National Guidelines
on the
Management of Sexually Transmitted Infections

MINISTRY OF
HEALTH
GUYANA

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Abbreviations and Acronyms

AIDS	Acquired Immunodeficiency Syndrome
ALT	Alanine Aminotransferase
Anti-HBc	Antibody to Hepatitis B core antigen
Anti-HCV	Hepatitis C antibody
ASC-US	Atypical Squamous Cells of Undetermined Significance
BCA	Bichloroacetic Acid
BV	Bacterial Vaginosis
CBC	Complete Blood Count
CIN	Cervical Intraepithelial Neoplasia
CLD	Chronic Liver Disease
CNS	Central Nervous System
CSF	Cerebrospinal Fluid
DFA	Direct Fluorescent Antibody
DGI	Disseminated Gonococcal Infection
DNA	Deoxyribonucleic Acid
EC	Emergency Contraception
EIA	Enzyme Immunoassay
ELISA	Enzyme-linked immunosorbent assay
EPT	Expedited Partner Therapy
FDA	Food and Drug Administration (US)
FTA-ABS	Fluorescent Treponemal Antibody Absorbed
gG	Glycoprotein G
GNID	Gram-negative intracellular Diplococci
HAV	Hepatitis A virus
HBIG	Hepatitis B immune globulin
HbsAg	Hepatitis B surface antigen
HBV	Hepatitis B Virus
HCV	Hepatitis C virus
HIV	Human Immunodeficiency Virus
IFA	Immunofluorescence Assay
IgE	Immunoglobulin E
Ig	Immune globulin
IgG	Immunoglobulin G
IgM	Immunoglobulin M
IM	Intramuscularly
IUD	Intrauterine Device
IV	Intravenous or intravenously
KOH	Potassium Hydroxide
LGV	Lymphogranuloma Venereum
MAC	Mycobacterium Avium Concentration
MSM	Men who have sex with men

N9	Nonoxynol-9
NAAT	Nucleic Acid Amplification test
NGU	Nongonococcal Urethritis
Pap	Papanicolaou
PCR	Polymerase Chain Reaction
PEP	Postexposure Prophylaxis
PID	Pelvic Inflammatory Disease
PO	By Mouth (Per Os)
PPV	Positive Predictive Value
RNA	Ribonucleic Acid
RPR	Rapid Plasma Reagin
RVVC	Recurrent Vulvovaginal Candidiasis
SIL	Squamous Intraepithelial Lesion
STI	Sexually Transmitted Infection
TCA	Trichloroacetic Acid
TE	Toxoplasmic Encephalitis
TP-PA	Treponema Pallidum Particle Agglutination
VDRL	Venereal Disease Research Laboratory
VVC	Vulvovaginal Candidiasis
WB	Western Blot
WBC	White Blood Cell
WSW	Women who have sex with Women
WSWM	Women who have sex with women and men

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Introduction

1.1 Background

Sexually transmitted infections (STIs) continue to have profound public health impact on sexual and reproductive health worldwide, as well as at a country level.

More than 1 million STIs are acquired every day. In 2020, WHO estimated 374 million new infections with one of four STIs: chlamydia (129 million), gonorrhoea (82 million), syphilis (7.1 million) and trichomoniasis (156 million). More than 490 million people were estimated to be living with genital HSV (herpes) infection in 2016, and an estimated 300 million women have an HPV infection, the primary cause of cervical cancer. An estimated 296 million people are living with chronic hepatitis B globally. Both HPV and hepatitis B infections are preventable with vaccination.

STIs continue to place a significant burden on the public health system in Guyana among the general populations and more particularly among key populations who are engaged in high-risk behaviours such as unprotected, condomless sex which puts them at an increased risk for the acquisition and transmission of STIs, including HIV.

The Epidemiology and Surveillance Unit of the Ministry of Health (MOH) reported a 29 percent increase in STI cases (6610 cases) in 2019 compared to 2015 (5142 cases). Genital Discharge Syndrome (GDS) and Genital Ulcer Disease (GDS) were among the most reported syndromes in 2019 with 6121 cases and 489 cases respectively. Of all the GDS cases, 21 percent were in males and 79 percent in females showing how STIs disproportionately manifest in the population by gender.

There is also the important intersection of HIV and STIs. In 2019 the National Care and Treatment Centre (NCTC) recorded 1.4% cases of STIs co-infected with HIV. This represented a significant decrease in the number of reported co-infection with HIV compared to previous years. There were 50 cases of Syphilis, 12 gential discharge syndrome, and nine genito-ulcer disease co infected with HIV. Syphilis remains the most reported STI co-infected with HIV and the majority was among males. There were also seven co-infections of Hepatitis-B and HIV in 2019.

The treatment of STIs in Guyana is guided by its national STI treatment guidelines that are aligned with the guidance of the World Health Organisation (WHO) and is based on syndromic management. Since the development of these guidelines in 2016, there have been new advances at the global and national levels in the management of STIs. For example, WHO, in July 2021, launched new treatment Guidelines for the Management of Symptomatic Sexually Transmitted Infections. Also, the Guyana NAPS has scaled up testing and treatment for STIs with the implementation of rapid testing for STIs through community testing supported by civil society organisations and targeting key populations.

The term “sexually transmitted infection” (STI) refers to a pathogen that causes infection through sexual contact, whereas the term “sexually transmitted disease” (STD) refers to a recognizable disease state that has developed from an infection. Physicians and other health care providers have a crucial role in preventing and treating STIs. These Guidelines are written for health care workers, program managers, policy makers, civil society and persons living with STI’s. They are intended to support clinicians in the prevention, diagnosis , treatment and support of patients with STI’s and their partners within both the public and private healthcare systems.

The guidelines can also be used as a reference source for program managers and policy makers to guide the planning, implementation and evaluation of STI programs. Much of the core evidence has been derived from the recent recommendations from PAHO/WHO and the CDC.

The guidelines is a combination of syndromic and etiological management and prevention strategies. The WHO recommended syndromic management algorithms are included in these guidelines, they will be especially helpful where we are not able to do diagnostic testing or where follow up visits for results are uncertain.

The most recent recommendations from the CDC’s Sexually Transmitted Infections Treatment Guidelines are also included.

As Guyana moves towards the Elimination of Mother to Child Transmission of HIV, Syphilis and Hepatitis B, it is hoped that these guidelines will serve as a practical guide to this goal.
The guidelines are divided into 4 parts:

1.2 What's New in The Guidelines

Prevention

An increased emphasis is placed on pre-exposure vaccination for hepatitis A, hepatitis B, and human papillomavirus (HPV), and pre-exposure prophylaxis (PrEP) for HIV and STI and post-exposure prophylaxis (PEP) for HIV as appropriate.

PrEP for HIV effectively prevents HIV in individuals with high-risk sexual behaviors.
PrEP for STI prevents the incidence of bacterial STIs in MSM and Transgender Women.

Screening

Several existing screening recommendations, including for pregnant individuals, adolescents, incarcerated individuals, those at increased risk for HIV, and gender nonconforming individuals have been updated.

Pregnant individuals

Screening for syphilis at 28 week's gestation and again at delivery if the patient is high risk for syphilis. Maternal risk factors have been expanded to include multiple partners, sex with drug use, I.V. drug use, late or no prenatal care, incarceration, or unstable housing. Universal screening for hepatitis C (Hep C) and repeat screening with each pregnancy if the overall community prevalence of Hep C is greater than 1.1%.

Adolescents

Annual screening for rectal and pharyngeal chlamydia and gonorrhea in adolescent MSM and in adolescent females based on reported sexual behaviours and exposures.

Incarcerated Individuals

The guidelines recommend opt-out testing for gonorrhea, chlamydia, and trichomonas in all incarcerated individuals.

High HIV risk

All people considered to be at high risk for exposure to HIV – adolescents, people in correctional facilities, individuals with genital or perianal ulcers – should be screened for HIV and offered PrEP.

Gender nonconforming individuals

Due to the diversity of gender confirmation surgery, hormone treatmen t, and sexual practices, the guidelines recommend screening for STIs based on anatomy as well as sexual orientation.

Testing and Treatment

These guidelines discuss::

1) Updated recommendations for treatment of *Neisseria gonorrhoeae, Chlamydia trachomatis*, and *Trichomonas vaginalis*;

2) The addition of metronidazole to the recommended treatment regimen for pelvic inflammatory disease;
3) Alternative treatment options for bacterial vaginosis;
4) The management of *Mycoplasma genitalium*;
5) Two-step testing for serologic diagnosis of genital herpes simplex virus.

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Clinical Prevention Guidance

Prevention and control of STIs are based on the following five major strategies:

- Accurate risk assessment , education and counseling of persons at risk on behaviour changes and prevention services
- Pre-exposure vaccination for vaccine preventable STIs
- Identification of both symptomatic and asymptomatically infected persons and persons with symptoms associated with STIs
- Effective diagnosis, treatment, counseling, and follow-up of infected persons; and
- Evaluation, treatment, and counseling of sex partners of persons who are infected with an STI.

STI/HIV Risk Assessment

Primary prevention of STIs includes **assessment of behavioral risk** (i.e., assessing the sexual behaviors that can place persons at risk for infection) and **biologic risk** (i.e., testing for risk markers for STI and HIV acquisition or transmission). As part of the clinical encounter, health care providers should routinely obtain sexual histories from their patients and address risk reduction.

Effective interviewing and counseling skills, characterized by respect, compassion, and a nonjudgmental attitude toward all patients, are essential to obtaining a thorough sexual history and delivering effective prevention messages.

Using open-ended questions is an effective technique for facilitating rapport with patients e.g. “tell me about any new sex partners you’ve had since your last visit”, understandable, non-judgmental language, eg. “what gender are you sex partners” and normalizing language, “e.g., “Some of my patients have difficulty using a condom with every sex act. How is it for you?”

The “Five P’s” approach as defined by the US Center of Disease Control uses questions on Partners, Practices, Prevention of STIs, Past history of STIs and Prevention of Pregnancy to obtain a sexual history.

The Five Ps Approach

1) Partners
- "Are you currently having sex of any kind?"
- "What is the gender(s) of your partner(s)?"

2) Practices
- "To understand any risks for sexually transmitted infections (STIs), I need to ask more specific questions about the kind of sex you have had recently."
- "What kind of sexual contact do you have or have you had?"
  - "Do you have vaginal sex, meaning 'penis in vagina' sex?"
  - "Do you have anal sex, meaning 'penis in rectum/anus' sex?"
  - "Do you have oral sex, meaning 'mouth on penis/vagina'?"

3) Protection from STIs
- "Do you and your partner(s) discuss prevention of STIs and human immunodeficiency virus (HIV)?"
- "Do you and your partner(s) discuss getting tested?"
- For condoms:
  - "What protection methods do you use? In what situations do you use condoms?"

4) Past history of STIs
- "Have you ever been tested for STIs and HIV?"
- "Have you ever been diagnosed with an STI in the past?"
- "Have any of your partners had an STI?"

5) Additional questions for identifying HIV and viral hepatitis risk:
- "Have you or any of your partner(s) ever injected drugs?"
- "Is there anything about your sexual health that you have questions about?"
- Pregnancy intention
- "Do you think you would like to have (more) children in the future?"
- "How important is it to you to prevent pregnancy (until then)?"
- "Are you or your partner using contraception or practicing any form of birth control?"
- "Would you like to talk about ways to prevent pregnancy?"

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

STI screening is part of a comprehensive HIV/STI risk assessment. STIs are biologic markers of risk, particularly for HIV acquisition and transmission among certain Key Populations. Persons seeking treatment or evaluation for a particular STI should be screened for HIV and other STIs as indicated by individual risk factors. Persons should be informed about all the tests for STIs they are receiving.

Persons should be informed of their test results and recommendations for future testing. Efforts should be made to ensure that all persons receive STI care regardless of personal circumstances (e.g., ability to pay, citizenship or immigration status, gender identity, language spoken, or specific sex practices).

STI/HIV Prevention Counseling

After obtaining a sexual history from their patients, all providers should encourage risk reduction by offering prevention counseling.

Prevention counseling is most effective if provided in a nonjudgmental and empathetic manner appropriate to the patient's culture, language, sex and gender identity, sexual orientation, age, and developmental level. Prevention counseling for STIs and HIV should be offered to all sexually active adolescents and to all adults who have received an STI diagnosis, have had an STI during the previous year, or have had multiple sex partners.

Intensive behavioral counseling eg. client-centered STI and HIV prevention counseling, which is directed at a person's risk, the situations in which risk occurs, and the use of personalized goal-setting strategies is a recommended approach. Videos with prevention messages and group counseling are also proven methods of providing information on STIs and reducing disease transmission. Risk reduction and prevention interventions should include, abstinence until treatment is completed, partner treatment, partner reduction and condom use.

Patients should be educated on the signs and symptoms, complications and treatment of STIs. Counselling should also focus on patients understanding of disease transmission to partner/spouse and discussing approaches to notify sexual partners. Related social issues such as risk of violence, stigma and discrimination and disclosure should be discussed. Patients should be empowered to take control of their lives and be responsible for disease prevention. Confidentiality remains overarching to the counselling process.

2.1 Primary Prevention Methods

Prevention can be categorized into Pre-exposure vaccination, the use of contraceptives, pre and post exposure prophylaxis and the reduction in possible exposure.

2.1.1 Pre-Exposure Vaccination

Vaccination is one of the most effective methods of preventing transmission of certain sexually transmitted infections. Human Papilloma Virus (HPV), Hepatitis A and Hepatitis B are all vaccine preventable infections.

HPV vaccination is recommended routinely for males and females ages 9 – 26 years and for certain adults between 27 and 45 years.

Hepatitis A vaccine is recommended for all adults who are unvaccinated, uninfected, sexually active with more than one partner or who are being evaluated or treated for an STI. Men who

have sex with men are at increased risk for HAV infection. People with HIV are at increased risk for severe disease from HAV infection.

Hepatitis B vaccine has been given routinely to all infants at birth, 2, 4 and 6 months since 2000 in Guyana. It is recommended for all unvaccinated, uninfected, sexually active adults.

2.1.2 Condoms

Male Condoms

When used consistently and correctly, external latex condoms, also known as male condoms, are effective in preventing the sexual transmission of HIV infection and consistent condom use reduces the risk for other STIs, including chlamydia, gonorrhea, hepatitis B, and trichomoniasis. In addition, consistent and correct use of latex condoms reduces the risk for HPV infection and HPV-associated diseases, genital herpes, syphilis, and chancroid when the infected area or site of potential exposure is covered.

By limiting lower genital tract infections, condoms also might reduce the risk for pelvic inflammatory disease (PID) among women.

Providers should advise that condoms must be used consistently and correctly to be effective in preventing STIs and HIV while noting that any condom use is better than no condom use. Providing instructions about the correct use of condoms can be useful. Communicating the following recommendations can help ensure that patients use external condoms correctly:

- Use a new condom with each sex act (i.e., oral, vaginal, and anal).
- Carefully handle the condom to avoid damaging it with fingernails, teeth, or other sharp objects.
- Put the condom on after the penis is erect and before any genital, oral, or anal contact with the partner.
- Use only water-based or silicone-based lubricants (e.g., K-Y Jelly) with latex condoms. Oil-based lubricants can weaken latex and should not be used; however, oil-based lubricants typically can be used with polyurethane or other synthetic condoms.
- Ensure adequate lubrication during vaginal and anal sex, which might require using exogenous water-based lubricants.
- Hold the condom firmly against the base of the penis during withdrawal and withdraw while the penis is still erect to prevent the condom from slipping off.

2.1.3 Female Condoms

Condoms for internal vaginal use, female condoms, can provide protection from acquiring and transmitting STIs, their efficacy when used in receptive anal intercourse is however, unknown.

Internal condoms are more costly compared with external condoms; however, they offer the advantage of being controlled by the receptive partner as an STI and HIV prevention method.

2.1.4 Cervical Diaphragms

Cervical diaphragms do protect against cervical gonorrhea, chlamydia, and trichomoniasis but should not be relied on as the sole source of protection against HIV and other STIs.

2.1.5 Topical Microbicides and Spermicides

Nonspecific topical microbicides are ineffective for preventing HIV infection.
Tenofovir gel has been studied for prevention of herpes simplex virus 2 (HSV-2) and HIV infections. Prevention of HIV infection, especially among women, was not seen.

Vaginal rings containing dapivirine have provided some reduction in HIV infection.

Spermicides containing nonoxynol-9 (N-9) might disrupt genital or rectal epithelium and have been associated with an increased risk for HIV infection. N-9 use also has been associated with an increased risk for bacterial urinary tract infections among women.

2.1.6 Nonbarrier Contraception, Female Surgical Sterilization, and Hysterectomy

Contraceptive methods that are not mechanical barriers offer no protection against HIV or other STIs.

Sexually active women who use contraceptive methods other than condoms should be counseled about STI and HIV infection prevention measures. These include pre-exposure prophylaxis (PrEP) and postexposure prophylaxis (PEP), limiting the number of sex partners, and correct and consistent use of condoms.

2.1.7 Emergency Contraception

Unprotected intercourse exposes women to risks for STIs and unplanned pregnancy. Providers should offer counseling about the option of emergency contraception if pregnancy is not desired.

2.1.8 Male Circumcision

Male circumcision reduces the risk for HIV infection and certain STIs among heterosexual men. Three randomized, controlled trials demonstrated that male circumcision reduces the risk for HIV acquisition among men by 50%–60% and was also protective against other STIs. No definitive data exist to determine whether male circumcision reduces HIV acquisition among MSM.

2.1.9 Pre-Exposure Prophylaxis For HIV (PrEP)

Daily oral antiretroviral PrEP with a fixed-dose combination of emtricitabine (FTC) and either tenofovir disoproxil fumarate (TDF) or tenofovir alafenamide (TAF) have demonstrated safety and a substantial reduction in the rate of HIV acquisition for MSM. TDF/FTC has demonstrated safety and efficacy for mixed-status heterosexual couples and heterosexual men and women; however, no evidence is yet available regarding TAF/ FTC among heterosexually active women. One clinical trial involving persons who inject drugs and one involving heterosexual mixed-status couples demonstrated substantial efficacy and safety of daily oral PrEP with TDF alone. High adherence to oral PrEP was strongly associated with protection from HIV infection. Studies with MSM have demonstrated that taking PrEP at specific times before and after sexual intercourse

(event-driven PrEP) was also effective in preventing HIV; this regimen has not been studied among other populations.
Among HIV-negative sexually active men and women, bacterial STIs are key indicators of risk for HIV acquisition. Sexually active adults and adolescents should be screened for STIs (e.g., chlamydia, gonorrhea, and syphilis) and persons at risk for HIV acquisition be offered PrEP.

Persons at risk for HIV acquisition include HIV-negative persons whose sexual partner or partners have HIV infection (especially if viral load is detectable or unknown), persons who have had gonorrhea or syphilis during the previous 6 months, and injecting drug users who share injection equipment.

Comprehensive clinical guidelines on prescribing and monitoring patients on PrEP are available for providers.

2.1.10 Pre-Exposure Prophylaxis for STI

Doxycycline prophylaxis has been examined for preventing bacterial STIs. In a pilot study with 30 MSM living with HIV with previous syphilis infections doxycycline 100 mg for 48 weeks demonstrated a 73% reduction in any bacterial STI at any site, without substantial differences in sexual behavior. Additional studies examining doxycycline prophylaxis are under way or in development.

2.1.11 Post-exposure Prophylaxis for HIV and STIs

HIV Post-Exposure Prophylaxis (PEP)

Persons who have had a non-occupational exposure to HIV should be evaluated for risk of HIV acquisition when presenting < 72 hours after exposure.
All persons being considered for nPEP should have a baseline HIV test before starting treatment. If test results are not available immediately or testing is not available and PEP is indicated, it should be initiated without delay.
Age-appropriate 3 -drug ARV regimens are recommended for nPEP.
Guidelines for prescribing nPEP are available to all providers.
Sexually active persons seeking HIV PEP should be evaluated for PrEP after completing their PEP course and testing negative for HIV. HIV PEP is also discussed elsewhere in these guidelines (see Sexual Assault and Abuse and STIs).
Genital hygiene methods (e.g., vaginal washing and douching) after sexual exposure are ineffective in protecting against HIV and STIs and might increase the risk for bacterial vaginosis (BV), certain STIs, and HIV infection.

STI Post Exposure Prophylaxis (PEP)

Doxycycline 200 mg taken within 24-72 hrs of condomless anal sex (doxy-PEP) has been studied among MSM and transgender women and the results demonstrated significant reduction in the incidence of chlamydia, gonorrhea and syphilis. It is important to note that current efficacy data only applies to gay and bisexual men and transgender women. Studies among heterosexual cis-gender women are ongoing.

Patients using doxy-PEP should be counselled about the potential adverse side-effects of doxycycline – phototoxicity, GI symptoms, and rarely, esophageal ulceration.
People using doxy-PEP should continue to be screened, tested and treated for bacterial STIs

2.1.12 HIV Treatment as Prevention: Antiretroviral Treatment of Persons with HIV to prevent HIV Among Partners

In HIV mixed-status heterosexual couples, treating the infected partner with ART decreases the risk for transmission to the uninfected partner by 96%. HIV infected patients on ART who maintain an undetectable viral load demonstrate no risk for transmitting HIV to their HIV-negative sex partners. Therefore, ART is not only beneficial to the health of persons with HIV infection, it also reduces the risk for transmission. For these reasons, ART should be offered to all persons with HIV infection to obtain viral suppression.

2.1.13 HIV Seroadaptive Strategies

Seroadaptive strategies for HIV prevention is practiced among serodiscordant couples within the MSM community. They include ***serosorting and seropositioning***. Serosorting includes limiting condomless anal sex to partners with the same HIV status as their own. In seropositioning the person with HIV infection is the receptive partner for anal intercourse. Observational studies have consistently reported that serosorting confers greater risk for HIV infection than consistent condom use but has lower risk compared with anal intercourse without a condom and without serosorting. Serosorting practices have been associated with increased risk for STIs, including chlamydia and gonorrhea.

Though practiced in the MSM community serosorting is not recommended for the following reasons: many MSM who have HIV infection do not know they have HIV, men's assumptions about the HIV status of their partners might be wrong, and some men with HIV infection might not disclose their HIV status. All of these factors increase the risk that serosorting can lead to HIV infection.

Abstinence and Reduction of Number of Sex Partners

Abstinence from oral, vaginal, and anal sex and participating in a long-term, mutually monogamous relationship with a partner known to be uninfected are prevention approaches to avoid transmission of STIs.

For persons who are being treated for an STI (or whose partners are undergoing treatment), counseling that encourages abstinence from sexual intercourse or condom use until completion of the entire course of medication is vital for preventing reinfection.

2.2 Partner Services:

The term “partner services” refers to a continuum of clinical evaluation, counseling, diagnostic testing, and treatment designed to increase the number of infected persons brought to treatment and to reduce transmission among sexual networks.

Treatment of patients’ sex partners can reduce the risk for reinfection and potentially diminishes transmission of STIs. Therefore, clinicians should encourage all persons with STIs to notify their sex partners and urge them to seek medical evaluation and treatment. They should be advised to bring their primary sex partner to the clinic so that both persons could be treated concurrently. Exceptions to this practice include circumstances posing a risk for intimate partner violence; because of the reported high prevalence of intimate partner violence in our general population, providers should consider this potential risk before notifying partners of persons and/or encouraging partner notification.

The responsibility for discussing the treatment of partners of persons with STIs rests with the diagnosing provider and the patient.

