it may be appropriate to treat presumptively for primary syphilis.

Latent syphilis

- Serology: both treponemal and non-treponemal tests; note that a negative non-treponemal test does not rule out the diagnosis of latent syphilis.
- All patients should undergo a physical examination, including neurologic examination, to evaluate for the presence of signs of tertiary syphilis. Chest x-ray may be appropriate to evaluate for the presence of cardiovascular syphilis (e.g., aneurysm of ascending aorta).
- Lumbar puncture may be appropriate (see Cerebrospinal fluid, above).
- Treat as appropriate for stage.

Tertiary syphilis

- Serology: both treponemal and non-treponemal tests; note that a negative non-treponemal test does not rule out the diagnosis of tertiary syphilis.
- All patients with suspected tertiary syphilis should undergo CSF examination.
  - If CSF is not compatible with a central nervous system (CNS) infection, treat as for late latent syphilis.
  - If CSF is compatible with a CNS infection, treat as for neurosyphilis.

Congenital syphilis

- Obtain venous samples from both mother and baby (note that cord blood is not suitable) for serology (treponemal and non-treponemal tests).
  - The interpretation of reactive antibodies in the neonate must take into consideration the maternal history, including stage of syphilis, history of treatment, and syphilis serology results.
- Placenta, neonatal nasal discharge or skin lesions may be examined by dark-field microscopy or DFA/IFA for *T pallidum*.
- CSF examination should be performed on all infants with suspected congenital syphilis.
- Long-bone x-rays should be performed.

Treatment

- Although regimens containing daily IM procaine penicillin for 10–14 days are equally efficacious to regimens containing benzathine penicillin G, the latter are preferred because of better adherence with less frequent dosing.
- Benzathine penicillin G is available in Canada only through provincial/territorial sexually transmitted infection services, which obtain the drug from non-Canadian pharmaceutical companies through Health Canada's Special Access Program, as the drug is no longer available in Canada.

Table 3. Treatment

Stage	Preferred treatment	Alternative treatment for penicillin-allergic patients
All non-pregnant adults • Primary • Secondary • Early latent (<1 year duration)	• Benzathine penicillin G 2.4 million units IM as a single dose*[19–22] *[A-II; A-III for HIV-infected individuals]*	• Doxycycline 100 mg PO bid for 14 days[23,24] *[B-II]* • Alternative agents (to be used in exceptional circumstances):† ceftriaxone 1 g IV or IM daily for 10 days[25,26] *[B-II]*
Pregnant women • Primary • Secondary‡ • Early latent (<1 year duration)	• Benzathine penicillin G 2.4 million units IM as a single dose*[27] *[A-II]*	• There is no satisfactory alternative to penicillin for the treatment of syphilis in pregnancy; insufficient data exist to recommend ceftriaxone in pregnancy • Strongly consider penicillin desensitization, followed by treatment with penicillin *[A-III]*
All non-pregnant adults • Late latent syphilis • Latent syphilis of unknown duration • Cardiovascular syphilis and other tertiary syphilis not involving the CNS	• Benzathine penicillin G 2.4 million units IM weekly for 3 doses[28,29] *[A-II]*	• Consider penicillin desensitization • Doxycycline 100 mg PO bid for 28 days[24] *[B-II]* • Alternative agents (to be used in exceptional circumstances):† ceftriaxone 1 g IV or IM daily for 10 days[30] *[C-III]*
Pregnant women • Late latent syphilis • Latent syphilis of unknown duration • Cardiovascular syphilis and other tertiary syphilis not involving the CNS	• Benzathine penicillin G 2.4 million units IM weekly for 3 doses[31] *[A-II]*	• There is no satisfactory alternative to penicillin for the treatment of syphilis in pregnancy; insufficient data exist to recommend ceftriaxone in pregnancy • Strongly consider penicillin desensitization, followed by treatment with penicillin *[A-III]*

Table 3. Treatment (continued)

Stage	Preferred treatment	Alternative treatment for penicillin-allergic patients
All adults • Neurosyphilis	• Penicillin G 3–4 million units IV every 4 hours (16–24 million units/day) for 10–14 days[29] *[A-II]*	• Strongly consider penicillin desensitization, followed by treatment with penicillin • Ceftriaxone 2 g IV/IM per day for 10–14 days[29,32,33] *[B-II]*
Congenital syphilis[34]	• Early (<1 month): crystalline penicillin G 50,000 units/kg IV every 12 hours for the first week of life and every 8 hours thereafter for 10 days of total therapy *[A-II]*	
	• Late (≥1 month): crystalline penicillin G 50,000 units/kg/ IV every 6 hours for 10–14 days *[A-II]*	• If no neurologic involvement and normal CSF: benzathine penicillin G 50,000 units/kg IM (max 2.4 million units) weekly for 3 successive weeks *[B-II]* • No data are available to recommend penicillin alternatives in the case of penicillin allergy
Epidemiological treatment of sexual contacts in the preceding 30 days to primary, secondary and early latent syphilis[§¥35]	• Benzathine penicillin G 2.4 million units IM as a single dose *[B-II]*	• See comment below on azithromycin[¥]

CNS = central nervous system

* Some experts recommend 3 weekly doses (total of 7.2 million units) of benzathine penicillin G in HIV-infected individuals.

† The efficacy data supporting the use of these agents is limited, and as such they should only be used in exceptional circumstances and when close patient follow-up is assured.

‡ Secondary syphilis in late pregnancy (>20 weeks gestation) should be treated with two doses of benzathine penicillin G 2.4 million units given 1 week apart (see note under Pregnancy, below).

§ If sexual contact is unreliable or unable to test, epidemiological treatment should be strongly considered.

¥ Azithromycin: in light of recent reports of failure of azithromycin for the treatment of early syphilis[36] and the rapid development of azithromycin resistance in *T pallidum*,[37,38] this agent should not be routinely used as a treatment option for early or incubating syphilis, unless adequate and close follow-up can be ensured, and only in jurisdictions where little to no azithromycin genotypic resistance in *T pallidum* has been demonstrated. It should be noted, however, that at the present time, very limited Canadian data on the prevalence of azithromycin resistance in T pallidum is available, with 1 of 47 specimens between 2000 and 2003 as compared with 4 of 12 specimens from MSM in 2004–2005 collected in Vancouver demonstrating resistance.[38]

Penicillin desensitization

- Skin testing with the major and minor determinants can reliably identify persons at high risk for penicillin reactions.
- Patients who have a positive skin test to one of the penicillin determinants can be desensitized.

Table 4. Oral desensitization protocol for patients with a positive skin test[39]

Penicillin V suspension dose number*	Amount† units/mL	Volume administered (mL)	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

* Interval between doses, 15 minutes; elapsed time, 3 hours and 45 minutes; cumulative dose, 1.3 million units.
† The specific amount of drug is diluted in approximately 30 mL of water and then administered orally.

- Oral desensitization is preferable to IV desensitization, as it is safer and less costly.
- Desensitization should occur in a hospital setting, as serious allergic reactions, although unlikely, can occur. The whole procedure can usually be completed in 4 hours, after which the first dose of penicillin is given. After administration of the dose, the patient should be observed for at least 1 hour.

Consideration for Other STIs

- All patients with reactive syphilis serology should be tested for HIV, as this affects treatment and follow-up.
- Testing for other STIs, including chlamydia and gonorrhea, should be performed.
- Genital ulcers should also be tested for herpes simplex virus and/or chancroid and/or lymphogranuloma venereum, depending on epidemiologic risk.
- Immunization against hepatitis B and/or A may be indicated if not already immune.

Reporting and Partner Notification

- Infectious syphilis (primary, secondary and early latent syphilis) is reportable in all provinces and territories and to the Public Health Agency of Canada.
- Non-infectious syphilis (late latent, cardiovascular and neurosyphilis) may be reportable at the provincial/territorial level but is not reportable to the Public Health Agency of Canada.
- All sexual or perinatal contacts within the following time periods must be located, tested and treated if serology is reactive.

Table 5. Partner notification

Stage of syphilis	Time period
Primary syphilis	3 months prior to the onset of symptoms
Secondary syphilis	6 months prior to the onset of symptoms
Early latent	1 year prior to the diagnosis
Late latent	Assess marital or other long-term partners and children as appropriate
Congenital	Assess mother and her sexual partner(s)
Stage undetermined	Assess/consult with a colleague experienced in syphilis management

Follow-up

- In the absence of a test of cure, NTTs should be monitored until they are seronegative or at a stable low titre (e.g., 1:4 dilutions).[40]
- See Table 6 for a guide to the monitoring of NTTs.
- See Table 7 for a guide to adequate serologic response (in NTT: e.g., RPR).[41]
- Note that the NTT may revert to non-reactive after treatment or remain at a low steady level (sero-fast); repeat testing is not required if the baseline or follow-up NTT becomes non-reactive, except in HIV-infected individuals.
- A rising NTT after treatment may indicate treatment failure or reinfection. If treatment failure is suspected, further investigation, including CSF examination, may be indicated.

Table 6. Monitoring of NTTs

Primary, secondary, early latent	1, 3, 6, 12 months after treatment
Late latent, tertiary	12 and 24 months after treatment
Neurosyphilis	6, 12 and 24 months after treatment
HIV-infected (any stage)	1, 3, 6, 12 and 24 months after treatment and yearly thereafter
Babies born to mothers with reactive syphilis serology*	3 and 6 months after birth; repeat non-treponemal and treponemal tests at 12 and 18 months if tests remain reactive at 6 months
Congenital syphilis*	0, 3, 6, 12 and 18 months after birth

* NTT titres should decline by 3 months of age and be non-reactive by 6 months if the infant was not infected. If the titres are stable or increase after 6–12 months of age, the child should be evaluated (including cerebrospinal fluid examination) and treated as for congenital syphilis. Passively transferred treponemal antibodies can be present in an infant up to 15 months; a reactive treponemal test after 18 months is diagnostic of congenital syphilis.

Table 7. Adequate serologic response

Primary	2-tube* drop at 6 months, 3-tube drop at 12 months, 4-tube drop at 24 months
Secondary	3-tube and 4-tube drop at 6 and 12 months, respectively
Early latent	2-tube drop at 12 months

*2-tube drop=four-fold drop, e.g., change from 1:32 dilutions to 1:8 dilutions.

- Patients with neurosyphilis and abnormal CSF examinations should have a lumbar puncture repeated at 6 month intervals after completion of treatment until CSF parameters normalize. CSF pleocytosis is generally the first measure of improvement and should occur over about 6 months.[42] Elevated protein levels, if present, will begin to decline during the first 6 months but can take up to 2 years to return to normal.[43] CSF protein may decline more slowly in patients who are neurologically abnormal compared with those who are neurologically normal.[44] The CSF-VDRL titre should decline (four-fold within a year) if it is initially high, but it may take years to revert to negative.[42] A persistent, low CSF-VDRL titre after a course of treatment may warrant retreatment, but if CSF pleocytosis and elevated protein levels have resolved and serum VDRL titre has not risen, additional treatment is unlikely to be beneficial.[45] All CSF laboratory parameters normalize more slowly in patients co-infected with HIV.[44] The possibility of treatment failure should be considered if there is clinical progression, increase in RPR/VDRL by ≥2 dilutions or CSF pleocytosis fails to resolve; treatment options for patients with treatment failure should be discussed with a colleague experienced in this area.

Special Considerations

HIV infection

- Persons co-infected with HIV may require a longer course of treatment, as well as closer and longer follow-up.

Pregnancy[46]

- All women newly diagnosed with syphilis during pregnancy should receive treatment appropriate to their stage of disease, with the exception of secondary syphilis in late pregnancy, where despite the administration of the recommended penicillin regimen, as many as 14% will have a fetal death or deliver infants with clinical evidence of congenital syphilis.[47–49] These cases should therefore be treated with two doses of benzathine penicillin G 2.4 million units 1 week apart, although the effect of this regimen in preventing fetal syphilis is not known.[46]
- Retreatment during pregnancy is not necessary unless there is clinical or serologic evidence of new infection (four-fold rise in a non-treponemal test titre) or history of recent sexual contact with early syphilis.
- Erythromycin is the least effective agent for the treatment of syphilis and does not penetrate the CSF or placental barrier well; it is therefore not recommended in pregnancy.[50, 51]
- If the mother is >20 weeks gestation, an ultrasound should be performed and she should be managed with an obstetrician/maternal-fetal medicine specialist; if fetal abnormalities are identified, the mother should be hospitalized for treatment and fetal monitoring.[52]
- All babies should be assessed at delivery by a pediatrician, and if a maternal non-penicillin regimen was used, consideration should be given to treating the baby empirically for congenital syphilis.

Congenital syphilis[53]

- 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 the infant's non-treponemal titre is four-fold (2 tubes) higher than the mother's.
  - If maternal treatment was inadequate, did not contain penicillin, is unknown or occurred in the last month of pregnancy, or if maternal serologic response is inadequate.
  - If adequate follow-up of the infant cannot be ensured.

Jarisch-Herxheimer reaction[54]

- Patients should be made aware of this possible reaction to treatment, especially with penicillin.
- An acute febrile illness with headache, myalgia, chills, rigours generally occurring within 8–12 hours and resolving within 24 hours.
- Common in early syphilis, but usually not clinically significant unless there is neurologic or ophthalmic involvement or in pregnancy where it may cause fetal distress and premature labour.
- Not a drug allergy.
- Can be treated with antipyretics.
- Steroids may be indicated for the management of severe reactions but should be used in consultation with a colleague experienced in this area.

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SPECIFIC POPULATIONS

IMMIGRANTS AND REFUGEES

Definitions

A *legal immigrant* is a person born outside of Canada who has been granted the right to live in Canada permanently by immigration authorities, whereas an *illegal immigrant* has not been granted such a right. A *refugee* is a person outside his/her country of nationality who is unable or unwilling to return because of persecution on account of race, religion, nationality, membership in a particular social group, or political opinion.[1]

Epidemiology

Over 5 million Canadians were born outside of the country, and about 250,000 new immigrants arrive in Canada each year,[2,3] but data on migrant health in Canada are limited. Recent immigrants underuse health services; it has not been established whether this is associated with cultural barriers, language barriers, reduced perceived needs, reduced needs (this *healthy immigrant effect* refers to recent immigrants being healthier than Canadian-born individuals) or socioeconomic barriers (e.g., lack of access to telephone, transportation to clinic etc).[4–7] Many countries of origin have much higher rates of sexually transmitted infections (STIs) than Canada.[8,9]

Prevention

Health care providers must pay special attention to the complex and stressful process that newcomers may have to undergo to integrate into a new society. Potential loss of social support and cultural identity during the transition may prove challenging. Illegal immigrants present even greater challenges because of the underground nature of their existence. They do not have health insurance and may avoid seeking medical attention for fear of being deported.

Clinical and public health services must be sensitized to the following issues in the provision of affordable, comprehensive and culturally/linguistically appropriate sexual health counselling and STI prevention and management services for the immigrant and refugee population:[10–12]

- Language, cultural and socioeconomic barriers may prevent access to STI and prevention services.
- This population may experience social isolation from loss of social support.
- Understanding social/sexual mixing patterns, health belief systems, practices and taboos is important in STI prevention, diagnosis, management and partner notification.

- Health care providers must be aware of stigma and discrimination so that individuals from high-prevalence countries are not stigmatized.
- Mental health, including post-traumatic stress disorder, can influence behaviours and interaction with the health system.
- Gender power differential and domestic violence can be barriers to prevention and partner notification.
- Patients may have a history of torture and rape.
- Patients may have a limited knowledge of STIs in Canada and other health resources.
- There may be a travel-related risk of patients either carrying an STI from their place of origin or of acquiring an STI when they return home to visit friends/relatives. This population is less likely to seek pre-travel advice or post-travel care.

Evaluation

Assessment

A non-judgmental and culturally sensitive STI risk assessment should be part of a comprehensive approach to the prevention and early detection of STIs. Issues to explore include the following:

- The presence of opposite-sex and same-sex activity.
- The range and frequency of various sexual practices, taking into account cultural and gender context (see *Primary Care and Sexually Transmitted Infections* chapter).
- The patient's history of STIs, including HIV, with awareness of the stigma and discrimination that come with these infections.
- Injection drug use (IDU).
- Suboptimal screening in pregnant women.

Screening

Based on the results of the risk assessment, conventional STI screening in asymptomatic individuals should be considered for those engaging in high-risk practices (see *Primary Care and Sexually Transmitted Infections* chapter):

- Syphilis testing:
  - Syphilis serology (non-treponemal only) is a standard Citizenship and Immigration Canada (CIC) test requirement for immigrant and refugee applicants 15 years of age or over.
  - Possible false-positive syphilis tests should be kept in mind in individuals from areas of the world where pinta, yaws and bejel are prevalent[13] (see *Syphilis* chapter).

- HIV serology (unless known to be seropositive):
  - Since 2002, HIV serology has been a standard CIC test requirement for immigrant and refugee applicants 15 years of age or over, and for a child with blood/blood product exposure, born to an HIV-infected mother or being considered as an international adoptee.
  - High-risk individuals who have not had a recent HIV antibody test should be counselled and tested accordingly (see *Human Immunodeficiency Virus Infections* chapter).
  - A child should be offered HIV testing unless there is a reason not to do so, especially if it is likely that the child was born to or breastfed by an undiagnosed HIV-infected mother.

At present, HIV and syphilis are the only mandatory STI tests for immigrant/refugee applicants. Some laboratories abroad may have quality-control issues, and some applicants may pay to obtain negative tests in order to facilitate their application.

For individuals with anogenital symptoms, it is important to keep in mind the following when considering appropriate investigation:

- Chancroid and lymphogranuloma venereum (LGV) are common in parts of Africa, Asia, the Caribbean and Latin America (see *Chancroid* and *Lymphogranuloma Venereum* chapters).
- For assessment of genital ulcers, see *Genital Ulcer Disease* chapter.
- Quinolone-resistant gonorrhea is particularly prevalent in Asia, the Pacific Islands, Australia, Israel, the United Kingdom, parts of the United States and Canada (see *Gonococcal Infections* chapter).

Hepatitis B and C

Currently, hepatitis B and C testing are not required for the immigration and refugee application process in Canada. However, the prevalence of chronic hepatitis B infection in Asia, Africa, Eastern Europe and Latin America is much higher than in Canada. In asymptomatic individuals from high-prevalence regions, hepatitis B screening should be undertaken for *either* hepatitis B surface antigen carriage and the antibody to hepatitis B surface antigen (for immunity) *or* the antibody to hepatitis B core antigen (for past exposure to the virus). Further hepatitis B testing may be performed depending on the results of the screening tests. Household and sexual contacts of a hepatitis B carrier should be assessed. Those who have not been exposed to hepatitis B or previously immunized should receive a three-dose series of the hepatitis B vaccine (see *Canadian Immunization Guide*[14] and *Hepatitis B Virus Infections* chapter).

The prevalence of chronic hepatitis C infection in Asia, Africa and the Mediterranean is much higher than in Canada.[15] Hepatitis C is primarily transmitted parenterally. Recently, transmission of hepatitis C has been increasingly reported in Europe among men who have sex with men who are not injection drug users, in association with fisting, LGV, HIV and other STIs.[16–21] As with all patients, hepatitis C should be considered in immigrants and refugees with any of the following risk factors:[19–32]

- Any history of IDU.
- Receipt of contaminated blood/blood products in some countries, even after 1990, because of inadequate quality control in the laboratory or inadequate blood screening.
- Procedures (e.g., injection, surgery, transfusion, ceremonial rituals, acupuncture) involving sharing of contaminated equipment in parts of the world with high hepatitis C virus (HCV) prevalence.
- Exposure to hepatitis C in a prison setting.
- Needlestick or sharp injuries.
- Non-sterile tattooing and body piercing.
- Hemodialysis.
- Sharing personal items contaminated with blood from an HCV-infected individual (e.g., razors, nail clippers, toothbrush).
- Sharing intranasal equipment for snorting drugs.
- Hepatitis B infection.
- HIV infection.
- Being a child born to a mother infected with HCV.
- Undiagnosed liver disease.

Sexual transmission is usually inefficient, and the risk of hepatitis C is slightly increased in individuals with the following risk factors:

- A sexual partner with HCV.
- Multiple sexual partners.
- HIV and other STI co-infections.
- Practicing anal intercourse.

Specimen Collection and Laboratory Diagnosis

(See Laboratory Diagnosis of Sexually Transmitted Infections *chapter. See individual chapters for specific STIs/syndromes)*

- Same as for all patients.
- Please note that specimen collection can be affected by a history of female genital mutilation. The genital structure may appear different, and visualization of the cervix may not be possible with a standard-size speculum. Performing a bimanual pelvic examination may also be difficult, especially if the introitus has been sutured.