2.2.1 Expedited Partner Therapy (EPT)

Partners who are unable or unlikely to seek treatment, can benefit from Expedited Partner Therapy (EPT). EPT is the clinical practice of treating the sex partners of persons with diagnosed chlamydia or gonorrhea, who are unable or unlikely to seek timely treatment, by providing medications or prescriptions to the patient. Providing packaged medications is the preferred approach. All partners from the previous 60 days should be treated. If the patient has not had sex during the 60 days before diagnosis, providers should offer EPT for the patient’s most recent sex partner. Medication or prescriptions provided for EPT should be accompanied by educational materials for the partner, treatment instructions, warnings about taking medications (e.g., if the partner is pregnant or has an allergy to the medication), general health counseling, and a statement advising that the partner visit a clinic at the earliest opportunity for medical evaluation.

2.2.2 Reporting and Confidentiality

Accurate and timely reporting of STIs is integral to public health efforts in assessing morbidity trends, allocating limited resources, and assisting local health authorities with partner notification and treatment. STI and HIV/AIDS cases should be reported in accordance with national statutory requirements. Syphilis (including congenital syphilis), gonorrhea, chlamydia, chancroid, and HIV are reportable diseases in Guyana.

2.2.3 Retesting After Treatment to Detect Repeat Infections

Retesting 3 months after diagnosis of chlamydia, gonorrhea, or trichomoniasis can detect repeat infection and potentially can be used to enhance population-based prevention. Any person who has a positive test for chlamydia or gonorrhea, along with women who have a positive test for trichomonas, should be rescreened 3 months after treatment. Any person who receives a syphilis diagnosis should undergo follow-up serologic syphilis testing per current recommendations and follow-up testing for HIV.

3

Detection of STIs in Special Populations

3.1 Pregnant Women

Intrauterine or perinatally transmitted STIs can have debilitating effects on the expectant mother, her unborn child and her entire family.

All pregnant women and their sex partners should be asked about STIs, counseled about the possibility of perinatal infections, and provided access to recommended screening and treatment, if needed.

Screening Recommendations

Hepatitis B	All pregnant women should be routinely tested for hepatitis B surface antigen (HBsAg) at the first prenatal visit even if they have been previously vaccinated or tested. If positive they should be referred for counseling and clinical management. Women who test negative and are unvaccinated should be counseled and referred for Hepatitis B vaccination.
Hepatitis C	All women should be offered Hepatitis C screening at their first antenatal visit. If HCV antibody test is positive, HCV RNA should be offered. The small risk of perinatal transmission depends on the presence of maternal HCV RNA. All women who test positive should be referred to a clinician for treatment.

HIV	All pregnant women should be screened for HIV at their first antenatal visit, in the 2nd trimester and in the 3rd trimester if they have been exposed to HIV or have an ongoing risk of infection. Known HIV + women are the only exceptions to this. All pregnant women who test positive should be referred to a care and treatment site to start antiretroviral treatment.
Syphilis	All pregnant women should be screened for syphilis at their first prenatal visit, even if they have been tested previously. Testing in the third trimester and at delivery can prevent congenital syphilis cases. Partners of pregnant women with syphilis should be evaluated, tested, and treated. Pregnant women should be retested for syphilis at 28 weeks' gestation and at delivery if they are at risk for syphilis acquisition during pregnancy (e.g., iv drug user or has an STI during pregnancy, having multiple sex partners, having a new sex partner, or having a sex partner with an STI). Neonates should not be discharged from the hospital unless the syphilis serologic status of the mother has been determined at least once during pregnancy. Any woman who delivers a stillborn infant should be tested for syphilis.
Chlamydia	All pregnant women <25 years and those at risk *for chlamydia should be offered screening at their first ante natal visit. Pregnant women identified as having chlamydia should be treated immediately and have a test of cure to document chlamydial eradication by a nucleic acid amplification test (NAAT) 4 weeks after treatment. All persons diagnosed with a chlamydial infection should be rescreened 3 months after treatment.
Gonorrhea	All pregnant women aged <25 years as well as women aged ≥25 years at increased risk* for gonorrhea should be screened for *Neisseria gonorrhoeae* at the first prenatal visit. Pregnant women who remain at high risk for gonococcal infection also should be retested during the third trimester to prevent maternal postnatal complications and gonococcal infection in the neonate). Pregnant women testing positive for gonorrhea should be treated immediately. All persons diagnosed with gonorrhea should be rescreened 3 months after treatment.
Bacterial Vaginosis, Trichomonas, Genital Herpes, Human Papillomavirus (HPV)	Routine screening for Bacterial Vaginosis, Trichomonas, Genital Herpes and Human Papillomavirus is not recommended among asymptomatic pregnant women. If clinical suspicion arises screening and recommended treatment is advised.

*At increased risk = women with other STIs during pregnancy or women with a new sex partner or more than one sex partner women with a sex partner with concurrent partners, or women with a sex partner who has an STI or is exchanging sex for money or drugs

3.2 Adolescents

STI prevalence rates are highest among adolescents and young adults (15-24 years). Adolescents are unique in that both biologically and behaviorally they are at a higher risk to contract STIs than adults.

Behaviorally, they are more likely to engage in high-risk sexual behaviours, such as condomless sex, concurrent partners. Adolescents are also less likely to access sexual health services. The combination of these factors leads to a higher chance of exposure and a lower chance of diagnosis and treatment.

From a biological point of view, adolescent females are more susceptible to certain STIs, like Chlamydia Trachomatis and Human Papillomavirus, because of a lower production of cervical mucus and increased cervical ectopy.

Routine screening for common STIs is recommended for all sexually active adolescents. Recommendations for screening should be based on disease severity and sequelae and prevalence.

Screening Recommendations

Chlamydia	Annual screening for all females <25years and YMSM* Rectal and pharyngeal screening should be offered on the basis of sexual behaviour and anatomic site of exposure
Gonorrhea	Annual screening for all females <25years and YMSM* Rectal and pharyngeal screening should be offered on the basis of sexual behaviour and anatomic site of exposure
HIV Infection	HIV screening should be offered to all sexually active adolescents. Frequency of screening should be based on sexual behaviours. Adolescents who test positive should be counseled and linked to a care and treatment site. Adolescents who test negative should be counseled and offered PrEP.
Syphilis	Pregnant females and YMSM should be offered syphilis screening. Adolescents who test positive should be offered counseling and treatment.
Cervical Cancer	Cervical cancer screening should be offered to every sexually active female 25years and older.

Hepatitis B	Screening for unvaccinated adolescents and young adults. Vaccination should be offered to the unvaccinated.

Primary Prevention Recommendations

Primary prevention and education on recognizing symptoms of STIs should be a part of all adolescent health care visits.

1) HPV vaccination is recommended for males and females >10yrs to 26 years
2) HBV vaccination is recommended for those adolescents who may not have received the series in infancy.
3) HAV vaccination series should be offered to adolescents and young adults who are at increased risk of HAV infection eg. YMSM, all who use illegal drugs, the homeless.
4) Information regarding HIV transmission, prevention, testing, and implications of infection should be provided to all adolescents and young adults as part of routine health care.
5) HIV PrEP should be offered to adolescents and young adults who are HIV negative and are considered high risk for HIV infection. Indications for PrEP, initial and follow-up prescribing guidance, and laboratory testing recommendations are the same for adolescents and adults and are outlined in the National PrEP Guidelines.
6) Adolescents should receive counseling about the sexual behaviors that are associated with risk for acquiring STIs and should be educated on evidence-based prevention strategies, which include discussion abstinence and other risk-reduction behaviors (e.g., consistent and correct condom use and reduction in the number of sex partners including concurrent partners.
7) Educational materials (e.g., handouts, pamphlets, and videos) can reinforce office-based educational efforts.

3.3 Children

Management of children who have STIs requires close cooperation among clinicians, laboratorians, counselors and child-protection authorities. Official investigations, when indicated, should be initiated promptly.

Certain diseases (e.g., gonorrhea, syphilis, HIV, chlamydia, and trichomoniasis), if acquired after the neonatal period, strongly indicate sexual contact. For other diseases (e.g., HSV, HPV and anogenital warts, and vaginitis), the association with sexual contact is not as clear.

It is important to note that perinatally acquired genital infection with *T.vaginalis* and rectal and genital infection with *C.Trachomatis* can persist for up to 2-3 years. Genital warts in children are usually associated with child sexual abuse but they can also be found in children who have no other evidence of abuse. Bacterial Vaginosis has been diagnosed in both children who have been abused and those who have not.

Evaluating a Child for an STI

The decision to screen a child for an STI should be made based on a history of sexual abuse and a physical examination which supports the suspicion of abuse (bruising, tearing, genital discharge, foul odour).

Children who are diagnosed with one STI should be screened for others. For preverbal children or children who cannot verbalize the details of the assault, urogenital, oropharyngeal and rectal testing should be done.

Some factors that may lead a physician to request STI screening/testing for a child include:

1. The child has experienced penetration or has evidence of recent or healed penetrative injury to the genitals, oropharynx and/or rectum.
2. The child has signs or symptoms of an STI – vaginal discharge or pain, genital itching or odour, urinary symptoms or genital lesions or ulcers
3. The child or the parents request STI testing
4. The child is unable to verbalize the details of the assault
5. The child has been abused by a stranger or the child has been abused by an individual who is known to have an STI

If a child has symptoms, signs, or evidence of an infection that might be sexually transmitted, the child should be tested for common STIs before starting any treatment that might interfere with diagnosing other STIs.

Screening Recommendations

N. gonorrhoeae *and* C. trachomatis	Collect specimens from vagina, pharynx and rectum from girls. Cervical specimens are not recommended from prepubertal girls Collect specimens from pharynx, rectum and urine from boys. If urethral discharge is present a meatal specimen discharge is adequate. An intraurethral swab specimen is not necessary.
Trichomonas vaginalis	There is an overall low prevalence of T. vaginalis among children. Screening for T. vaginalis should not be limited to girls with vaginal discharge, as asymptomatic sexually abused children maybe infected False positives can occur, so it is recommended that specimens that are initially positive be confirmed.
HSV	Specimens for culture should be taken from all vesicular or ulcerative genital or perianal lesions
Treponema Pallidum	Presumptive diagnosis requires a nontreponemal and a treponemal test

HIV	All sexually abused children should be offered nPEP and tested for Acute HIV infection.
Hepatitis B	All unvaccinated or partially vaccinated abused children should be screened for HBV.

3.4 Men Who Have Sex with Men (MSM)

MSM comprise a diverse group in terms of behaviors, identities, and health care needs. The term "MSM" is used clinically to refer to sexual behavior alone, regardless of sexual orientation. Sexual orientation is independent of gender identity. Classification of MSM can vary in the inclusion of transgender men and women on the basis of whether men are defined by sex at birth or current gender identity. Therefore, sexual orientation as well as gender identity of individual persons and their sex partners should be obtained during health care visits.

MSM might be at increased risk for HIV and other STIs because of their sexual network or behavioral or biologic factors, including number of concurrent partners, condomless sex, anal sex, or substance use. These factors, along with sexual network or higher community disease prevalence, can increase the risk for STIs among MSM compared with other groups.

A detailed and comprehensive sexual history is the first step in identifying vulnerability and providing tailored care and treatment. Repeat syphilis and gonorrhea infections are common among MSM. Repeat syphilis infections may be associated with HIV infection. Repeat gonorrhea infections among MSM are more likely to show antimicrobial resistance when compared to other groups.

HIV Risk among MSM

MSM are disproportionately at risk for HIV infection. HIV, transmission occurs much more readily through receptive anal sex, compared with penile-vaginal sex. Similar to other STIs, multiple partners, anonymous partners, condomless sex, and substance use are all associated with HIV infection. Importantly, other STIs also might significantly increase the risk for HIV infection, eg. an estimated 10% of new HIV infections were attributable to chlamydial or gonococcal infection.

Clinical care involving MSM, including those who have HIV infection, should involve questions about their sexual behaviors and symptoms consistent with common STIs, including urethral discharge, dysuria, ulcers, rash, lymphadenopathy, and anorectal symptoms that might be consistent with proctitis (e.g., discharge, rectal bleeding, pain on defecation, or pain during anal sex) and routine STI testing.

In addition, clinicians should provide education and counseling regarding evidence-based safer-sex approaches that have demonstrated effectiveness in reducing STI incidence.

Screening Recommendations

STI screening among MSM has been reported to be suboptimal. Limited data exist regarding the optimal frequency of screening for gonorrhea, chlamydia, and syphilis among MSM. However evidence obtained from mathematical modeling in Australia and Canada has shown that quarterly screening for syphilis resulted in earlier identification and treatment of disease which in turn decreased transmission and ultimately prevalence among MSM.

In an MSM transmission model that explored the impact of HIV PrEP use on STI prevalence, quarterly chlamydia and gonorrhea screening was associated with an 83% reduction in incidence. Therefore, on the basis of available evidence, more frequent (quarterly) screening for gonorrhea, chlamydia, and syphilis for certain sexually active MSM can improve case finding, which can reduce the duration of infection at the population level, reduce ongoing transmission and, ultimately, prevalence among this population.

HIV	If status is unknown. If partner status is unknown.
Syphilis	Quarterly screening recommended Serologic testing is recommended to establish whether persons with reactive tests have untreated syphilis, have partially treated syphilis, or are manifesting a slow or inadequate serologic response to recommended previous therapy.
Gonorrhea	Quarterly or semiannual screening recommended. Test for urethral infection (men who have had insertive sex) Test for rectal infection (men who have had receptive sex) Test for pharyngeal infection (men who have had receptive oral sex)
Chlamydia	Quarterly or semiannual screening recommended Test for urethral infection (men who have had insertive sex) Test for rectal infection (men who have had receptive sex)
Hepatitis B Virus	Screen with HBsAg, HBV core antibody, and HBV surface antibody testing to detect HBV infection. Vaccination against HBV is recommended for all MSM for whom previous infection or vaccination cannot be documented. Serologic testing can be considered before vaccination if patient's vaccination history is unknown.
Hepatitis C Virus	All adults should be screened at least once for HCV HIV+ MSM should be screened annually. Screening with HCV antibody assays followed by HCV RNA testing to confirm positive antibody test.

	Suspicion for acute HCV infection (e.g., clinical evidence of hepatitis and risk behaviors) should prompt consideration for HCV RNA testing, despite a negative antibody test.
Human Papilloma Virus	HPV infection and associated conditions (e.g., anogenital warts and anal squamous intraepithelial lesions) are highly prevalent among MSM. The HPV vaccination is recommended for all men, including MSM and transgender persons or immunocompromised males, including those with HIV infection.
Herpes Simplex Virus	Clinical diagnosis of genital herpes should be confirmed by type-specific virologic testing from the lesion by culture

Pre Exposure Prophylaxis for HIV Prevention (PrEP)

PrEP is the use of medications for preventing an infection before exposure. Studies have demonstrated that a daily oral medication TDF/FTC is effective in preventing HIV acquisition, and specifically among MSM. PrEP guidelines provide information regarding which sexually active persons are at substantial risk for acquiring HIV infection and information regarding daily PrEP use with either TDF/FTC (men or women) or tenofovir alafenamide and emtricitabine for MSM.

Screening for bacterial STIs should occur at least every 6 months for all sexually active patients and every 3 months among MSM or among patients with ongoing risk behaviors. MSM taking PrEP might compensate for decreased HIV acquisition risk by using condoms less frequently or modifying their behavior in other ways, although data regarding this behavior are inconsistent. Studies have reported that MSM taking PrEP have high rates of STIs, and frequent screening is warranted.

3.5 Women Who Have Sex with Women (WSW)

WSW are a diverse group with variations in sexual identity, practices, and risk behaviors. Studies indicate that certain WSW, particularly adolescents, young women might be at increased risk for STIs and HIV on the basis of reported risk behaviors.

Few data are available regarding the risk for STIs conferred by sex between women; however, transmission risk probably varies by the specific STI and sexual practice (e.g., oral-genital sex; vaginal or anal sex using hands, fingers, or penetrative sex items; and oral-anal sex).

Testing of WSW depends on history, the clinical picture and identified risk factors. Routine cervical cancer screening and the human papillomavirus (HPV) vaccine should be offered to all women.

Screening Recommendations

Trichomonas Vaginalis	Relatively common among WSW. Screen routinely
Bacterial Vaginosis	Common among WSW. Screen if symptomatic
Hepatitis B Virus	Screen all women. Offer vaccination if not already vaccinated
Syphilis	Can be transmitted between WSW Screen if symptomatic
C. Tracheomatis	Screen if has had a male partner within last 6 months
N. Gonorrhea	Woman to woman transmission uncommon
Human Papilloma Virus	Offer HPV vaccine if unvaccinated

Sexually active women are at risk for acquiring bacterial, viral, and protozoal STIs from current and previous partners, both male and female. WSW should not be presumed to be at low or no risk for STIs on the basis of their sexual orientation. Report of same-sex behavior among women should not deter providers from considering and performing screening for STIs and cervical cancer. Effective screening requires that care providers and their female patients engage in a comprehensive and open discussion of sexual and behavioral risks that extends beyond sexual identity.

3.6 Transgender and Gender Diverse People:

Trans and gender diverse people are people whose gender is different from that which was presumed for them at birth. Transgender persons often experience high rates of stigma and socioeconomic and structural barriers to care that negatively affect health care usage and increase susceptibility to HIV and STIs.

Transgender women are women who were assigned male sex at birth (born with male anatomy).

Transgender men are men who were assigned female sex at birth (i.e., born with female anatomy).

Gender nonbinary are persons who identify outside the gender binary of male or female or move back and forth between different gender identities and use such terms as "*gender nonbinary," "genderqueer," or "gender fluid"* to describe themselves.

"**Agender**" or "**null gender**" are persons who do not identify with having any gender.

"Cisgender" are persons who identify with their assigned sex at birth.

Clinicians should create a welcoming environment that facilitate disclosure of gender identity and sexual orientation. By asking transgender persons for their choice of terminology or modifying language (e.g., asking patients their gender pronouns) to be used during clinic visits and history taking and examination, clinicians can improve the experience of sexual health screening and counseling for transgender persons. Health care providers should take a comprehensive sexual history, including a discussion of STI screening, HIV PrEP and PEP, behavioral health, and social determinants of sexual health.

Options for fertility preservation, pregnancy potential, and contraception options should also be discussed, if indicated.

Screening Recommendations

Health Care providers should remain aware of symptoms consistent with common STIs and screen for asymptomatic infections on the basis of the patient's sexual practices and anatomy.

1) Screen annually for *C. trachomatis* and *N. gonorrhoea* in all sexually active females aged <25 years._This should include transgender men and nonbinary persons with a cervix.
2) HIV screening should be discussed and offered to all transgender persons.
3) Annual STI screening (Syphilis, HCV, Urogenital and extragenital screening for Gonorrhea and Chlamydia) for Transgender persons with HIV infection who have sex with cisgender men and transgender women
4) Transgender women who have had vaginoplasty surgery should undergo routine STI screening for all exposed sites (e.g., oral, anal, or vaginal).
5) Transgender men who have undergone metoidioplasty surgery with urethral lengthening and have not had a vaginectomy, assessment of genital bacterial STIs should include a cervical swab because a urine specimen will be inadequate for detecting cervical infections.
6) Cervical cancer screening for transgender men and nonbinary persons with a cervix should occur annually.

3.7 Persons in Correctional Facilities

Multiple studies have demonstrated that persons entering correctional facilities have a high prevalence of STIs, HIV and Viral hepatitis. Risk behaviors for acquiring STIs (e.g., having condomless sex, having multiple sex partners, substance misuse, and engaging in commercial, survival, or coerced sex) are common among incarcerated populations. It is vital to address and treat STIs in correctional facilities.

Screening Recommendations

Chlamydia	Females aged <35 and Males< 30years on admission to facility.
Gonorrhea	Females < 35 years and Males <30 years on admission
Trichomonas	Females <35 years on admission.

Syphilis	Screening for all persons on admission
HIV	Screen all persons on admission *
Viral Hepatitis	Screen for HAV. HBV and Hepatitis C. Offer: vaccination for HAV and HBV to those persons who test negative and have not been previously vaccinated
Cervical Cancer	Women and Transgender Men should be offered cervical cancer screening as per the National Guidelines.

**For those persons who test positive for HIV, treatment should be started according to the National HIV Guidelines. For those persons considered to be at risk for HIV infection and being released into the community, starting HIV PrEP or providing linkage to an HIV PrEP site should be considered.*

4

Management of the Patient with a Sexually Transmitted Infection

The patient with a sexually transmitted infection needs to be evaluated thoroughly in order to be given a correct diagnosis, receive treatment, reduce infectiveness and reduce the risk of developing complications from the STI.

4.1 Evaluation and Management of the STI Patient

The steps to a comprehensive evaluation and management of the patient are outlined below:

1) A detailed medical and sexual history – including history of prior STIs and treatment received
2) Behavioral Assessment /Risk Assessment – including substance use
3) A physical examination – including examination of the reproductive system
4) Laboratory testing based on history and physical
5) Establishing a diagnosis – using syndromic management or based on laboratory results
6) Appropriate and effective treatment
7) Patient education about the infection, the treatment and any side effects, and risk reduction strategies.including promotion or provision of preventive interventions
8) Encouragement to notify sex partners
9) Clinical follow up.

4.2 History Taking and Risk Assessment

History taking is a key element of the evaluation of a person with an STI. In order for the patient to feel comfortable discussing their symptoms and sexual history freely the health care provider should ensure there is adequate privacy and that their approach is non-judgmental and non-discriminatory.

A comprehensive history should include:

Past Medical and Sexual History:

- Past medical history should examine any allergies to medications, co-morbid diseases, previous hospitalization, immunizations, blood transfusions and surgeries. A social history of alcohol and drug use, incarceration and domestic violence is also important. For women

information on their menstrual cycle, number of pregnancies and last Pap smear is also needed

- Sexual history should include questions on type of sex partner(s), whether regular or casual, whether sex is transactional. The patient should be asked about present and past sexual contacts and their sexual practices and whether condoms were used consistently.

Presenting Complaints

Chief complaint and any accompanying complaints should be explored. Details should include the duration of the symptoms, presence of discharge, colour and/or odour of discharge. Any accompanying rash or itching. The use of any previous treatment should be detailed.

Risk Assessment

Risk should be assessed based on the "5 P Risk Assessment"

Physical Examination

Once the history has been taken, the physical examination is the next step. The patient should be given information on the examination and consent to proceed must be obtained. Any examination of the anogenital area should be conducted in the presence of a chaperone, unless it is not possible because of staff shortages.

All physical examinations should be conducted in privacy and in a room with good lighting. A modesty sheet/blanket should be provided to cover the person in preparation for the examination. The physical exam must include a general examination which looks for manifestations of STIs outside the anogenital area; such as lymphadenopathy, cutaneous manifestations including nodes, and abdominal abnormalities, especially for women with PID.

Anogenital Examination for female patients should include observation and Inspection of external genitalia area taking note of any discharge, lesions, such as warts, condylomata lata and excoriations on the vulva.

Inspection of the labia and the urethral opening for any lesions or discharge. A digital exam and a speculum exam should also be performed

Anogenital Examination for male patients should include checking the external genitals, including the perianal area, and taking note of any lesions, including warts or discharge. The penis and scrotum should be examined for signs of tenderness, swelling, rashes, warts or sores. The glans penis and urethral meatus should be checked for lesions and discharge.

4.3 Establishing a Diagnosis:

Ideally, everyone presenting with a condition assumed to be an STI should be diagnosed through a process of obtaining a medical and sexual history, physical examination and laboratory testing of relevant specimens from either the lesion, blood or urine.

However, in many parts of the world, and especially in those countries with the highest STI burden, this process is not possible because of a lack of inexpensive diagnostic tests, In the absence of diagnostic tests, a syndrome-based approach to managing people with STIs has been developed by the WHO and adopted in many countries. The approach is based on identifying consistent groups of symptoms and easily recognized signs (syndromes) and providing treatment for most of or the most serious organisms responsible for producing the syndrome. The syndromic approach, generally, has high sensitivity at the expense of specificity, thus resulting in overtreatment.