- In many cultures, screening compliance is poor if swabs are used because of the invasive nature of specimen collection. Some immigrants and refugees have very limited opportunity to interface with the health system, especially some patients who may have cultural sensitivities toward health care providers of the opposite sex. Urine nucleic acid amplification test screening of high-risk individuals can enhance compliance and patient comfort.

Management and Treatment

(See individual chapters for specific STIs/syndromes)

- Same as for all patients.
- It is important to address sociocultural and economic factors that may affect treatment adherence. Language barriers may contribute to difficulty following instructions on why and how to take medications, practice safer-sex etc. In some cultures, it may be difficult to discuss monogamy or condom use.
- It is important to obtain a history of traditional/herbal medicine to minimize toxicities and drug interactions.

Reporting and Partner Notification

(See individual chapters for specific STIs/syndromes)

- Same as for all patients.
- It is important to address sociocultural factors that may affect partner notification. Language barriers may contribute to difficulty understanding the importance of partner notification. In some cultures, fear of domestic violence can be an issue with partner notification.

Follow-up

- Same as for all patients.
- Patients who receive their first dose of hepatitis B vaccination should be reminded to return to complete the three-dose immunization series.

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INMATES AND OFFENDERS

Background

The responsibility for corrections in Canada is shared by the federal, provincial and territorial governments.[1] In 2001, the average count of adult offenders incarcerated in federal, provincial and territorial facilities was 32,073 (133/100,000). A further 122,870 adult offenders were under community supervision, including probation, conditional sentence and conditional release.[2] Statistics on juvenile corrections are not routinely collected at the national level,[1] but in 1994–95, 1,095 female young offenders were sentenced to secure custody, 1,795 were placed in open custody and another 6,952 were placed on probation;[3] in 1996–97, 10,396 male young offenders were sentenced to secure custody, 11,541 were placed in open custody and 28,395 were placed on probation.[4]

Although Aboriginal people constitute about 3% of the general population in Canada, they represent approximately 15% of the federal offender population.[1] Women made up approximately 3% of the total incarcerated population in Correctional Service Canada (CSC) facilities in 2000–2001.[5] Canada's incarceration rate is higher than that of many Western European countries, but is much lower than that of the United States.[1]

Epidemiology

Inmates in correctional facilities around the world bear a disproportionate burden of illness related to infectious disease compared to the general population. As a result, rates of sexually transmitted infections (STIs), hepatitis B virus (HBV), hepatitis C virus (HCV) and HIV/AIDS are significantly higher among prison inmates. Often, inmates belong to vulnerable populations in which high-risk behaviours for STI infection are present, such as injection drug use (IDU) and unprotected sexual intercourse.[5] Although many inmates enter correctional facilities already infected, any inmate who engages in risky behaviours in prison is at risk of becoming infected or reinfected with an STI.[5] As of 2002, CSC estimated that 70% of the inmates who entered prison had self-identified drug- or alcohol-abuse problems.[6] Although penetrative sexual activity is known to occur in correctional settings,[7] it is likely underreported because it is often prohibited and may carry stigma.[6] Non-consensual sexual activity may also be an issue.[8] Other practices within the prison setting, such as IDU, tattooing and/or piercing, may contribute to the transmission of infectious diseases as well.[6]

In January 2000, CSC, in collaboration with Health Canada (now the Public Health Agency of Canada), introduced a comprehensive surveillance system to provide more accurate and extensive information about infectious diseases within federal correctional settings — the CSC Infectious Diseases Surveillance System (CSC-IDSS).[5] The CSC-IDSS is based on aggregate data on testing and test results for blood-borne and sexually transmitted pathogens, and it allows CSC to monitor trends in prevalence among newly admitted and general-population inmates.

According to CSC, a revised system, which includes line-listed risk behaviour and test-outcome data, is currently being implemented to better target harm-reduction programs.

Reported rates of infection in Canadian penitentiaries to 2002 are as follows:[5,9,10]

- HIV:* The prevalence of HIV among offenders in federal facilities increased steadily between 2000 and 2002, from 1.7% to 2.0%. In 2002, the rate was higher in women (3.7%) than in men (1.9%).
- HCV:* The prevalence of HCV among offenders in federal facilities increased from 2,542 cases (19.7%) in 2000 to 3,173 (25.4%) in 2002. In 2002, the rate was higher in women (33.7%) than in men (25.2%), but between 2000 and 2002, rates decreased for women and increased for men.
- HBV:† HBV prevalence among federal inmates in 2002 was 0.2%. There was a sharp increase from 2000 (0.1%) to 2001 (0.3%), but rates fell in 2002. Most cases identified were in men.
- Chlamydia:† There were 53 cases reported in 2002 (0.32% prevalence). The rate is increasing compared to 2000–2001. Over 90% of cases have been diagnosed in men.
- Gonorrhea:† There were 20 cases reported in 2002 (0.12% prevalence). The rate has increased compared to 2000–2001. About 85% of cases have been diagnosed in men.
- Syphilis:† There were three cases reported in 2002. The rate has increased compared to 2000–2001.

Notes:

* Testing uptake levels for HIV and HCV indicate that up to 70% of inmates may remain unscreened for these infections. As a result, reported rates may severely underestimate the true burden of disease within federal correctional facilities.

† Lack of reporting and underdiagnosis of HBV and STIs (including lack of routine screening for STIs) are likely to result in an underestimate of the actual rates of these infections in inmates.

Prevention

Correctional facilities in Canada are recognized as an important focus for public health measures to control STIs, HBV, HCV, HIV/AIDS and other infectious diseases. By its very nature, incarceration may offer one of the best opportunities to access high-risk individuals and provide them with the preventive services, treatment and skills necessary to stay healthy.[5] Interventions are limited by the length of incarceration, but even brief counselling encounters can have a significant impact on risky behaviours. Since most inmates eventually return to the community, harm-reduction efforts within the correctional system can have favourable implications, not only for the inmate population but also for the wider community. For this reason, it is important to coordinate prevention activities with local public health officials and other community-based care groups. Discharge planning for

infected inmates is also an important step in order to optimize the continuation of care for offenders outside the correctional setting.[5,11]

Components to be considered for STI prevention programs within correctional facilities are similar to those in the community:[12] education; voluntary testing and counselling; distribution of clean needles or bleach; distribution of condoms; and drug-dependence treatment (including substitution treatment) have all been proven effective in reducing HIV/STI risk in prisons and have been shown to have no unintended negative consequences.[12] The appropriate care, treatment and support of inmates with STIs helps prevent transmission of these infections. This includes partner notification, as well as testing and treatment of recent sexual contacts.

It is important to include the issues of alcohol and drug use in educational efforts, acknowledging their contribution to heightened risk for STIs and other infections.[13] Harm-reduction education to minimize the negative consequences of risky behaviours and provide alternatives can impact favourably on the transmission of STIs and other infections.[5] CSC currently has a number of health-education and peer-counselling support programs to disseminate information and encourage behaviour modification.

As part of the Canadian Strategy on HIV/AIDS and in partnership with the Public Health Agency of Canada, CSC has implemented several initiatives aimed at preventing and controlling the transmission of infectious diseases (including STIs, HIV, HBV and HCV) within federal correctional facilities.[14] These include confidential, voluntary testing for inmates on admission and throughout their incarceration, as well as pre- and post-test counselling.[14] Serological testing and immunization for hepatitis A virus (HAV) and HBV are offered. Educational programs and materials are provided for offenders and staff.[14] In 1992, condoms, dental dams and water-based lubricants were introduced into federal penitentiaries.[5] CSC has also initiated a national drug strategy aimed at controlling the supply of drugs in federal institutions. Its goal is to reduce the demand for drugs among federal offenders by implementing prevention and treatment programs,[6] such as methadone maintenance treatment and substance-use programs.[14] CSC currently provides bleach kits to inmates for cleaning needles and most recently has instituted a pilot project of tattoo parlours in six federal prisons. Currently, CSC does not provide needle-exchange services to inmates, citing its zero-tolerance policy toward drug use and trafficking in prison, as well as concerns about the health of inmates and the security of the institution. Discussions between CSC and the Public Health Agency of Canada about possible collaborative projects in federal correctional facilities are underway.

Evaluation

Health care professionals may be reluctant to ask and offenders may be reluctant to disclose information about their health, especially when issues such as sexual activity, substance use and possible illegal activities are involved. It is essential that the confidential nature of the interaction be stressed so that a true understanding of a patient's risk for STIs and other infections can be gained.

History

A complete sexual history should be taken (see *Primary Care and Sexually Transmitted Infections* chapter).

It is important to be aware that self-identified sexual identity is not an accurate predictor of sexual behaviour.[8] Although some inmates may consider themselves heterosexual, they may have been involved in sexual activity with members of the same sex (either prior to and/or during incarceration). Therefore, it is essential that a basic sexual history include questions about opposite-sex and same-sex activity. This can be achieved by asking open-ended questions such as: "Do you have sex with men, women or both?" For a more complete discussion of this topic, see *Men Who Have Sex with Men/Women Who Have Sex with Women* chapter.

Patients engaging in practices (both sexual and non-sexual) that are associated with an increased risk for STIs need to be identified. Such practices include the following:

- Receptive and insertive anogenital intercourse.
- Oral-anal intercourse (anilingus/rimming).
- Unprotected sexual activity (oral, anal or genital).
- Sharing of sex toys.
- Receptive manual-anal intercourse (insertion of finger or fist in anus of partner).
- Substance use accompanying sex.
- Tattooing.
- IDU and other substance use.

Because of the high prevalence of substance use in correctional settings, a substance-use history should also be taken (see *Substance Use* chapter).

Screening

Voluntary testing offered to new admissions to the correctional system may be one of the best opportunities for screening and identifying prevalent infections among offenders.[5] Non-invasive tests such as nucleic acid amplification tests (NAATs) (e.g., ligase chain reaction [LCR], polymerase chain reaction [PCR]) of urine has made STI screening in correctional facilities more available and acceptable,[5] but anecdotal reports suggest that this has not translated into higher rates of uptake.[5] One possible explanation may be inmates' reluctance to submit urine, as urine

testing is typically associated with testing for drug use, something inmates may be anxious to hide. A detailed explanation of the testing procedure may help to overcome this hurdle.

Whether for a new admission or not, greater use of routine testing for inmates at risk is needed,[5] especially given the often asymptomatic nature of STIs. This highlights the importance of the sexual history for identifying those at risk (see *Primary Care and Sexually Transmitted Infections* chapter). Collaborations involving corrections, public health officials and evaluators have been shown to facilitate increased STI screening in inmates.[15]

Pre- and post-test counselling for positive and negative results is essential and should reflect the primary public health purposes of counselling and testing: to help non-infected individuals initiate and sustain behaviour changes to reduce their risk of infection and to help infected individuals seek health care and avoid infecting others.[8]

Based on the results of the history/risk assessment, the following screening should be considered for inmates and offenders:

- Routine STI screening at all potential sites of infection: chlamydia, gonorrhea, syphilis, HIV and HBV (if not already immunized or known to be immune).
- Testing for herpes simplex virus, if symptoms are present (see *Genital Herpes Simplex Virus Infections* chapter).
- HCV serology: IDU, tattooing and high-risk sexual practices are known risk behaviours associated with the transmission of HCV in the prison/inmate population.[6]
- For those with identified risk, screen for HAV immunity prior to vaccination.

For specific screening considerations in men who have sex with men and women who have sex with women, see *Men Who Have Sex with Men/Women Who Have Sex with Women* chapter.

Cervical screening for dysplasia and/or human papillomavirus (HPV) infection in female inmates should be considered if there is no evidence of screening with a normal result within the previous year (see *Genital Human Papillomavirus Infections* chapter).

Specimen Collection and Laboratory Diagnosis

In the correctional setting, the rapid turnover and transfer of offenders within institutions, especially at reception and among temporary detainees (those returning from parole), may limit the time available to diagnose and treat an STI. For this reason, rapid point-of-care testing may be especially relevant.

Urine-based testing is generally more acceptable than more invasive urethral or cervical swabs, but its association with drug testing may make inmates reluctant to provide a sample. A discussion of exactly what the urine is being tested for may facilitate acceptance by inmates.

Management and Treatment

In the correctional setting, the rapid turnover and transfer of offenders within institutions, especially at reception and among temporary detainees (those returning from parole), may limit the use of longer-term treatment regimens. In these cases, single-dose therapies for the treatment of STIs may be more appropriate.

Reporting and Partner Notification

According to a CSC infection control directive, CSC physicians or the Chief of Health Services on behalf of a physician must ensure that all diagnosed provincially reportable communicable diseases are reported to the local public health unit or the appropriate public health office.

Partner notification is a major component of STI follow-up. However, inmates who test positive for an STI may be reluctant to disclose information about contacts or behaviours that may be deemed inappropriate, illegal or stigmatized. It is critical to ensure that the partner-notification process is voluntary and non-coercive, preserving confidentiality and trust and respecting the dignity and human rights of the individual.[8]

Follow-up

Inmates who continue to engage in risky behaviour should be encouraged to be screened regularly for STIs. Safer-sex and harm-reduction education and counselling should continue to be emphasized.

If HAV and HBV vaccination have been initiated, the vaccination schedule must be completed as recommended.

As for all women, female inmates should have regular cervical screening for dysplasia and/or HPV infection as appropriate.

It is important that correctional services work in concert with local public health officials to follow up when appropriate with offenders who have been released to the community (i.e., referral/reporting to public health of unmanaged cases and contacts released to or residing in the community).

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MEN WHO HAVE SEX WITH MEN (MSM)/WOMEN WHO HAVE SEX WITH WOMEN (WSW)

Definition

Men who have sex with men (MSM) may have sex with men exclusively, or with both men and women, and may self-identify as gay, bisexual or heterosexual.

Women who have sex with women (WSW) may have sex with women exclusively, or with both women and men, and may self-identify as gay, lesbian, bisexual or heterosexual.

Epidemiology

Following a decline in the prevalence of reportable sexually transmitted infections (STIs) among MSM beginning in the 1980s, the incidence of syphilis, gonorrhea, chlamydia, genital herpes, hepatitis A virus (HAV), hepatitis B virus (HBV) and HIV infections has risen among MSM in Canada and internationally since the mid-1990s.[1–12] Recent outbreaks of syphilis among MSM have been reported,[2,3,13,14] with a large proportion of cases co-infected with HIV. Similarly, recent outbreaks of lymphogranuloma venereum (LGV) have been reported internationally[15–20] and in Canada[21] among MSM, with a high degree of HIV co-infection. Co-infection is of particular concern, given that syphilis and other STIs can increase the likelihood of HIV transmission and acquisition.[22–25]

Rising rates of STIs among MSM are associated with increases in unsafe sexual practices,[26] including unprotected anal intercourse (otherwise known as bare-backing);[12,27–31] an increase in the number of sex partners;[1,12] partner-finding on the Internet;[32–37] other anonymous partnering venues (e.g., bathhouses);[1,38] recreational and non-recreational drug use;[1,27,39–43] and unprotected oral sex.[1] Rates of unprotected anal intercourse have increased among MSM of all ages, and between HIV serodiscordant partners.[28,31,44]

Many explanations have been proposed for the recent increase in risky sexual practices among MSM, including fatigue with safer-sex messages and reduced fear of acquiring HIV due to optimism about new HIV treatments,[45,46] although the correlation with treatment optimism has not been shown consistently.[47] The increase in unsafe sexual practices among HIV-infected MSM has been attributed in part to the increasing proportion of HIV-infected MSM who feel healthy, are living longer and are therefore having sex more often and with more partners. Lack of knowledge of their own and their partners' STI status, including HIV, is also a concern; for example, almost 27% of HIV-positive men in the *Ontario Men's Survey* were unaware of their HIV status.[26]

Common recreational drugs used at bathhouses, raves or circuit parties include alcohol, methamphetamine ("crystal meth"), methylenedioxymethamphetamine (MDMA or "ecstasy"), ketamine ("special K"), gamma hydroxybutyrate (GHB), volatile nitrites (poppers) and cocaine (see *Substance Use* chapter). The reduction in inhibition that accompanies the use of these drugs can increase the likelihood of multiple sex partners and unprotected sex, and may be partnered with the use of sildenafil citrate (Viagra), vardenafil (Levitra) or tadalafil (Cialis) to counteract the erectile-dysfunction side effect of some of them. The use of sildenafil among MSM has been linked to an increased risk for multiple sex partners and STI acquisition.[48,49]

Sexually transmitted epidemics of enteric infections such as *Salmonella enterica* serotype *typhi* (typhoid fever)[50] and *Campylobacter jejuni* subsp. *jejuni*,[51] as well as sexual transmission of human herpes virus[8,52] have been documented among MSM populations in Canada and the United States.

There are very few data on rates of STIs among WSW, although studies have consistently found higher rates of STIs — specifically human papillomavirus (HPV), genital warts, HIV, syphilis and genital ulcer disease — among heterosexual and bisexual women than among women who have sex with women exclusively.[53–55] Although STI transmission among WSW is strongly correlated with sexual contact with male partners, sexual transmission of HIV, syphilis, HPV, herpes simplex virus types 1 and 2 (HSV-1 and -2), *Trichomonas vaginalis*, *Chlamydia trachomatis* and HAV have been reported in WSW with no history of a male partner.[56–61] Higher rates of bacterial vaginosis and hepatitis C virus (HCV) have been reported for WSW than for women with male sex partners only.[55,62,63] The few studies exploring STI risk behaviours among WSW have demonstrated higher rates of sexual contact with homosexual/bisexual men;[55,64,65] sex with HIV-infected partners;[64] injection drug use;[54,55,64,66] sex for money or drugs;[54,64,66] and a greater number of recent partners[64] among WSW compared to exclusively heterosexual women.

Prevention

Prevention counselling with MSM and WSW, as with all sexually active populations, should emphasize personal risk and risk behaviours, as well as the initiation and maintenance of risk-reduction activities with a patient-centred focus. It is important for health care providers to avoid making assumptions about involvement in risky behaviours, including drug use, based on sexual orientation. It is also important that health professionals accurately communicate the risks associated with various sex acts to their sexually active patient, including the risk of transmission via oral sex (i.e., although the risk of STI transmission is lower via oral sex than vaginal or anal sex, many STIs, including syphilis, chlamydia, gonorrhea, herpes and HIV, can be transmitted through unprotected oral sex).

Risk-reduction strategies to include in discussions with MSM and WSW, and all sexually active patients, include the following (see *Primary Care and Sexually Transmitted Infections* and *Human Immunodeficiency Virus Infections* chapters for more information on safer-sex and HIV-specific counselling):

- Avoiding or minimizing unprotected anal, vaginal, oral and anal-oral intercourse; in addition to intercourse, minimize other sexual activities involving exchange of bodily fluids (i.e., sharing of sex toys), which also carry risk for STI transmission.
- Ensuring consistent and correct use of condoms for vaginal intercourse and both insertive and receptive anal intercourse.
- Ensuring use of barrier protection for oral sex.
- Avoiding or minimizing sexual encounters with multiple and anonymous partners, as well as the use of recreational drugs in conjunction with sex.
- Regular testing for STIs if engaging in unprotected or risky sexual activity.
- Negotiating safety in sexual encounters, including disclosure of STI status to partners and learning partners' STI status; it should be noted, however, that serostatus disclosures may or may not be accurate, and that safer-sex practices (i.e., condom use or non-penetrative acts) provide the best protection against STIs in a sexual encounter.
- Avoiding the use of products containing nonoxynol-9 (N-9) during intercourse, given the safety and efficacy concerns regarding its use (see *Primary Care and Sexually Transmitted Infections* chapter for more information on N-9). N-9 found on spermicidally lubricated condoms may provide added protection against pregnancy, but it does not effectively protect against infection with HIV or other STIs and may irritate the genital mucosal lining, facilitating their transmission; however, a condom lubricated with N-9 is better than no condom at all.
- Receiving vaccination for both HBV and HAV; this should be offered to all MSM, given their increased risk of infection[67,68] and poor vaccination coverage;[69] the first dose can be given while waiting for serological test results (if performed), as immunization is not harmful for previously vaccinated or infected persons (see *Hepatitis B Virus Infections* chapter for more information on HBV vaccination and preimmunization screening).*
- For WSW, undergoing regular cervical screening for dysplasia and/or HPV infection.

Note:

* Preimmunization testing for immunity against HAV should be considered for populations with the potential for higher levels of pre-existing immunity (i.e., older Canadians and people from HAV-endemic areas). Routine preimmunization serologic screening for HBsAg, anti-HBs or anti-HBc is recommended for people at high risk of having been infected, but is not practical for universal immunization programs.[70]

Recognizing that MSM and WSW are diverse populations and that reasons for unsafe sexual practices will vary across individuals and subcultures, prevention messages should be tailored to the individual in question and should allow for discussion of realistic safer-sex goals. To be most effective, safer-sex messaging should not be a discussion of sexual risk alone, but one that takes into account the broader context of sexual health influences, including intimacy; sexuality and arousal; drugs and alcohol; mental health, including self-esteem and self-worth; abuse and coercion; and sexual identity.[71,72] Using a motivational interviewing approach for prevention counselling can be effective in promoting harm-reduction behaviours (see *Primary Care and Sexually Transmitted Infections* chapter for more information on motivational interviewing).

Evaluation

Prior experiences of MSM and WSW with discrimination, homophobia and heterosexism may have an effect on health care–seeking behaviour and disclosure of sexual behaviour in consultations.[73,74] In every patient encounter, it is important to avoid the assumption of heterosexuality. Taking a basic sexual history for all sexually active patients is important for establishing the following:

- Presence of opposite-sex and same-sex activity.
- Range and frequency of sexual practices.
- Level of risk for specific STIs.

Self-identified sexual identity is not an accurate predictor of behaviour;[75] it is necessary to ask specific questions about the gender of sexual partners when taking a sexual history. Using gender-neutral terms such as “partner” can help to create an environment that is comfortable for disclosure.[73] The best approach to obtaining a sexual history is to begin with open-ended, non-judgmental questions regarding broad categories of sexual behaviour and progressing to specific sexual practices.

Asking, “Do you have sex with men, with women, or with both?” may be a useful question during the sexual history to assess gender of sexual partners (see *Primary Care and Sexually Transmitted Infections* chapter for more information on taking a sexual history).

Specific sexual practices that are associated with increased risk of STIs and should be assessed for with all sexually active patients include the following:

- Receptive (passive) and insertive (active) anogenital intercourse.
- Oral-anal intercourse (anilingus).
- Unprotected sexual activity (oral, anal or genital).
- Sharing of sex toys.
- Rectal douching in association with receptive anogenital intercourse.
- Receptive manual-anal intercourse (insertion of finger or fist in anus of partner).
- Anonymous partnering and use of anonymous partnering venues (e.g., bathhouses, Internet, raves, circuit parties).

- Substance use accompanying sex.
- Injection drug use (IDU) and other substance use.

Based on results from the risk assessment, the following screening should be considered for men who have had unprotected sex with another man in the preceding year:

- Routine STI screening at all potential sites of infection (chlamydia, gonorrhea, syphilis), HIV serology (unless known to be seropositive) and HBV and HAV serology (if not previously immunized or known to be immune) (see *Hepatitis B Virus Infections* chapter for more information on HBV screening).
- Although asymptomatic screening for HSV and HPV is not currently recommended, new information may alter these recommendations. Studies are ongoing assessing whether screening in certain situations is cost-beneficial.

Assessment for STI symptoms including dysuria, anorectal symptoms (e.g., pain, discharge, bleeding, pruritus), urethral discharge, genital ulcers or lesions, and skin rash should be completed and appropriate diagnostic testing conducted if symptoms are present. In addition to a careful genital and targeted extragenital examination, a physical examination for MSM may include the following (see *Primary Care and Sexually Transmitted Infections* chapter for more information on physical examination):

- Examination of lymph nodes, skin, sclera, oral cavity, pharynx and perianal region.
- Anoscopy or proctoscopy for symptomatic MSM who are the receptive partner for anogenital sex.

Misconceptions about the STI risk and sexual practices of WSW may negatively impact the sexual history and screening performed for this group of women. STI-screening recommendations for WSW should be based on a detailed risk assessment, not on assumptions of low-risk sexual behaviours (see *Primary Care and Sexually Transmitted Infections* chapter). WSW, including those with no history of a male sexual partner, are at risk for cervical abnormalities[55,58] and should be encouraged to receive regular cervical screening for dysplasia and/or HPV infection.

Specimen Collection and Laboratory Diagnosis

As for all patients, while the choice of STI screening tests is based on the results of the sexual history (as described above), the choice of STI diagnostic tests should be based on the differential diagnosis of the presenting syndrome (e.g., proctitis). The following recommendations apply (see *Laboratory Diagnosis of Sexually Transmitted Infections* chapter for specific information on specimen collection):

- Anorectal gonorrhea and chlamydia cultures, if engaging in unprotected anal intercourse.
- Pharyngeal gonorrhea cultures, if performing unprotected oral sex.
- Laboratory testing for pathogens not usually associated with STIs (i.e., HAV, enteric organisms) but that can cause sexually transmitted proctitis, proctocolitis and enteritis may be indicated based on risk assessment and symptoms (e.g., examination of stool for ova and parasites).

Note:
Although culture remains the recommended test method for assessing pharyngeal or rectal infections, limited studies suggest a potential role for nucleic acid amplification tests for detection of pharyngeal gonorrhea[76] and rectal chlamydia;[77] further studies are needed before recommendations can be made.

Management and Treatment

- Same as for all patients.
- It is important to be aware of the potential stress associated with the "coming out" process and to be knowledgeable about gay- and lesbian-specific support groups and community networks for referral as needed.

Reporting and Partner Notification

- Same as for all patients.
- Anonymous partnering presents a challenge for partner notification, making it difficult, if not impossible, to contact and treat partners who have been exposed to an STI.

Follow-up

- WSW should be encouraged to undergo regular cervical screening for dysplasia and/or HPV infection.
- Patients whose history reveals unsafe sexual behaviours should be encouraged to engage in safer-sex and harm-reduction behaviours, and to be screened frequently for STIs (at least yearly) (see *Primary Care and Sexually Transmitted Infections* chapter).
- Patients who receive their first dose of HBV or HAV vaccination should be reminded to return to complete the vaccination series (one additional dose for HAV vaccine and two additional doses for HBV vaccine).

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PREGNANCY

This chapter will highlight aspects of STI management particular to pregnancy, but details for each condition should be reviewed elsewhere in these guidelines.

A lower threshold of screening for sexually transmitted infections (STIs) should exist in pregnancy, as there are significant potential complications for both the pregnancy outcome (gestational age at delivery and type of delivery) and the health of the newborn, due to the risk of vertical transmission. As such, the following recommendations are presented.

- At the first prenatal visit, all pregnant women should be:
  - Offered HIV counselling and testing.
  - Screened for hepatitis B surface antigen (HBsAg).
  - Screened for *Chlamydia trachomatis* and *Neisseria gonorrhoeae*.
  - Screened for syphilis.
- All pregnant women should be evaluated for STI risk factors prior to and during pregnancy. Risk factors are described in the *Primary Care and Sexually Transmitted Infections* chapter. Any woman with ongoing risk factors for STI acquisition during pregnancy should be considered for rescreening each trimester.
- If an STI is diagnosed in pregnancy, treatment specific to the disease should be initiated, taking the pregnancy into consideration (see below).
- Due to the potential for decreased efficacy of treatments in pregnancy, follow-up after treatment of STIs for both the patient and her sexual partner(s) is important to ensure therapeutic success.

Antimicrobial Therapy in Pregnancy

- Special attention is required to safely treat STIs in pregnancy.
- Always consult with an experienced colleague if you are unclear about a medication risk in pregnancy. Data or risks associated with antimicrobials are beyond the scope of this document. The Motherisk Clinic at the Hospital for Sick Children in Toronto is an excellent resource and can be accessed at www.motherisk.org or by calling (416) 813-6780.
- The following is an incomplete list of drugs that are relatively or absolutely contraindicated in pregnancy:
  - Erythromycin estolate
  - Sulfamethoxazole
  - Fluoroquinolones
  - Podophyllin/podophyllotoxin/5-fluoro-uracil/imiquimod (not licensed for use in pregnancy)
  - Doxycycline/tetracycline/minocycline
  - Gamma benzene hexachloride/lindane
  - Interferons
  - Ribavirin

Specific Issues Related to Obstetric and Gynecologic Circumstances

STI and pregnancy termination

Women presenting for surgical or medical termination of pregnancy should ideally be screened for STIs prior to termination. When feasible, screening for chlamydia and gonorrhea and subsequent treatment are appropriate pre-procedure. When screening is not feasible, prophylaxis pre-procedure with single-dose azithromycin (1 g PO *[A-I])* or doxycycline for *C trachomatis* coverage is recommended.[1] Although bacterial vaginosis (BV) is thought to contribute to postoperative infection, a recent randomized clinical trial of treatment with metronidazole prior to surgery in documented cases of BV did not improve outcome.[2] Further study is required in this area.

Artificial insemination and STI risk

STI risk with donor insemination is reduced with current Canadian practices of serologic screening for HIV, hepatitis B virus (HBV), hepatitis C virus (HCV) and syphilis. It is recommended that donor semen be stored until repeat donor serology at 6 months is negative for HIV. Initial and repeat screening of donor semen should include *N gonorrhoeae* and *C trachomatis* testing.[3] Antibiotic use at the time of embryo transfer to reduce iatrogenic pelvic inflammatory disease from *C trachomatis* has not been studied in a controlled fashion.[4] However, a recent survey in the U.K. indicates that *C trachomatis* prophylaxis is used in half of embryo transfers in that country.[5]

Chlamydia Trachomatis

There are variable reports in the literature, but no consistent association exists between poor pregnancy outcome (i.e., preterm birth or preterm prolonged rupture of membranes) and *C trachomatis* cervicitis.[6] Vertical transmission occurs in 50% of infants born vaginally to infected mothers. Vertical transmission can occur with cesarean section where membranes are intact. Of those neonates who acquire infection, at least 20% develop conjunctivitis, and 20% develop pneumonia.[7,8] Although provincial guidelines may vary, general national recommendations are to screen for *C trachomatis* early in pregnancy. Repeat screening should be performed in the third trimester for women at continuing risk for STI acquisition. (See *Chlamydial Infections* chapter for a full discussion of *C trachomatis* diagnosis and management.)

Treatment

Table 1. Treatment for* C trachomatis *during pregnancy

- Amoxicillin 500 mg PO tid for 7 days *[A-I]*

OR

- Erythromycin base 500 mg PO qid for 7 days *[A-I]*

OR

- Azithromycin 1 g PO in a single dose if poor compliance is expected *[A-I]*

Note:
Doxycycline and quinolones are contraindicated in pregnancy and in lactating women. Erythromycin estolate is contraindicated in pregnancy due to associated hepatotoxicity and cholestatic hepatitis. Amoxicillin and erythromycin are effective; however, compliance with erythromycin may be difficult due to gastrointestinal side effects.[9] Azithromycin appears to be safe and effective.[10–12]

Sexual partners should be treated and undergo follow-up testing to ensure cure. Condoms or abstinence are recommended during treatment and until follow-up tests are negative. Repeat polymerase chain reaction (PCR) chlamydial testing may be positive due to the presence of persistent DNA from killed organisms for up to 4 weeks after the completion of treatment.[13] Repeat testing should therefore be by PCR (as it is most sensitive) at 3–4 weeks post-treatment, or by culture if time does not allow for a 3 week waiting period. All pregnant women should be retested following treatment to ensure cure.

Gonococcal Infections

Infection with *N gonorrhoeae* in pregnancy is associated with endometritis, pelvic sepsis, ophthalmia neonatorum and systemic neonatal infection.[14] Although gonococcal infection is relatively uncommon in many clinical practices, it is still suggested that all pregnant women be screened in early pregnancy due to the adverse consequences of an untreated infection.

Those infected should be treated with a recommended or alternate cephalosporin.[15] Women with a penicillin allergy or those who cannot tolerate a cephalosporin should be administered a single 2 g dose of spectinomycin IM.[16] A diagnosis of *N gonorrhoeae* is strongly associated with co-infection of *C trachomatis*.[17] Treatment for both STIs is recommended when *N gonorrhoeae* is diagnosed,[18] unless testing for *C trachomatis* is negative. In pregnant women, a test of cure is recommended. (See *Gonococcal Infections* chapter for a full discussion of *N gonorrhoeae* diagnosis and management.)

Ensure simultaneous treatment of *C trachomatis* when treating *N gonorrhoeae*, unless testing for *C trachomatis* is documented negative (see *Chlamydial Infections* and *Gonococcal Infections* chapters).

Treatment

Table 2. Treatment for* N gonorrhoeae *during pregnancy

Preferred	Alternative
• Cefixime 400 mg PO in a single dose *[A-I]* OR • Ceftriaxone 125 mg IM in a single dose *[A-I]*	• Spectinomycin 2 g IM in a single dose (available only through SAP) *[A-I]*

SAP = Special Access Program

All sexual partners of patients who have *N gonorrhoeae* infection should be evaluated and treated for both *N gonorrhoeae* and *C trachomatis* infections. Patients and contacts should abstain from unprotected intercourse until treatment of both partners is complete (i.e., after completion of a multiple-dose treatment or for 7 days after single-dose therapy). In pregnancy, a test of cure in both partners is recommended.

Syphilis

Infectious syphilis in pregnancy, defined as primary, secondary or early latent infection (typically the first year after infection), can lead to fetal infection with stillbirth, preterm birth, congenital abnormalities and active disease at delivery. Transmission occurs transplacentally (as early as 14 weeks and throughout pregnancy) or at the time of delivery. Untreated primary or secondary syphilis carries a transmission risk of up to 100%, while early latent infection has a 40% transmission risk.[19] Treated syphilis has a transmission rate of 1.8%.[20] In a small Canadian study, 1 of 98 treated women had a child with congenital syphilis, whereas 4 of 9 women not treated in pregnancy had infants with congenital syphilis.[21]

All women should be screened serologically with a non-treponemal screening test for syphilis at the first prenatal visit (Venereal Disease Research Laboratories [VDRL] or rapid plasma reagin [RPR]). In those considered high-risk, a treponemal test should be added to initial testing, and repeat testing should be performed at both 28 weeks' gestation and delivery. If screening serology is positive, treponemal-specific testing is required to confirm the diagnosis: *Treponema pallidum* immobilization (TPI), fluorescent treponemal antibody absorbed (FTA-ABS) or microhemagglutination-*T pallidum* (MHA-TP) (*T pallidum* particle agglutination [TP-PA] in Quebec). Any woman who delivers a stillborn infant after 20 weeks' gestation should be tested for syphilis.

Biological false-positive results are possible with non-treponemal and treponemal tests in pregnancy, but they are more common with non-treponemal results.

For details on specific tests, see *Syphilis* chapter.

Diagnostic considerations

Pregnant women with confirmed syphilis should be considered infected unless an adequate treatment history is documented and sequential serologic antibody titres have declined. In some cases, titres will not decline to undetectable levels even after successful treatment and may remain positive at low levels, such as 1:1 or 1:2, indefinitely.

Treatment

Penicillin is effective for preventing maternal transmission to the fetus and for treating fetal infection. Treatment during pregnancy should consist of the penicillin regimen appropriate for the presenting stage. Penicillin alternatives have not been proven effective for the treatment of syphilis during pregnancy. Pregnant women who have a history of significant penicillin allergy should be desensitized and then treated with penicillin.

Table 3. Treatment for syphilis during pregnancy

Primary or secondary syphilis	Benzathine penicillin G 2.4 million units IM in a single dose (available only through SAP) *[B-II]*
Early latent syphilis	Benzathine penicillin G 2.4 million units IM in a single dose (available only through SAP) *[B-II]*
Late latent syphilis or latent syphilis of unknown duration	Benzathine penicillin G 7.2 million units total, administered as three doses of 2.4 million units IM each at 1 week intervals (available only through SAP) *[B-II]*

SAP = Special Access Program

In the second half of pregnancy, management and counselling may be facilitated by a sonographic fetal evaluation for congenital syphilis, but this should not delay therapy. Sonographic signs of fetal syphilis (i.e., hepatomegaly, ascites and hydrops) indicate a greater risk for fetal treatment failure; such cases should be managed in consultation with obstetric specialists.[22]

Women treated for syphilis during the second half of pregnancy are at risk for premature labour and/or fetal distress if the treatment precipitates the Jarisch-Herxheimer reaction; this includes fever, uterine irritability and contractions. It is estimated to occur in 40% of patients with primary or secondary syphilis, begins on average within 10 hours of treatment and resolves within 24 hours.[23] These women should be advised to seek obstetric attention after treatment if they notice any contractions or decrease in fetal movements. Some centres admit and conduct fetal monitoring at the time of treatment. Although stillbirth is a rare complication of treatment, concern about this complication should not delay necessary treatment.

All patients who have syphilis should be offered testing for HIV infection. In the case of suspected congenital syphilis, consult a colleague with experience in this area.

Trichomoniasis

Vaginal trichomoniasis has been associated with adverse pregnancy outcomes, particularly premature rupture of the membranes, preterm delivery and low birthweight. However, data have not indicated that treating asymptomatic trichomoniasis during pregnancy lessens the risk of adverse pregnancy outcomes. In fact, treatment of asymptomatic trichomoniasis with metronidazole 2 g x 2 doses has been shown to increase preterm birth in a placebo-controlled trial.[24] For this reason, screening of all pregnant women cannot be recommended. Women who are symptomatic with trichomoniasis, however, should be treated to ameliorate symptoms and minimize the risk of sexual transmission as described below.[25–27] Women may be treated with 2 g of metronidazole orally in a single dose. Marginally better cure rates have been found with 7 day treatment (as per treatment recommendations, below).[27] Multiple studies and meta-analyses have not demonstrated a consistent association between metronidazole use during pregnancy and adverse fetal effects — it is therefore considered safe in pregnancy.[28–30]

Diagnostic considerations

Diagnosis of vaginal trichomoniasis is usually performed by microscopy of vaginal secretions (wet mount), but this method has a sensitivity of only about 60–70%. Microscopy and culture performed rapidly from time of sample collection is the most sensitive available method of diagnosis.

Treatment

Table 4. Treatment for trichomoniasis during pregnancy

Preferred	Alternative
• Metronidazole 2 g PO in a single dose *[A-I]*	• Metronidazole 500 mg PO bid for 7 days *[A-I]*

Topical therapy is ineffective for cure compared to oral metronidazole (<50% with intravaginal treatment).[31] Treatment of sexual partner(s) is essential for cure.

Abstinence during treatment is recommended to avoid reinfection. Retesting in pregnancy is necessary only for those who remain symptomatic after treatment.

Bacterial Vaginosis

Bacterial vaginosis in pregnancy has been associated with adverse outcomes, including premature rupture of membranes, preterm labour, preterm birth and postpartum endometritis. There is evidence to support screening and treatment at 12–16 weeks in high-risk pregnancies (i.e., previous preterm labour/delivery or preterm premature rupture of membranes). If the patient is symptomatic or at high risk, test for BV and treat as below. Treatment of BV in

such cases may reduce the risk of prematurity, low birthweight and preterm premature rupture of membranes.[32–35] In low-risk and asymptomatic women, screening is not recommended, as it has not been shown to affect adverse outcomes in well-designed randomized, controlled trials.[35,36] If symptoms suggest BV, testing is appropriate, and positive results warrant treatment for symptom resolution.

Treatment

Table 5. Treatment for bacterial vaginosis during pregnancy

Preferred	Alternative
• Metronidazole 500 mg PO bid for 7 days *[A-I]*	• Clindamycin 300 mg PO bid for 7 days *[A-I]*

Systemic rather than topical treatment is recommended in pregnancy, as vaginal treatment has not been shown to decrease the risk of adverse pregnancy outcomes. Also, clindamycin topical treatment has been associated with adverse outcomes in the newborn when used in pregnancy.[37–39] Based on multiple studies, most recently assessed by meta-analysis, the evidence supports the safety and lack of teratogenicity of systemic metronidazole use in pregnancy.[28–30] Rescreening and re-treating may be advisable in women with high-risk pregnancies (i.e., previous preterm labour, delivery or preterm premature rupture of membranes). It is important to note that clindamycin has been associated with increased risk of pseudomembranous colitis and should be used only when alternatives are not possible.