4.4 Patient Education and Counseling

Health education is the provision of accurate and evidence-informed information about STIs so that the patient becomes knowledgeable about the subject and can make informed choices. Counselling is a two-way interaction between patients and provider intended to help the patients to better understand their feelings, attitudes, values and beliefs and to empower them to make changes for a healthier life.

The key messages to give to a person seeking care for STIs is how the infection may have been contracted, how to prevent future infections and the importance of completing a course of treatment and abstaining from further sexual intercourse until treatment has been completed and the infection has been controlled or cured. If abstinence from sex is not possible patients should be advised to use condoms.

Follow up

People diagnosed with STIs should be provided with same day treatment, the results of diagnostic tests should not delay the provision of treatment. Giving treatment during the same visit reduces infectiousness and breaks the chain of transmission. It also prevents STI-related complications and long-term sequalae.

If effective medicines are given and test results are available on the same visit, then follow-up may be restricted only to those with persistent symptoms after completion of treatment. This will reduce costs for the patient as many times patients do not return because of distances to the clinic and transport fees.

4.5 Partner Notification

Partner notification is important in breaking the chain of transmission and preventing reinfection. There are many approaches to partner notification and treatment– contact tracing, provider referral patient notification, expedited partner therapy. Regardless of which method of partner notification and treatment is followed, confidentiality, non-judgmental attitudes and absence of coercion must be observed.

5

Diseases Characterized By Genital, Anal or Perianal Ulcers

The majority of young, sexually active patients who have genital, anal, or perianal ulcers have either genital herpes or syphilis, however, genital herpes is the more prevalent causative agent. Less common infectious causes of genital, anal, or perianal ulcers include Chlamydia Trachomatis, and H. ducreyi. Genital herpes, syphilis, chlamydia, gonorrhea, and chancroid have been associated with an increased risk for HIV acquisition and transmission.

Genital, anal, or perianal lesions can also be associated with infectious and noninfectious conditions that are not sexually transmitted (e.g., yeast, trauma, carcinoma, aphthae or Bechet's disease, fixed drug eruption, or psoriasis).

Clinical diagnosis of genital, anal and perianal ulcers is often inaccurate, particularly in settings where several aetiologies are common. Moreover, clinical manifestations and patterns of ulcers may be further altered in the presence of HIV infection. Diagnosis is often inadequate when based solely on history and physical examination.

Table 2: Differential Diagnosis of Genital, Anal and Perianal Ulcers

Condition	Organism	Painful Lesion	Lymphadenopathy	# of Lesions
Herpes	HSV-1 or 2	Yes	Yes	More likely multiple (clusters), rather than one
Syphilis	Treponema Pallidum	No	Yes	More likely one rather than multiple
Chancroid	H. ducreyi	Yes	Yes (suppurative)	One or more

Granuloma Inguinale (Donavanosis)	Klebsiella granulaomatis	No	No	One
Lymphogranuloma Venerem (LGV)	C. trachomatis serovars L1, L2 or L3	Yes	Yes (may suppurate)	Often transient and unnoticed

5.1 Genital Herpes

Genital herpes is a chronic, lifelong viral infection. Two types of HSV can cause genital herpes: HSV-1 and HSV-2. Most cases of recurrent genital herpes are caused by HSV-2, however, an increasing proportion of anogenital herpetic infections have been attributed to HSV-1 which is especially prominent among young women and MSM.

Most persons infected with HSV-2 have mild or unrecognized infections but shed virus intermittently in the anogenital area. Therefore, most genital herpes infections are transmitted by persons unaware that they have the infection or who are asymptomatic. Management of genital HSV should also address the chronic nature of the infection and not only focus on treating acute episodes of genital lesions.

5.1.1 Clinical Presentation

First-episode Genital Herpes infections are those in which the person does not have a previous history of genital herpes, and they are often associated with systemic and local symptoms of fever, headache, malaise and myalgia, usually in the first 3–4 days. Locally, there may be pain, itching, dysuria, vaginal or urethral discharge and tender inguinal lymphadenopathy. Among both men and women with primary genital HSV infection, the presentation is with blistering or ulcerative lesions on the external genitalia. The lesions may start as papules (pimples) or vesicles (blisters), which spread rapidly over the genital area. The lesions may last up to 15–20 days until crusting and/or healing. Crusting does not occur on mucosal surfaces. The first episode can be ***primary genital herpes***, in which the person is seronegative for HSV antibodies, occurring after an incubation period of within 5–14 days of sexual contact.

Initial episodes of genital herpes refer to individuals who have the lesions for the first time but already have antibodies to HSV-2, indicating past asymptomatic acquisition of HSV-2. Although this would be the person's first recognized episode, it would not indicate recent acquisition.

Recurrent genital herpes tends to have more localized symptoms of itching, recurrent ulcers and mild pain, and the duration of the episode averages between four and five days but may be as along as 12-15 days.

5.1.2 Diagnosis

Clinical diagnosis of genital herpes can be difficult because the self-limited, recurrent, painful, and vesicular or ulcerative lesions classically associated with HSV are absent in many infected

persons at the time of clinical evaluation. If genital lesions are present, clinical diagnosis of genital herpes should be confirmed by type-specific virologic testing from the lesion by NAAT or culture. Type-specific serologic tests can be used to aid in the diagnosis of HSV infection in the absence of genital lesions.

HSV-2 genital herpes infection increases the risk for acquiring HIV twofold to threefold; therefore, all persons with genital herpes should be tested for HIV.

5.1.3 Virologic Tests

HSV NAAT assays are the most sensitive tests because they detect HSV from genital ulcers or other mucocutaneous lesions; these tests vary in sensitivity from 90.9% to 100%; however, they are considered highly specific.

PCR is also the test of choice for diagnosing HSV infections affecting the central nervous system (CNS) and systemic infections (e.g., meningitis, encephalitis, and neonatal herpes).

The sensitivity of viral culture is low, especially for recurrent lesions, and decreases rapidly as lesions begin to heal.

Type-Specific Serologic Tests

Both type-specific and type-common antibodies to HSV develop during the first weeks after infection and persist indefinitely. The majority of available, accurate type-specific HSV serologic assays are based on the HSV-specific glycoprotein G2 (gG2) (HSV-2) and glycoprotein G1 (gG1) (HSV-1). Type-common antibody tests do not distinguish between HSV-1 and HSV-2.

The sensitivity of glycoprotein G type-specific tests for detecting HSV-2 antibody varies from 80% to 98%; false-negative results might be more frequent at early stages of infection.

In cases of recent suspected HSV-2 infecction, repeat type-specific antibody testing 12 weeks after the presumed time of acquisition is indicated. Since almost all HSV-2 infections are sexually acquired, presence of type-specific HSV-2 antibody implies anogenital infection. The presence of HSV-1 antibody alone is more difficult to interpret.

HSV-1 serologic testing does not distinguish between oral and genital infection and typically should not be performed for diagnosing genital HSV-1 infection. Persons with HSV-1 antibodies often have oral HSV infection acquired during childhood, which might be asymptomatic.

Lack of symptoms in a person who is HSV-1 seropositive does not distinguish anogenital from orolabial or cutaneous infection, and, regardless of site of infection, these persons remain at risk for acquiring HSV-2. Diagnosis of HSV-1 infection is confirmed by virologic tests from genital lesions.

Type-specific HSV-2 serologic assays for diagnosing HSV-2 are useful in:

- recurrent or atypical genital symptoms

- lesions with a negative HSV PCR or culture result
- clinical diagnosis of genital herpes without laboratory confirmation
- a patient's partner has genital herpes.

HSV-2 serologic screening among the general population is not recommended.
Patients who are at higher risk for infection (e.g., those presenting for an STI evaluation, especially for persons with ≥10 lifetime sex partners, and persons with HIV infection) might need to be assessed for a history of genital herpes symptoms, followed by type-specific HSV serologic assays to diagnose genital herpes for those with genital symptoms.

5.1.4 Genital Herpes Management

Antiviral medication offers clinical benefits to symptomatic patients and is the mainstay of management. The goals of treatment are to treat or prevent symptomatic genital herpes recurrences and improve quality of life and suppress the virus to prevent transmission to sexual partners. Counseling regarding the natural history of genital herpes, risks for sexual and perinatal transmission, and methods for reducing transmission is also integral to clinical management.

5.1.4.1 Initial Episode

Systemic antiviral drugs neither eradicate latent virus nor affect the risk, frequency, or severity of recurrences after the drug is discontinued. Topical therapy with antiviral drugs offers minimal clinical benefit and is discouraged.

Table 3: First Clinical Episode of Genital Herpes

Recommended Regimens*:
Acyclovir** 400mg orally 3 times/day for 7-10 days
Famciclovir 250 mg orally 3 times/day for 7-10 days
Valacyclovir 1 g orally 2 times/day for 7-10 days.

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

*Treatment can be extended if healing is incomplete after 10 days of therapy.
**Acyclovir 200 mg orally five times/day is also effective but is not recommended because of the frequency of dosing.

5.1.4.2 Recurrent HSV-2 Genital Herpes

Episodic Treatment

Episodic treatment of recurrent herpes is most effective if therapy is initiated within 1 day of lesion onset or during the prodrome that precedes some outbreaks.

Table 4 : Recommended Regimens for Episodic Therapy for Recurrent HSV-2 Genital Herpes*

Acyclovir 800 mg orally 2 times/day for 5 days OR
Acyclovir 800 mg orally 3 times/day for 2 days OR
Famciclovir 1 gm orally 2 times/day for 1 day OR
Famciclovir 500 mg once, followed by 250 mg 2 times/day for 2 days OR **Famciclovir** 125 mg 2 times/day for 5 days OR
Valacyclovir 500 mg orally 2 times/day for 3 days OR
Valacyclovir 1 gm orally once daily for 5 days

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

*Acyclovir 400 mg orally 3 times/day is also effective, but are not recommended because of the frequency of dosing.

Suppressive Therapy

Suppressive therapy reduces frequency of genital herpes recurrences by 70%–80% among patients who have frequent recurrences, it also has the additional advantage of decreasing the risk for transmitting HSV-2 genital herpes to susceptible partners.

Table 5: Suppressive Therapy

Recommended Regimens
Acyclovir 400 mg orally 2 times/day OR
Valacyclovir 500 mg orally once a day* OR
Valacyclovir 1 gm orally once a day OR
Famciclovir 250 mg orally 2 times/day

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

*Valacyclovir 500 mg once a day might be less effective than other valacyclovir or acyclovir dosing regimens for persons who have frequent recurrences (i.e., ≥10 episodes/year).

5.1.4.3 Recurrent HSV-1 Genital Herpes

Recurrences of HSV-1 genital herpes are less frequent after the first episode of HSV-1 genital herpes when compared to HSV-2 genital herpes, and genital shedding rapidly decreases during the first year of infection. Because of the decreased risk for recurrences and shedding, suppressive therapy for HSV-1 genital herpes should be reserved for those with frequent recurrences through shared clinical decision-making between the patient and the provider.

5.1.4.4 Severe Disease

Intravenous treatment and hospitalization is necessary for patients with severe HSV disease or complications (disseminated disease, pneumonitis, hepatitis) or CNS complications (meningitis, encephalitis).

HSV-2 meningitis is a rare complication of HSV-2 genital herpes which affects women more than men. Clinical symptoms of HSV-2 meningitis are signs of headache, photophobia, fever, meningismus, and cerebrospinal fluid (CSF) lymphocytic pleocytosis, accompanied by mildly elevated protein and normal glucose.

Table 6: Recommended Regimen For Severe Disease

Acyclovir (IV): 5-10mg/kg iv every 8 hrs until clinical improvement followed by
Acyclovir po 400mg every 8 hrs to complete 10-14 days of total therapy

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

Table 7: Recommended Regimen for HSV Meningitis/Encephalitis

Acyclovir (IV): 5-10mg/kg iv every 8 hrs until clinical improvement followed by
Valacyclovir po 1g every 8 hrs to complete 10-14 days of total therapy.

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

For patients with previous episodes of documented HSV-2 meningitis, oral valacyclovir may be used for the entire course during episodes of recurrent HSV-2 meningitis.
HSV Encephalitis requires a longer course (14–21 days) of IV therapy.

Hepatitis

Hepatitis is a rare manifestation of disseminated HSV infection, often reported among pregnant women who acquire HSV during pregnancy. HSV hepatitis is associated with fulminant liver failure and high mortality (25%). Therefore, a high index of suspicion for HSV is necessary, for any pregnant woman in any trimester who presents with fever and hepatitis (elevated transaminases) with or without skin lesions and empiric IV acyclovir should be initiated pending confirmation of any laboratory tests.

5.1.5 Management of Sex Partners

The sex partners of persons who have symptomatic genital herpes should be evaluated and counseled. Symptomatic sex partners should be treated in the same manner as patients who have symptomatic genital herpes. Asymptomatic sex partners should be asked about a history of genital symptoms and offered type-specific serologic testing for HSV-2.

5.1.6 Special Considerations

HIV Infection:

Lesions caused by HSV are common among persons with HIV infection and might be severe, painful, and atypical. Episodes of infection can be severe and prolonged. HSV shedding is increased among persons with HIV infection. Though ART reduces the severity and frequency of symptomatic genital herpes, frequent subclinical shedding still occurs. HSV-2 type-specific serologic testing can be considered for persons with HIV infection during their initial evaluation, particularly among those with a history of genital symptoms indicative of HSV infection.

Recommended therapy for first-episode genital herpes is the same as for persons without HIV infection, although treatment courses might need to be extended. The risk for GUD increases during the first 6 months after starting ART, especially among persons who have a $CD4^+$ T-cell count <200 cell/mm^3. Suppressive antiviral therapy reduces the risk for GUD among this population and can be continued for 6 months after ART initiation when the risk for GUD returns to baseline levels.

Table 8: Recommended Regimens for Daily Suppressive Therapy among Persons with HIV

Recommended Regimens for Daily Suppressive Therapy among Persons with HIV
• Acyclovir: 400-800 mg orally 2-3 times daily **OR** • Famciclovir: 500mg orally 2 times daily **OR** • Valacyclovir: 500mg orally 2 times daily

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

Table 9 : Recommended Regimens for Episodic Infection among Persons with HIV

Recommended Regimens for Episodic Infection among Persons with HIV
• Acyclovir : 400mg orally 3 times daily for 5-10 days **OR** • Famciclovir: 500mg orally 2 times daily for 5-10 days **OR** • Valacyclovir: 1g orally 2 times daily for 5-10 days

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

Antiviral-Resistant HSV Infection

If lesions persist or recur in a patient receiving antiviral treatment, acyclovir resistance should be suspected. If viral culture is possible then, it should be obtained for phenotypic sensitivity testing. All acyclovir-resistant strains are also resistant to valacyclovir, and the majority are resistant to famciclovir.

Foscarnet (40–80 mg/kg body weight IV every 8 hours until clinical resolution is attained) is the treatment of choice for acyclovir-resistant genital herpes. Cidofovir 5 mg/kg body weight IV once weekly might also be effective.

Foscarnet and cidofovir are nephrotoxic medications that require intensive laboratory monitoring and infectious disease specialist consultation.

Imiquimod 5% applied to the lesion for 8 hours 3 times/week until clinical resolution is an alternative that has been reported to be effective. Topical cidofovir gel 1% can be applied to lesions 2–4 times daily (cidofovir must be compounded at a pharmacy.)

Prevention of antiviral resistance remains challenging especially among persons with HIV infection. Experience with another group of immunocompromised persons showed that persons receiving daily suppressive antiviral therapy were less likely to experience acyclovir-resistant HSV infection compared with those who received episodic therapy for outbreaks.

5.2 Chancroid

Chancroid prevalence has declined worldwide, although infection might still occur in certain African regions and the Caribbean. Chancroid is a risk factor in HIV transmission and acquisition.

5.2.1 Diagnosis

The diagnosis of Chancroid is made on the basis of clinical symptoms and the exclusion of recent T.pallidum and HSV-1 and 2 infection. A definitive diagnosis of chancroid requires identifying H. ducreyi on special culture media that is not widely available from commercial sources. For both clinical and surveillance purposes, a probable diagnosis of chancroid can be made if all of the following four criteria are met:

1. the patient has one or more painful genital ulcers
2. the clinical presentation, appearance of genital ulcers and, if present, regional lymphadenopathy are typical for chancroid (inguinal lymphadenopathy occurs in <50% of cases)
3. the patient has no evidence of *T. pallidum* infection by darkfield examination or NAAT or by serologic tests for syphilis performed at least 7–14 days after onset of ulcers
4. HSV-1 or HSV-2 testing is negative.

5.2.2 Treatment

Successful antimicrobial treatment for chancroid cures the infection, resolves the clinical symptoms, and prevents transmission to others. In advanced cases, genital scarring and rectal or urogenital fistulas from suppurative buboes can result despite successful treatment.

Table 10: Treatment Regimens for Chancroid

Recommended Regimens
• Azithromycin 1g orally in a single dose OR • Ceftriaxone 250mg IM in a single dose OR • Ciprofloxacin 500mg orally 2 times daily for 3 days OR • Erythromycin Base 500 mg orally 3 times daily for 7 days

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

Other Treatment Considerations

Men who are uncircumcised and persons with HIV infection do not respond as well to treatment as persons who are circumcised or are HIV negative (*430*). Patients should be tested for HIV at the time chancroid is diagnosed. If the initial HIV test results were negative, the provider can consider the benefits of offering more frequent testing and HIV PrEP to persons at increased risk for HIV infection.

5.2.3 Follow-Up

Patients should be reexamined 3–7 days after therapy initiation. With successful treatment, ulcers usually improve symptomatically within 3 days and objectively within 7 days. If no clinical improvement is evident, the clinician should consider whether another STI is present, the patient has HIV infection, non-adherence to treatment, or the *H. ducreyi* strain causing the infection is resistant to the prescribed antimicrobial.

The time required for complete healing depends on the size of the ulcer; large ulcers might require >2 weeks. In addition, healing can be slower for uncircumcised men who have ulcers under the foreskin. Clinical resolution of fluctuant lymphadenopathy is slower than that of ulcers and might require needle aspiration or incision and drainage, despite otherwise successful therapy.

5.2.4 Management of Sex Partners

Sex partners of patients with chancroid should be examined and treated if they had sexual contact with the patient during the 10 days preceding the patient's symptom onset.

5.2.5 Special Considerations

Pregnancy

No adverse effects of chancroid on pregnancy outcome have been reported. Ciprofloxacin should be avoided in breast feeding mothers.

HIV Infection

Persons with HIV infection who have chancroid infection should be monitored closely because they are more likely to experience chancroid treatment failure and to have ulcers that heal slowly. Repeated or longer courses of therapy maybe required, and treatment failures can occur with any regimen. Data are limited concerning the therapeutic efficacy of the recommended single-dose azithromycin and ceftriaxone regimens among persons with HIV infection.

Children

H. ducreyi is recognized as a major cause of nonsexually transmitted cutaneous ulcers among children in tropical regions. Acquisition of a lower-extremity ulcer attributable to *H. ducreyi* in a child without genital ulcers should not be considered evidence of sexual abuse. However chancroid ulcers in the genital or perineal region of a child is highly suspicious of sexual abuse.

5.3 Granuloma Inguinale (Donovanosis)

Granuloma inguinale (donovanosis) is a genital ulcerative disease caused by the intracellular gram-negative bacterium *Klebsiella granulomatis* (formerly known as *Calymmatobacterium granulomatis*).

Clinically, the disease is characterized as painless, slowly progressive ulcerative lesions on the genitals or perineum without regional lymphadenopathy; subcutaneous granulomas (pseudobuboes) also might occur. The lesions are highly vascular (i.e., beefy red appearance) and can bleed.

Extragenital infection can occur with infection extension to the pelvis, or it can disseminate to intra-abdominal organs, bones, or the mouth. The lesions also can develop secondary bacterial infection and can coexist with other sexually transmitted pathogens.

5.3.1 Diagnosis

The causative organism of granuloma inguinale is difficult to culture, and diagnosis requires visualization of dark-staining Donovan bodies on tissue crush preparation or biopsy. No FDA-cleared molecular tests for the detection of *K. granulomatis* DNA exist.

Table 11: Recommended Regimens for the Treatment of Granuloma Inguinal

Recommended Regimen	Alternative Regimen
• Azithromycin 1g orally weekly **OR** 500 mg daily for >3 weeks and until all lesions have healed completely	• Doxycycline 100mg orally twice daily for at least 3 weeks and until all lesions have healed completely **OR** • Erythromycin Base 500 mg orally 4x/day for at least 3 weeks and until all lesions have healed completely **OR** • Trimethoprim – Sulfamethoxazole 960mg (180mg/800mg) twice daily for at least 3 weeks and until all lesions have healed

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

5.3.2 Treatment

The addition of another antibiotic to these regimens can be considered if improvement is not evident within the first few days of therapy.

5.3.3 Follow-Up

Patients should be followed clinically until signs and symptoms resolve. All persons treated for granuloma inguinale should be offered an HIV test.

5.3.4 Management of Sex Partners

Persons who have had sexual contact with a patient who has granuloma inguinale within the 60 days before onset of the patient's symptoms should be examined and offered therapy. The value of empiric therapy in the absence of clinical signs and symptoms has not been established.

5.3.5 Special Considerations

Pregnancy

Pregnant and lactating women with granuloma inguinale should be treated with a macrolide regimen (erythromycin or azithromycin). Use of doxycycline in pregnancy might be associated with discoloration of teeth. It is safe while breast feeding.

Sulfonamides can be associated with neonatal kernicterus among those with glucose-6-phospate dehydrogenase deficiency and should be avoided during the third trimester and while breastfeeding.

HIV Infection

Treatment regimens are the same for persons with granuloma inguinale and HIV infection as those who do not have HIV.

5.4 Lymphogranuloma Venereum (LGV)

LGV is caused by *Chlamydia trachomatis* serovars L1, L2, or L3. LGV can cause severe inflammation and invasive infection. Clinical manifestations of LGV can include GUD, lymphadenopathy or proctocolitis. Proctocolitis is the most common presentation of LGV infection and can mimic inflammatory bowel disease with clinical findings of mucoid or hemorrhagic rectal discharge, anal pain, constipation, fever, or tenesmus. LGV proctocolitis can be an invasive, systemic infection and, if it is not treated early, can lead to chronic colorectal fistulas and strictures. Rectal LGV can also be asymptomatic.

A common clinical manifestation of LGV among heterosexuals is tender inguinal or femoral lymphadenopathy, typically unilateral. LGV-associated lymphadenopathy can be severe, with bubo formation from fluctuant or suppurative inguinal or femoral lymphadenopathy. Oral ulceration can occur and might be associated with cervical adenopathy.
Persons with genital or colorectal LGV lesions can also experience secondary bacterial infection or can be infected with other sexually and nonsexually transmitted pathogens.

5.4.1 Diagnosis

A definitive LGV diagnosis can be made only with LGV-specific molecular testing (e.g., PCR-based genotyping). However, these tests are not widely available. Therefore, diagnosis is based on clinical suspicion, epidemiologic information, along with exclusion of other etiologies for proctocolitis, inguinal lymphadenopathy, or genital, oral, or rectal ulcers. A Lymph node specimen can be tested for chlamydia by culture, direct immunofluorescence or nucleic acid detection. Chlamydia serology (compliment fixation titres >1:64) can support the diagnosis of LGV. Severe symptoms of proctocolitis (e.g., bloody discharge, tenesmus, and rectal ulcers) indicate LGV. A rectal Gram stain with >10 white blood cells (WBCs) has also been associated with rectal LGV. Chlamydia serology should not be used routinely as a diagnostic tool for LGV because the utility of these serologic methods has not been established.