Vulvovaginal Candidiasis

Vulvovaginal candidiasis is a common occurrence in pregnancy. Management depends on the degree of symptomatology. Often *Candida* is difficult to eradicate in pregnancy, so the primary goal of therapy should be symptom control. To date, only topical “azole” treatments are recommended in pregnancy, and these should be monitored by a physician. Treatment for 7 days may be necessary in pregnancy to achieve resolution of symptoms.[40] Oral fluconazole is considered teratogenic in animal studies,[41] but in 226 cases of first-trimester exposure in humans there was no increased risk of complications.[42] There are reports, however, of women with chronic exposure in pregnancy who have had infants with skeletal malformation syndromes suggestive of fluconazole teratogenic effects.[43,44] Therefore, oral “azoles” are not recommended. The use of intravaginal boric acid is not recommended in pregnancy due to its teratogenic potential in animal studies.[45]

Treatment

Table 6. Treatment options for vulvovaginal candidiasis during pregnancy

Butoconazole *[A-I]*	• 2% cream 5 g (butaconazole1-sustained release) in a single intravaginal application
Clotrimazole *[A-I]*	• 1% cream 5 g intravaginally per day for 7–14 days OR – 100 mg vaginal tablet, one tablet per day for 7 days • OR • 100 mg vaginal tablet, two tablets per day for 3 days OR • 500 mg vaginal tablet, one tablet in a single application
Miconazole *[A-I]*	• 2% cream 5 g intravaginally per day for 7 days OR • 100 mg vaginal suppository, one suppository per day for 7 days OR • 200 mg vaginal suppository, one suppository per day for 3 days
Nystatin *[A-I]*	• 100,000 unit vaginal tablet, 1 tablet per day for 14 days
Terconazole *[A-I]*	• 0.4% cream 5 g intravaginally per day for 7 days OR • 0.8% cream 5 g intravaginally per day for 3 days OR • 80 mg vaginal suppository, one suppository per day for 3 days

Ectoparasitic Infestations

Phthirus pubis

Patients who have *P pubis* (i.e., pubic lice) usually seek medical attention because of pruritus, lice or nits in their pubic hair. Pediculosis pubis is usually transmitted by sexual contact.[46] Treatment should be given in pregnancy as follows (see also *Ectoparasitic Infestations* chapter).

Treatment

Table 7. Treatment for pubic lice during pregnancy

• Permethrin 1% cream rinse applied to affected areas and washed off after 10 minutes *[B-II]*
OR
• Pyrethrins with piperonyl butoxide applied to the affected area and washed off after 10 minutes *[B-II]*

Note: Lindane is contraindicated in pregnancy .

Follow-up

Patients should be evaluated after 1 week if symptoms persist. Re-treatment may be necessary if lice or eggs are observed at the hair-skin junction. Patients who do not respond to one of the recommended regimens should be re-treated with an alternative regimen. However, pruritus alone in the absence of persistent organisms warrants symptomatic treatment only.

Sexual partners within the last month should be treated. Patients should avoid sexual contact with their sexual partner(s) until patients and partners have been treated and re-evaluated to rule out persistent disease.

Scabies

The predominant symptom of scabies is pruritus. Sensitization to *Sarcoptes scabiei* must occur before pruritus begins. The first time a person is infected with *S scabiei*, sensitization takes up to several weeks to develop. However, pruritus may occur within 24 hours after a subsequent reinfestation. Scabies in adults often is sexually acquired, although scabies in children is usually not (see *Ectoparasitic Infestations* chapter for more information on transmission). Pruritus may persist for several days or weeks after treatment.[46–48]

Treatment

Table 8. Treatment for scabies during pregnancy

- Permethrin cream (5%) applied to all affected areas of the body from the neck down and washed off after 8–14 hours *[B-II]*

Note: Lindane and ivermectin are contraindicated in pregnancy and lactation.

Both sexual and close personal or household contacts within the preceding month should be examined and treated. Re-treat if symptoms persist or recur.

Genital Herpes Simplex Virus Infection

Counselling on the signs and symptoms of herpes simplex virus (HSV), as well as risk reduction behaviours to avoid contracting genital herpes, is important for all women who present for pregnancy care. There is currently no evidence to investigate or treat pregnant women who have no history of genital herpes and whose partners also have no history. However, without past history, these women are at risk of acquiring primary infection in pregnancy. Primary infection in pregnancy is associated with significant vertical transmission rates.

Women without a history of HSV should receive risk-reduction behaviour counselling to avoid contracting HSV. Both HSV-1 and HSV-2 can cause genital lesions, be vertically transmitted and lead to neonatal disease. Diagnosis of genital

herpes can be complicated due to the common phenomenon of asymptomatic or subclinical disease. Diagnosis requires a careful assessment of clinical features, culture or PCR of genital sites and type-specific serology. Neonatal HSV is associated with significant morbidity and mortality, causing cutaneous, central nervous system and disseminated disease, such as pneumonitis and encephalitis.

Primary infection

If the mother is seronegative, she is at risk of primary infection with HSV-1 or -2 in pregnancy. If this occurs during the second half of pregnancy, a vertical transmission rate of 30–50% exists.[49,50] A significant proportion of neonatal herpes cases are born to mothers with no recognized history of genital herpes.[51,52] At present, there is no evidence that routine serotesting in pregnancy will be successful at decreasing the risk of neonatal herpes. However, if a known serosusceptible pregnant woman is known to have a partner with oral or genital herpes, it is prudent to advise abstinence from oral and/or genital sexual contact. In addition, non-pregnancy data would suggest that suppressive therapy in the male partner with genital herpes would decrease the risk of sexual transmission, but this should not replace abstinence or judicious condom use.[53]

Treatment

Table 9. Treatment for genital HSV during pregnancy

- Acyclovir 200 mg five times per day for 5–10 days *[A-I]*[54]

Primary infection in pregnancy warrants acyclovir treatment and consideration of cesarean section for delivery, especially if infection is in the late third trimester. Such measures reduce, but do not eliminate, the risk of vertical transmission.[55] See *Genital Herpes Simplex Virus Infections* chapter for more information on treatment.

Recurrent infection

In a woman with prior infection, the risk of vertical transmission is 2–4%. For those who have had an outbreak within the previous year, prophylaxis at 36 weeks' gestation until delivery with acyclovir 400 mg PO tid is recommended *[A-I]*.[54] Transmission can occur at the time of delivery, with or without lesions, due to asymptomatic shedding. Treatment with acyclovir reduces the risk of lesions and the risk of asymptomatic viral shedding, thereby reducing the cesarean section rate.[54,56] See *Genital Herpes Simplex Virus Infections* chapter for more information on suppressive therapy.

If genital lesions or prodromal symptoms are present at the time of delivery, cesarean section is recommended.[56] In the event of ruptured membranes, cesarean section is thought to confer protection, ideally if performed within less than 4 hours.[57,58]

Genital Warts and Genital Human Papillomavirus Infection

Vertical transmission of genital human papillomavirus (HPV) types 6 and 11 can cause recurrent respiratory papillomatosis (RRP) in infants and children. Symptomatic perinatal transmission is infrequent and is usually clinically apparent within 2 years. When it occurs, it is associated with anogenital and vocal-cord lesions in the newborn. Although maternal HPV prevalence is high, HPV vertical transmission is low, and RRP is rare.[59–61] The value of cesarean section for reducing/preventing transmission is unknown. Cesarean section is not recommended for the sole purpose of reducing transmission of HPV to the newborn. If the pelvic outlet is obstructed by warts, or if the warts are significant in number as to cause a bleeding complication with vaginal delivery, cesarean section may be warranted.

Genital warts may proliferate, reappear and become friable in pregnancy. Women should be reassured that this growth usually regresses postpartum. In general, the practice is to defer treatment due to poor response to therapy in pregnancy. If treatment is desired, the following options are appropriate. Weekly treatment may be required.

Treatment

Table 10. Treatment for genital HPV during pregnancy

- TCA trichloroacetic acid (85%) *[B-II]*
- Cryotherapy (liquid nitrogen) *[B-II]*
- CO_2 laser *[B-II]*
- Surgical excision *[B-II]*

Note: Imiquimod, podophyllin, podofilox, podophyllotoxin, 5-fluoro-uracil and interferon are contraindicated in pregnancy.

Hepatitis A Virus Infection

Vertical transmission of hepatitis A virus is not described. An infected woman can infect her newborn through the usual fecal/oral routes of transmission. Immunization and/or gammaglobulin treatment in pregnancy is safe and may confer some protection for the newborn.[62]

If a pregnant woman is infected, consider prophylaxis with vaccine and/or gammaglobulin for household contacts. Household contacts should consider receiving hepatitis A vaccine. If a pregnant woman is a contact of an infected person, there is no contraindication to the use of gammaglobulin or hepatitis A vaccine in pregnancy *[B-II]*.

Hepatitis B Virus Infection

Mothers who are acutely infected with HBV, or are carriers, can transmit the virus to their infant. Transmission appears to occur at time of delivery, but not transplacentally. Depending on the stage of maternal infection, the vertical transmission risk of hepatitis B can be as high as 90% in the absence of intervention at the time of delivery.[63] Ninety-five percent of cases can be prevented with the use of hepatitis B immune globulin (HBIG) and hepatitis B vaccine administered at birth to the neonate, followed by two additional vaccine doses at 1 and 6 months.[64] The first dose of hepatitis B vaccine should be administered within 12 hours of birth and HBIG immediately after birth (efficacy decreases sharply after 48 hours).[65]

If a woman is newly identified to be HBsAg-positive in pregnancy, she warrants further investigation. Consideration should be given to testing for HIV, hepatitis B e antigen, hepatitis B core antibody, HBV DNA, hepatitis A IgM and hepatitis C antibodies (anti-HBc IgM and IgG). If she is found to be positive for any of these, an evaluation of liver transaminases and function is warranted (see *Hepatitis B Virus Infections* chapter).

If the mother is infectious at time of delivery, document the diagnosis on prenatal forms and plan for administering HBIG and the first dose of hepatitis B vaccine to the neonate immediately after birth. The second and third dose of the vaccine should be given to the infant 1 and 6 months after the first dose. Special attention is required to complete the three-dose schedule, since long-term exposure is possible and there may be difficulty in reaching the family for the third dose. A follow-up hepatitis B surface antibody at 1–2 months after completion of HBV vaccine series to document adequate immune response is recommended (see *Hepatitis B Virus Infections* chapter and *Canadian Immunization Guide*).[3] Breastfeeding is safe if the neonate is treated.

If the mother is a contact of an infected person or is at risk of acquiring hepatitis B, there is no contraindication to HBIG or HBV vaccine in pregnancy *[A-I]*.

Hepatitis C Virus Infection

Approximately 0.8% of the Canadian population is infected with hepatitis C.[66] Persons with hepatitis C should be referred to health care professionals with experience in the treatment of hepatitis C. Pregnancy does not appear to have an effect on the progression of hepatitis C.

Hepatitis C in pregnancy may be associated with increased rates of cholestasis.[67]

The risk of vertical transmission is estimated to be 7.9%.[68] It is not yet known if cesarean section reduces the vertical transmission of HCV, as it has not been adequately studied to date.[69]

Breastfeeding is considered to be safe unless nipples are cracked or bleeding. Although HCV RNA has been identified in breast milk,[70] breastfeeding is still considered safe. Assessment of and education to reduce risk behaviour is important in pregnancy.

Current treatments available for HCV infection are contraindicated in pregnancy (i.e., interferon-alpha and ribavirin, combination therapies of pegylated interferon-alpha 2a and 2b plus ribavirin). Although not well studied, interferon-alpha does not appear to have an adverse affect on the human embryo or fetus, but it is associated with increased rates of preterm delivery and intrauterine growth restriction. Animal studies have shown an increased rate of fetal loss.[71] If interferon is to be used in pregnancy, the potential benefits of its use should clearly outweigh possible hazards.[72–74] Because there are no large studies of ribavirin use during human pregnancy and ribavirin is highly teratogenic in animal studies, its use during pregnancy is absolutely contraindicated.[75] Ribavirin has been given Pregnancy Category X by the U.S. Food and Drug Administration. It is recommended that women and/or their male partners who have received ribavirin as part of a combination treatment for HCV infection both use a highly effective method of birth control to prevent pregnancy during ribavirin therapy and for 6 months afterward.

Canadian guidelines for the management of hepatitis C in pregnancy are detailed elsewhere.[68]

Human Immunodeficiency Virus Infection

All women should be offered HIV antibody testing with appropriate counselling and informed consent at their first prenatal visit. A diagnosis of HIV and pregnancy presents a need for complex care and requires consultation with experts in the area as soon as possible. Initiation of antiretroviral therapy in HIV-infected pregnant women is critical for the reduction of vertical transmission; this typically consists of combination antiretroviral therapy, also known as highly active antiretroviral therapy (HAART). Effective suppression of viral load in pregnancy prior to delivery, along with intrapartum and 6 weeks of neonatal antiretroviral therapy, reduces vertical transmission from 25% to less than 1%.[76]

If the mother is found to be HIV-positive on confirmatory testing (see *Human Immunodeficiency Virus Infections* chapter), consultation should be made with a specialist in HIV pregnancy care. The best care and greatest chance for viral suppression is with early management. If the pregnancy is to be continued, HAART should be initiated either immediately or at 14–18 weeks' gestation, depending on CD4 counts and viral load. Women should be counselled regarding the potential side effects of antiretroviral therapy, the importance of strict compliance and need for close monitoring. At a minimum, monthly complete blood count, aspartate aminotransferase, alanine aminotransferase, amylase, bilirubin, creatinine, serum lactate, glucose, CD4 count and viral load are recommended. Specific guidelines are found elsewhere.[76]

Specific antiretroviral drugs that are contraindicated in pregnancy include the following:

- Efavirenz
- Delavirdine
- Hydroxyurea
- Nevirapine (the initiation of continuous nevirapine in pregnancy is not currently recommended due to its potential toxicities: rash, severe hepatitis, Stevens-Johnson syndrome)

If a woman presents in pregnancy already taking nevirapine and tolerating it well, continuation may be considered. One-time maternal dosing of nevirapine used in the high-risk setting at the time of delivery is still appropriate.

Because of the complexity associated with the use of antiretroviral drugs in pregnancy, all HIV-positive pregnant women should be managed in cooperation with an HIV specialist.

If HIV viral load is undetectable at the time of delivery, vaginal delivery is usually recommended, unless cesarean section is required for obstetric reasons. With a viral load greater than 1,000 copies/mL, a cesarean section is usually recommended to reduce the risk of vertical transmission.[77–81] Additionally, all infected women should receive IV zidovudine from the onset of labour until delivery or before a cesarean section is started. Breastfeeding is contraindicated, as HIV can be transmitted through breast milk.

Women who are diagnosed HIV-positive late in pregnancy or in labour are at very high risk for perinatal transmission of infection. Further management should be in cooperation with both adult and pediatric HIV specialists, who may recommend one or more of the following: intrapartum prophylaxis options with IV zidovudine, cesarean section, single-dose nevirapine to the woman in labour and single-dose nevirapine to the infant, and 6 weeks of oral antiretroviral therapy to the infant.[76]

Note that these guidelines are under constant revision, and each case should be managed with an expert in the area. For more detailed information, please see the Canadian guidelines for management of HIV-affected pregnancy, labour and delivery, and postpartum period.[76]

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SEXUAL ABUSE IN PERIPUBERTAL AND PREPUBERTAL CHILDREN

Background

Canadian Law regarding Age of Consent to Sexual Activity (at the time of publication)

Canadian law is fairly nuanced in respect to defining the points at which sexual activities involving persons under the age of 18 become criminal offences.[1] Depending on the circumstances, any form of touching for a sexual purpose can constitute an offence. Consent is the key factor in determining whether any form of sexual activity is a criminal offence. The law recognizes some minors as having the ability to consent, in some situations. Generally speaking, persons over 14 are recognized as being able to give consent to participate in sexual activities, unless the activities are taking place in a relationship where one participant has some authority over or is in a position of trust in relation to the other person, where there is dependency, or where there is exploitation of one participant by the other. The *Criminal Code* provides a "close in age" exception: a 12 or 13 year old can consent to engage in sexual activity with another person who is less than two years older and with whom there is no relationship of trust, authority, dependency, or exploitation Children under 12 do not have the legal capacity to consent to any form of sexual activity.

Definition

The definition of sexual abuse varies, but involves all sexual acts that the child cannot comprehend, for which the child is not developmentally prepared and/or cannot give consent to, and/or that violates the law.[2] Activities may range from fondling to penetration. For the purpose of these guidelines, as is relevant to the potential transmission of sexually transmitted infections (STIs), the definition will include complete or partial penetration by a penis of the mouth, anus and/or vagina, although it is noted that contact of the mouth with the external genitalia or anus could potentially transmit herpes simplex virus (HSV) infections.

In addition, for the purpose of these guidelines, peripubertal refers to individuals aged 11–13 and prepubertal to individuals less than 11 years of age.

Epidemiology

It is difficult to accurately estimate the prevalence of sexual abuse due to underreporting. The reported prevalence varies from study to study, depending on a number of factors. This form of abuse affects children of all ages, socioeconomic classes and geographic locations.[3] Some studies estimate that approximately 1% of children experience some form of sexual abuse each year, resulting in sexual victimization of 12–25% of girls and 8–10% of boys by age 18.[4] The perpetrator may be a member of a child's family or a complete stranger, but in either case the abuser is often an adult male (adolescents may be the perpetrators in as many as 20% of all cases). Boys may be abused as often as girls, but they are less likely to report the abuse.

The Canadian Incidence Study of Reported Child Abuse and Neglect[5] estimated that 135,573 child maltreatment investigations were carried out in Canada in 1998, an annual incidence rate of 21.52 investigations per 1,000 children. Ten percent (15,614 or 2.48 investigations per 1,000 children) of these investigations involved sexual abuse as the primary reason for investigation. Of these, an estimated 2,742 child investigations involved allegations of oral, vaginal or anal sexual activities. Non-parental figures were most often investigated in sexual abuse cases, with non-parental relatives representing 28%, biological fathers 15% and stepfathers 9% of all cases. Seven percent of sexual abuse investigations involved mothers as alleged perpetrators (5% biological mothers and 2% stepmothers). Sixty-eight percent (~9,813 cases) involved female children, with adolescent females aged 12–15 accounting for 21% of investigations and girls 4–7 years accounting for 23%.

Multiple factors affect the risk of transmission of infection with sexual abuse, including the following:[6–9]

- Prevalence of STIs within the local population.
- Type of sexual activity: the risk of STI transmission with penile-rectal penetration is greater than penile-vaginal penetration, which is greater than penile-oral penetration etc.
- Degree of trauma: injuries to the genital tract are more common in children.
- Sexual maturity of the child: altered susceptibility to STIs due to maturational differences in the genital tract.
- Lack of use of barrier contraception.
- Multiple episodes of abuse.

Prevention

Children should be screened throughout childhood, during routine visits to health care providers' offices, for evidence of sexual abuse. Children who may be at higher risk include those with developmental, behavioural and medical problems.[10,11] Health care providers should also be aware that recognizing and reporting child sexual abuse is the most effective means of preventing further abuse, reactive abuse and pedophilia.[12–15]

Evaluation

Sexually abused children may present in many ways. They may present alone or with their parents for evaluation of alleged sexual abuse. They may present at a health care provider's office with an unrelated complaint and then disclose abuse. The health care provider may even suspect abuse during a routine visit, highlighting the need for vigilance, because abuse may present in ways that may be so non-specific that the problem may not be considered.[16–18] Rectal or genital bleeding, the presence of STIs and developmentally unusual sexual behaviour are some of the more specific signs of sexual abuse.[19]

Victims of sexual assault may be reluctant to disclose that they have been sexually assaulted for a variety of reasons, including being coerced into secrecy, fear of not

being believed or fear of retribution. In some instances, children may not recognize that abuse has taken place.

Assessment and follow-up of children who are victims of sexual abuse should be carried out with great sensitivity and ideally with the direct involvement of experienced teams or services (see *Appendix G*). When direct referral cannot be made (e.g., in remote areas), every effort should be made to consult with the nearest referral centre.

Health care providers who suspect the occurrence or possibility of sexual abuse should inform the parents/guardians in a calm, non-accusatory manner.[2] Health care providers must be aware of local reporting requirements (see Reporting and Partner Notification, below).

The health care provider's role is not to conduct a legal interview or obtain details of the abuse from the child, but rather to do the following:[20]

1. Take a pertinent medical history.
2. Ensure the physical and emotional well-being of the patient.
3. Treat or prevent illness or injury.
4. Accurately record spontaneous disclosure or volunteered information.
5. Obtain and document physical findings consistent with abuse or suspicions of abuse.
6. Inform the child and caregivers about the medical outcome of the investigation.
7. Assist child protection and law enforcement agencies in their investigation.

History

When a health care provider suspects abuse, he/she must take a pertinent medical history to satisfy the medical needs of the child and generate adequate information to assist child protection agencies.

When direct referral to specialist referral centre is not possible (e.g., in remote areas), several methods may be used when asking young children about abuse.[21] The child may also spontaneously provide information. If possible, the child should be interviewed alone, although the presence of a non-threatening caregiver may be appropriate. In addition, the parents/guardians may provide a history of behavioural changes that may be relevant to the situation.

Physical exam

The following information is provided as a guide and may be useful when screening for the possibility of sexual abuse. A full evaluation should ideally be performed by a clinician experienced in this area.

Injuries requiring immediate attention should take precedence over any other examination. The physical examination should be explained to the child before it is performed and should not result in additional emotional trauma.

A complete pediatric examination should be performed, with special attention paid to the growth parameters and sexual development of the child using Tanner staging (see *Appendix H*). Injuries and other evidence of abuse should be documented, including bruising, swelling and areas of tenderness. If the abuse has occurred within 72 hours, or if there is bleeding or acute injury, the examination should be performed immediately so that forensic specimens can be collected.[2] After 72 hours has passed and when no acute injuries are evident, then the evaluation should be performed when convenient for the child and investigative team.

Careful examination of all areas involved in sexual activity should be performed and notes made of any abnormalities. Examination of the genital and rectal areas may be aided by instruments that illuminate and/or magnify the area. In both sexes, the anus should be examined, and in females the hymenal opening should be examined. Digital and speculum examination is not usually necessary and should not be performed in prepubertal children.

Specimen Collection and Laboratory Diagnosis

For prepubertal children, the decision to perform testing should be done on an individual basis. The following situations put the child at higher risk for STIs and are indications for testing:[22]

- The child has symptoms or signs of an STI (e.g., vaginal discharge or pain, genital itching or odour, urinary symptoms, genital ulcers or lesions).
- The suspected assailant is known to have an STI or to be at risk for an STI.
- Another child or adult in the household is known to have an STI.
- The prevalence of STIs in the community is high.
- There is evidence of genital, oral or anal penetration.

If testing is warranted, an experienced clinician (ideally one involved with a referral centre) must be consulted; the testing procedures described below are intended as a guide and for information only.

Minimal investigation should include testing for *Neisseria gonorrhoeae* and *Chlamydia trachomatis*, and if genital ulcers are present, for herpes simplex virus and syphilis. The genital organs of female infants, children and adolescents vary significantly from those of adults, influencing the microbiological flora of the genital tract and sampling sites for screening. Sampling sites must be specific for the sexual maturity of the young person. Speculum examinations should not be performed on prepubertal children.

The health care provider may elect to use several techniques, including the use of small swabs (such as urethral or ear, nose and throat swabs) moistened with sterile saline for transhymenal vaginal sampling. Placing the child in the prone knee-chest position allows cultures to be taken without touching the hymen and causing pain and without the child being alarmed by the sight of the swab.[23] Vulvar or vaginal washings are also suitable (see Table 1).

Table 1. Initial visit: prepubertal children

Specimen type by gender	Condition or organism to be detected
Males and females Urine • First-catch urine (10–20 mL), after not voiding for 2 hours	• A molecular diagnostic test, preferably a NAAT, should be collected for gonorrhea and chlamydia. This test is generally more sensitive than genital culture and may be acceptable for medico-legal purposes if confirmed by a second set of primers or, in some cases, a second test sent to another laboratory • Postexposure NAAT testing can be taken at the time of presentation, without needing to wait for 48 hours after exposure
Females Vagina, vestibule or discharge (if present) • 1 urethral swab, premoistened with sterile water (to minimize discomfort)* • Vaginal wash† technique preferred to multiple vaginal swabs if NAAT used for *Chlamydia trachomatis* and *Neisseria gonorrhoeae*	• Gram stain, if available, for abnormal bacterial flora, bacterial vaginosis, candidiasis, gonorrhea should be taken • Molecular diagnostic tests, especially NAATs, are more sensitive than culture for *C trachomatis* and *N gonorrhoeae* • Cultures have been the preferred method for medico-legal purposes, but NAATs may be acceptable if positive results are confirmed by a second set of primers or, in some cases, a second test sent to another laboratory • If available, both tests (culture and NAAT) should be taken • If available, wet mount and/or culture for *T vaginalis* should be taken • Since culture tests collected <48 hours after exposure may be falsely negative, they should be repeated 1–2 weeks after exposure if prophylaxis is not offered; a postexposure NAAT can be taken at the time of presentation

Table 1. Initial visit: prepubertal children (continued)

Specimen type by gender	Condition or organism to be detected
Males Meatus • 1 urethral swab, premoistened in sterile water for meatal specimen; intraurethral specimen not recommended	• Gram stain for gonococcal urethritis should be taken • Molecular diagnostic tests, especially NAATs, are more sensitive than culture for *C trachomatis* and *N gonorrhoeae* • Cultures have been the preferred method for medico-legal purposes, but NAATs may be acceptable if positive results are confirmed by a second set of primers or, in some cases, a second test sent to another laboratory • If available, both tests (culture and NAAT) should be taken • If available, wet mount and/or culture for *T vaginalis* should be taken • Since culture tests collected <48 hours after exposure may be falsely negative, they should be repeated 1–2 weeks after exposure if prophylaxis is not offered; a postexposure NAAT can be taken at the time of presentation
Pharynx • 1 swab	• *N gonorrhoeae* culture should be taken • Test for *C trachomatis* by culture if available; note that organisms can be detected in oropharynx from perinatal transmission for up to 6 months following birth • No approved NAAT for throat specimens
Rectum • 1–2 swabs	• *N gonorrhoeae* and *C trachomatis* culture should be taken; no approved NAATs at present • HSV culture should be taken (if inflammation present)
Genital ulcers • 1 swab	• HSV culture should be taken • *Treponema pallidum* direct test should be taken (see *Syphilis* chapter)

Table 1. Initial visit: prepubertal children (continued)

Specimen type by gender	Condition or organism to be detected
Serologic specimens	Syphilis • Consider screening test(s) for syphilis‡ • Syphilis tests should be repeated at 12 and 24 weeks after exposure. In some instances (e.g., high-risk assailant; see the *Syphilis* chapter) and in areas experiencing outbreaks of syphilis, it may be appropriate to repeat tests 2–4 weeks post-assault
	Hepatitis B • If the child is known to be immune to hepatitis B (HBsAb ≥10 IU/L) or HBsAg-positive, then no testing is required • Baseline antibodies to HBsAg should be collected when hepatitis B immune status is unknown
	HIV • Baseline HIV antibody testing should be collected • HIV antibody testing should be repeated at 6, 12 and 24 weeks following significant exposures
	Hepatitis C • Baseline HCV antibody is optional, since transmission of HCV is low via sexual contact. It may be considered if the (alleged) perpetrator(s) is/are at high risk for hepatitis C (e.g., known injection drug user[s]) and significant trauma has occurred with the assault • If baseline testing has been performed and is negative, HCV antibody testing should be repeated at 12 and 24 weeks following significant exposures

HBsAb = hepatitis B surface antibody
HBsAg = hepatitis B surface antigen
HCV = hepatitis C virus
HSV = herpes simplex virus
NAAT = nucleic acid amplification test

* Vaginal specimens can be taken without a speculum in a relaxed child as long as the hymenal ring is not touched. A small swab (e.g., urethral swab), is preferred. Speculum examination is only rarely required, and in prepubertal females requires consultation with a specialist or may require a general anesthetic.

† Vaginal washes are performed by instilling 1.5–2 mL of sterile, preservative-free normal saline at room temperature into the vagina via a modification of the method described by Pokorny and Stormer.[24,25] The tubing from a 25 mm butterfly needle, with the needle and butterfly wings removed, is inserted into the distal end of a No. 8 bladder catheter. This assembly is then attached to a 3 mL syringe by the end of the butterfly tubing. This system allows for aspiration of the vaginal contents without the end of the butterfly tube becoming occluded by the vaginal walls. The normal saline and vaginal discharge fluid are then aspirated from the vagina.

‡ Baseline screening for syphilis should be considered in areas with high prevalence or regional outbreaks of syphilis, foreign-born children, parents/family members/perpetrators diagnosed with syphilis and children diagnosed with another STI.[26]

All specimens for forensic evidence should be collected by professionals experienced in these procedures and should follow established regional/local protocols (see *Appendix F*). It should be noted that most forensic kits do not contain tests for STIs or blood-borne pathogens. They are useful in the identification of semen or other body fluids, forensic DNA analysis, microscopic hair examination, textile damage assessment and examinations involving fibres and other types of trace evidence. These, in turn, may be used to establish that some form of association occurred between the victim and the accused, that sexual contact occurred and/or that the assault was violent or forceful, thereby indicating lack of consent. All isolates and specimens should be retained in case additional or repeated testing is required.

***Table 2. Implications of a diagnosis of STIs for a diagnosis of sexual abuse*[2,9]**

Incubation period of infection	Probability of abuse	Mother-to-child transmission
Gonorrhea: 2–7 days	Strong; probable if child <1 year	Can be seen in children from 0–6 months of age
Chlamydia: 1–3 weeks, but up to 6 weeks	Probable; strong if child >3 years	Can be seen in children up to 3 years of age
HSV: 2–14 days	Probable	Can be seen in children up to 3 months of age
Trichomoniasis: 1–4 weeks	Strong if child >6 months	Can be seen in children 0–6 months of age
HPV: ≥1 month	Possible; probable if >2 years	Can be seen in children from 0–2 years of age
Syphilis: up to 90 days	Strong	Must be excluded
HIV: up to 6 months, but the majority seroconvert within 4–12 weeks	Possible	Must be excluded
Hepatitis B: up to 3 months	Possible	Must be excluded

HSV = herpes simplex virus
HPV = human papillomavirus

Management and Treatment

Considerations for prophylaxis

- Offer prophylaxis if:
  - The patient presents within 48 hours after an assault.
  - It is requested by a parent/patient/guardian.
  - The patient is at high risk for an STI (see Specimen Collection and Laboratory Diagnosis, above).
- It should be noted that the efficacy of antibiotic prophylaxis has not been studied in sexual assault; prophylaxis should be as recommended for treatment of specific infections. See chapters on specific infections for more information.

Table 3. Recommended prophylaxis for uncomplicated urogenital infections

(See chapters on specific infections for alternate treatment choices and non-genital infections.)

Sexually transmitted infection	Recommended prophylaxis
Gonorrhea	• <45 kg: cefixime 8 mg/kg PO in a single dose (max 400 mg PO)*† *[A-I]* • >45 kg: cefixime 400 mg PO in a single dose*† *[A-II]*
Chlamydia	• <45 kg: azithromycin 15 mg/kg PO in a single dose (max 1 g) *[A-I]* • >45 kg: azithromycin 1 g PO in a single dose *[A-I]*
Trichomoniasis	• Treat only if positive for trichomonas • <45 kg: metronidazole 30 mg/kg/day divided every 6–12 hours for 1 week *[B-III]* • >45 kg: metronidazole 2 g PO as a single dose[27] *[A-I]*
Syphilis	• Prophylaxis with azithromycin (given for prophylaxis against chlamydia) is no longer considered to be effective against incubating syphilis in light of the recent emergence of syphilis resistant to azithromycin. Prophylaxis with other agents may be considered if the patient is unlikely to return or there is a potentially high-risk source in an area experiencing an outbreak of infectious syphilis (see *Syphilis* chapter for more information) • If the child subsequently has reactive syphilis serology, he/she should be retreated with a recommended treatment for syphilis

Table 3. Recommended prophylaxis for uncomplicated urogenital infections (continued)

Sexually transmitted infection	Recommended prophylaxis
Hepatitis B	• Prophylaxis for hepatitis B should be considered in all cases of sexual assault/abuse where the sexual acts have included anal or vaginal penetration or oral-anal contact without a condom, or if condom status is unknown and the source is not immune to hepatitis B (see Table 1). Oral-genital and oral-oral contact do not appear to be significant modes of transmission[28] • Recommended prophylaxis as outlined in the *Canadian Immunization Guide*, 2002,[29] includes the following: – HBIG 0.06 mL/kg IM up to 14 days after exposure – A 3-dose course of hepatitis B vaccine at 0, 1 and 6 months following exposure or on an accelerated schedule
Hepatitis C	• No PEP available
HIV	• HIV PEP is recommended when the assailant is known to be HIV-infected and significant exposure has occurred (e.g., oral, anal and/or vaginal penetration without a condom or condom status unknown/broken)[30] • PEP may also be available on a case-by-case basis for other high-risk exposures (e.g., source a known injection drug user, multiple assailants and/or significant injury) and vaginal, anal or oral penetration has occurred • Recommendations vary by province, and the decision to offer PEP should be made in conjunction with a pediatric HIV specialist • If HIV PEP is used, it should be started as soon as possible — no later than 72 hours after the assault — and continued for 28 days[30]

HBIG = hepatitis B immune globulin
PEP = postexposure prophylaxis
* Cefixime should not be given to persons with cephalosporin allergy or a history of immediate and/or anaphylactic reactions to penicillins.
† Treatment for gonorrhea should be accompanied by treatment for chlamydia unless a NAAT is negative for chlamydia.

Pregnancy

- See the Pregnancy section in the *Sexual Assault in Postpubertal Adolescents and Adults* chapter if this is a possibility.

Other management issues

- Appropriate referral should be made as necessary and available (e.g., to child protection authorities, sexual assault teams, local police/Royal Canadian Mounted Police, psychological support, local victim support organizations etc.).
- Consideration should be given to assessing other children in the family or setting where the abuse is thought to have occurred, as it is not unusual to find other children who have also been sexually abused.[5]
- If the patient is sexually active, advise of the need to practice safer-sex or abstain from sexual intercourse until infection has been ruled out and/or prophylaxis is complete.
- Offer tetanus toxoid if relevant (e.g., dirty wounds/abrasions sustained outdoors) and the child's immunization schedule is not up to date.

Reporting and Partner Notification

- Every province and territory has statutes in place that require the reporting of child abuse. Although the exact requirements may differ by province/territory, health care professionals should be aware of local reporting requirements and procedures with respect to child abuse and other acts of maltreatment. If reasonable cause to suspect child abuse exists, local child protection services and/or law enforcement agencies must be contacted promptly.
- An individual with a confirmed notifiable STI should be reported to provincial/territorial authorities as appropriate.
- Partner notification of individuals found to be infected with an STI should follow the recommendations in the relevant chapter.

Follow-up

- Follow-up tests of cure are recommended for all curable STIs identified in peripubertal and prepubertal children. Follow-up will vary depending on the type of test performed and the type and duration of treatment given. In general, nucleic acid amplification tests should be repeated 3–4 weeks after completion of treatment and culture tests 4–5 days after completion of treatment.
- If no prophylaxis was taken, follow-up should be arranged for 7–14 days after the original visit to review available laboratory test results and repeat an STI screen to detect infections acquired at the time of the assault that were not detected at the initial examination.
- If empiric prophylactic therapy was given, follow-up should be arranged at 3–4 weeks.
- Arrange follow-up serologic testing for HIV, hepatitis B and C, and syphilis as required (see Table 1).

- Review mental state and arrange appropriate referral to mental health services if necessary.
- Psychological and social support should also be offered to affected family members.

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SEXUAL ASSAULT IN POSTPUBERTAL ADOLESCENTS AND ADULTS

Definition

The definition of sexual assault varies but involves all non-consensual sexual acts, ranging from fondling to penetration. For the purpose of these guidelines, as is relevant to the potential transmission of sexually transmitted infections (STIs), the definition will include complete or partial penetration by a penis of the mouth, anus and/or vagina, although it is noted that contact of the mouth with the external genitalia or anus could potentially transmit herpes simplex virus (HSV) infections.

Epidemiology

Both females and males of any age may be affected by sexual assault. Incidence varies by geographic location and appears, in some studies, to have a seasonal distribution, with peaks occurring in the summer.[1,2] In the majority of assaults, the victims are young females, but 5–6% of assaults are reported among males.[3] Assaults by acquaintances have been estimated to occur at least as often as assaults by strangers and may be underreported.[4]

Canadian data show that 16% of all women (1.7 million) have been involved in at least one incident of sexual or physical assault by a date or boyfriend by the age of 16, and 24% of women 18–24 years had been sexually and/or physically assaulted by a date or boyfriend.[5] According to Canadian crime statistics, male-against-female violence was the most common type of overall violence but the least likely to involve a stranger.[6] In 76.8% of reported cases, the woman knew her assailant. In 28.9% of reports, the woman was assaulted by her spouse/ex-spouse.

Gonorrhea, chlamydia and trichomoniasis are the most frequent infections identified in women who give a history of sexual assault.[7–9] The peak age incidence of sexual assault victims corresponds with the peak age incidence of many STIs, so their presence does not necessarily indicate acquisition as a result of the assault.[8]

Prevention

Most sexual assaults cannot be prevented, but becoming aware of situations that can make sexual assault more likely and taking preventative steps is of primary importance. Such steps can include measures to remain safe (i.e., at home or while driving), and the avoidance of situations whereby a perpetrator may use alcohol or drugs to impair the victim's ability to resist the assault.

Evaluation

Victims may be reluctant to disclose that they have been sexually assaulted for a variety of reasons, including fear of becoming involved in the criminal system; fear of not being believed or fear of retribution; feelings of guilt, shame or self-blame; or a desire to forget the event. Despite this reluctance to disclose events surrounding the assault, these victims may present for medical attention because of concerns about pregnancy, STIs or injury.[10] In addition, they may present with post-traumatic stress, depressive symptoms, alcohol or substance abuse, or self-harm.[11]

Assessment and follow-up of sexual assault victims should be carried out with great sensitivity and in conjunction with local teams or services experienced in the management of victims of sexual assault.

Documentation

Clear and complete documentation of history, physical examination findings and specimen collections should be made.

History

History taking should include the date, location and time(s) of the assault(s); what is known about the (alleged) perpetrator(s) (e.g., relationship to the victim, known injection drug use etc.); orifice(s) that have been penetrated and condom use; sexual history before and after the assault; past medical history (e.g., gynecological, menstrual and contraceptive history); current medications; immunization history; if a shower or bath was taken after the assault; if clothing was changed; and available support systems for the patient. Extensive interviewing about the details of the assault should be left to law-enforcement agencies, as this may adversely affect the forensic interview.

Physical exam

Injuries requiring immediate attention should take precedence over any other examination. Ideally, the patient should be asked to disrobe completely, and if forensic specimens are to be collected, this should be done while standing on an open sheet (to collect evidence that may fall off). All clothing worn during the assault should be collected in separate labelled plastic bags. The patient should put on a gown so that a complete examination for bruises and other injuries can be performed. All injuries (including those seen on genital examination) should be accurately documented on body-map diagrams. It is important to look for petechial hemorrhages on the palate if there was a history of forced oral penetration. Colposcopy and photography rarely provide any useful information and may produce unnecessary distress.[7,12]

Specimen Collection and Laboratory Diagnosis

The decision to obtain genital or other specimens for the diagnosis of STIs or blood-borne pathogens (BBPs) should be made on a case-by-case basis. Since baseline diagnostic testing for STIs and BBPs facilitates optimum medical management of the victim, this is strongly recommended whenever possible. It may be appropriate, however, to inform the individual that the results of any test for an STI will become part of his/her medical record, and in the case of a sexual assault could be brought into evidence in a court proceeding.

Wherever possible, baseline screening for common STIs should be performed due to the significant incidence of pre-existing STIs among women who present after sexual assault and the smaller but significant incidence of acquisition of STIs resulting from rape. Baseline testing also facilitates recommended follow-up (e.g., test of cure in pregnant women) if an STI is identified. When it is not possible to screen for all STIs, a minimal investigation should include testing for *Neisseria gonorrhoeae* and *Chlamydia trachomatis*.

Speculum examination should be performed in females, including postpubertal females, whenever possible. If it is not possible to pass a speculum, blind vaginal sampling, together with urethral and/or urine nucleic acid amplification tests (NAATs), are advised.

Wherever possible, the (alleged) perpetrator(s) should also be screened.

All specimens for forensic evidence should be collected by professionals experienced in these procedures and should follow established regional/local protocols (see *Appendix F*). It should be noted that most forensic kits do not contain tests for STIs or BBPs. They are useful in the identification of semen or other body fluids, forensic DNA analysis, microscopic hair examination, textile damage assessment and examinations involving fibres and other types of trace evidence. These, in turn, may be used to establish that some form of association occurred between the victim and the accused, that sexual contact occurred and/or that the assault was violent or forceful, thereby indicating lack of consent. All isolates and specimens should be retained in case additional or repeated testing is required.