5.4.2 Treatment

Patients with clinical signs and symptoms of LGV should be treated presumptively at the time of presentation. LGV signs and symptoms include, symptoms or signs of proctocolitis (e.g., bloody discharge, tenesmus, or ulceration); severe inguinal lymphadenopathy with bubo formation, a genital ulcer (if other etiologies have been ruled out). The goal of treatment is to cure infection and prevent ongoing tissue damage, although tissue reaction to the infection can result in scarring. Buboes might require aspiration through intact skin or incision and drainage to prevent formation of inguinal or femoral ulcerations.

Table 12: Treatment Regimens for LGV

Recommended Regimen for LGV	Alternative Regimens for LGV
Doxycycline 100 mg orally 2 times/day for 21 days	Azithromycin 1 gm orally once weekly for 3 weeks* OR Erythromycin base 500 mg orally 4 times/day for 21 days

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

*Because this regimen has not been validated, a test of cure with *C. trachomatis* NAAT 4 weeks after completion of treatment can be considered.

Longer courses of therapy might be required in the setting of fistulas, buboes, and other forms of severe disease.

5.4.3 Follow - Up

Patients should be followed clinically until signs and symptoms have resolved. Patients should be retested for Chlamydia between 3-12 months after initial treatment.
Persons who receive an LGV diagnosis should be tested for other STIs, especially HIV, gonorrhea, and syphilis. HIV PrEP should be offered to those who test negative for HIV.

5.4.4 Management of Sex Partners

Persons who have had sexual contact with a patient who has LGV within the 60 days before onset of the patient's symptoms should be evaluated, examined, and tested for chlamydial infection, depending on anatomic site of exposure. Asymptomatic partners should be presumptively treated with a chlamydia regimen (doxycycline 100 mg orally 2 times/day for 7 days).

5.4.5 Special Considerations

Pregnancy

Use of doxycycline in pregnancy might be associated with discoloration of teeth; however, the risk is not well defined. Doxycycline is compatible with breastfeeding. Azithromycin might prove useful for LGV treatment during pregnancy, at a presumptive dose of 1 g weekly for 3 weeks. Pregnant and lactating women with LGV can be treated with erythromycin, although this regimen is associated with frequent gastrointestinal side effects.

Pregnant women treated for LGV should have a test of cure performed 4 weeks after the initial *C. trachomatis* NAAT-positive test.

HIV Infection

Persons with LGV and HIV infection should receive the same regimens as those who do not have HIV. Prolonged therapy might be required because a delay in resolution of symptoms might occur

5.5 Syphilis

Syphilis is a systemic disease caused by the spirochaete Treponema pallidum. The infection can be classified as **congenital** or **acquired**. **Congenital syphilis** is transmitted from mother to child in utero. Acquired syphilis, from sexual contact or blood transfusion,is divided into **early** and **late** syphilis. Early syphilis comprises the primary, secondary and early latent stages – syphilis of less than two years from acquisition of infection. Late syphilis refers to late latent syphilis, gummatous, nervous system and cardiovascular syphilis.

5.5.1 Stages of Syphilis

The stages of syphilis are based on the clinical findings and guide the treatment and follow-up.

1. **Primary syphilis** infection (i.e., ulcers or chancre at the infection site). that develops after an incubation period of about three weeks, (9-90 days). The lesions are minimally tender or nontender and may have characteristic indurated edges with a clean base. Regional lymph nodes may be felt within the first week. The mouth and anus must also be examined for ulcers. Ulcers heal even without treatment after some 2–10 weeks.
2. **Secondary syphilis**- Secondary syphilis sets in about six weeks to six months after infection. The manifestations may be more disseminated, including the classic palmar/plantar rash or a desquamating rash of the palms and soles; a papular squamous eruption that may be generalized on the body; alopecia; iritis; condyloma lata; and generalized lymphadenopathy. Rash may resemble pityriasis rosea, guttate psoriasis, and drug- or viral eruptions. Can also be presented as neurologic deficit—hearing loss, vision loss, or neuropathy. Liver irritation with a raised ALT/AST may also occur.
3. **Tertiary syphilis** (i.e., cardiac, gummatous lesions, tabes dorsalis, and general paresis), but not neurosyphilis (normal Cerebro-spinal fluid- CSF)
4. **Latent Syphilis** is characterized by sero-reactivity without other evidence of primary, secondary, or tertiary disease (i.e., those lacking clinical manifestations).
    - **Early latent syphilis** – that is syphilis acquired within the preceding year. May present without any obvious clinical signs but serological findings may be elevated. Diagnosis of early latent syphilis is made if, during the year preceding the diagnosis, the patient had 1) a documented seroconversion or a sustained (>2 week) fourfold or greater increase in nontreponemal test titers; 2) unequivocal symptoms of primary or secondary syphilis; or 3) a sex partner documented to have primary, secondary, or early latent syphilis.
    - **Late latent syphilis** – is having syphilis for more than a year or syphilis of unknown duration.
5. **Neurosyphilis** occurs at any stage when *T. pallidum* infects the central nervous system. Syphilitic uveitis or other ocular manifestations (e.g., neuroretinitis and optic neuritis) can be associated with neurosyphilis. A CSF examination should be performed in all instances of ocular syphilis. Manifestations of neurosyphilis are catergorised as early or

late neurological manifestations. Early neurologic manifestations (i.e., cranial nerve dysfunction, meningitis, stroke, acute altered mental status, and auditory or ophthalmic abnormalities) are usually present within the first few months or years of infection. Late neurologic manifestations (i.e., tabes dorsalis and general paresis) occur 10– 30 years after infection.

5.5.2 Diagnosis

Types of laboratory tests

1. Diagnosis of early syphilis- Dark field examination for *T. pallidum* in lesion exudate or tissue. The test is however less reliable in examining rectal and non-penile genital lesions and not suitable for examining oral lesions due to commensal treponemes.
2. Serological Tests - A presumptive diagnosis of syphilis is possible with the use of two types of serological tests:
    - Non-treponemal antibody testing that includes Venereal Disease Reference Laboratory (VDRL) and Rapid Plasma Reagin (RPR).
    - Treponemal tests that include Fluorescent treponemal antibody abosorbed (FTA-ABS) test, *T. pallidum* passive particle agglutination (TP-PA) assay, Treponema Pallidum Hemaglutination Assay (TPHA), Various Enzymes Immunoassays EIAs, Chemiluminescence immunoassays, Immunoblots and Rapid Treponemal Assays.

To correctly diagnose syphilis, more than one type of serological test must be used because each test has its own limitations. For example, false positive non-treponemal test results can occur with various medical conditions, this includes other infections (e.g. HIV), autoimmune conditions, immunizations, pregnancy, injection drug use and older age. Therefore, persons with a reactive nontreponemal test should always receive a treponemal test to confirm the diagnosis of syphilis. Laboratory monitoring of patients is critical in understanding response to treatment. This is best done using a combination of treponemal- (TPHA) and non-treponemal tests (VDRL and RPR). Nontreponemal antibody titres usually correlate with disease activity and are used to help determine the stage of the infection, monitor treatment response, and assess reinfection. A fourfold titre decrease in non-treponemal test (e.g., from 1:16–1:4 or from 1:32–1:8) is indicative of a positive treatment response. The non-treponemal tests, VDRL and RPR are equally valid assays, but quantitative results from the two tests cannot be compared directly because RPR titres are often slightly higher than VDRL titres. Because of this, it is important to compare the same non-treponemal test when determining treatment response for a patient.

VDRL or RPR tests are often negative in late syphilis but this does not exclude the need for treatment. Other treponemal infections, such as yaws or pinta, may give positive serogical test results for syphilis although the RPR or VDRL result is usually of low titre (1:8). Because it is not possible to exclude latent syphilis in this situation, it is recommended that these patients be managed as though they have syphilis.

Treponemal tests, once reactive, usually remain reactive for life regardless of treatment, although some cases will sero-revert if the patient is treated during the primary stage.

Serofast refers to situation where patients, despite undergoing effective treatment for syphilis, continue to have a reactive non-treponemal test, usually with a VDRL or RPR titre of <1:4. They are then considered to be in a serofast state and can remain so for the rest of their lives and do not require any further treatment. Regardless of the stage of syphilis, in serofast patients, annual serological monitoring for a period of 5 years is required. High-risk patients should undergo periodic serological monitoring every 3–6 months to monitor possible reinfections.

In suspected neurosyphilis cases, CSF-VDRL test is the standard serologic test for diagnosis.

5.5.3 Treatment

Penicillin G administered parenterally is the preferred drug for treating persons in all stages of syphilis.

Table 13: Treatment of Syphillis:

Stage of Syphilis	Recommended Treatment (Adults)	Alternative (penicillin allergy)	Retreatment
Primary and Secondary Syphilis	**Benzathine penicillin G** 2.4 million units IM in a single dose	Doxycycline 100mg bid 14 days **OR** Tetracycline 500mg qid 14 days **OR** Ceftriaxone 1-2g IM or IV for 10 to 14 days **OR** Azithromycin 2g single dose. (must not be used in MSM, HIV or pregnancy).	Treatment failure or reinfection- Persistence or reoccurrence of signs and symptoms, plus at least a fourfold increase in nontreponemal test titer persisting for >2 weeks **Benzathine penicillin G 2.4 million units IM for 3 weeks**
Early Latent Syphilis	**Benzathine penicillin G** 2.4 million units IM in a single dose	Doxycycline 100mg bid 28 days **OR** Tetracycline 500mg qid 28 days	A CSF examination should be performed if 1) a sustained (>2 weeks) fourfold increase or greater in titer is observed, 2) an initially high titer (≥1:32) fails to decline at least fourfold within 12–24 months of therapy, or 3) signs or symptoms attributable to syphilis develop **Benzathine penicillin G** 2.4 million units IM in a single dose

Late Latent Syphilis	**Benzathine penicillin G** 7.2 million units total, administered as 3 doses of 2.4 million units IM each weekly for 3 weeks		
Tertiary Syphilis (gummas and cardiovascular syphilis) with normal CSF*	**Benzathine penicillin G** 7.2 million units total, administered as 3 doses of 2.4 million units IM each at 1-week intervals		
Neurosyphilis and Ocular Syphilis	**Aqueous crystalline penicillin G** 18–24 million units per day, administered as 3–4 million units IV every 4 hours or continuous infusion, for 10–14 day **OR** **Procaine Penicillin G** 2.4 million units IM once dailyfor 10-14 days **PLUS** **Probenecid** 500mgs orally four times a day for 10-14 days	Ceftriaxone 2g daily either IM or IV for 10-14 days.	Consider retreatment if the cell count has not decreased after 6 months, or if the CSF cell count or protein is not normal after 2 years.

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

General Notes

*A CSF evaluation should be done to rule our neurosyphilis prior to starting treatment.
Patients with more than 14 days interval between doses- consider repeating the full course. Alternative regimens recommended in cases of penicillin allergy of the non-pregnant adult should have close serological and clinical monitoring, especially for HIV positive persons

There is no alternative regimen to penicillin is available for the treatment of neurosyphilis, congenital syphilis and syphilis in pregnant women.

5.5.4 Other Management Considerations

Jarisch-Herxheimer Reaction

The Jarisch-Herxheimer reaction is an acute febrile reaction frequently accompanied by headache, myalgia, and fever that can occur within the first 24 hours of any syphilis therapy; it is

a reaction to treatment and not an allergic reaction to penicillin. It occurs most frequently among persons who have early syphilis, presumably because bacterial loads are higher during these stages. Patients should be informed about this possible adverse reaction and how to manage it if it occurs. Antipyretics can be used to manage symptoms; however, they do not prevent this reaction. The Jarisch-Herxheimer reaction might induce early labor or cause fetal distress in pregnant women; however, this should not prevent or delay therapy.

Treatment of Sex partners

Persons who have had sexual contact with a person who receives a diagnosis of primary, secondary, or early latent syphilis <90 days before the diagnosis should be treated presumptively for early syphilis, even if serologic test results are negative.

Persons who have had sexual contact with a person who receives a diagnosis of primary, secondary, or early latent syphilis >90 days before the diagnosis should only be treated presumptively for early syphilis if serologic test results are not available. If testing is available and serologic tests are negative, no treatment is needed. If serologic tests are positive, treatment should be based on clinical and serologic evaluation and syphilis stage.

5.5.5 Follow-up and monitoring

Patients with primary and secondary syphilis

- Follow up testing at 3 months, 6 months, and 1 year after treatment.
- Treatment Failure or Reinfection- Persistence or reoccurrence of signs and symptoms, plus at least a fourfold increase in nontreponemal test titer persisting for >2 weeks is a likely indication of treatment failure or re-infection. Failure of nontreponemal test titers to decline fourfold within 6–12 months after therapy for primary or secondary syphilis may also be indicative of treatment failure. This can also be attributed to the person's stage of syphilis (earlier stages are more likely to decline fourfold and become negative) and initial nontreponemal antibody titers (lower titers are less likely to decline fourfold than higher titers). In these cases retreat and reevaluate for HIV infection.

Patients with latent syphilis

- Follow up nontreponemal serologic tests should be repeated at 6, 12, and 24 months.
- A CSF examination should be performed if 1) a sustained (>2 weeks) fourfold increase or greater in titer is observed, 2) an initially high titer (≥1:32) fails to decline at least fourfold within 12–24 months of therapy, or 3) signs or symptoms attributable to syphilis develop.
- Patients with CSF abnormalities should be treated for neurosyphilis.
- Patients with no negative CSF findings, a retreat for latent syphilis.

Patients with tertiary syphilis

- Follow-up test at 6 months and 1 year after treatment, then yearly for 5 years if they remain serofast above non-reactive post-treatment

Patients with Neurosyphilis

- In cases where CSF pleocytosis was present initially, repeat CSF examination every 6 months until the cell count is normal.
- Consider retreatment if the cell count has not decreased after 6 months, or if the CSF cell count or protein is not normal after 2 years.

All persons with syphilis infection should be tested for **HIV infection**.

5.5.6 Syphilis among people with HIV infection

Interpretation of treponemal and nontreponemal serologic tests for persons with HIV infection is the same as for persons without HIV. Neurosyphilis, ocular syphilis, and otosyphilis should be considered in the differential diagnosis of neurologic, ocular, and other signs and symptoms among persons with HIV infection.

Treatment

Persons with HIV infection who have early syphilis might be at increased risk for neurologic complications and might have higher rates of inadequate serologic response with recommended regimens.

Table 14: Treatment for Persons with HIV infection

Stage of Syphilis	Recommended Regimen	Alternative Regimen	Retreatment
Primary and Secondary Syphilis	Benzathine penicillin G, 2.4 million units IM in a single dose	Doxycycline 100mg bid 14 days OR Tetracycline 500mg qid 14 days OR Ceftriaxone 1-2g IM or IV for 10 to 14days	Treatment failure or reinfection- Persistence or reoccurrence of signs and symptoms, plus at least a fourfold increase in nontreponemal test titer persisting for >2 weeks Benzathine penicillin G 2.4 million units IM for 3 weeks
Early Latent Syphilis	Benzathine penicillin G, 2.4 million units IM in a single dose	Doxycycline 100mg bid 28 days OR Tetracycline 500mg qid 28 days	
Late Latent Syphilis	Benzathine penicillin G, 7.2 million units total, administered as 3 doses of 2.4 million units IM weekly for 3 weeks		

Tertiary Syphilis	Benzathine penicillin G 7.2 million units total, administered as 3 doses of 2.4 million units IM weekly for 3 weeks		
Neuro and Ocular Syphilis	Aqueous crystalline penicillin G 18–24 million units per day, administered as 3–4 million units IV every 4 hours or continuous infusion, for 10–14 day OR Procaine Penicillin G 2.4 million units IM once dailyfor 10-14 days PLUS Probenecid 500mgs orally four times a day for 10-14 days	Ceftriaxone 2g daily either IM or IV for 10-14 days.	Consider retreatment if the cell count has not decreased after 6 months, or if the CSF cell count or protein is not normal after 2 years.

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

Additional Considerations

Antiretroviral therapy as per current guidelines might improve clinical outcomes in persons with HIV infection and syphilis. CSF abnormalities (e.g., mononuclear pleocytosis and elevated protein levels) are common in persons with HIV infection. The clinical and prognostic significance is unknown. All patients with HIV infection and primary or secondary syphilis should be evaluated clinically and serologically for treatment failure at 3, 6, 9, 12, and 24 months after therapy. Consider CSF examination and retreatment for patients whose nontreponemal test titers do not decrease fourfold within 12–24 months of therapy.

5.6 Management of Persons with Penicillin Allergy

Penicillin and other ß-lactam antibiotics have a crucial role in treating STIs. Penicillin is recommended for all clinical stages of syphilis, and remains the drug of choice for treating neurosyphilis, congenital syphilis, or syphilis during pregnancy.

Patients are often incorrectly labeled as allergic to penicillin because of the imprecise use of the term “allergy” by families and clinicians and lack of clarity to differentiate between immunoglobulin E (IgE)-mediated hypersensitivity reactions, drug intolerances, and other reactions that can occur days after exposure.

Penicillin allergy triggers an immunoglobulin E (IgE)-mediated response which results in immediate reactions (within minutes to one hour), which manifest as signs and symptoms of acute anaphylaxis such as urticaria, flushing, dyspnea, bronchospasm with wheezing, angioedema, hypotension, tachycardia, mental status change or gastrointestinal (GI) upset.

A person who reports a penicillin allergy, must be evaluated based on:

1. A thorough medical history, including exposure to penicillin.
2. A skin test evaluation using penicillin minor and major determinants.
3. And for those with a negative skin test, an observed oral challenge with 250 mg amoxicillin before proceeding directly to treatment with the indicated ß-lactam therapy.

Skin Testing for Penicillin Allergy should be performed:

1. For persons who have a history of penicillin-related IgE mediated reactions (anaphylaxis, asthma etc).
2. For persons to definitively rule out penicillin allergy

A person with a negative skin test should follow up with an oral challenge to confirm the negative status.

Skin Testing for Penicillin Allergy should NOT be performed on:

1. Persons with a history of severe adverse cutaneous reaction (e.g., Stevens-Johnson syndrome or toxic epidermal necrolysis) and other severe non-IgE-mediated reactions (e.g., interstitial nephritis, and hemolytic anemia).
2. Persons with high-risk symptom histories (e.g., anaphylaxis within the previous 10 years)

Penicillin and any other ß-lactam antibiotics should be avoided indefinitely among patients in both these groups

High-risk symptom histories include development of the following after penicillin or ß-lactam administration: anaphylaxis within 6 hours or severe adverse cutaneous reaction (e.g., eosinophilia and systemic symptoms, Stevens-Johnson syndrome, toxic epidermal necrolysis, or acute generalized exanthematous pustulosis), and other severe non-IgE-mediated reactions (e.g., kidney or hepatic injury, hemolytic anemia, or thrombocytopenia).

6

Diseases Characterized by Urethritis and Cervicitis

6.1 Urethritis

Urethritis or urethral inflammation can be caused by either infectious or noninfectious conditions. Characteristically men present with dysuria, urethral pruritis, and mucoid, mucopurulent, or purulent discharge. The most common causes of infectious urethritis are *N. gonorrhoeae*, *C. trachomatis*, *M. genitalium* and *T.vaginalis . to lesser extent HSV, EBV and adenovirus .*

6.1.1 Diagnosis

Nucleic Acid Amplification Testing (NAAT) is the current gold standard for detecting *C.Trachomatis ,and N.gonorrhoeae.* A first catch urine specimen or urethral swab can be used. NAAT offers the best method for detecting M. genitalium from a first-catch urine in men, and has the highest sensitivity of all methods for detecting *T. vaginalis.*

- Point of Care Testing (POC): Gram stain, Gentian Violet (GV) and Methylene Blue (MB) are POC diagnostic tests used to evaluate urethritis. They are highly sensitive and specific for documenting both urethritis and the presence or absence of gonococcal infection.
    - Presumed gonococcal infection is established by documenting the presence of WBCs containing Gram Negative Intracellular Diplococci (GNID) in Gram stain or intracellular purple diplococci in MB or GV smears.
    - If no intracellular gram-negative or purple diplococci are present, men should receive NAATs for *C. trachomatis* and *N. gonorrhoeae* and can be managed for NGU as recommended (see Nongonococcal Urethritis).
    - Gram stain of urethral secretions that demonstrate ≥2 WBCs per oil immersion field.
- Positive leukocyte esterase test on first-void urine or microscopic examination of sediment from a spun first-void urine demonstrating ≥10 WBCs/HPF

6.1.2 Treatment

Ideally, treatment should be pathogen based; however, diagnostic information might not be immediately available. Presumptive treatment should be initiated at diagnosis.

Table 15: Treatment options for Cervicitis/ Urethritis

Organism	First Line option	Alternative option
N.Gonorrheae	Ceftriaxone 500mg im in a single dose + Azithromycin 1g orally in a single dose	Cefixime 400mg orally in a single dose + Azithromycin 1g orally in a single dose
C.Trachomatis	Doxycycline 100 mg, orally, twice daily for seven days (to be given only if gonorrhoea therapy did not include Azithromycin	Azithromycin 1 gram, orally, single dose or Erythromycin 500 mg, orally, 4 times a day for 7 days or Ofloxacin 200–400 mg, orally, twice a day for 7 days. (to be given only if gonorrhoea therapy did not include azithromycin
Treatment for Recurrent or persistent symptoms		
M.genitalium	Azithromycin 500 mg, orally on day 1, 250 mg daily on days 2–5	
T.vaginalis	Metronidazole 2 grams, orally, single doses	Metronidazole 400 or 500 mg, twice daily for 7 days

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

6.1.3 Other management considerations for Urethral Discharge

Counsel to abstain from sexual intercourse until patient and partner(s) have been adequately treated (i.e., for 7 days after single-dose therapy or until completion of a 7-day regimen and symptoms resolved).

Advise patients to return for reevaluation should symptoms persist and repeat testing after 3 months.

Evaluate, test and presumptively treat persons who have had sexual contact with the patient during the 60 days preceding the onset of symptoms. If the last sexual intercourse was >60 days before onset of symptoms or diagnosis, the most recent sex partner should be treated.
Test for other STIs including HIV. Offer PrEP for HIV for those who test negative.

6.2 Cervicitis

Cervicitis is an irritation or infection of the cervix. Cervicitis frequently is asymptomatic; however, certain women might report an abnormal vaginal discharge and intermenstrual vaginal bleeding (e.g., especially after sexual intercourse). Several women may have lower abdominal pain because of ascending infection, causing pelvic inflammatory disease

Two major diagnostic signs characterize cervicitis: 1) a purulent or mucopurulent endocervical exudate visible in the endocervical canal or on an endocervical swab specimen (commonly referred to as mucopurulent cervicitis), and 2) sustained endocervical bleeding easily induced by gentle passage of a cotton swab through the cervical os. Either or both signs might be present.

C. trachomatis or *N. gonorrhoeae* is the most common etiology of cervicitis defined by diagnostic testing. Trichomoniasis, genital herpes (especially primary HSV-2 infection), or *M. genitalium* also have been associated with cervicitis. However, in many cases of cervicitis, no organism is isolated, especially among women at relatively low risk for recent acquisition of these STIs (e.g., women aged >30 years).

The majority of persistent cases of cervicitis are not caused by reinfection with *C. trachomatis* or *N. gonorrhoeae;* other factors might be involved (e.g., persistent abnormality of vaginal flora, *M. genitalium,* douching or exposure to other types of chemical irritants, dysplasia, or idiopathic inflammation in the zone of ectopy).

6.2.1 Diagnosis

Speculum examination

A normal-looking cervix may be seen in the presence of endocervical infection. For those with abnormalities, the cervix may be erythematous or severely eroded and associated with a muco-purulent cervical discharge. The cervix may be friable and bleed easily on contact.

Microscopy

The presence of intracellular gram-negative diplococci in polymorphonuclear leukocytes in Gram-stained smears from the cervix are considered positive to presumptively diagnose gonorrhea in women.

Molecular detection

Molecular testing has become the recommended gold standard technology to diagnose and screen populations for C. trachomatis and N. gonorrhoeae. Among women, a vulvovaginal specimen, (self-collected), can be used for testing for these infections.

Culture methods

Processing C. trachomatis for culture is complex, laborious and time-consuming to be of economic value. It is rarely performed nowadays except for special purposes. Culture for N. gonorrhoeae requires a special culture medium with nutrient supplementation for the organism to grow. The process is still necessary to undertake antimicrobial susceptibility testing to guide

therapy, especially in cases of infection with N. gonorrhoeae isolates resistant to standard recommended therapies.

Diagnostic Considerations

Women with cervicitis should be evaluated for concomitant BV and Trichomoniasis. Because cervicitis might be a sign of upper genital tract infection (e.g., endometritis), women should also be assessed for signs of PID and tested for *C. trachomatis* and *N. gonorrhoeae* on vaginal, cervical and urine samples.

6.2.2 Treatment

Women < 25 years, women with a new sex partner, or a sex partner with concurrent partners, or a partner with an STI are considered to be at increased risk and should be treated presumptively for *C. trachomatis and N. gonorrheae.* Trichomoniasis and BV should be treated if detected. For women at lower risk for STIs, deferring treatment until results of diagnostic tests are available is an option.

To minimize transmission and reinfection, women treated for cervicitis should be instructed to abstain from sexual intercourse until they and their partners have been treated (i.e., until completion of a 7-day regimen or for 7 days after single-dose therapy) and symptoms have resolved.

Women who receive a cervicitis diagnosis should be tested for syphilis and HIV in addition to other recommended diagnostic tests. Women with cervicitis and HIV infection should receive the same treatment regimen as those who do not have HIV.

Treatment Regimen for Cervicitis

Though Ceftriaxone only is recommended for the treatment of uncomplicated gonococcal infections in the United States, in settings in which local antimicrobial resistance data are not available, the WHO STI guidelines suggest dual therapy for gonorrhoea.

Table 16: Treatment Regimens for Cervicitis

	Preferred Regimen	*Alternative Regimen*
N. gonorrhoeaea N	Ceftriaxone 500 mg, intramuscularly, single dose for persons < 150kg*¶ PLUS Azithromycin 1 gram, orally, single dose	Cefixime 800 mg, orally, single dose PLUS Azithromycin 1 gram, orally, single dose
C. trachomatis	Doxycycline 100 mg, orally, twice daily for 7 days	Azithromycin 1 gram, orally, single dose OR Erythromycin 500 mg, orally, 4 times a day for 7 days OR

	(to be given only if gonorrhoea therapy did not include azithromycin)	Ofloxacin 200–400 mg, orally, twice daily for 7 days (to be given only if gonorrhoea therapy did not include azithromycin)
M. genitalium	If Macrolide sensitive: Doxycycline 100g orally 2x/daily for 7 days PLUS Azithromycin 1g orally day 1, then 500 mg daily for 3 days If Macrolide Resistant or Resistance testing is not available. Doxycycline 100g orally 2x/daily for 7 days PLUS Moxifloxacin 400mg orally once daily for 7 days PLUS	

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

For persons weighing ≥150 kg, 1 g ceftriaxone intramuscularly in a single dose.* ¶ ***If cephalosporin allergy:* ***Gentamicin*** *240 mg IM in a single dose PLUS* ***Azithromycin*** *2 g orally in a single dose*

6.2.3 Follow-Up

Women receiving treatment should return to their provider for a follow-up visit to determine whether cervicitis has resolved. Women with a specific diagnosis of chlamydia, gonorrhea, or trichomoniasis should be offered partner services and instructed to return in 3 months after treatment for repeat testing. If symptoms persist or recur, women should be instructed to return for reevaluation.

6.2.4 Management of Sex Partners

All sex partners during the previous 60 days should be referred for evaluation, testing, and presumptive treatment if chlamydia, gonorrhea, or trichomoniasis was identified. EPT and other effective partner referral strategies are alternative approaches for treating male partners of women who have chlamydial or gonococcal infection (see Partner Services). To avoid reinfection, sex partners should abstain from sexual intercourse until they and their partners are treated.

6.2.5 Persistent or Recurrent Cervicitis

Women with persistent or recurrent cervicitis despite antimicrobial therapy should be reevaluated for possible reexposure or treatment failure. For women with persistent symptoms that are clearly attributable to cervicitis, referral to a gynecologic specialist can be considered for evaluation of noninfectious causes (e.g., cervical dysplasia or polyps).

6.2.6 Other Gonococcal infections in adults and adolescents

Gonococcal infection is a common cause of urethral infections in men, cervical infections and pelvic inflammatory disease in women. *These are discussed in the relevant sections*.
Gonococcal infections in adults and adolescents can also manifest in other areas and include:

- Infection of the pharynx
- Gonococcal conjunctivitis
- Disseminated gonococcal infection (DGI)

    Manifests as disseminated diseases with petechial or pustular acral skin lesions, asymmetric polyarthralgia, tenosynovitis, or oligoarticular septic arthritis.
    Rarely, DGI is complicated by perihepatitis which can be associated with gonococcal PID, endocarditis or meningitis.

Diagnosis

Culture, NAAT, and POC NAAT, such as GeneXpert, are available for detecting genitourinary infection with N. gonorrhoeae; culture requires endocervical or urethral swab specimens. Culture is also available for detecting rectal, oropharyngeal, and conjunctival gonococcal infection.

Gram stain has high specificity (>99%) and sensitivity (>95%). A Gram stain of urethral secretions that demonstrates polymorphonuclear leukocytes with intracellular Gram negative diplococci can be considered diagnostic for infection with N. gonorrhoeae in symptomatic men. Because of lower sensitivity, a negative Gram stain should not be considered sufficient for ruling out infection in asymptomatic men.

Infection detection by using Gram stain of endocervical, pharyngeal, and rectal specimens also is insensitive and is not recommended. MB or GV stain of urethral secretions is an alternative POC diagnostic test with performance characteristics similar to Gram stain. Gonococcal infection is diagnosed among symptomatic men by documenting the presence of a WBC-containing intracellular purple diplococci in MB or GV smears.

6.2.7 Antimicrobial-Resistant N. gonorrhoeae

Gonorrhea treatment is complicated by the ability of N. gonorrhoeae to develop resistance to antimicrobials. The epidemiology of antimicrobial resistance guides decisions about gonococcal treatment recommendations and has evolved because of shifts in antimicrobial resistance patterns, such as the discontinuation of fluroquinolones as treatment for gonorrohea in 2007 and the removal of Cefixime as first-line therapy in 2010. Since 2013 there has been a gradual increase in resistance to Azithromycin to *N. gonorrhoeae*; it has also been demonstrated in *M.genitalium* and such enteric pathogens as *Shigella* and *Campylobacter* and there are

concerns regarding azithromycin treatment efficacy for chlamydia . Consequently only Ceftriaxone is recommended for treatment of gonorrhea in the United States.

Table 17 Treatment Regimens for Other Gonococcal Infections

Uncomplicated Gonococcal Infection of the Pharynx	Ceftriaxone 500 mg* IM in a single dose for persons weighing <150 kg If Chlamydial infection is present: Add Doxycycline 100mg orally 2x daily for 7 days	
Gonococcal Conjunctivitis	Ceftriaxone 1g im in a single dose	
Gonococcal related Arthritis and Arthritis-Dermatitis Syndrome	Ceftriaxone 1g im/iv every 24 hrs** If Chlamydia infection cannot be excluded, ADD Doxycline 100mg orally 2x/day for 7 days	Cefotaxime 1 g by IV every 8 hours OR Ceftizoxime 1 g every 8 hours If Chlamydia infection cannot be excluded, ADD Doxycline 100mg orally 2x/day for 7 days
Gonococcal Meningitis and Endocarditis	Ceftriaxone 1-2g iv every 12-24 hrs *** If Chlamydia infection cannot be excluded ADD Doxycline 100mg orally 2x/day for 7 days	

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

*For persons weighing ≥150 kg, 1 g ceftriaxone should be administered.
**The patient can be switched to an oral agent guided 24–48 hours after substantial clinical improvement, for a total treatment course of at least 7 days.
*** Length of treatment for DGI should be determined based on clinical presentation. Therapy for meningitis should be continued with recommended parenteral therapy for 10–14 days. Parenteral antimicrobial therapy for endocarditis should be administered for >4 weeks. Treatment of gonococcal perihepatitis should be managed in accordance with the recommendations for PID.

6.2.8 Management of Sex Partners:

Patients with gonococcal infections should be asked to refer partners with whom they have had sexual contact during the previous 60 days for evaluation, testing, and presumptive treatment.

7

Diseases Characterized by Vulvovaginal Itching, Burning, Irritation, Odour or Discharge

Most women will have a vaginal infection, with discharge, itching, burning, or odor, during their lifetime. Symptomatic women will often use complementary and alternative therapies and over-the-counter medications for candidiasis before or in addition to an evaluation by a medical provider.

A careful history (including questions regarding sexual behaviours, vaginal hygiene practices and self- treatment), examination, and laboratory testing to determine the etiology of any vaginal symptoms are necessary to make a diagnosis of vaginitis. The infections most frequently associated with vaginal symptoms are

- BV (Bacterial Vaginosis
- Trichomoniasis
- Vulvovaginal candidiasis (VVC). Not usually sexually transmitted but frequently diagnosed in women with STIs

Cervicitis can also cause an abnormal vaginal discharge.

7.1 Bacterial Vaginosis (BV)

BV is a vaginal dysbiosis which results from the replacement of normal hydrogen peroxide and lactic-acid–producing *Lactobacillus* species in the vagina with high concentrations of anaerobic bacteria, including G.vaginalis, Prevotella species Mobiuncus species, *A. vaginae*, and other BV-associated bacteria. BV is a highly prevalent condition and the most common cause of vaginal discharge worldwide. Women with BV can also be asymptomatic.

BV is associated with having multiple male/female sex partners, a new sex partner, lack of condom use, douching, and HSV-2 seropositivity. Male circumcision reduces the risk for BV among women. BV prevalence increases during menses and among women with copper-containing IUDs. Women who have never been sexually active are rarely affected. Hormonal contraception does not increase risk for BV and may protect against BV development

Women with BV are at increased risk for STI acquisition: complications after gynecologic surgery; complications of pregnancy; and recurrence of BV. BV also increases HIV infection acquisition. BV appears to recur with higher frequency among women who have HIV infection. Women with HIV infection and BV should receive the same treatment regimen as those who do not have HIV. Although BV-associated bacteria can be identified on male genitalia, treatment of male sex partners has not been beneficial in preventing the recurrence of BV.

7.1.1 Diagnosis

A Gram's stain of a vaginal specimen with Nugent scoring has traditionally been considered the gold standard for diagnosing BV, but it is now used in research settings only. In the clinical setting point of care (POC) testing such as the Amsel criteria or assays such as the OSOM BVBlue Test are more frequently used to diagnose BV. Vaginal culture and a Papanicolaou Smear (Pap Smear) have low sensitivity and specificity and are therefore not recommended to diagnose BV.

Clinical diagnosis of BV by Amsel criteria requires at least three of the following four symptoms or signs:

- Homogeneous, thin discharge (milk like consistency) that smoothly coats the vaginal walls
- Clue cells (e.g., vaginal epithelial cells studded with adherent bacteria) on microscopic examination
- pH of vaginal fluid >4.5
- A fishy odor of vaginal discharge before or after addition of 10% KOH (i.e., the whiff test)

Multiple POC tests are available for BV diagnosis eg:

- The *Osom BV Blue* test (Sekisui Diagnostics) detects vaginal sialidase activity.
- The *Affirm VP III* (Becton Dickinson) is an oligonucleotide probe test that detects high concentrations of *G. vaginalis* nucleic acids for diagnosing BV, *Candida* species, and *T. vaginalis.*

BV NAATs are available for BV diagnosis among symptomatic women. These tests are based on detection of specific bacterial nucleic acids and have high sensitivity and specificity.
Five quantitative multiplex PCR assays are available: Two of these assays are FDA cleared (BD Max Vaginal Panel and Aptima BV), and the other three are laboratory-developed tests.

7.1.2 Treatment

Treatment for BV is recommended for women with symptoms. Benefits of therapy among nonpregnant women are to relieve vaginal symptoms and signs of infection and to reduce the risk of acquiring other sexually transmitted infections.

Table 18: Treatment options for BV treatment

Recommended Regimens	Alternative Regimens
Metronidazole 500 mg orally 2 times/day for 7 days OR Metronidazole gel 0.75% one full applicator (5 g) intravaginally, once a day for 5 days OR Clindamycin cream 2% one full applicator (5 g) intravaginally at bedtime for 7 days	Clindamycin 300 mg orally 2 times/day for 7 days OR Clindamycin ovules 100 mg* intravaginally once at bedtime for 3 days OR Secnidazole 2 g oral granules in a single dose† OR Tinidazole 2 g orally once daily for 2 days OR Tinidazole 1 g orally once daily for 5 days

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

Clindamycin cream is oil based and might weaken latex condoms and diaphragms for 5 days after use. Women should be advised to refrain from sexual activity or to use condoms consistently and correctly during the BV treatment regimen. There is no data to support the use of douching for treatment or symptom relief. Douching may increase the risk of relapse.

7.2 Trichomoniasis

Trichomoniasis is estimated to be the most prevalent nonviral STI worldwide. Risk factor for Trichomoniasis include: Having more than one sex partner in the previous year, Incarceration - rates of T. vaginalis infection are high among incarcerated persons of both sexes. Lower education level, poverty, having an older sex partner (for adolescents)

Women with BV are at higher risk for *T. vaginalis*. Male partners of women with trichomoniasis are likely to have infection, although the prevalence of trichomoniasis among MSM is low.

The majority of persons with *T. vaginalis* have either minimal or no genital symptoms, untreated infections can last from months to years. Trichomoniasis in men is uasually asymptomatic but men can have symptoms of urethritis, epididymitis, or prostatitis. T. vaginalis infection in men may also contribute to impaired sperm motility. Women with trichomoniasis sometimes have a malodourous frothy gray or yellow green vaginal discharge, with or without vulvar irritation. On colposcopy, the presence of cervical punctate, -“strawberry cervix”- stongly suggests a diagnosis of trichomoniasis, but this occurs in less the 5% of infected women.

Trichomoniasis is readily passed between sex partners during penile-vaginal sex or through transmission of infected vaginal fluids or fomites among women who have sex with women.

The best way to prevent genital trichomoniasis is through consistent and correct use of condoms (external or internal). Partners of circumcised men might have a somewhat reduced risk for *T.*

vaginalis infection. Douching is not recommended because it might increase the risk for vaginal infections, including trichomoniasis.

T.vaginalis causes reproductive morbidity and has been associated with a 1.4-times greater likelihood of preterm birth, premature rupture of membranes, and infants who are small for gestational age. In a meta-analysis of 17 studies *T. vaginalis* was determined to be associated with a 2.1-fold increased risk for cervical cancer. Another meta-analysis of six studies reported a slightly elevated but not statistically significant association between *T. vaginalis* and prostate cancer. *T. vaginalis* infection is associated with a 1.5-fold increased risk for HIV acquisition. Among women with HIV infection, *T.vaginalis* infection is associated with increased risk for PID.

Diagnostic testing for *T. vaginalis* should be performed for women seeking care for vaginal discharge. Routine annual screening for *T. vaginalis* among asymptomatic women with HIV infection is recommended because of the adverse events associated with trichomoniasis and HIV infection.

Extragenital *T. vaginalis* is highly uncommon compared with genital infections therefore, rectal and oral testing for *T. vaginalis* is not recommended.

7.2.1 Diagnosis

In clinical practice wet-mount microscopy traditionally has been used as the preferred diagnostic test for *T. vaginalis* among women because it is inexpensive and can be performed at the POC; however, it has low sensitivity (44%–68%) compared with culture and with NAATs.

Wet Mount Preparation

The diagnosis of trichomoniasis can be made by microscopic visualization of motile trichomonads on a vaginal wet mount slide. Although this method is inexpensive, simple to perform and can be done in a clinical setting, it has a sensitivity of only 44-68%, and is operator dependent.

Culture

Culture was considered the most sensitive method for diagnosing *T. vaginalis* infection before molecular detection methods became available. Culture has sensitivity of 44%–75% and specificity of <100%. For women, vaginal secretions are the preferred specimen type for culture as urine culture is less sensitive. For men, culture specimens require a urethral swab, urine sediment, or semen. Cultures require an incubator and are necessary for *T. vaginalis* drug susceptibility testing.

Nucleic Acid Amplification Testing

NAATs are highly sensitive, detecting more *T. vaginalis* infections than wet-mount microscopy among women (*1060*). Several NAAT–based methods are available for the diagnosis of *T. vaginalis*, including transcription-mediated amplification and polymerase chain reaction (PCR).

The Aptima *T. vaginalis* assay (Hologic) uses transcription-mediated amplification for detection of *T.vaginalis* RNA. It has a sensitivity of 95.3%-100% and specificity of 95.2% - 100%. The test is

FDA cleared for detection of *T. vaginalis* from symptomatic or asymptomatic women, and it can be used on clinician-collected endocervical and vaginal swabs, female urine specimens, and liquid Pap smear specimens collected in PreservCyt Solution (Hologic). This assay has not been FDA cleared for use among men.

The Probe Tec TV Q^{x} Amplified DNA Assay (Becton Dickinson) uses Strand Displacement Amplification technology and is FDA cleared for detection of *T. vaginalis* from vaginal swabs (patient-collected or clinician-collected), endocervical swabs, or urine specimens from women. This assay has a sensitivity of 98.3% and specificity of 99.6% for detecting *T.vaginalis.* This test is only FDA cleared for use among women.

The Max CTGCTV2 assay (Becton Dickinson) is a FDA cleared PCR assay for gonorrhea and chlamydia and has been modified to test concurrently for *T.vaginalis* in patient-collected or clinician-collected vaginal swab specimens and male and female urine specimens, with sensitivity and specificity of 96.2%–100% and 99.1%–100%, respectively.

GeneXpert TV (Cepheid) is a PCR-based NAAT that can be performed in ≤1 hour and can be used at the POC. It has been FDA cleared for use with endocervical swabs, vaginal specimens (patient or clinician-collected), and both male and female urine specimens, with sensitivity and specificity of 99.5%–100% and 99.4%–99.9% (*1007*), respectively.

Point Of Care Testing

There are multiple FDA-cleared rapid tests available for detecting *T. vaginalis* in **women**.
The Osom trichomonas rapid test (Sekisui Diagnostics) is an antigen-detection test that uses immunochromatographic capillary flow dipstick technology. It can be used with clinician-obtained vaginal specimens. Results are available in approximately 10–15 minutes, with sensitivities of 82%–95% and specificity of 97%–100%.

The Solana trichomonas assay (Quidel) uses isothermal Helicase-Dependent Amplification technology to detect *T. vaginalis* DNA from asymptomatic and asymptomatic female urine specimens or clinician-collected vaginal specimens, with sensitivity >98% for vaginal samples and >92% for urine specimens. Results are available within 40 minutes after specimen collection.

The Amplivue trichomonas assay (Quidel) is another rapid test providing qualitative detection of *T. vaginalis* that has been FDA cleared for vaginal specimens from symptomatic and asymptomatic women, with sensitivity of 90.7% and specificity of 98.9%.

Papanicolaou Testing

Pap testing is not considered an appropriate diagnostic tool for trichmoniasis. If *T.vaginalis* infection is identified on a routine Pap smear, the woman should be retested with a standard trichomonas diagnostic test and treated if infection is confirmed.

7.2.2 Treatment

Treatment of *T-vaginalis* reduces symptoms and signs of infection and might reduce transmission.

Table 18: Treatment of Trichomoniasis

Recommended Regimen*	Alternative Regimen
For Women: Metronidazole 500mg 2 times daily for 7 days. For Men: Metronidazole 2g orally in a single dose	For both men and women: ** Tinidazole 2g orally in a single dose

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

*These gender specific recommendations are based on 2 studies conducted in women, that demonstrated oral metronidazole given for 7 days was more effective at curing infection than a single 2-gram oral dose.

** Tinidazole should be avoided in pregnant women.

The nitroimidazoles are the only class of medications with clinically demonstrated efficacy against *T. vaginalis* infections. Randomized controlled trials comparing single 2-g doses of metronidazole and tinidazole indicated that tinidazole is equivalent or superior to metronidazole in achieving parasitologic cure and symptom resolution. Tinidazole reaches higher levels in serum and the genitourinary tract, has a longer half-life than metronidazole (12.5 hours versus 7.3 hours), and has fewer gastrointestinal side effects and in randomized clinical trials, the recommended tinidazole regimen has resulted in cure rates of approximately 92%–100% compared to 84%-98% with recommended metronidazole regimen.

Metronidazole gel is not effective for the treatment of trichomoniasis, it does not reach therapeutic levels in the urethra and perivaginal glands.

Persons being treated for *T.vaginalis* infection should abstain from sex until they and their sex partners have completed the course of treatment and symptoms have resolved. Testing for other STIs (HIV, syphilis, gonorrhea and chlamydia should be offered to persons with *T. vaginalis.*

7.2.3 Follow-Up

All sexually active women who are diagnosed and treated for *T. vaginalis* infection including pregnant women) should retested 3 months after initial treatment to evaluate the possibility of treatment failure. Data are insufficient to support retesting in men.

7.2.4 Management of Sex Partners

All persons diagnosed with trichomoniasis should refere all sex partners in the prior 60 days for evaluation, comprehensive STI testing including HIV testing, presumptive treatment for trichomoniasis. Expedited Partner management maybe considered for partners who are unable or unwilling to come to clinic.

7.2.5 Recurrent/Persistent Trichomoniasis

The most likely reasons for recurrent or persistent trichomoniasis are:

- Reinfection from an untreated partner
- Lack of adherence to treatment
- Antimicrobial resistant *T.vaginalis* infection. (Metronidazole resistance occurs in 4-10% of cases, Tinidazole resistance in 1%)

Treatment of Recurrent/Persistent Trichomoniasis

Treatment Failure with Reexposure:

Men and women who received standard treatment for trichomoniasis and have treatment failure due to reexposure from an untreated partner, should be retreated with the same regimen they initially received.

Treatment Failure without Reexposure: For men who have treatment failure, without reexposure, after receiving an initial single-dose therapy of Metronidazole 2g, it is recommended they be retreated with Metronidazole 500mg orally twice daily for 7 days. For women who have failed the initial treatment of twice daily Metronidazole for 7 days, and have not been reexposed, should be retreated with a 7 -day regimen of either Metronidazole 2g once daily or Tinidazole 2g once daily. Tinidazole should not be given to pregnant women.

Treatment Failure after Second-Line Treatment without Reexposure: If a person has persistent infection despite retreatment with a second-line regimen and reexposure has not occurred, the clinician should suspect 5-Nitroimidazole drug resistance. If testing for drug resistance is available, it should be requested. In the absence of resistance testing, the patient can be presumptively treated for 5-Nitroimidazole-resistant trichomoniasis.

Treatment of 5-Nitroimidazole –Resistant Trichomoniasis: If treatment with once daily Metronidazole 2g or Tinidazole 2g for 7 days has been unsuccessful, the next option is: Tinidazole 2 g po daily + Intravaginal tinidazole 500mg twice daily for 14 days.

If this option fails, consider using: Tiniazole 1 g po three times daily + intravaginal paromomycin (4 grams of 6.25% intravaginal paromomycin nightly) for 14 days. Tinidazole should not be used in pregnant women.