Table 1. Initial visit: postpubertal children/adolescents/adults

Sexually transmitted infection	Recommended specimen type
Gonorrhea (see *Gonococcal Infections* chapter)	• Gram stain (for Gram-negative intracellular diplococci) if available, should be taken • Culture from all penetrated (partially or fully) orifice(s) and urethra in males and females should be taken • A molecular diagnostic test, preferably a NAAT, should also be performed on specimens collected from the urethra (males), endocervix/urethra (females), urine (males and females), as appropriate. This test is generally more sensitive than genital culture and may be acceptable for medico-legal purposes if confirmed by a second set of primers or, in some cases, a second test sent to another laboratory. Note that a NAAT should not be performed on pharyngeal specimens, and referral to the manufacturer's guidelines is recommended for testing of rectal specimens • Since culture tests collected <48 hours after exposure may be falsely negative, they should be repeated in 1–2 weeks after exposure if prophylaxis is not offered; a postexposure NAAT can be taken at the time of presentation
Chlamydia (see *Chlamydial Infections* chapter)	• Molecular diagnostic tests, especially NAATs, are more sensitive than culture and should be performed whenever possible on urine (males and females), urethral (males) or cervical (females) specimens. Urine testing may make testing more acceptable to some individuals • Cultures have been the preferred method for medico-legal purposes, but NAATs may be acceptable if the positive results are confirmed by a second set of primers or, in some cases, a second test sent to another laboratory. NAATs have not been adequately evaluated for throat and rectal specimens • If available, both tests (culture and NAAT) should be performed • Since culture tests collected <48 hours after exposure may be falsely negative, they should be repeated 1–2 weeks after exposure if prophylaxis is not offered; a postexposure NAAT can be taken at the time of presentation
Trichomoniasis	• If available, wet mount and/or culture for *Trichomonas vaginalis*
Syphilis (see *Syphilis* chapter)	• A non-treponemal test (e.g., RPR, VDRL) and a treponemal test (e.g., TP-PA) should be performed • Both the treponemal and non-treponemal tests should be repeated at 12 and 24 weeks after exposure. In some instances (e.g., a high-risk assailant; see *Syphilis* chapter) and in areas experiencing outbreaks of syphilis, it may be appropriate to repeat tests 2–4 weeks post-assault

Table 1. Initial visit: postpubertal children/adolescents/adults (continued)

Sexually transmitted infection	Recommended specimen type
Hepatitis B	• If the individual is known to be immune to hepatitis B (HBsAb ≥10 IU/L) or HBsAg-positive, then no testing is required • Baseline antibodies to HBsAg should be collected when hepatitis B immune status is unknown
HIV	• Baseline HIV antibody testing should be performed • HIV antibody testing should be repeated at 6, 12 and 24 weeks following significant exposures
Hepatitis C	• Baseline HCV antibody is optional, since transmission of HCV is low via sexual contact. Testing may be considered if the (alleged) perpetrator(s) is/are at high risk for hepatitis C (e.g., known injection drug user[s]) and significant trauma has occurred with the assault • If baseline testing performed and is negative, HCV antibody testing should be repeated at 12 and 24 weeks following significant exposures

HBsAb = hepatitis B surface antibody
HBsAg = hepatitis B surface antigen
HCV = hepatitis C virus
NAAT = nucleic acid amplification test
RPR = rapid plasma reagin
TP-PA = *Treponema pallidum* particle agglutination
VDRL = Venereal Disease Research Laboratory

Management and Treatment

Considerations for prophylaxis

- Offer prophylaxis if:
  - Unsure that the patient will be returning for follow-up.
  - It is known that the assailant is infected with a specific STI.
  - It is requested by the patient/parent/guardian.
  - The patient has signs or symptoms of an STI.
- In addition, it may be appropriate to routinely offer prophylaxis in situations where vaginal, oral or anal penetration has occurred, because most sexual assault victims do not return for follow-up visits.[8,13,14]
- It should be noted that the efficacy of antibiotic prophylaxis has not been studied in sexual assault; prophylaxis should be as per recommendations for treatment of specific infections (see chapters on specific infections for more information).

Table 2. Recommended prophylaxis for uncomplicated urogenital infections

(See chapters on specific infections for alternative treatment choices and non-genital infections.)

Sexually transmitted infection	Recommended prophylaxis
Gonorrhea	• Non-pregnant adults – Cefixime 400 mg PO in a single dose* *[A-I]* OR – Ciprofloxacin 500 mg PO in a single dose† (unless not recommended due to quinolone resistance) *[A-I]* • Pregnant adults – Cefixime 400 mg PO in a single dose *[A-I]*
Chlamydia	• Non-pregnant adults – Azithromycin 1 g PO in a single dose if poor compliance is expected *[A-I]* OR – Doxycycline 100 mg PO bid for 7 days *[A-I]* • Pregnant adults – Amoxicillin 500 mg PO tid for 7 days *[B-I]* OR – Azithromycin 1 g PO in a single dose if poor compliance is expected *[B-I]*
Trichomonas	• Treat only if test is positive for trichomonas • All adults: metronidazole 2 g PO in a single dose[15] *[A-I]*
Syphilis	• Prophylaxis with azithromycin (given for prophylaxis against chlamydia) is no longer considered to be effective against incubating syphilis in light of the recent emergence of syphilis resistant to azithromycin. Prophylaxis with other agents may be considered if the patient is unlikely to return or there is a potentially high-risk source in an area experiencing an outbreak of infectious syphilis (see *Syphilis* chapter for more information) • If the recipient subsequently has reactive syphilis serology, he/she should be retreated with a recommended treatment agent for syphilis

Table 2. Recommended prophylaxis for uncomplicated urogenital infections (continued)

Sexually transmitted infection	Recommended prophylaxis
Hepatitis B	• Prophylaxis for hepatitis B should be considered in all cases of sexual assault/abuse where the sexual acts have included anal or vaginal penetration or oral-anal contact without a condom or condom status is unknown and the source is not immune to hepatitis B (see Table 1). Oral-genital and oral-oral contact do not appear to be significant modes of transmission[16] • Recommended prophylaxis as outlined in the *Canadian Immunization Guide*, 2002[17] includes the following: – HBIG up to 14 days after exposure – A 3-dose course of hepatitis B vaccine at 0, 1 and 6 months following exposure or accelerated schedule as appropriate
Hepatitis C	• No PEP available
HIV	• HIV PEP is recommended when the assailant is known to be HIV-infected and significant exposure has occurred (e.g., oral, anal, and/or vaginal penetration without a condom or condom status unknown/broken)[18] • PEP may also be available on a case-by-case basis for other high-risk exposures (e.g., source a known injection drug user, multiple assailants and/or significant injury) and vaginal, anal or oral penetration has occurred • Recommendations vary by province, and the decision to offer PEP should be made in conjunction with an HIV specialist and/or provincial/territorial/regional protocols • If HIV PEP is used, it should be started as soon as possible — no later than 72 hours after exposure — and continued for 28 days[18]

HBIG = hepatitis B immune globulin
PEP = postexposure prophylaxis
* Cefixime and ceftriaxone should not be given to persons with cephalosporin allergy or a history of immediate and/or anaphylactic reactions to penicillins.
† Quinolones are not recommended if the case or contact are from, or are epidemiologically linked to, any area with rates of quinolone-resistant *N gonorrhoeae* >3–5%:
- Asia
- Pacific Islands (including Hawaii)
- India
- Israel
- Australia
- United Kingdom
- Regions of the United States (check with the U.S. Centers for Disease Control and Prevention for rates of quinolone resistance by geographic area)
- MSM with contact or epidemiologically linked to the United States
- Areas in Canada experiencing high rates of quinolone resistance; current numbers provided by the National Microbiology Laboratory place Quebec, Ontario, Alberta and British Columbia above the 3% threshold for quinolone resistance. Please check with your local public health officials to learn about quinolone resistance in your area. In Alberta all ciprofloxacin resistant cases in 2004–05 were in MSM or linked to travel outside of Alberta, therefore ciprofloxacin remains a recommended agent for the treatment of gonorrhea in Alberta except in these situations (source: Alberta Health and Wellness STD Services). For data on national quinolone resistance in Canada, please visit the Public Health Agency of Canada website (www.phac-aspc.gc.ca). For more information see *Gonococcal Infections* chapter.

Pregnancy

- If pregnancy is a possible result of the assault, the emergency contraceptive pill (ECP) should be considered:[19]

Preferred	Alternative
• Plan B: levonorgestrel 1.5 mg PO as a single dose	• levonorgestrel 0.75 mg PO bid x 2 doses if a single dose is not likely to be tolerated

- Treatment should be taken as soon as possible, up to 72 hours after exposure (efficacy declines after this, but some benefit may be achieved up to 120 hours after exposure).
- The ECP is more effective and better tolerated than the Yupze method.[20]
- The ECP is contraindicated if there is evidence of an established pregnancy as confirmed by a positive pregnancy test.
- For the two-dose regimen, Gravol 50 mg given 30 minutes before the second dose of levonorgestrel may prevent vomiting.

Other management issues

- If the patient consents, appropriate referral should be made as necessary and as available (e.g., to sexual assault teams, local police/Royal Canadian Mounted Police, psychological support, local victim support organizations etc.). Advise of the need to practice safer sex or abstain from sexual intercourse until infection has been ruled out and/or prophylaxis is complete.
- Offer tetanus toxoid if relevant (e.g., dirty wounds/abrasions sustained outdoors).

Reporting and Partner Notification

- Every province and territory has statutes in place that require the reporting of child abuse. Although the exact requirements may differ by province/territory, health professionals should be aware of local reporting requirements and procedures with respect to child abuse and other acts of maltreatment. If reasonable cause to suspect child abuse exists, local child protection services and/or law enforcement agencies should be contacted.
- An individual with a confirmed notifiable STI should be reported to provincial/territorial authorities as appropriate.
- Partner notification of individuals found to be infected with an STI should follow the recommendations in the relevant chapter.

Follow-up

- If no prophylaxis was taken, follow-up should be arranged for 7–14 days after the original visit to review available laboratory test results and to repeat an STI screen to detect infections acquired at the time of the assault that were not detected at the initial examination.

- Test of cure for specific infections should follow recommendations outlined in the relevant chapters.
- If empiric prophylactic therapy was given, follow-up should be arranged at 3–4 weeks.
- Arrange follow-up serologic testing as required (see Table 1).
- Review mental state and arrange appropriate referral to mental health services if necessary.

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SEX WORKERS

Definition

Sex workers are female, male or transgendered adults or young people who receive money, shelter or goods in exchange for sexual services, either regularly or occasionally, and who may or may not consciously define those activities as income-generating.[1] There are no reliable verbal or visual clues as to whether a patient is a sex worker or not. Where appropriate, patients should be asked whether they have ever received money, shelter or goods in exchange for sexual services.

Epidemiology

Sex workers are vulnerable to sexually transmitted infections (STIs), including HIV, because of the following factors:

- Lack of control (e.g., condom use, refusing clients).
- Lifestyle risks, such as violence, substance use and mobility.[1]
- Stigmatization and marginalization.
- Limited economic options.
- Limited access to health, social and legal services.
- Limited access to information about and the means of prevention.
- Gender-related differences and inequalities.
- Sexual abuse and exploitation, including trafficking and child prostitution.
- Legislation and policies affecting the rights of sex workers.
- Mental health problems.
- Incarceration.
- Lack of family and social support.

Because of high rates of partner change, sex workers play an important role in the transmission of STIs, especially of those with short periods of infectiousness, such as syphilis and gonorrhea.[2] Studies from developed and developing countries have shown increased STI and HIV incidence and prevalence among sex workers.[2–10] Sex workers tend to use condoms less often with regular partners, even though these individuals are often at high risk for STIs and HIV themselves. Adolescents and children who work in the sex trade are especially vulnerable to STIs due to the cellular immaturity of the female vagina and cervix, as well as an inferior ability to negotiate for safer sex and higher risk of violence and abuse.[11]

Prevention

Successful STI/HIV prevention focuses on the promotion of safer sexual behaviour through female and male condom availability and correct usage; improved negotiating skills; and supportive policies and laws.[1–3] Peer education, outreach work, accessible services, advocacy, community development, program coordination and sex worker involvement are all important prevention principles and strategies.[1–3,12–15]

Lubricants have been associated with a reduced risk for STIs.[16] Spermicides such as nonoxynol-9 have been linked to enhanced susceptibility to infection and have not been shown to enhance the protective effect of condoms.[17] Hepatitis B vaccination should be available to sex workers, since they are at increased risk for infection.[18] Hepatitis A vaccination should be available to sex workers at high risk, such as male sex workers who engage in oral-anal contact with male customers.

Evaluation

Sex workers presenting for STI care or a routine medical examination should have an STI/HIV history taken and undergo a physical examination focusing on the genital area, including a speculum exam for women and a throat and rectal exam if indicated.[19] Privacy and confidentiality must be assured. STI/HIV evaluation of sex workers cannot always be performed in ideal clinic conditions; it may need to be adapted to less structured settings, such as mobile clinics. In addition to the standard STI/HIV evaluation, it is important to ask about current or past drug use, whether there is a regular partner and whether there is condom use with both customers and partners.[19]

Specimen Collection and Laboratory Diagnosis

History, examination and setting should determine specimen collection. With counselling and informed consent, sex workers should receive regular laboratory screening for syphilis, HIV infection (unless known to be HIV-positive), gonorrhea, chlamydia, vaginitis/vaginosis and HPV infection (if available).[19] Regular cervical screening for dysplasia and/or HPV infection is important. Persons at risk for hepatitis C should be counselled and tested.

Because of the nature of sex work and the social situation of many sex workers, urine-based laboratory testing, rapid point-of-care testing and self-collected specimens are especially relevant.

Management and Treatment

Sex workers should be able to access standard STI and HIV/AIDS management and treatment recommendations.[20] Curing a single sex worker of gonorrhea can result in fewer secondary cases and reduce the risk of HIV, thereby saving 120 disability-adjusted life years (DALYs) at a cost below US$1 per DALY.[21] Single-dose, oral therapies for STIs should be available to sex workers who are unable to complete a longer course of treatment. Epidemiological or syndromic treatment without a full evaluation or laboratory testing may sometimes be necessary.[1,19]

Education and counselling is a vital component of STI/HIV management for sex workers, as well as for other patients.[1,19] It is especially important that sex workers know how to use condoms, how to negotiate for safer-sex and why they should use condoms with regular partners. Clinicians need to understand the specific circumstances of risk for each patient and develop an individualized risk reduction plan for him/her.

Reporting and Partner Notification

STI/HIV surveillance is important, and accurate and prompt reporting is the basis of effective STI surveillance and case management. Sex workers and other marginalized populations often rely on publicly funded STI/HIV services, so to facilitate case management and cooperation with patient reporting, trust, respect and confidentiality should be emphasized in these situations.

Sex worker partners (both regular and commercial) need to be notified in a confidential manner and offered treatment in the same manner as non–sex workers. The possibility that partner notification may result in violence toward the index sex worker should be explored and mitigated where possible. In this instance, notification by the health department or a health care worker (keeping the identity of the sex worker anonymous) is often preferable.

Follow-up

Sex workers should be encouraged to have a regular monthly STI evaluation.[19] Children and youth who may have been exploited should be reported to the relevant youth protection agency (see *Sexual Abuse in Peripubertal and Prepubertal Children* chapter). Sex workers with mental health, social service, housing or legal issues need to be referred to appropriate agencies or practitioners.

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SUBSTANCE USE

The objective of this chapter is to provide an overview of substance use issues as they pertain to the prevention, management and treatment of sexually transmitted infections (STIs). Additional sources of information[1,2] can provide a more comprehensive overview of substance use prevention and treatment in general.

Definition

Substance use may be for medicinal or non-medicinal purposes and may be done legally or illegally. It occurs along a continuum from experimental use to harmful use and dependence:[3]

- No use: the person does not use alcohol or other drugs.
- Experimental use: the person tries a substance out of curiosity and may or may not use the drug again.
- Social or occasional use: the person uses the drug in an amount or frequency that is not harmful (e.g., to health, family, school or work).
- Harmful use: the person experiences negative consequences of drug use (e.g., health, family, school, work or legal problems).
- Dependence: the person is psychologically and/or physically dependent on a drug, which is used excessively, and continues use despite experiencing serious problems.

Epidemiology

- The 2002 Canadian Community Epidemiology Network on Drug Use national report on drug trends in Canada indicates that self-reported alcohol use is rising for both males and females, with an average of 20.2% of Canadians (29.0% male and 11.4% female) reporting frequent heavy alcohol use (five or more drinks on one occasion, 12 or more times a year).[4]
- Cannabis is the most frequently used illicit drug among Canadian youth and adults, with 18.6% of respondents reporting lifetime use; 3.6% report ever using LSD, speed or heroin; and 2.7% report cocaine use.[4]
- There are approximately 50,000 to 100,000 injection drug users in Canada, with concentration in Vancouver, Montreal and Toronto.[5,6] In 2002, 24% of positive HIV tests reported to the Centre for Infectious Disease Prevention and Control were attributable to injection drug use (IDU).[7]
- Aboriginal Canadians and street youth are at greater risk for and have higher rates of alcohol and illicit substance abuse than other Canadians.[5]
- Although there are few data available on the abuse of solvents in Canada, there is particular concern about solvent abuse among Aboriginal youth.[4]

- The use of alcohol and illicit drugs is associated with risky sexual behaviour. Alcohol and illicit drug use, especially the use of crack cocaine[8–13] and methamphetamine,[9,10] are associated with poor and inconsistent condom use,[9,11,13–19] sex with multiple partners,[9,10,13–21] early sexual debut,[20,22] trading sex,[10,11,14,15,18,19] buying sex,[23] sex with known injection drug users,[19] lower condom use self-efficacy or perceived ability to use condoms,[16] and lower HIV-related knowledge.[16]
- Substance use has also been linked to elevated hepatitis C[24,25] and STI transmission,[19–23] including herpes simplex virus type 2,[21–24] hepatitis B,[24] trichomoniasis,[20,26] syphilis,[24,27] HIV,[19,24,27] chlamydia[20,24,26,27] and gonorrhea.[20,24,26,27]
- Users of more stigmatized substances, such as injection drugs and crack, are at higher behavioural risk for STIs than users of less stigmatized drugs, such as marijuana.[28]
- Youth who abuse substances are more likely to engage in risky sexual behaviour and continue these risky behaviours and drug use into adulthood.[17,29]
- The use of recreational drugs among men who have sex with men (MSM) has risen in recent years and has been linked to increases in risky sexual behaviour and rising STI rates (see *Men Who Have Sex with Men/Women Who Have Sex with Women* chapter). Sildenafil citrate (Viagra), vardenafil (Levitra) or tadalafil (Cialis) can be used to counteract the erectile dysfunction side effect of some of these drugs, a practice that has been linked to multiple sex partners and STI acquisition.[37,38]

Prevention

While the elimination of harmful substance use is the ideal approach to preventing substance use reducing the associated STI risk, this can be a difficult if not unattainable goal, especially when substance dependence has already developed. For substance users, substance abstinence should not be used as the exclusive focus of substance use or STI-prevention efforts and should not be a requirement for using STI treatment services. Two prevention strategies are recommended, depending on the patient's placement on the risk continuum:[39]

- Risk avoidance: to avoid or prevent the adoption of risk behaviours among non-users and low-risk users (e.g., people of legal drinking age who drink at low or moderate levels).
- Harm or risk reduction: to encourage the adoption of acceptable behavioural change, no matter how small, to reduce, if not eliminate, risk (e.g., using clean needles from a needle exchange, cessation of needle sharing).

A harm reduction approach is non-judgmental and takes into account individual needs and a number of potential approaches when discussing realistic personal risk reduction goals. Some potential harm-reduction strategies related to substance use include the following:

- Abstaining from one or more drugs for a limited or open time period.
- Decreasing the frequency and/or amount of a substance used.
- Switching to lower-risk substances and delivery methods (e.g., methadone, cannabis).
- Separating substance use from driving, working and other tasks.
- Creating a safer drug use environment (where, when and with whom; safer purchases/possession; use of needle-exchange programs; and safer injection sites).
- Considering treatment, rehabilitation, detoxification, counselling or support programs.
- Developing a trusting relationship with a health care professional to help monitor physical and mental health.
- Learning about overdose prevention and response.
- Addressing nutritional needs and ways to improve nutrition.

Harm reduction strategies specific to injection drug users include safer injection practices:[40]

- Use a new needle and syringe for each injection.
- If sharing cannot be avoided, clean the syringe properly before use:[40]
  - Fill syringe completely with clean water, and shake vigorously for 30 seconds. Squirt water out.
  - Fill syringe with full-strength (undiluted) bleach, leave in for at least 30 seconds, and shake vigorously. Squirt bleach out. Do this at least twice, using fresh bleach each time.
  - Rinse bleach from syringe by repeating the first step at least twice, using clean water each time.
- Avoid sharing vials, cotton and spoons, as well as recapping the needles of others.
- Before shooting up, always clean the injection site with a sterile alcohol swab, rubbing alcohol, aftershave lotion (which contains alcohol) or soap and water.
- Sterilize spoons with an alcohol swab or bleach and water before each use.
- Mix drugs using sterile water or, if this is not available, water that has been recently boiled. To remove impurities from the mix, it is best to fill the syringe by drawing the liquid through a cotton filter (or a piece torn from an alcohol swab).

STI prevention should be discussed within the context of potential influences on sexual behaviour, including substance use, and should also focus on harm reduction (see *Primary Care and Sexually Transmitted Infections* chapter). For substance users with poor condom practices, skill-building around condom use and negotiation may help to improve condom use.[41] A motivational interviewing approach for prevention counselling can help promote harm reduction behaviours (see *Primary Care and Sexually Transmitted Infections* chapter).

Because involvement in illicit drug use is a risk factor for hepatitis A virus (HAV) and hepatitis B virus (HBV) infection, and because vaccination coverage for this population is poor, HAV and HBV vaccination is recommended for injection drug users. HAV vaccination is also recommended for those involved in oral drug use in unsanitary conditions[42] (see *Hepatitis B Virus Infections* chapter).

- As self-reported HBV infection and immunization status among both injection and non-injection drug users may not be accurate,[43] vaccination should be offered to all in these groups.
- To maximize reach in high risk populations beyond primary care settings, immunization for HBV and HAV can be successfully delivered in non-traditional settings (e.g., public health nursing outreach to geographic areas with high rates of substance use).[44]

Note:
According to the *Canadian Immunization Guide*,[42] pre-immunization testing for immunity against HAV should be considered for populations with the potential for higher levels of pre-existing immunity. Routine pre-immunization serologic screening for HBsAg, anti-HBs or anti-HBc is recommended for people at high risk of infection, but is not practical for universal immunization programs.

Evaluation

- Evaluation of current and past substance use is an important component of STI risk assessment (see *Primary Care and Sexually Transmitted Infections* chapter). Table 1 outlines the six main elements of a substance use history, including sexual risk associated with substance use and possible questions for each element.
- The word *use* carries no value judgment, but *abuse* does. Asking about substance use is more likely to lead to an open, honest answer.
- Elicit information on legal drug use, illegal drug use and harmful use of drugs sold for medicinal purposes.
- When assessing substance use as part of the STI risk assessment, use language that will be easily understood. Becoming familiar with the terms used in your region can help you to effectively communicate. Table 2 provides a quick reference for frequently used substances, street names and possible modes of delivery.

***Table 1. Main elements of taking a substance use history*[45]**

Main element	Possible questions
Substance/alcohol use	Do you or have you ever used drugs? What drugs do you use? How often do you use drugs? Do you drink alcohol? How often?
Injection drug use and equipment	Have you ever injected drugs? Do you have your own injection equipment? Do you prepare your own drug for injection? Do you use a needle-exchange program? Have you ever shared a needle, syringe, cooker, cotton or water — even once?
Other drug use risks	Do you ever snort drugs? Have you ever shared a snorting straw? Are others present when you inject so that help can be summoned if needed?
Sex under the influence	Have you ever had sex under the influence of alcohol or drugs? If so, have you been more likely to have risky sexual encounters when under the influence, such as having unprotected sex or multiple partners?
Consequences	What effect has drug or alcohol use had on your life? Has your drug or alcohol use caused problems with work? With family? With your health?
Other percutaneous risks	Do you have any body piercings? Any tattoos? Where did you have your piercings or tattoos done?

Table 2. Reference to frequently used substances and their modes of delivery[46]

Substance	Street name	Eat	Freebase*	Inhale	Inject	Oral	Smoke	Sniff/snort	Spray into mouth
Alcohol	Booze, brew, hooch, grog				Some-times	X			
Amphetamines	Speed, ice, glass, crystal, crank, bennies, uppers				X	X	X		
Barbiturates	Downers, barbs, blue heavens, yellow jackets, red devils				Some-times	X			
Cannabis	Marijuana, pot, grass, hashish, hash oil, weed	X					X		
Cocaine	Crack, coke, C, blow, flake, snow		X		X		X	X	
LSD/ hallucinogens	Derived from mushrooms (psilocybin), cactus (mescaline), glory seeds, jimson weed. Other examples include LSD (acid), PCP (angel dust), hog				X	X		X	

Table 2. Reference to frequently used substances and their modes of delivery[46] (continued)

Substance	Street name	Eat	Freebase*	Inhale	Inject	Oral	Smoke	Sniff/snort	Spray into mouth
Narcotic analgesic	Derived from Asian poppy; opium, codeine, morphine, heroin			X	X	X	X		
Ritalin, talwin	T and R				X	X			
Solvents/ aerosols	Glue, gas, sniff			X				X	X
Steroids	Juice, white, stuff, roids				X	X			

* Freebase: to use purified cocaine by burning it and inhaling the fumes. Cocaine is "purified" by dissolving it in a heated solvent and separating and drying the precipitate.

Specimen Collection and Laboratory Diagnosis

- Same as for all patients.
- Given the circumstances often surrounding substance use, urine-based testing, rapid point-of-care testing, self-collected specimens and use of locally based clinics should be considered to improve access to STI testing for this population.

Management and Treatment

- Where patient compliance is a concern, effective single-dose or short-course treatments for STIs are recommended; epidemiologic or syndromic treatment without full evaluation or laboratory testing may sometimes be necessary.
- Integrating STI screening, counselling and treatment into substance treatment and outreach programs has been recommended.[24,26,47–49] Entry into substance treatment has been linked to a reduction in risky sexual behaviour.[50]
- Be aware of substance use treatment programs and community resources (including safer injection sites, needle-exchange programs and support networks) for referral as needed.

- Substance users who are infected with HIV may be at particular risk for serious outcomes. For example, methamphetamine use by people infected with HIV can result in hypertension, hyperthermia, rhabdomyolysis and stroke, and it can produce paranoia, auditory hallucinations and violent behaviour when the user is intoxicated.[51] Fatal interactions between antiretroviral medications (stavudine, saquinavir and ritonavir) and methamphetamine, as well as between ritonavir and ecstasy (MDMA), have been reported.[51]

Reporting and Partner Notification

- As with all patients, conditions reportable according to provincial and territorial regulations should be reported to the local public health authority.
- Persons diagnosed with a blood-borne infection such as HIV or infectious syphilis and who share drug using equipment should have their sharing partners notified about possible infection and encouraged to go for testing.
- There are a number of potential reasons substance using patients may not accurately report their own substance use or their sexual/injection partners, including fear of violence from partner(s), fear of legal repercussions, stigma, confidentiality concerns, lack of information on partner(s) and forgetting.
- Repeat prompting and reading back the list of recalled sexual and injection partners can elicit reports of additional sexual and injection partners.[52]

Follow-up

Patients with substance use problems participating in sexual and/or injection risk behaviours should be encouraged to get regularly screened for STIs, including HIV. Patients whose assessment indicates moderate to severe substance use should be encouraged and facilitated as appropriate to enter a substance treatment/rehabilitation program for follow-up.

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TRAVELLERS

Definition

There has been a long-standing association between travel, sexual behaviour and the risk of acquiring sexually transmitted infections (STIs). Travellers are defined as people who are journeying temporarily, permanently or episodically for recreational or occupational reasons.[1] Categories of travellers include but are not limited to: tourists, business travellers, military personnel, seamen, truckers, diplomats, college and university students on school break and immigrants visiting their country of origin.[2–4] Sex tourists are a particular category of travellers whose main intention is to engage in sexual activity when abroad.[2] They are more likely to engage in sex with sex workers and to have multiple partners when travelling.[2] Prostitution has developed around tourist resorts in some countries, particularly in Southeast Asia and increasingly in Eastern Europe.[2,5,6]

Epidemiology

In 2002, Canadians took 13 million overnight trips to the United States with an average length of stay of 4 nights and 4.7 million trips overseas with an average length of stay of 15.2 nights.[7] The ten most popular destinations in descending order (excluding the United States) were the United Kingdom, Mexico, France, Cuba, the Dominican Republic, Germany, Italy, the Netherlands, Spain and China.[7]

The risk of acquiring STIs is increased in travellers because travel affords freedom from the normal social constraints of daily life at home, as well as increased time and opportunity for casual sex.[8] Studies have shown that 5–50% of travellers engage in casual sex[1,9,10] and that ⅓ to over ½ of travellers do not consistently use condoms.[1,11] Those at higher risk include males, younger travellers, those who are travelling alone or with friends, those who are single, men who have sex with men (MSM), those planning a long duration of stay, those travelling on business, smokers or those using alcohol or illicit drugs.[1,4,5,8,11,12]

STIs are among the most common notifiable infections worldwide, with rates being particularly high in developing countries.[1] *Chlamydia trachomatis* is the most prevalent bacterial STI worldwide.[11] Gonococcal infections remain common worldwide, with the incidence of antibiotic resistance increasing. Antimicrobial susceptibility patterns of *Neisseria gonorrhoeae* vary worldwide, with a high prevalence of resistance seen in Africa and Asia.[9,11] For further information on antimicrobial resistance, see *Gonococcal Infections* chapter.

The World Health Organization estimated that, worldwide, at the end of 2003, there were 38 million adults and children living with HIV — 4.8 million infected in 2003 alone.[13] In Canada, the HIV epidemic is largely due to infection with B subtype viruses. However, travellers may be at risk for transporting non-B subtypes of HIV virus home.[2,6]

Prevention

Evidence of the effectiveness of pre-travel interventions is very limited.[1,8,14] Health care providers should advise travellers to take condoms with them, alert them to the high rates of STIs and reinforce the message that alcohol or illicit drug use lowers inhibitions.[5,10,11,14] Travellers should be informed that condoms available overseas may be of inferior quality and that hot, humid conditions can decrease the effectiveness of condoms.[11] Collaboration between travel clinics and STI programs or clinics is helpful in ensuring appropriate prevention and treatment.[1]

Hepatitis B virus (HBV) vaccine is recommended for travellers to areas of HBV endemnicity.[10,15,16] Up-to-date information on HBV prevalence can be found on the World Health Organization website on International Travel and Health at www.who.int/ith/en or by consulting the 2001 *International Travel Health Guide*.[17] Hepatitis A virus (HAV) vaccination is recommended for MSM, injection drug users and travellers to countries where HAV is endemic to prevent person-to-person transmission of HAV.[15,16] Combination vaccines for HAV and HBV are useful for patients who require protection against both infections. Chemoprophylatic use of antibiotics for the prevention of STIs while travelling is not recommended.[5]

Prevention efforts should also be targeted at immigrants from HIV-endemic countries who are at increased risk of acquiring HIV infection during visits to their country of origin following immigration to Canada.[3,6]

Evaluation

Early diagnosis and treatment is key in preventing further spread of STIs, particularly to regular sexual partners at home. A travel and sexual history should be taken. It is important to be aware that self-identified sexual identity is not an accurate predictor of sexual behaviour while travelling. Although some travellers may consider themselves heterosexual, they may have been involved in sexual activities with members of the same sex (either prior to and/or during travel). Therefore it is essential that a sexual history include questions regarding opposite sex and same sex activity. This can be achieved by asking open-ended questions such as: “Do you have sex with men, women or both?”

For a more complete discussion, see *Men Who Have Sex with Men/Women Who Have Sex with Women* and *Primary Care and Sexually Transmitted Infections* chapters.

Practices while travelling (both sexual and non-sexual) that are associated with an increased risk for acquiring STIs should be assessed. These include the following:

- Unprotected oral, vaginal or anal intercourse (receptive and insertive).
- Oral-anal intercourse (anilingus).
- Receptive manual-anal intercourse (insertion of finger or fist in anus of partner).
- Substance use accompanying sex.
- Tattooing or body piercing.
- IDU and other drug use.

A substance use history should also be taken.

Travellers who have had unprotected sex with a new partner while travelling should be offered STI screening for chlamydia, gonorrhea, syphilis, HIV and HBV (if unvaccinated).[9] Hepatitis C virus (HCV) testing should be offered if the history reveals drug use, tattooing, body piercing, or other activities where sharing of contaminated equipment may have occurred (see *Immigrants and Refugees* chapter for more information). Health care workers should be aware that travellers may present with STIs rarely seen in Canada, such as chancroid or lymphogranuloma venereum (LGV) (see *Chancroid* and *Lymphogranuloma venereum* chapters). HIV testing should be accompanied by recommended counselling (see *Human Immunodeficiency Virus Infections* chapter).

Specimen Collection and Laboratory Diagnosis

Same as for all patients. See relevant chapters on specific infections.

Management and Treatment

Same as for all patients. See relevant chapters on specific infections.

Reporting and Partner Notification

Same as for all patients. See relevant chapters on specific infections.

Notification of partners abroad may pose a challenge but should be attempted in conjunction with local and provincial departments of health and the Public Health Agency of Canada.

Follow-up

Travellers who engage in high-risk sexual activities when travelling should be encouraged to undergo regular STI screening. Safer-sex and harm reduction counselling should continue to be emphasized. HIV, HBV and HCV testing should be scheduled following the window period, and adherence to safer-sex practices until that time may be indicated to prevent infection of current partners. HAV and HBV vaccination series should be completed if initiated prior to travelling.

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APPENDIX A: PATIENT COUNSELLING GUIDE ON CONDOM USE

Essential Information on Condoms and Patient Counselling Guide

Check the label

- The most common type of condom is the latex condom, but synthetic (polyurethane) condoms also offer protection against unintended pregnancies as well as sexually transmitted infections (STIs), including HIV.
- Natural membrane condoms (also called "sheepskin") are not recommended for use in protection against certain viral diseases such as hepatitis and HIV.
- Novelty condoms, such as "edible condoms," do not offer pregnancy or STI prevention.

Store condoms properly and check them before use

- Condoms should be stored in a cool, dry place out of direct sunlight (i.e., do not store in wallet, in automobile or any place where condoms will be exposed to extreme heat or cold).

Always check the expiry date before using the condom; expired condoms should not be used

- 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.
- Condoms should be put on before any genital contact to prevent exposure to body fluids that may contain infectious agents. Nonoxynol-9 (N-9) is not recommended as an effective means of HIV or STI prevention. The best STI and HIV barrier is a latex or polyurethane condom *without* N-9.
  - If N-9 is used as an aid to contraception, its benefit should be carefully considered in light of the increased risk of genital lesions and the resulting potential for an increased risk of HIV transmission.[1]

Suggestions for Enhancing Adherence to Condom Use for STI Prevention

- Routinely recommend "dual protection" — using condoms together with oral contraceptives — for STI prevention and highly effective birth control.
- Prepare a "Prescription Pad Counselling Guide" as follows:[2]
  If you or your partner has ever had another sexual partner, we strongly recommend that you make one of these safer-sex choices:
  - Use a condom consistently to prevent pregnancy and STIs.
  - Always use a condom for the first 3 months of a sexual relationship with a new partner, and then come in with your partner for STI and HIV testing. If your tests are negative, you can quit using condoms, as long as you and your partner feel that you are willing and able to remain monogamous and take appropriate birth control measures.

Barriers to Condom Use and Means to Overcome Them

Table 1. Perceived barrier and proposed intervention strategy

Decreases sexual pleasure or sensation	• Often perceived by those who have never used a condom • Encourage patient to try the following: – 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 – Try a thinner latex condom – Try different brands – Try more lubrication
Decreases spontaneity of sexual activity	• Encourage incorporation of condom use during foreplay • Remind patient that peace of mind may enhance pleasure for self and partner
Embarrassing, juvenile, "unmanly"	• Remind patient that it is "manly" to protect oneself and others
Poor fit (too small or too big, slips off, uncomfortable)	• Smaller and larger condoms are available
Requires prompt withdrawal after ejaculation	• Reinforce the protective nature of prompt withdrawal • Suggest substitution of other postcoital sexual activities

Table 1. Perceived barrier and proposed intervention strategy (continued)

Fear of breakage may lead to less vigorous sexual activity	• With prolonged intercourse, lubricant wears off and condom begins to rub. Have a water-soluble lubricant available to reapply
Non-penetrative sexual activity	• Condoms are advocated for use during fellatio; non-lubricated condoms may prove best for this purpose • There are flavoured condoms now on the market, but they should not be confused with edible condoms found in some novelty sex shops • Other barriers, such as dental dams or a non-lubricated 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 anilingual sex).

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APPENDIX B: HOW TO USE A MALE CONDOM/ HOW TO USE A FEMALE CONDOM

How to Use a Male Condom

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

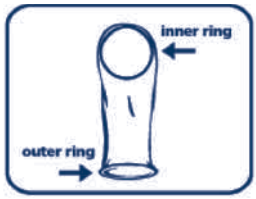
1. Open the package; handle carefully to avoid damaging the condom.
2. A water-based lubricant may be used inside the tip of the condom or on the penis to avoid irritation or tearing the condom; KY Jelly or a liquid form such as Astro-Glide should be used. Petroleum- or oil-based lubricants (such as petroleum jelly, cooking oils, shortening and lotions) should not be used, because they weaken the latex.
3. Press the air out of the tip, leaving enough space to hold the semen (about 1 cm).
4. Pinching the condom tip, unroll the condom over as much of the hard penis as possible.
5. After sex, take the penis out with the condom still on and the penis still hard. Hold the base of the condom firmly so that the semen doesn't spill.
6. After use, tie a knot at the open end and dispose of the condom in the garbage (not in the toilet). Do not reuse.

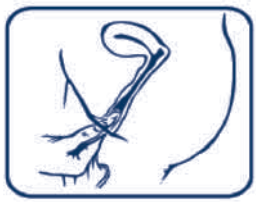
Note:
If a condom breaks, it should be replaced immediately. If ejaculation occurs after condom breakage and there is need for protection against pregnancy, emergency oral contraception should be used.

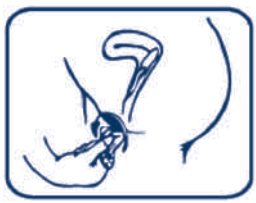
How to Use a Female Condom

Insert the condom into the vagina before sexual contact.

1. Open the package, handling carefully to avoid tearing the condom.
2. Squeeze the flexible inner ring at the closed end of the sheath.
3. Gently insert the inner ring into the vagina.
4. Place the index finger on the inside of the condom, and push the inner ring up as far as it will go.
5. Be sure the sheath is not twisted. The outer ring should remain on the outside of the vagina.
6. Guide the penis into the sheath's opening. Be sure that the penis is not entering on the side, between the vagina wall and the sheath.
7. If the condom moves out of place during sex, lubrication can be used either on the inside of the condom or on the penis.
8. To remove the condom, twist the outer ring and gently pull the condom out to avoid spilling the semen.
9. Dispose of the condom in the garbage (not in the toilet). Do not reuse.







Note:
If the condom is dislodged, twisted or breaks, it should be replaced immediately. If ejaculation occurs after condom failure and there is need for protection against pregnancy, emergency oral contraception should be used.

APPENDIX C: RESOURCES AND REFERENCE TOOLS FOR HEALTH PROFESSIONALS

Books

Canadian Guidelines for Sexual Health Education. **Health Canada**

A resource and reference tool developed by Health Canada in collaboration with sexual health experts to provide the basis for program planners, policy makers, health care professionals, researchers and those working in related fields to build effective sexual health education programs to meet the diverse needs of Canadians. Available in PDF format online at www.phac-aspc.gc.ca/publicat/cgshe-ldnemss/cgshe_index.htm.

HIV/HCV Transmission: Guidelines for Assessing Risk: A Resource for Educators, Counsellors, and Health Care Providers. **4th ed. Canadian AIDS Society**

A comprehensive, evidence-based guide outlining the risks associated with various sexual activities, graded from no-risk to high-risk. Available in PDF format online at www.cdnaids.ca.

Sex Sense. **Society of Obstetricians and Gynaecologists of Canada**

A comprehensive booklet about sexuality and contraception. This booklet covers all contraceptive methods available in Canada and provides fact-based information on protection against sexually transmitted infections. It contains helpful websites and phone numbers for support across Canada. Available to order online at www.sogc.org/sexsense/book.htm.

Sexual and Reproductive Health Counselling Guidelines. **Planned Parenthood Federation of Canada**

These guidelines can be used as a tool to improve support skills, train staff or provide additional information for patients in a clinical, community or educational setting. Available to order online at www.ppfc.ca.

Internet Links

www.aidssida.cpha.ca

The National AIDS Clearinghouse of the Canadian Public Health Association (1565 Carling Avenue, Suite 400, Ottawa, ON, K1Z 8R1) distributes a variety of pamphlets, posters and other safer-sex materials.

www.phac-aspc.gc.ca/std-mts/index.html

The Public Health Agency of Canada Sexual Health and Sexually Transmitted Infections website provides resources on STI support surveillance and targeted research studies, evidence-based national guidelines and policy, and the dissemination and exchange of information.

www.sexualityandu.ca/masexualite.ca

A sexual- and reproductive-health website sponsored by the Society of Obstetricians and Gynaecologists of Canada. It is widely used by teens, parents, adults, teachers and health care professionals to access relevant sexual and reproductive health information.