7.2.6 Special Considerations

Drug Allergy, Intolerance, and Adverse Reactions

Patients with an IgE-mediated-type hypersensitivity reaction to 5-nitroimidazole antimicrobials should be managed by metronidazole desensitization in consultation with an allergy specialist.

HIV Infection

Among women with HIV up to 53% have *T. vaginalis* infection, and they have been shown to have an increased risk for pelvic inflammatory disease and for shedding HIV in the genital tract. Because of the high prevalence of *T. vaginalis* among women with HIV and the potential for adverse reproductive health, poor birth outcomes, and possibly amplified HIV transmission, routine screening and prompt treatment are recommended for all women with HIV infection; screening should occur at entry to care and then at least annually. For pregnant women with HIV, screening at the first prenatal visit and prompt treatment are recommended because *T. vaginalis* infection is a risk factor for vertical transmission of HIV.

Treatment

Table 19: Recommended Regimen for Trichomonas Among Women with HIV infection

Metronidazole 500 mg orally 2 times/day for 7 days

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

For treatment failure, the protocol for Recurrent Trichomoniasis should be followed. Other management considerations, follow-up, and management of sex partners should be performed as for women without HIV infection. Treatment of men with HIV infection should follow the same guidelines as for men without HIV.

7.3 Vulvovaginal Candidiasis (VVC)

Vulvovaginal Candidiasis, commonly called “yeast” infection, is usually caused by the abnormal proliferation of one or more *Candida* species in the vaginal tract. Although it is not a sexually transmitted infection, VVC frequently causes symptoms which overlap with other sexually transmitted infections.

Typical symptoms of VVC include pruritus, vaginal soreness, dyspareunia, external dysuria, and abnormal vaginal discharge. None of these symptoms is specific for VVC.

Globally 138 million women will have VVC on an annual basis. An estimated 75% of women will have at least one episode of VVC, and 40%–45% will have two or more episodes and 5-10% will develop recurrent vulvovaginal candidiasis. Women with HIV have more frequent episodes of VVC than women without HIV. In advanced HIV disease, VVC can be severe and recur frequently.

Although there are no specific risk factors associated with VVC, for those women who have frequent, complicated and/or severe vulvovaginal candidiasis a number of factors have been identified. These include uncontrolled diabetes, repeated courses of antibiotics, HIV, pregnancy, corticosteroid use, hormone replacement therapy, sexual practices, oral contraceptives, IUDs, spermicides and genetic predisposition.

On the basis of clinical presentation, microbiology, host factors, and response to treatment, VVC can be classified as either uncomplicated or complicated.

Table 20: Classification of vulvovaginal candidiasis (VVC)

Uncomplicated VVC: Sporadic or infrequent VVC *and* Mild to moderate VVC *and* Likely to be *Candid albicans and* Non-immunocompromised women
Complicated VVC Recurrent VVC (3 or more episodes of symptomatic vvc in < 1year) or Severe VVC or Non-albicans candidiasis or Women with diabetes, immunocomprimising conditions (eg HIV), underlying immunodeficiency, or immunosuppressive therapy (e.g.corticosteroids).

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

7.3.1 Uncomplicated Vulvovaginal Candidiasis

Diagnosis

A diagnosis of *Candida* vaginitis is clinically indicated by the presence of external dysuria and vulvar pruritus, pain, swelling, and redness. Signs include vulvar edema, fissures, excoriations, and thick curdy vaginal discharge. The diagnosis can be made in symptomatic women on the basis of microscopic examination of vaginal secretions.

Vaginal pH: Vaginal pH remains normal (<4.5) in vulvovaginal candidiasis

Potassium Hydroxide (KOH) and Saline Wet Mount: Visualization of pseudohyphae and/or budding yeast on a KOH wet prep examination or a saline wet mount can confirm the diagnosis of Candidiasis.

Culture

For those with negative wet mounts but existing signs or symptoms, vaginal cultures for *Candida* should be considered. If cultures cannot be performed, empiric treatment can be considered. Identifying *Candida* by culture in the absence of symptoms or signs is not an indication for treatment because approximately 10%–20% of women harbor *Candida* species and other yeasts in the vagina. In women with complicated vulvovaginal candidiasis fungal cultures

are indicated to confirm diagnosis and to detect non-albicans species. For women with recurrent vulvovaginal candidiasis who have persistent symptoms despite being on antifungal maintenance therapy, culture and resistance testing are recommended.

Treatment

There are multiple Short-course over the counter and prescription topical formulations (i.e., single dose and regimens of 1–3 days) fir the effective treatment of uncomplicated VVC. Treatment with azoles results in relief of symptoms and negative cultures in 80%–90% of patients who complete therapy.

Table 21: Recommended Regimens for Vulvovaginal Candidiasis

OTC Intravaginal Agents	Prescription Intravaginal Agents	Oral Agent
Clotrimazole 1% cream 5g intravaginally daily for 7-14 days OR Clotrimazole 2% cream 5g intravaginally daily for 3 days OR Miconazole 2% cream 5g intravaginally daily for 7 days OR Miconazole 4% cream 5g intravaginally daily for 3 days OR Miconazole 100mg vaginal suppository one suppository daily for 7 days OR Miconazole 200mg vaginal suppository one suppository daily for 3 days OR Miconazole 1,200g one suppository for 1 day. OR Tioconazole 6.5% ointment 5g intravaginally in a single dose.	Butoconazole 2% cream (single-dose bioadhesive product) 5 g intravaginally in a single application OR Terconazole 0.4% cream 5 g intravaginally daily for 7 days OR Terconazole 0.8% cream 5 g intravaginally daily for 3 days OR Terconazole 80 mg vaginal suppository one suppository daily for 3 days	Fluconazole 150 mg orally in a single dose

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

NB: The creams and suppositories in these regimens are oil based and might weaken latex condoms and diaphragms. Women whose symptoms persist after using an over-the-counter preparation or who have a recurrence of symptoms <2 months after treatment for VVC should be evaluated clinically and tested. No substantial evidence exists to support using probiotics or homeopathic medications for treating VVC.

Follow-Up

Follow-up typically is not required. However, women with persistent or recurrent symptoms after treatment should return for follow-up visits.

Management of Sex Partners

Uncomplicated VVC is not usually a sexually transmitted illness, and data do not support treatment of sex partners.

Drug Allergy, Intolerance, and Adverse Reactions

Topical agents usually cause no systemic side effects, although local burning or irritation might occur. Oral azoles can occasionally cause nausea, abdominal pain, and headache.

7.3.2 Complicated Vulvovaginal Candidiasis

Diagnosis

Vaginal culture or PCR should be obtained from women with complicated VVC to confirm clinical diagnosis and identify non–*albicans Candida* which is intrinsically resistant to azoles; therefore, culture and susceptibility testing should be considered for patients who remain symptomatic.

7.3.3 Recurrent Vulvovaginal Candidiasis

Recurrent VVC, usually defined as three or more episodes of symptomatic VVC in <1 year, affects <5% of women. It can be either idiopathic or secondary. The pathogenesis of recurrent VVC is poorly understood, and the majority of women with recurrent VVC have no apparent predisposing or underlying conditions. *C. glabrata* and other non–*albicans Candida* species are observed in 10%–20% of women with recurrent VVC. Conventional antimycotic therapies are not as effective against these non–*albicans* yeasts as against *C. albicans*.

Treatment

Recurrent VVC caused by *C. albicans* responds well to short-duration oral or topical azole therapy.

Table 22: Treatment of C. albicans caused Recurrent VVC

Initial Therapy	Maintenance Therapy
Topical therapy for 7-14 days OR Fluconazole : 100-mg, 150-mg, or 200-mg po every third day for a total of 3 doses [days 1, 4, and 7]	Fluconazole (100mg, 150mg, or 200mg) po weekly for 6 months.

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

Severe VVC: 7–14 days of topical azole or 150 mg of fluconazole in two sequential oral doses (second dose 72 hours after initial dose).

7.3.4 Non–albicans Vulvovaginal Candidiasis

The optimal treatment of non–*albicans* VVC remains unknown. A longer duration of therapy (7–14 days) with a nonfluconazole azole regimen (oral or topical) is recommended. If recurrence occurs, 600 mg of boric acid in a gelatin capsule administered vaginally once daily for 3 weeks is indicated. This regimen has clinical and mycologic eradication rates of approximately 70%. If symptoms recur, referral to a specialist is advised.

7.3.5 Management of Sex Partners

No data exist to support treating sex partners of patients with complicated VVC.

7.3.6 Special Considerations

Compromised Host

Women with underlying immunodeficiency, e.g. poorly controlled diabetes, HIV, and those receiving immunosuppression therapy (e.g., corticosteroid treatment) might not respond as well to short-term therapies. More prolonged i.e., 7–14 days conventional treatment is necessary.

HIV Infection

Treatment for uncomplicated and complicated VVC among women with HIV infection should not differ from that for women who do not have HIV. With more advanced HIV disease vulvovaginal candidiasis is often more severe and may recur more frequently, but primary prophylactic fluconazole therapy is not recommended in these women.

Counseling and Education

Patients hould be counseled and educated on the nature and transmission of the disease and risk reduction strategies

- Asymptomatic colonization with Candida species is common and does not require treatment.
- Symptomatic VVC is caused by disruption of the normal vaginal microbiota by various factors, including pregnancy, diabetes, hormonal contraception, sexual activity and immunosuppressive conditions.
- Women with symptomatic VVC should be treated with antifungal therapy.

- Women with complicated VVC should be treated with a longer course of antifungal therapy.
- Vulvovaginal candidiasis is not considered a sexually transmitted infection.
- Avoid douching
- Avoid unnecessary antibiotic use.
- Avoid repeated courses of self-administered, over the counter antifungal therapy with no confirmed diagnosis.
- Complete the full course of the prescribed treatment.
- Optimize the management of other concurrent illnesses such as diabetes mellitus and HIV.

8

Pelvic Inflammatory Disease

All sexually active females presenting with lower abdominal pain should be examined and screened for Pelvic Inflammatory Disease (PID), once pregnancy has been ruled out. PID is a clinical syndrome characterized by infection and inflammation of the female upper genital tract. This process results from the ascending spread of microorganisms in the vagina or cervix to the structures of the upper female genital tract potentially resulting in infection and inflammation of the endometrium, fallopian tubes, pelvic peritoneum and the formation of tubo-ovarian abscess. PID can be classified as acute, subclinical or chronic.

Approximately 50% of women who receive a diagnosis of acute PID also test positive for either *N. gonorrhoeae* or *C. trachomatis*. Micro-organisms such as *G. vaginalis*, *H. influenzae*, enteric gram-negative rods, cytomegalovirus (CMV), *T. vaginalis*, *M. hominis*, *U. urealyticum* and *M. genitalium* might also have a role in PID pathogenesis.

Screening and treating sexually active women for chlamydia and gonorrhea reduces their risk for PID.

8.1 Diagnosis

Acute PID is difficult to diagnose because of the considerable variation in symptoms and signs associated with this condition, however delay in diagnosis and treatment can lead to the sequalae of PID, ectopic pregnancy, chronic lower abdominal pain and infertility. Women with acute PID often have subtle or nonspecific symptoms such as dyspareunia, dysuria or gastrointestinal symptoms; other symptoms include cramping, urinary frequency, vaginal discharge, lower abdominal or pelvic pain that is accentuated by coitus and intermittent or postcoital bleeding. In severe PID women appear very ill and have fever, chills, purulent vaginal discharge, nausea and vomiting. Physical examination findings can include cervical motion, uterine or adnexal tenderness. Because of the difficulty of diagnosis and the potential for damage to the reproductive health of women, a low threshold for the clinical diagnosis of PID should be maintained.

Presumptive treatment for PID should be initiated for sexually active young women and other women at risk for STIs if:

- They are experiencing pelvic or lower abdominal pain, or
- No cause for the illness other than PID can be identified, or

- One or more of the following three minimum clinical criteria are present on pelvic examination: cervical motion tenderness, uterine tenderness, or adnexal tenderness.

One or more of the following additional criteria can be used to enhance the specificity of the minimum clinical criteria and support a PID diagnosis:

- Oral temperature >38.3°C (>101°F)
- Abnormal cervical mucopurulent discharge or cervical friability
- Presence of abundant numbers of WBCs on saline microscopy of vaginal fluid
- Elevated erythrocyte sedimentation rate
- Elevated C-reactive protein
- Laboratory documentation of cervical infection with *N. gonorrhoeae* or *C. trachomatis*

In some women with suspected PID more extensive evaluation is warranted.

- Endometrial biopsy with histopathologic evidence of endometritis; or
- Transvaginal sonography or magnetic resonance imaging techniques demonstrating thickened, fluid-filled tubes with or without free pelvic fluid or tubo-ovarian complex, or Doppler studies indicating pelvic infection (e.g., tubal hyperemia) or laparoscopic findings consistent with PID.

8.2 Treatment

Treatment should be initiated as soon as the presumptive diagnosis has been made because prevention of long-term sequelae is dependent on early administration of recommended antimicrobials.

PID treatment regimens should provide empiric, broad-spectrum coverage of likely pathogens. The decision of whether hospitalization is necessary should be based on the medical provider's clinical judgment and whether the patient meets any of the following criteria:

- Surgical emergencies (e.g., appendicitis) cannot be excluded
- Tubo-ovarian abscess
- Pregnancy
- Severe illness, nausea and vomiting, or oral temperature >38.5°C (101°F)
- Unable to follow or tolerate an outpatient oral regimen
- No clinical response to oral antimicrobial therapy

No evidence is available to indicate that adolescents have improved outcomes from hospitalization for treatment of PID, and the clinical response to outpatient treatment is similar among younger and older women. The decision to hospitalize adolescents with acute PID should be based on the same criteria used for older women.

8.2.1 Parenteral Treatment

Randomized trials have demonstrated the efficacy of parenteral regimens.

Table 23: Recommended Parenteral Treatment for PID

Recommended Parenteral Regimens	Alternative Parenteral Regimens
Ceftriaxone1g IV every 24hrs + Doxycycline 100mg IV or orally every 12 hrs + Metronidazole 500mg IV or orally every 12hrs OR	Ampicillin-sulbactam 3g IV every 6hrs + Doxycycline 100mg IV every 12 hrs OR
Cefotetan 2g IV every 12 hrs + Doxycycline 100mg IV or orally every 12 hrs OR	Clindamycin 900mg IV every 8 hrs + Gentamicin IV/IM Loading dose: 2mg/kg then Maintenance dose 1.5mg/kg every 8 hrs (single daily dosing – 3-5mg/kg-can be substituted
Cefoxitin 2g IV every 6hrs + Doxycycline 100mg IV or orally every 12 hrs.	

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

Because of the pain associated with IV infusion, doxycycline should be administered orally when possible. Oral metronidazole is well absorbed and can be considered instead of IV for women without severe illness or tubo-ovarian abscess. After clinical improvement with parenteral therapy, transition to oral therapy with doxycycline 100 mg 2 times/day and metronidazole 500 mg 2 times/day is recommended to complete 14 days of antimicrobial therapy. For women with tubo-ovarian abscess, >24hrs of inpatient monitoring is recommended.

Alternative Parenteral Regimens

When using the clindamycin and gentamicin alternative parenteral regimen, women with clinical improvement after 24–28 hours can be transitioned to clindamycin (450 mg orally 4 times/day) or doxycycline (100 mg orally 2 times/day) to complete the 14-day therapy. However, when tubo-ovarian abscess is present, clindamycin (450 mg orally 4 times/day) or metronidazole (500 mg orally 2 times/day) should be used to complete 14 days of therapy with oral doxycycline to provide more effective anaerobic coverage.

8.2.2 Intramuscular or Oral Treatment

IM or oral therapy can be considered for women with mild to moderate acute PID. The clinical outcomes among women treated with these regimens are similar to those treated with IV therapy. Women who do not respond to IM or oral therapy within 72 hours should be reevaluated to confirm the diagnosis and be administered therapy IV.

Table 24: Recommended Oral or IM Treatment for PID

Recommended Intramuscular or Oral Regimens	Alternative Intramuscular or Oral Regimens
Ceftriaxone 500mg* IM as a single dose + Doxycycline 100mg orally every 12 hrs + Metronidazole 500mg orally every 12 hrs for 14 days	Levofloxacin 500mg orally once daily for 14 days OR
Cefoxitin 2g IM plus Probenecid** 1g orally + Doxycycline 100mg orally every 12 hrs + Metronidazole 500mg every 12 hrs for 14 days.	Moxifloxacin 400mg orally + Metronidazole 500mg orally twice daily for 14 days OR
Other 3rd generation Cephalosporin + Doxycycline 100mg orally every 12 hrs + Metronidazole 500mg for 14 days orally every12 hrs	Azithromycin 500mg IV daily for 1-2 days, then 250mg orally daily for a total of 7 days + Metronidazole 500mg orally twice daily for 12-14 days OR
*People weighing≥150kg should be given 1g Ceftriaxone **Probenecid should be given concurrently with Cefoxitin	Azithromycin 500mg IV daily for 1-2 days then 250mg orally for a total of 7 days

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

Diagnostic tests for gonorrhea should be obtained before starting therapy, and persons should be managed as follows:

- If a culture for gonorrhea is positive, treatment should be based on results of antimicrobial susceptibility testing.
- If the isolate is determined to be quinolone-resistant *N. gonorrhoeae* or if antimicrobial susceptibility cannot be assessed (e.g., if only NAAT testing is available), consultation with an infectious disease specialist is recommended.

8.3 Follow Up

Women with PID who are managed in an outpatient setting should be re-examined after 72 hours of treatment and should typically show clinical improvement in this time frame manifested as defervescence of fever; reduction in direct or rebound abdominal tenderness; and reduction in uterine, adnexal, and cervical motion tenderness. If there is no clinical improvement hospitalization, additional testing and possible surgical intervention may be necessary. All women who have received a diagnosis of chlamydial or gonococcal PID should be retested 3 months after treatment, regardless of whether their sex partners have been treated. If retesting at 3 months is not possible, they should be retested whenever they next seek medical care <12 months after treatment.

8.4 Other Management Considerations:

To minimize disease transmission, women should abstain from sexual intercourse until therapy is complete, symptoms have resolved, and sex partners have been treated. All women who receive a diagnosis of PID should be tested for gonorrhea, chlamydia, HIV, and syphilis. All contraceptive methods can be continued during treatment.

8.4.1 Management of Sex Partners

All sex partners during the 60 days preceding the woman's PID symptom onset or diagnosis should be evaluated, tested, and presumptively treated for chlamydia and gonorrhea, regardless of the pathogens isolated. If the last sexual intercourse was >60 days before symptom onset or diagnosis, the most recent sex partner should be treated. Expedited Partner Therapy (EPT) can be used if the partner is unlikely to come for testing and treatment. Sex partners of persons who have PID caused by *C. trachomatis* or *N. gonorrhoeae* are often asymptomatic. Abstinence from sexual intercourse until therapy is completed and symptoms have resolved is advised.

8.4.2 Management of PID in Adolescents and Young Adults

Adolescents and young adults have similar clinical outcomes as older women when managed in an outpatient setting. It is however, important to recognise that an adolescent may have barriers to accessing care and treatment. Counseling and education along with daily reminders (text, what's app) and even DOTS maybe necessary to help them complete their treatment.

8.4.3 Management of PID in Women with HIV

Women with HIV have similar symptoms, manifestations and treatment responses as women without HIV.

8.4.4 Management of Tubo-Ovarian Abscess

Women with suspected or diagnosed tubo-ovarian abscess should be hospitalized for prompt receipt of intravenous antibiotic therapy, intensive management and expert consultation. An estimated 15% of women with PID and tubo-ovarian abscess experience spontaneous rupture of the abscess, which can be life-threatening and would require emergency surgery.

8.4.5 Recent placement of Intrauterine Device (IUD)

For women who develop PID after a recent (≤2 weeks) IUD insertion, treatment can be initiated without removal of the IUD once the patient is closely followed. However, if there is no clinical improvement after 48-72 hrs of treatment, the IUD should be removed.

8.4.6 Drug Allergy, Intolerance and Adverse Reactions

The risk of penicillin cross-reactivity is highest with first generation cephalosporins but negligible between the majority of second-generation and all third generation cephalosporins.

9

Syndromic Management of STIs

Sexually transmitted infections (STIs) are a major cause of adult morbidity worldwide. In 1991, the World Health Organization (WHO) introduced the concept of the "syndromic approach" to managing sexually transmitted infections in resource limited countries. Syndromic approach refers to the approach of treating STI symptoms and signs based on the organisms most commonly responsible for each syndrome. A more definite or etiological diagnosis may be possible in some settings with laboratory facilities, but this is often problematic. Laboratory tests require resources, add to the cost of treatment, may require clients to make extra visits to the clinic and **almost always result in delays in treatment**. For these reasons, syndromic management guidelines are widely used for syndromes such as lower abdominal pain, urethral discharge and genital ulcer even in resource rich countries with readily available laboratory facilities. WHO has developed simple flowcharts (also called algorithms) to guide health care providers in using the syndromic approach to manage vaginal discharge, lower abdominal pain, genital ulcer disease, anorectal discharge and urethral discharge.

In order for syndromic management to be effective, seven items must be considered (known as the seven *Cs)* . These include client selection, effective chemical treatment, compliance, counselling, condom promotion, contact tracing/management, and coming back (follow-up).

The syndromic approach requires the clinician to have some knowledge on the clinical presentation of the STD, the risk level ofthe patient population and knowledge of the more common STIs in the local area.

Some of the advantages of syndromic management include:

- Patients can be treated at first visit without need for laboratory confirmation and are therefore not lost to follow-up.
- High cure rates are achievable in the symptomatic patients
- It is cost effective
- Syndromic management can easily be implemented in a primary care system.
- The algorithms are simple and problem focused.

Its disadvantages include:

- Overtreatment, which has associated increased costs
- Asymptomatic cases are usually not detected
- Not all algorithms have 2nd or 3rd line treatment.

This section of the guidelines aims to introduce flow charts and algorithms for the syndromic management of Urethral Discharge syndrome. Vaginal discharge syndrome, Genital Ulcer Disease, Anorectal Discharge and Lower Abdominal Pain in Women.

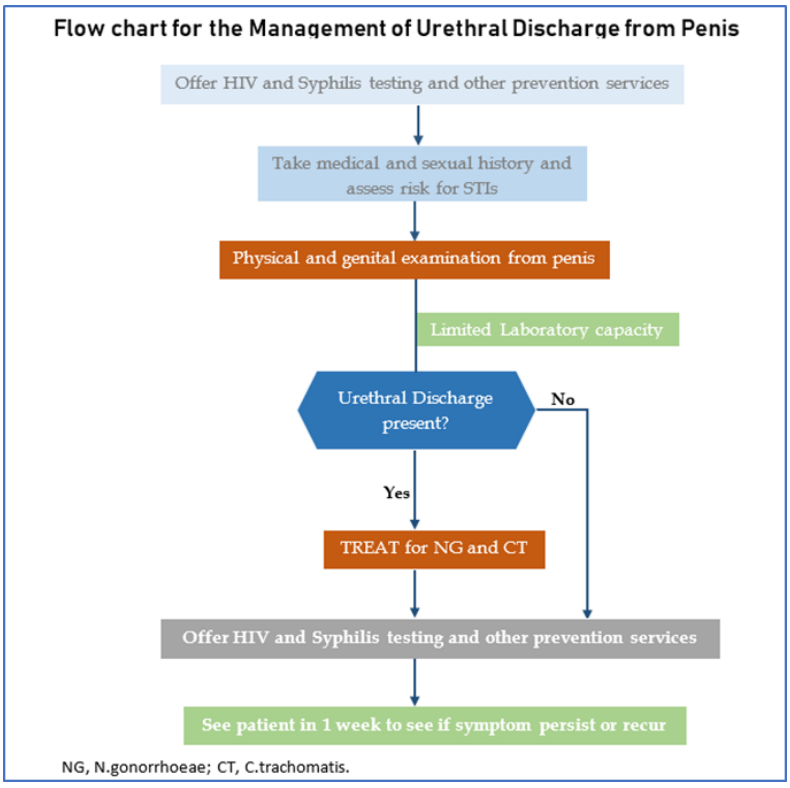
9.1 Urethral Discharge Syndrome:

Urethral discharge among men is commonly caused by N. gonorrhoeae and/or C. trachomatis and/or non-gonococcal and non-chlamydial pathogens, such as M. genitalium and T. vaginalis.

Clinical presentation

Characteristically, men with urethritis (inflammation of the urethra) present with urethral discharge with or without dysuria (pain on urination). Occasionally, dysuria or itching at the tip of the urethra may be the only symptoms.

Figure 1: Flow Chart for the Management of Urethral Discharge from Penis



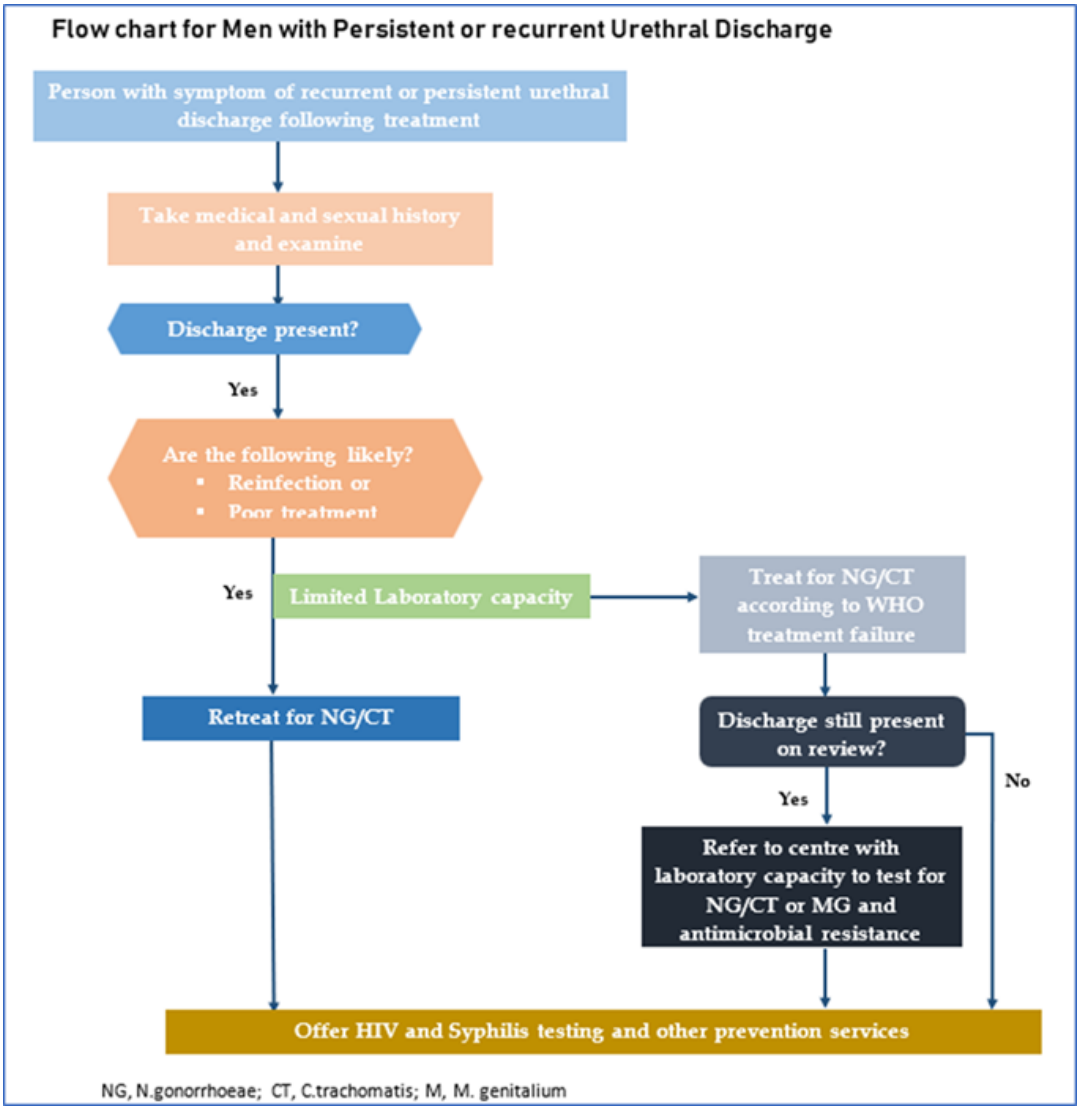
Adapted from the WHO Guidelines for the Management of Symptomatic Sexually Transmitted Infections June 2021

Persistent or Recurrent Urethral Discharge:

For patients who continue to have symptoms at follow up visit, after completion of treatment, it would be advisable to check partner notification and treatment history as well as question patient on adherence to medication.

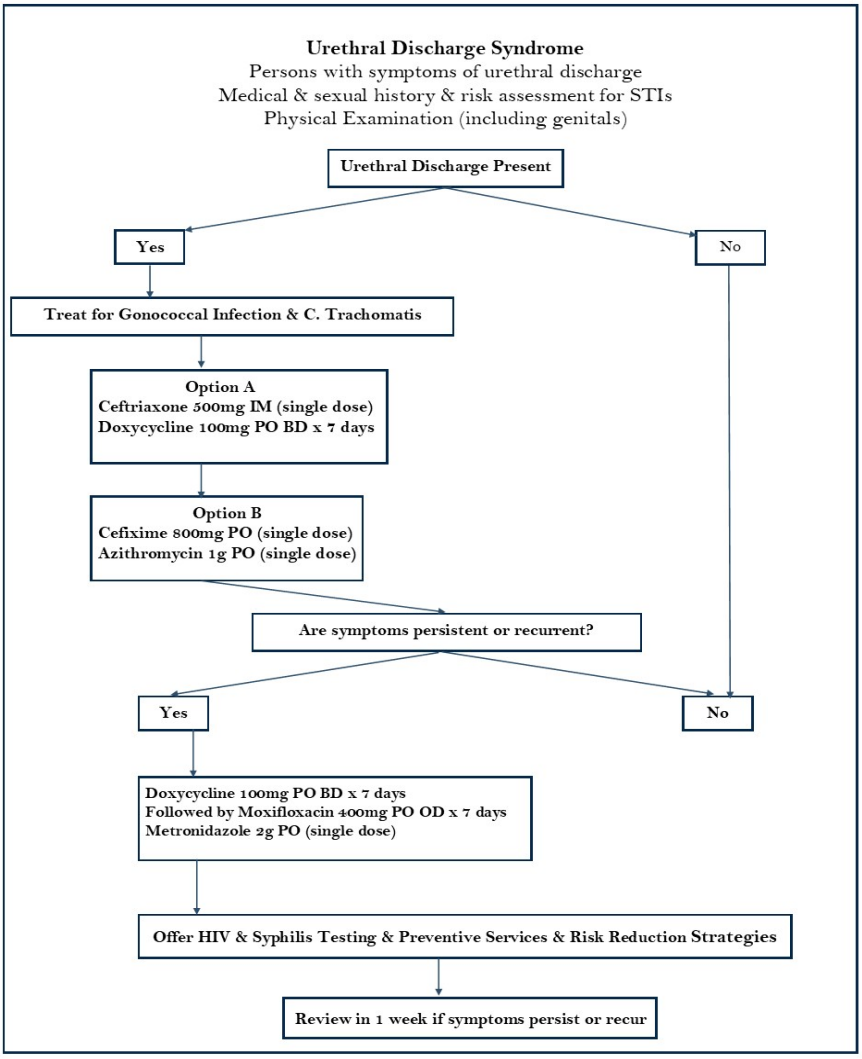
The following flow chart assumes the patient has received and taken effective treatment for *C.Trachomatis and N. Gonorrhoeae.*

Figure 2: Flow Chart for Men with Persistent or Recurrent Urethral Discharge



Adapted from Who Guidelines for the Management of Symptomatic Sexually Transmitted Infections June 2021

Figure 3: Algorithm for the Management of Urethral Discharge from Penis

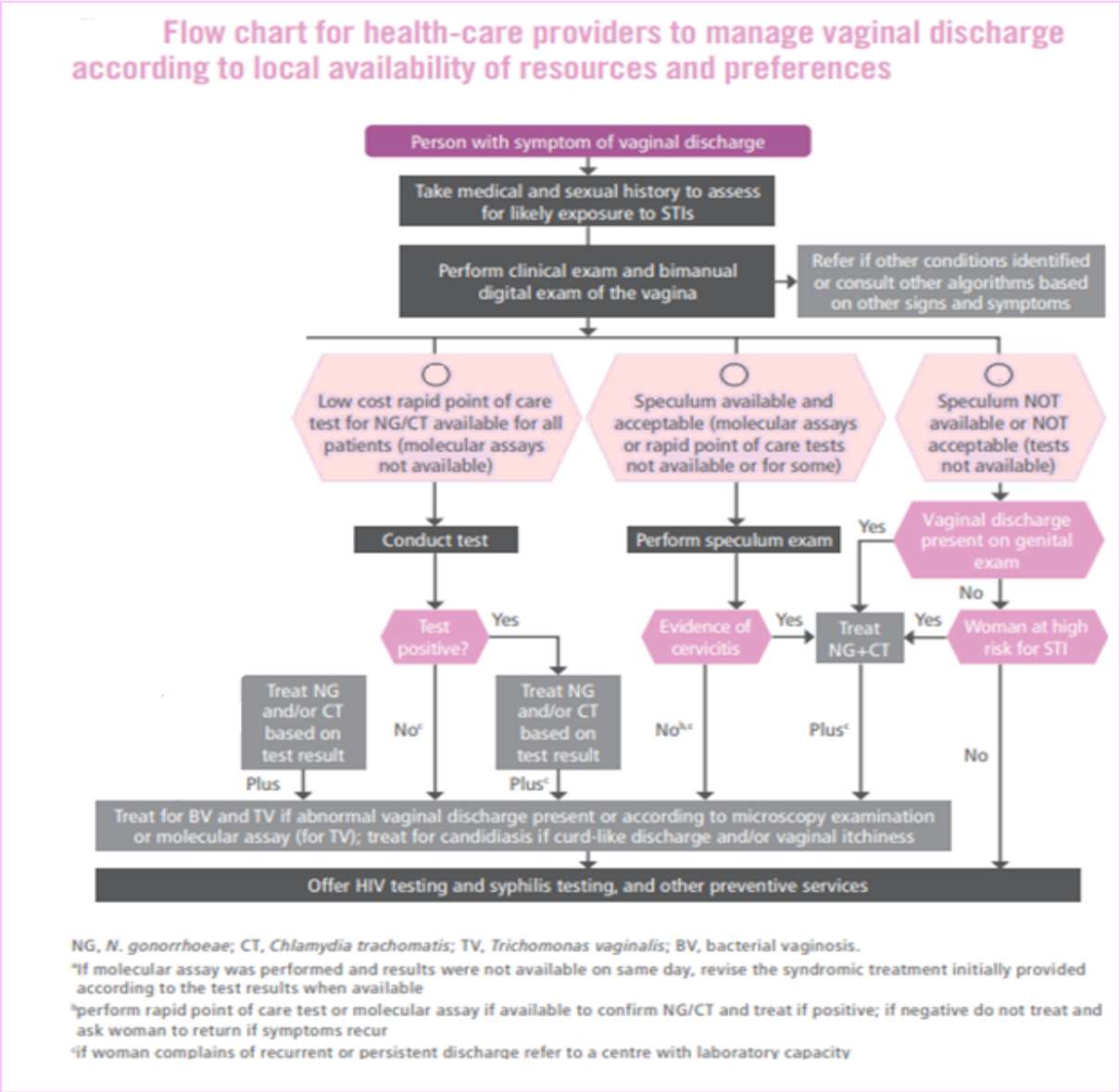


Adapted from Who Guidelines for the Management of Symptomatic Sexually Transmitted Infections June 2021 and CDC Sexually Transmitted Infections Treatment Guidelines, 2021

9.2 Vaginal Discharge Syndrome:

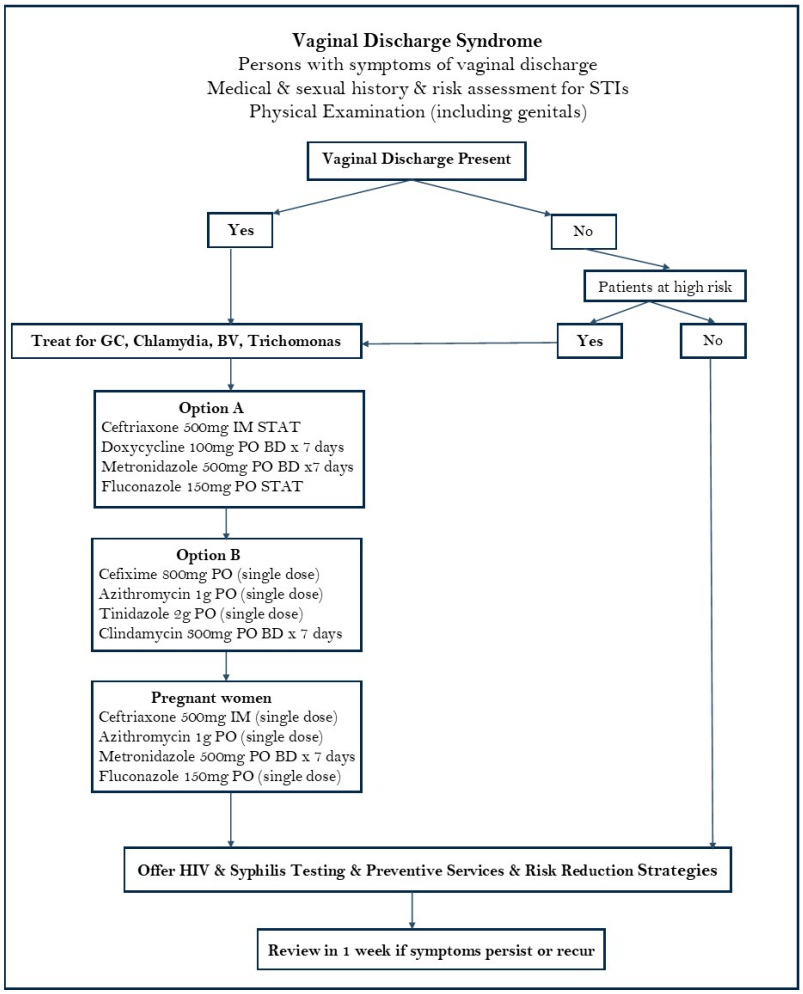
Vulvovaginal symptoms are one of the commonest reasons for women attending a health facility. The symptoms include a vaginal discharge perceived by the woman to be abnormal, vulval irritation or itching. The three most common causes of vaginal discharge are bacterial vaginosis and infection with T. vaginalis and C. albicans. Among postpubertal women, N. gonorrhoeae and C. trachomatis infect the endocervix rather than the vagina, and they therefore may not present with vaginal discharge.

Figure 4: Flow Chart for healthcare providers to manage vaginal discharge according to local availability of resources and preference



Adapted from WHO Guidelines for the Management of Symptomatic Sexually Transmitted Infections June 2021

Figure 5: Algorithm for Management of Vaginal Discharge Syndrome



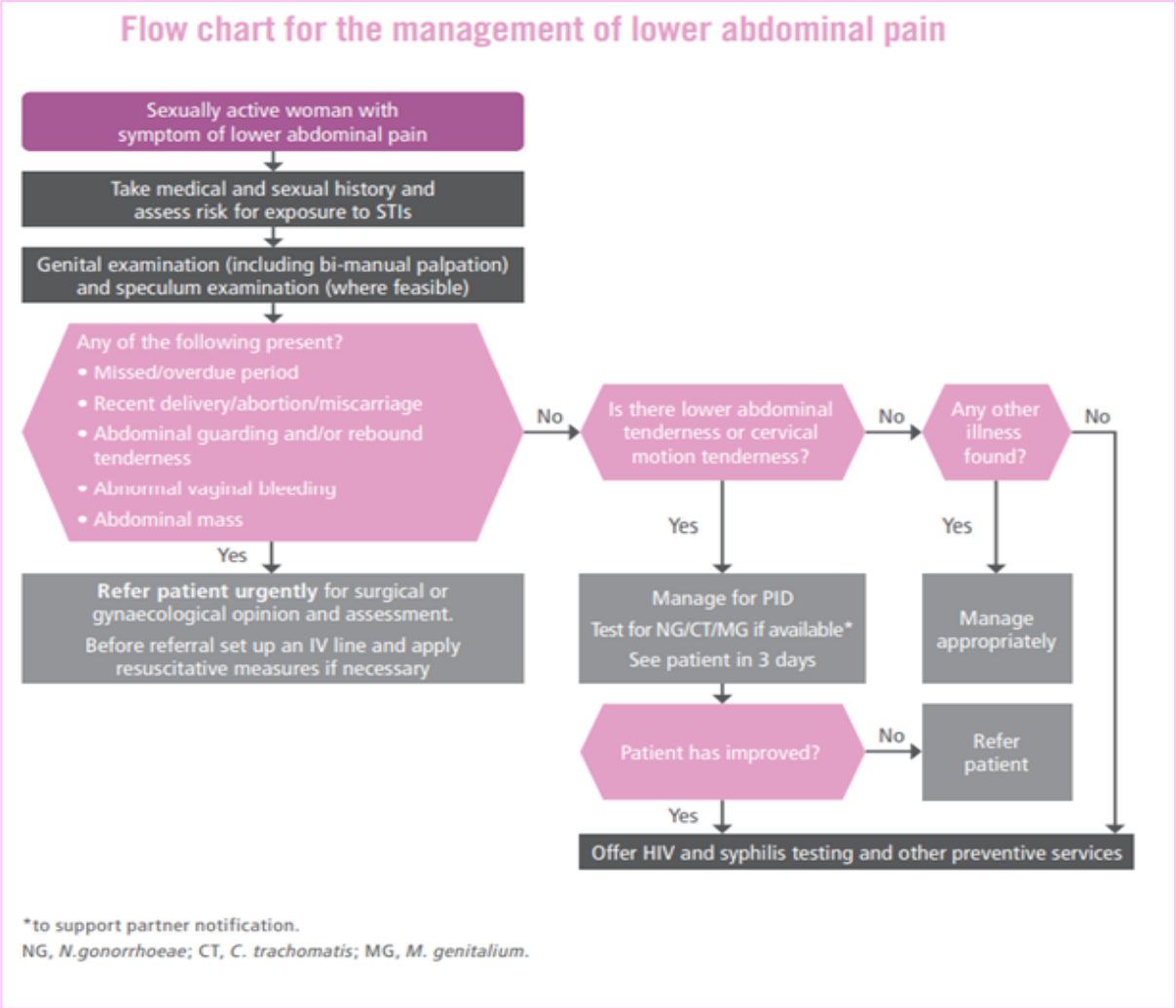
Adapted from Who Guidelines for the Management of Symptomatic Sexually Transmitted Infections June 2021 and CDC Sexually Transmitted Infections Treatment Guidelines, 2021

9.3 Lower Abdominal Pain

Causative agents of pelvic inflammatory disease include N. gonorrhoeae, C. trachomatis and bacteria associated with bacterial vaginosis. Facultative gram-negative rods and mycoplasmas have also been implicated. Differentiating between these clinically is almost impossible and precise microbiological diagnosis is difficult, treatment regimens must be effective against this broad range of pathogens.

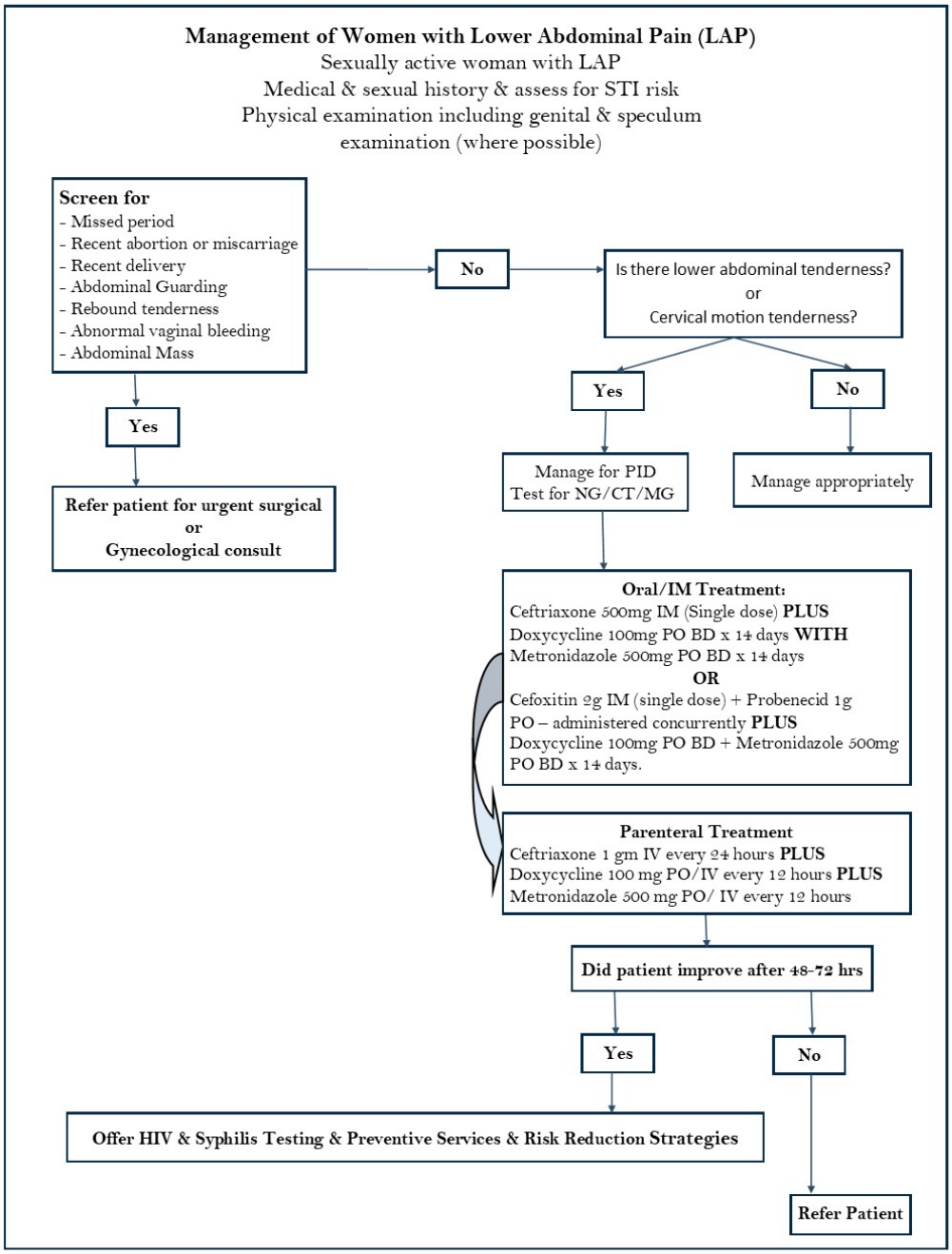
Sexually active women presenting with lower abdominal pain should be assessed for pelvic inflammatory disease and treated syndromically.