Note:
If you are not aware of a local source of health promotion material, contact your local public health authority or provincial/territorial director of STI control (see *Appendix D*).

APPENDIX D: PROVINCIAL AND TERRITORIAL DIRECTORS OF STI CONTROL

Alberta

Dr. Ameeta Singh
Infectious Diseases Medical Consultant
Office of Provincial Health Officer
24th Floor, Telus Plaza, North Tower
10025 Jasper Avenue
Edmonton, AB T5J 2N3
Tel: 780-427-5263
Fax: 780-427-7683
ameeta.singh@gov.ab.ca

British Columbia

Dr. Michael Rekart, Director
Division of STD/AIDS Control
BC Centre for Disease Control
655 West 12th Avenue
Vancouver, BC V5Z 4R4
Tel: 604-660-6178
Fax: 604-775-0808
michael.rekart@bccdc.ca

Manitoba

Dr. Carole Beaudoin
Epidemiologist, Communicable Disease
Manitoba Health
4th Floor, 300 Carleton Street
Winnipeg, MB R3B 3M9
Tel: 204-788-6786
Fax: 204-948-2040
cabeaudoin@gov.mb.ca

New Brunswick

Dr. Holy Akwar
Communicable Disease Epidemiologist
Office of the Chief Medical Officer of Health
New Brunswick Department of Health and Wellness
2nd Floor, 520 King Street, PO Box 5100
Fredericton, NB E3B 5G8
Tel: 506-453-2323
Fax: 506-453-8702
holy.akwar@gnb.ca

Newfoundland and Labrador

Dr. Faith Stratton
Chief Medical Officer of Health
Department of Health
Building 801, Pleasantville
St. John's, NF A1B 4J6
Tel: 709-729-3430
Fax: 709-729-5824
fstratton@mail.gov.nf.ca

Northwest Territories

Dr. André Corriveau
Chief Medical Health Officer
Department of Health and Social Services
Population Health, Health Protection Unit
Government of Northwest Territories
Yellowknife, NT X1A 2L9
Tel: 867-920-8646
Fax: 867-873-0442
andre_corriveau@gov.nt.ca

Nova Scotia

Dr. Jeff Scott
Office of the Chief Medical Officer
of Health
PO Box 488
Halifax, NS B3J 2R8
Tel: 902-424-8698
Fax: 902-424-0550
medicalofficerofhealth@gov.ns.ca

Nunavut

Elaine Randell
Communicable Disease Consultant
Dept of Health & Social Services
PO Box 1000, Station 1000
Iqaluit, NU X0A 0H0
Tel: 867-975-5775
Fax: 867-979-3190
ERandell@gov.nu.ca

Ontario

STI Medical Director
STI/AIDS Sexual Health Unit
Ministry of Health and Long-Term Care
8th Floor, 5700 Yonge Street
Toronto, ON M2M 4K5
Tel: 416-327-7429
Fax: 416-327-7439

Prince Edward Island

Dr. Lamont Sweet
Chief Medical Officer of Health
16 Garfield Street, Box 2000
Charlottetown, PE C1A 7N8
Tel: 902-368-4996
Fax: 902-620-3354
lesweet@ihis.org

Quebec

M^{me} Lise Guérard
Chef de service
Service de lutte contre les infections
transmissibles sexuellement et
par le sang
Direction générale de la santé publique
Ministère de la Santé et
des Services sociaux
201, rue Crémazie Est, RC-03
Montréal, QC H2M 1L2
Tel: 514-873-9892
Fax: 514-873-9997
lise.guerard@msss.gouv.qc.ca

Saskatchewan

Dr. Huiming Yang
Deputy Chief Medical Health Officer
Communicable Disease Control
and Vaccines
Population Health Branch
Saskatchewan Health
3475 Albert Street
Regina SK S4S 6X6
Tel: 306-787-3148
Fax: 306-787-9576
hyang@health.gov.sk.ca

Yukon Territory

Ms. Colleen Hemsley
Communicable Disease Officer
Health & Social Services
Yukon Territorial Government
4 Hospital Road
Whitehorse, YT Y1A 3H8
Tel: 867-667-8369
Fax: 867-667-8349
colleen.hemsley@gov.yk.ca

APPENDIX E: PROVINCIAL LABORATORIES

For more information on laboratory diagnosis of sexually transmitted infections, first consult your local facility or your nearest public health laboratory.

Alberta

Provincial Laboratory for Public Health
(Microbiology)
Edmonton site:
8440 – 112 Street
Edmonton, AB T6G 2J2
Tel: 780-407-7121
Fax: 780-407-8984

Calgary site:
3030 Hospital Drive NW
Calgary, AB T2N 4W4
Tel: 403-944-1200
Fax: 403-283-0142

British Columbia

Provincial Laboratory
BC Centre for Disease Control
Laboratory Services
655 12th Avenue West
Vancouver, BC V5Z 4R4
Tel: 604-660-6030
Fax: 604-660-6073

Manitoba

Cadham Provincial Laboratory
750 William Avenue
Winnipeg, MB R3E 3J7
Tel: 204-945-6123
Fax: 204-786-4770

New Brunswick

Department of Laboratory Medicine
St. John Regional Hospital
400 University Avenue
Saint John, NB E2L 4L2
Tel: 506-648-6501
Fax: 506-648-6576

Newfoundland and Labrador

Newfoundland Public Health
Laboratories
The Leonard A. Miller Centre
for Health Sciences
100 Forest Road, PO Box 8800
St. John's, NF A1B 3T2
Tel: 709-777-6555
Fax: 709-737-7070

Nova Scotia

Department of Pathology and
Laboratory Medicine
Queen Elizabeth II
Health Science Centre
5788 University Avenue
Halifax, NS B3H 1V8
Tel: 902-473-2231
Fax: 902-473-4432

Ontario

Central Public Health Laboratory
81 Resources Road
Etobicoke, ON M9P 3T1
Tel: 416-235-6132
Toll-free: 1-800-640-7221
Fax: 416-235-6103

Hamilton Public Health Laboratory
250 Fennell Avenue West, PO Box 2100
Hamilton, ON L8N 3R5
Tel: 905-385-5379
Fax: 905-385-0083

Kingston Public Health Laboratory
181 Barrie Street, PO Box 240
Kingston, ON K7L 3K2
Tel: 613-548-6630
Fax: 613-548-6636

London Public Health Laboratory
850 Highbury Avenue, PO Box 5704,
Terminal A
London, ON N6A 4L6
Tel: 519-455-9310
Fax: 519-455-3363

Orillia Public Health Laboratory
750 Memorial Avenue, PO Box 600
Orillia, ON L3V 6K5
Tel: 705-325-7449
Fax: 705-329-6001

Ottawa Public Health Laboratory
2380 Saint Laurent Boulevard
Ottawa, ON K1G 6C4
Tel: 613-736-6800
Fax: 613-736-6820

Peterborough Public Health Laboratory
99 Hospital Drive, PO Box 265
Peterborough, ON K9J 6Y8
Tel: 705-743-6811
Fax: 705-745-1257

Sault Sainte-Marie
Public Health Laboratory
160 McDougall Street, PO Box 220
Sault Sainte-Marie, ON P6A 3A8
Tel: 705-254-7132
Fax: 705-945-6873

Sudbury Public Health Laboratory
2 – 1300 Paris Street
Sudbury, ON P3E 6H3
Tel: 705-564-6917
Fax: 705-564-6918

Thunder Bay Public Health Laboratory
336 South Syndicate Avenue
Thunder Bay, ON P7E 1E3
Tel: 807-622-6449
Fax: 807-622-5423

Timmins Public Health Laboratory
67 Wilson Avenue
Timmins, ON P4N 2S5
Tel: 705-267-6633
Fax: 705-360-2006

Toronto Public Health Laboratory
PO Box 9000, Terminal A
Toronto, ON M5W 1R5
Tel: 416-235-6132
Toll-free: 1-800-640-7221
Fax: 416-235-6103

Windsor Public Health Laboratory
3400 Huron Church Road, PO Box 1616
Windsor, ON N9E 4H9
Tel: 519-969-4341
Fax: 519-973-1481

Prince Edward Island

Division of Laboratories
Provincial Health Laboratory
Queen Elizabeth Hospital
Riverside Drive, PO Box 6600
Charlottetown, PE C1A 8T5
Tel: 902-894-2300
Fax: 902-894-2385

Quebec

Institut national de santé publique
du Québec
Laboratoire de santé publique
du Québec
20045, chemin Sainte-Marie ouest
Sainte-Anne-de-Bellevue, QC H9X 3R5
Tel: 514-457-2070
Fax: 514-457-6346

Saskatchewan

Saskatchewan Provincial
Laboratory Services
Saskatchewan Health
3211 Albert Street
Regina, SK S4S 5W6
Tel: 306-787-3131
Fax: 306-787-9122

APPENDIX F: FORENSIC EVIDENCE, SERVICES AND LABORATORIES

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 the victim and the accused.
  - That sexual contact occurred.
  - That the assault was violent or forceful, thereby indicating lack of consent.
  - That the victim may have been drugged.
- Types of forensic analyses most useful in sexual assault are as follows:
  - Identification of semen or other bodily fluids.
  - Forensic DNA analysis.
  - Hair examination (suitability for DNA analysis).
  - Textile damage assessment.
  - Examinations involving fibres and other types of trace evidence.
  - Drug screen (including alcohol) in bodily fluids (blood and urine).
- In some situations, it may be 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 the 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, below).

Collection of specimens

- Physicians should familiarize themselves with the test kit before they need to use it.
- Sexual assault examination kits differ by jurisdiction. An approved sexual assault examination kit should be used for the collection of specimens. Local practices and the instructions contained within the sexual assault kit 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 should then be allowed to air dry. The forensic laboratory will examine these specimens for the presence of semen and conduct DNA typing.

- 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 should be moistened with 1–2 mL of sterile saline.
  - Depending on local policies and the availability of appropriate equipment and training, samples can be examined for the presence of motile sperm. A positive finding suggests that the sexual activity occurred less than 6 hours previously. Confirmation of the presence of spermatozoa by the forensic laboratory is essential.
- Demonstration of saliva on the body or clothing of the person who has been abused or assaulted may provide valuable forensic evidence.
  - Samples from the body can be collected with a sterile cotton swab. The swab should be moistened slightly with distilled water and rubbed over the affected area of the body. The specimen should be allowed to dry and then packaged and labelled.
  - If a child or adult is unclear about which area(s) is (are) affected, the common target areas (the neck, breast, belly, genital area, penis, thighs and buttocks) may be swabbed; a separate swab should be used for each area and labelled accordingly.
- Judgment 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 may contain trace evidence (foreign material left by the perpetrator). Items commonly encountered include hair from any part of the body, clothing fibres, lubricants, petroleum jelly and lipstick. Any suspicious hair or fibre material found on the body of the person should be removed with forceps, folded in a piece of clean paper and put in a separate, properly labelled envelope. Suspicious material such as lubricants, petroleum jellies and lipstick on the body of the person should be removed using a sterile swab, then packaged and labelled. Each item of clothing worn by the person should be packaged separately and labelled.
- If the assaulted or abused person has reached puberty, the pubic hair should be combed and the comb, as well as any free hair collected, should be folded in a piece of paper or tissue and put in a labelled envelope or placed in a plastic bag and then sealed and labelled. Hairs can be assessed to determine their body area of origin (pubic, scalp or body hair). In addition, the root portions of any hairs may be suitable for DNA analysis.
- Fingernail scrapings/clippings should be collected if there is a possibility that the perpetrator was scratched during the incident. The forensic laboratory will examine these samples for the presence of blood and foreign DNA. Clippings can be collected using clean nail clippers or scissors, folded into a piece of paper or tissue and placed into a labelled envelope or container. Fingernail scrapings can be collected using a nail scraper and the scraper and debris folded into a piece of paper or tissue and placed into a labelled envelope or container.

Collection of known samples for DNA analysis

It is essential for DNA typing analysis to collect a known sample from the victim. A blood stain, mouth swab or pulled hair sample can be collected as a known sample from the victim following the instructions provided in the approved sexual assault examination kit. A known blood stain is the preferred sample to be collected from the victim. A known blood stain, mouth swab or pulled hair sample can also be collected using the appropriate consent sample collection kits that are available from the Case Receipt Units of the Royal Canadian Mounted Police Forensic Laboratory Services.

Collection of samples for toxicological analysis

Blood and urine samples should be collected from the victim for toxicological analyses using the blood collection tube and urine jar provided in the sexual assault kit or grey-stoppered blood collection tubes available at the hospital.

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 the abuse of children obliges 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 sexually transmitted infections.

Forensic Laboratories

Alberta

General Manager
Forensic Laboratory Services — Edmonton
Royal Canadian Mounted Police
15707 118th Avenue
Edmonton, AB T5V 1B7
Tel: 780-451-7400
Fax: 780-495-6961

British Columbia

General Manager
Forensic Laboratory Services — Vancouver
Royal Canadian Mounted Police
5201 Heather Street
Vancouver, BC V5Z 3L7
Tel: 604-264-3400
Fax: 604-264-3499

Manitoba

General Manager
Forensic Laboratory Services — Winnipeg
Royal Canadian Mounted Police
621 Academy Road
Winnipeg, MB R3N 0E7
Tel: 204-983-4267
Fax: 204-983-6399

Nova Scotia

General Manager
Forensic Laboratory Services — Halifax
Royal Canadian Mounted Police
3151 Oxford Street, PO Box 8208
Halifax, NS B3K 5L9
Tel: 902-426-8886
Fax: 902-426-5477

Ontario

Chief Scientific Officer
Forensic Laboratory Services — Ottawa
Royal Canadian Mounted Police
1200 Vanier Parkway, PO Box 8885
Ottawa, ON K1G 3M8
Tel: 613-993-0986
Fax: 613-952-0156

Northern Regional Laboratory of the Centre of Forensic Sciences
Suite 500, 70 Foster Drive
Sault Sainte-Marie, ON P6A 6V3
Tel: 705-945-6550
Fax: 705-945-6569

Director
Centre of Forensic Sciences
25 Grosvenor Street
Toronto, ON M7A 2G8
Tel: 416-314-3200
Fax: 416-314-3225

Quebec

Le directeur
Laboratoire de sciences judiciaires et de médecine légale
1701, rue Parthenais, PO Box 1500
Montreal, QC H2K 3S7
Tel: 514-873-2704
Fax: 514-873-4847

Saskatchewan

General Manager
Forensic Laboratory Services — Regina
Royal Canadian Mounted Police
6101 Dewdney Avenue West, PO Box 6500
Regina, SK S4P 3J7
Tel: 306-780-5810
Fax: 306-780-7571

APPENDIX G: REFERRAL CENTRES FOR STIs IN PERIPUBERTAL AND 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.

Alberta

Child Abuse Program
Alberta Children's Hospital
1820 Richmond Road Southwest
Calgary, AB T2T 5C7
Tel: 403-943-7886

Department of Pediatrics
Stollery Children's Hospital
2C–300 Walter McKenzie Health Centre
University of Alberta
Edmonton, AB T6G 2B7
Tel: 780-407-6370

British Columbia

Child Protection Services
Royal Columbian Hospital
330 East Columbia Street
New Westminster, BC V3L 3W7
Tel: 604-520-4253

BC Children's Hospital
4480 Oak Street
Vancouver, BC V6H 3V4
Tel: 604-875-2345

Sexual Assault Assessment Project
Department of Family Practice
University of British Columbia
5804 Fairview Avenue
Vancouver, BC V6T 1Z3
Tel: 604-822-5431

Suspected Child Abuse and Neglect Team
Victoria General Hospital
1 Hospital Way
Victoria, BC V8Z 6R5
Tel: 250-727-4212

Manitoba

Child Protection Centre
Children's Hospital of Winnipeg
Health Sciences Centre
685 William Avenue
Winnipeg, MB R3A 1R9
Tel: 204-787-2811

New Brunswick

Child Protection Consultation Team
Attn: Social Work
Moncton Hospital
135 MacBeath Avenue
Moncton, NB E1C 6Z8
Tel: 506-857-5331

Child Protection Team
Saint John Regional Hospital
PO Box 2100
Saint John, NB E2L 4L2
Tel: 506-648-6811

Newfoundland and Labrador

Protection Team
Janeway Children's Health & Rehabilitation Centre
300 Prince Phillip Drive
St. John's, NF A1A IR8
Tel: 709-777-6300

Northwest Territories

Department of Health and Social Services
Government of the Northwest Territories
PO Box 1320
Yellowknife, NT X1A 2L9
Tel: 867-920-3231
Fax: 867-873-0442

Nova Scotia

Child Abuse Team
IWK Health Centre
5850/5980 University Avenue,
PO Box 9700
Halifax, NS B3K 6R8
Tel: 902-470-8888

Nunavut

Director of Child and Family Services
Department of Health and
Social Services
Government of Nunavut
PO Box 1000, Station 1000
Iqaluit, NU X0A 0H0
Tel: 867-975-5750
Fax: 867-975-5705

Ontario

Child Abuse Committee
Brampton Memorial Hospital
20 Lynch Street
Brampton, ON L6W 2Z8
Tel: 905-451-1710

Child Protection Team
Hamilton Health Sciences
PO Box 2000, Station A
Hamilton, ON L8N 3Z5
Tel: 905-521-2100

Child Protection Team
Hotel Dieu Hospital
166 Brock Street
Kingston, ON K7L 5G2
Tel: 613-544-3310

Gyne/Endo Clinic
Children's Hospital of Western Ontario
800 Commissioners Road East
London, ON N6A 4G5
Tel: 519-685-8484

Child Abuse Team
Trillium Health Centre
100 Queensway West
Mississauga, ON L5B 1B8
Tel: 905-848-7100, ext. 2548

Child and Youth Protection
Children's Hospital of Eastern Ontario
401 Smyth Road
Ottawa, ON K1H 8L1
Tel: 613-737-7600

Child Abuse Committee
Blue Water Health
220 North Milton Street
Sarnia, ON N7T 6H6
Tel: 519-464-4500 ext. 8259

Child Abuse Team
Shoniker Clinic
2867 Ellesmere Road
Scarborough, ON M1E 4B9
Tel: 416-281-7301

Chief of Pediatrics
St. Joseph's Care Group
35 North Algoma Street
PO Box 3251
Thunder Bay, ON P7B 5G7
Tel: 807-343-2431

Suspected Child Abuse and
Neglect Program
Hospital for Sick Children
555 University Avenue
Toronto, ON M5G 1X8
Tel: 416-813-6275

Child Abuse Team
North York General Hospital
4001 Leslie Street
Toronto, ON M2K 1E1
Tel: 416-756-6000

Quebec

Adolescent Clinic
Montreal Children's Hospital
1040 Atwater Street
Montreal, QC H3Z 1X3
Tel: 514-934-1934, ext. 24481

Comité de prévention de l'enfance maltraitée
Direction de la protection de la jeunesse
Hôpital Maisonneuve-Rosemont
5415, boulevard de l'Assomption
Montreal, QC H1T 2M4
Tel: 514-252-3400, ext. 3826

Clinique de pédiatrie socio-juridique
Hôpital Sainte-Justine
3175, chemin Côte Ste-Catherine
Montreal, QC H3T 1C5
Tel: 514-345-4866 (0–11 years old)
Tel: 514-345-4721 (12–18 years old)

Comité de protection de l'enfance
Centre hospitalier de l'Université Laval (CHUL)
2705, boulevard Laurier
Ste-Foy, QC G1V 4G2
Tel: 418-656-4141

Clinique médico-juridique
Centre hospitalier universitaire de l'Estrie
Sherbrooke, QC J1H 5N4
Tel: 819-346-1110, ext. 14644

Saskatchewan

Child Abuse Team
Regina General Hospital
1440 14th Avenue
Regina, SK S4P 0W5
Tel: 306-766-4444

Child and Youth Service
Department of Psychiatry
Royal University Hospital
103 Hospital Drive
Saskatoon, SK S7N 0W8
Tel: 306-655-1000

Yukon

Communicable Disease Officer
Yukon Communicable Disease Control
4 Hospital Road
Whitehorse, YT Y1A 2C6
Tel: 867-667-8369
Fax: 867-667-8349

APPENDIX H: 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).

INDEX

A

B

C

D

E

F

G

H

N

O

P

Q

R

S

T

U

V

W

Y

Z