Figure 6: Flow Chart for the Management of Lower Abdominal Pain



Adapted from WHO Guidelines for the Management of Symptomatic Sexually Transmitted Infections, June 2021

Figure 7: Algorithm for management of lower abdominal pain in women



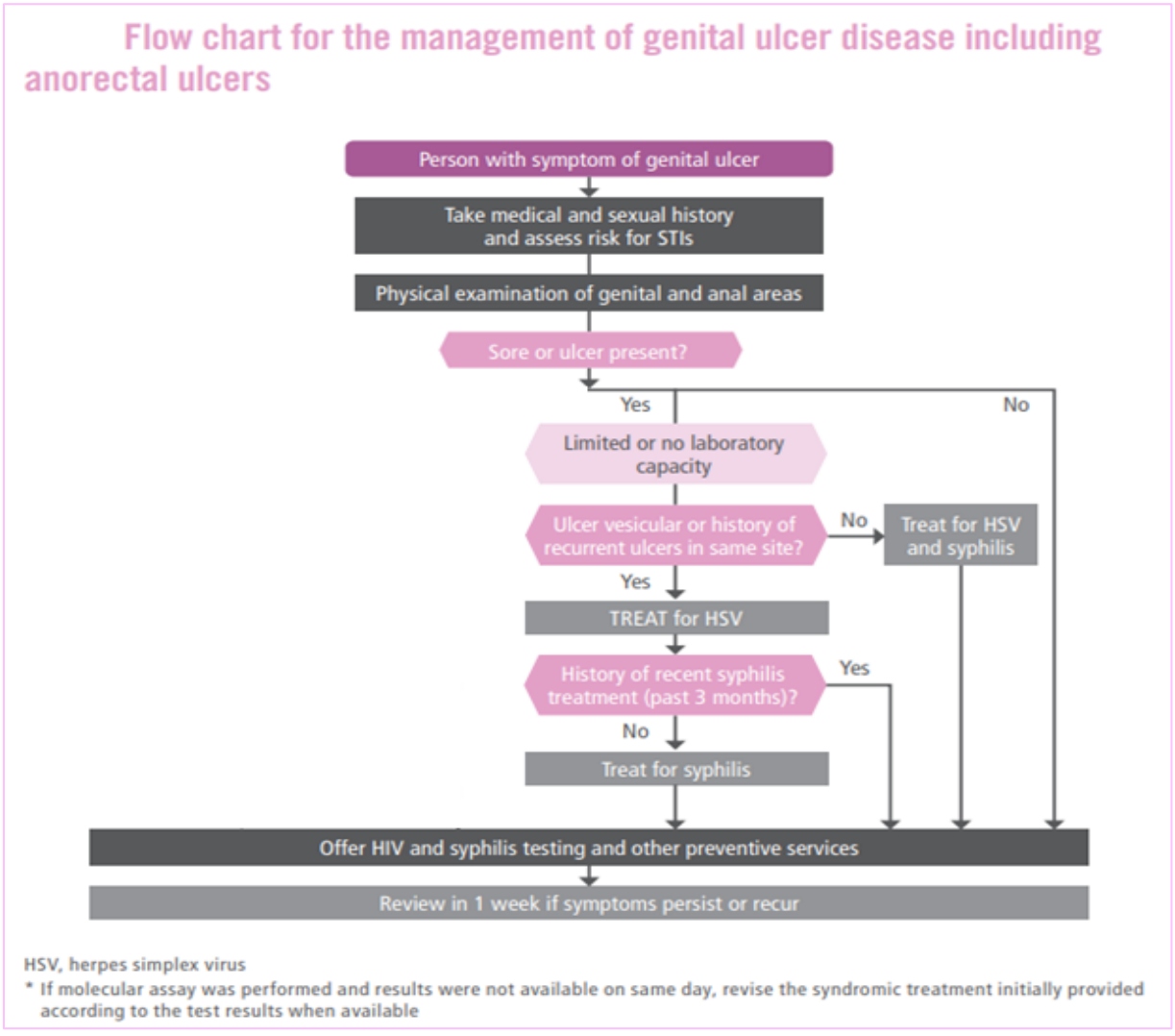
Adapted from Who Guidelines for the Management of Symptomatic Sexually Transmitted Infections June 2021 and CDC Sexually Transmitted Infections Treatment Guidelines, 2021

9.4 Genital Ulcer Disease Syndrome

The causative organisms for genital ulcer disease include HSV-2 and HSV-1, T. pallidum (syphilis) and C. trachomatis serovars L1–L3, causing lymphogranuloma venereum and, less so, H. ducreyi (chancroid). Genital ulceration among people with primary syphilis occurs before serological laboratory tests become positive; thus, laboratory findings are rarely helpful at the initial visit and may even be misleading by being negative in the presence of syphilis infection.

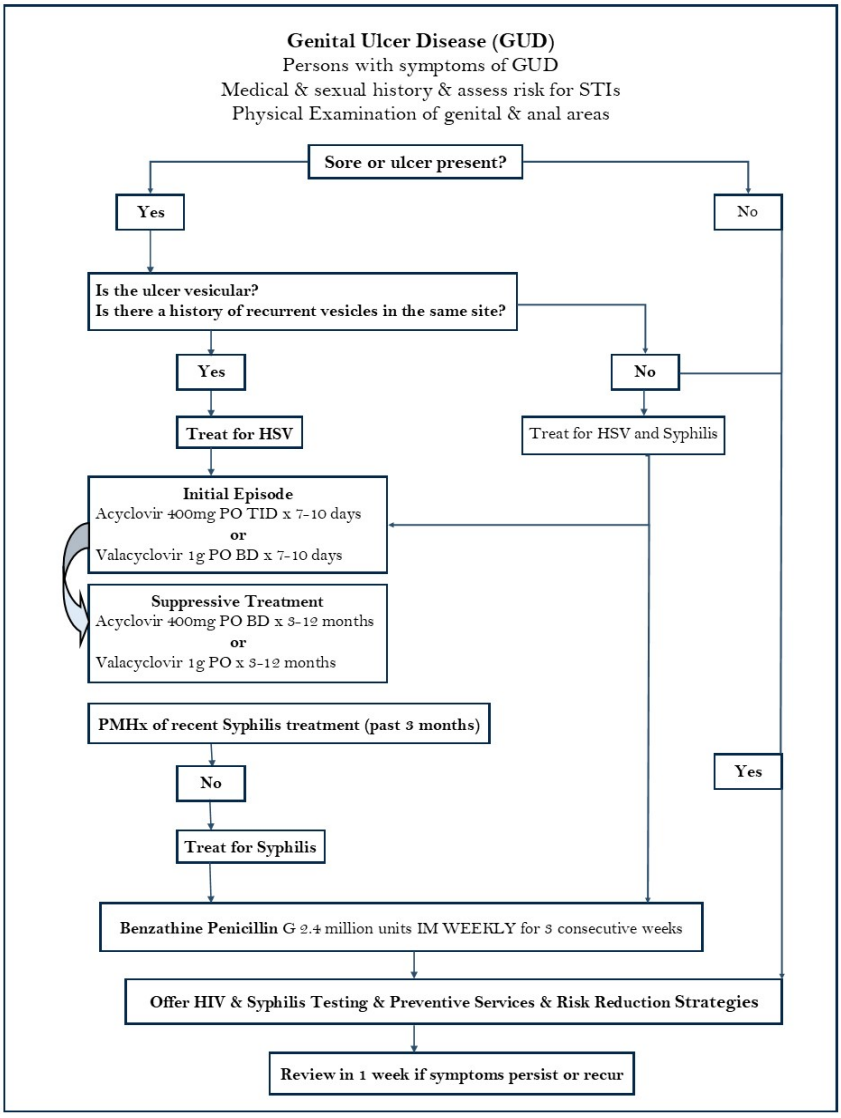
Further, in settings with a high prevalence of syphilis, a person with a genital ulcer may have a reactive serological test for syphilis from a previously treated infection, even if HSV-2 is the cause of the current ulcer. In addition, since the differential diagnosis of genital ulcers using clinical judgement has been shown to be inaccurate in over 50% of cases, even by experienced clinicians, the management of people with genital ulcer disease must be based either on laboratory-based etiological studies or a syndromic approach.

Figure 8: Flow Chart for the Management of Genital Ulcer Disease including Anorectal Ulcers



Adapted from WHO Guidelines for the Management of Symptomatic Sexually Transmitted Infections, June 2021

Figure 9: Algorithm for Management of Genital ulcer disease



Adapted from Who Guidelines for the Management of Symptomatic Sexually Transmitted Infections June 2021 and CDC Sexually Transmitted Infections Treatment Guidelines 2021

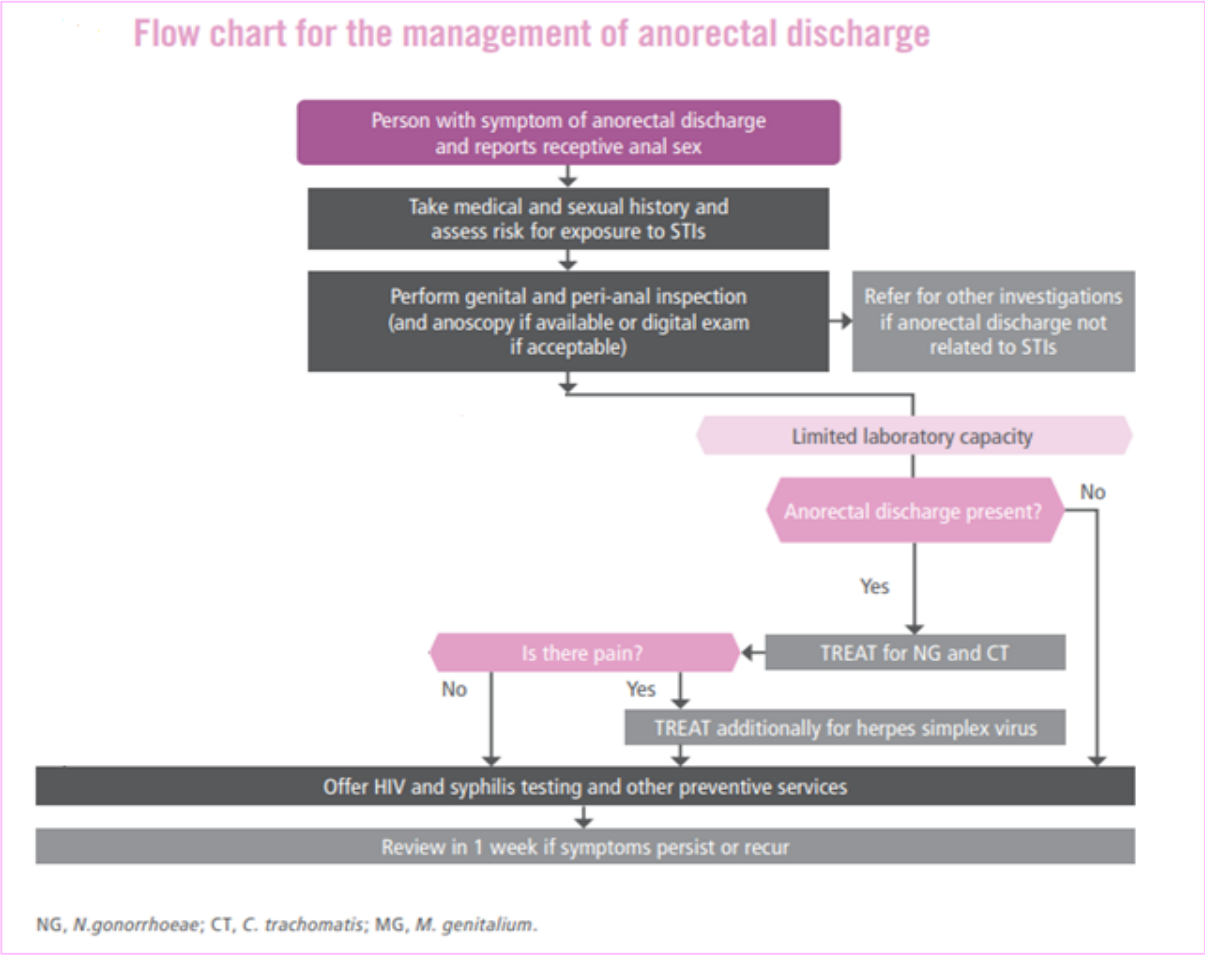
9.5 Anorectal Discharge

Anorectal symptoms and anorectal STIs are prevalent among men who have sex with men, female sex workers, transgender people and heterosexual women who engage in anal sexual intercourse. The common pathogens found in anal infections are HPV, HSV and syphilis; Anorectal infections may be associated with anorectal pain, itching, discharge, bleeding, and sensation of rectal fullness, tenesmus, constipation and mucus streaking of stools. Asymptomatic anorectal infections are not uncommon, although precise data are scarce.

Advise sexual abstinence during the course of treatment.

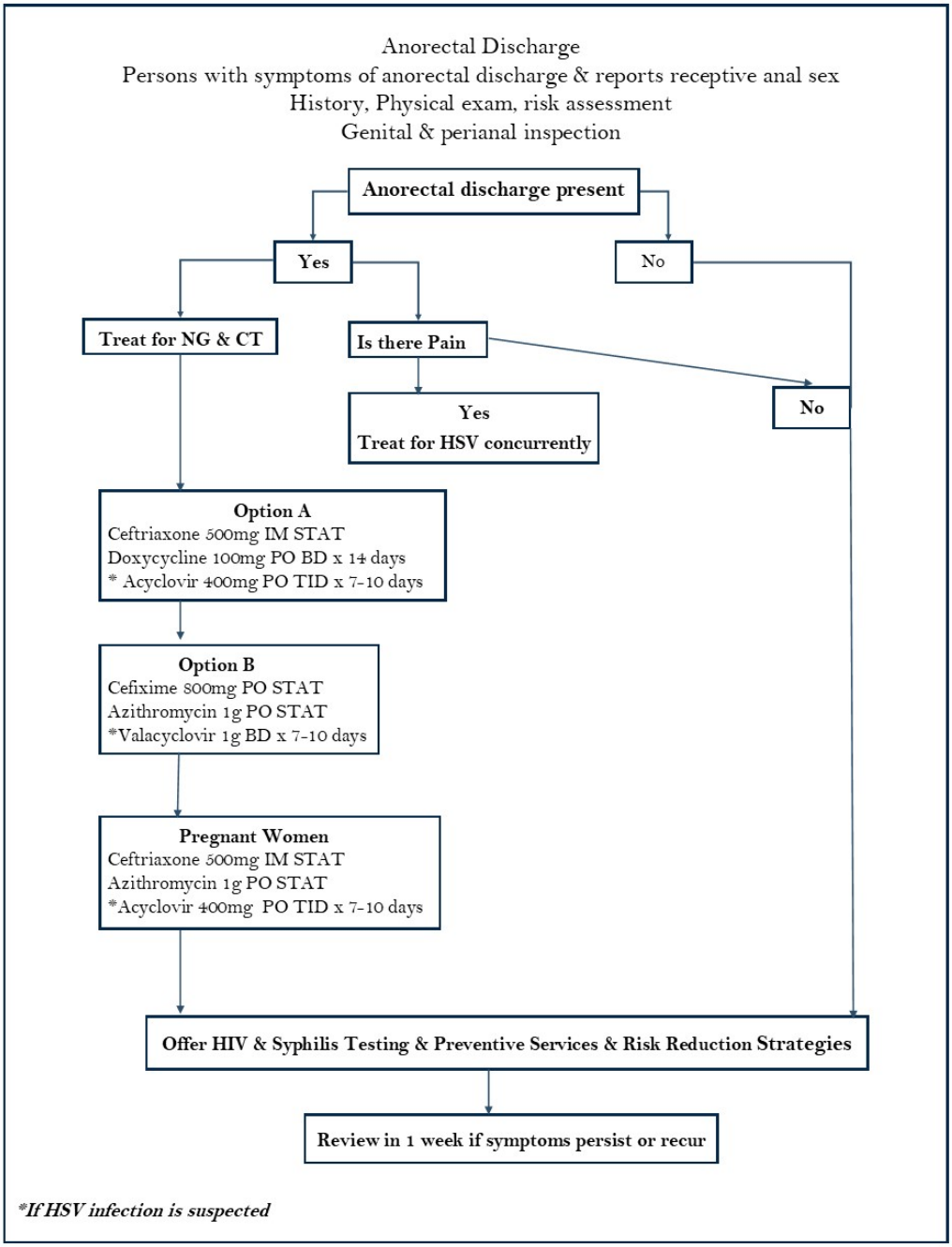
- Provide condoms, educate about correct and consistent use.
- Refer for voluntary counselling and testing for HIV, Syphilis and Hepatitis B.
- Consider immunization against Hepatitis

Figure 10: Flow Chart for the Management of Anorectal Discharge



Adapted from Who Guidelines for the Management of Symptomatic Sexually Transmitted Infections June 2021

Figure 11: Algorithm for Management of Anorectal Discharge



Adapted from Who Guidelines for the Management of Symptomatic Sexually Transmitted Infections June 2021 and CDC Sexually Transmitted Infections Treatment Guidelines, 2021

10

Epididymitis

Epididymitis, the inflammation of the epididymis, can be either acute or chronic. Acute epididymitis, characterized by pain, swelling and inflammation of the epididymis and sometimes involving a testicle (epididymo-orchitis) lasts for <6 weeks. Acute epididymitis can be caused by STIs (*C. trachomatis, N. gonorrhoeae or M. genitalium*) or enteric organisms (*E.Coli*). Acute epididymitis caused by an STI is usually accompanied by asymptomatic urethritis; acute epididymitis caused by sexually transmitted enteric organisms may occur among men who are the insertive partner in anal sex. Non-sexually transmitted acute epididymitis typically occurs with bacteriuria secondary to bladder outlet obstruction eg. Benign prostatic hyperplasia, among older men, it is also associated with prostate biopsy, urinary tract instrumentation or surgery, systemic disease or immunosuppression.

Chronic epididymitis is characterized by a >6week history of discomfort or pain in the scrotum, testicle or epididymis. Chronic infectious epididymitis is observed with conditions associated with a granulomatous reaction eg. Mycobacterium tuberculosis (TB). TB should be suspected among men with a known history or recent exposure to TB. The differential diagnosis of chronic, non-infectious epididymitis (epididymyalgia or orchialgia) is broad and men with this diagnosis should be referred to a urologist for clinical management.

10:1 Diagnosis

The diagnosis of acute epididymitis is based on the clinical symptoms of unilateral testicular pain and tenderness, hydrocele and palpable swelling of the epididymis. The spermatic cord is usually tender and swollen. For men with a sudden onset of severe unilateral pain without urethritis or urinary tract infection or for whom the diagnosis of acute epididymitis is questionable immediate referral to a urologist for evaluation of testicular torsion is of the utmost importance. Testicular torsion does occur more frequently in adolescents and in men who have no evidence of inflammation.

- All suspected cases of acute epididymitis should be screened for Gram, MB, or GV stain of urethral secretions demonstrating ≥2WBCs per oil immersion field. Gonococcal infection is established by documenting the presence of WBC-containing intracellular gram-negative or purple diplococci on urethral Gram, MB, or GV stain, respectively.
- Positive leukocyte esterase test on first-void urine.
- Microscopic examination of sediment from a spun first void urine demonstrating ≥10 WBCs/HPF.

10.2 Treatment

Treatment goals for acute epididymitis are:

- Microbiologic infection cure
- Improvement of signs and symptoms
- Prevention of transmission of chlamydia and gonorrhea to others
- Decreased potential for chlamydial or gonococcal epididymitis complications (e.g., infertility or chronic pain).

Table 25: Recommended Regimens for Epididymitis

For Acute Epididymitis most likely caused by Chlamydia or Gonorrhoea: Ceftriaxone 500mg* IM in a single dose + Doxycycline 100mg orally twice daily for 10 days
For Acute Epididymitis most likely caused by Chlamydia, Gonorrhea or Enteric Organisms (men who practice insertive anal sex): Ceftriaxone 500mg* IM in a single dose + Levofloxacin 500mg orally once daily for 10 days
For Acute Epididymitis caused by Enteric Organisms ONLY: Levofloxacin 500mg orally for 10 days

*For persons weighing ≥150kg 1g Ceftriaxone should be administered

10.2.1 Other Management Considerations:

Adjunt to therapy

Bed rest, scrotal elevation and non-steroidal anti-inflammatory drugs are recommended until fever and local inflammation have subsided. Men with acute epididymitis confirmed or suspected *N. gonorrhoeae* or *C. trachomatis* caused acute epididymitis should be advised to abstain from sexual intercourse until they and their partners have been treated and symptoms have resolved. All men with acute epididymitis should be tested for HIV and syphilis.

Follow Up

Men should be advised to return to clinic if their symptoms don't resolve by 72 hours after treatment. Men who continue to experience swelling and tenderness after completion of treatment should be evaluated for alternative diagnoses, including tumors, testicular cancer, TB and fungal epididymitis.

Management of Sex Partners

All sex partners during the previous 60 days before symptom onset should be referred for evaluation, testing, and presumptive treatment. If the last sexual intercourse was >60 days before onset of symptoms or diagnosis, the most recent sex partner should be evaluated and treated. EPT is an effective strategy for treating sex partners of men for whom linkage to care is anticipated to be delayed. Partners should be instructed to abstain from sexual intercourse until they and their sex partners are treated and symptoms have resolved.

HIV Infection

Men with HIV who have uncomplicated acute epididymitis should receive the same treatment regimen as those men without

Drug Allergy, Intolerance, and Adverse Reactions

The risk for penicillin cross-reactivity is negligible between all third-generation cephalosporins (e.g., ceftriaxone).

11

Human Papilloma Virus Infection (HPV)

Human Papilloma virus (HPV) is a small non-enveloped, double stranded DNA virus that has oncogenic potential. Approximately 150 types of HPV have been identified. Most sexually active persons will acquire genital HPV infection during their lifetime but approximately 90% of them are clinically silent and most infections resolve spontaneously. Oncogenic, high-risk HPV infection (e.g., HPV types 16 and 18) causes most of the cervical, penile, vulvar, vaginal, anal, and oropharyngeal cancers and precancers, HPV types 6 and 11 causes genital warts and recurrent respiratory papillomatosis. Persistent oncogenic HPV infection is the strongest risk factor for development of HPV-attributable precancers and cancers.

11.1 Prevention

- Three HPV vaccines are licensed and available : Ceravrix, a 2-valent vaccine (2vHPV) that targets HPV types 16 and 18
    - Gardasil, a 4-valent vaccine (4vHPV) that targets HPV types 6, 11, 16, and 18.
    - Gardasil 9, a 9-valent vaccine (9vHPV) that targets HPV types 6, 11, 16, 18, 31, 33, 45, 52, and 58.
- HPV vaccination is administered to all adolescents between 9 and 13 years of age.
- Catch up vaccination is administered through age 26 years for those who have not been previously vaccinated.
- HPV vaccination is recommended for certain adults aged 27-45 years of age who were not vaccinated previously.
- A 2-dose vaccine schedule (at 0- and 6–12-month intervals) is recommended for persons who start vaccination before their 15th birthday.
- A 3-dose vaccine schedule (at 0-, 1–2-, and 6-month intervals) for persons initiating vaccination at or after 15 years of age and immunocompromised persons regardless of age at initiation.
- HPV vaccines are not recommended for use in pregnant women.
- HPV vaccines can be administered regardless of history of anogenital warts, abnormal Pap test or HPV test, or anogenital precancer.

- Women who have received HPV vaccine should continue routine cervical cancer screening.
- Risk reduction also includes the consistent and correct use of condoms and limiting the number of sex partners.
- Abstaining from sexual activity is the most reliable method for preventing genital HPV infection.

11.2 Counselling

It is advisable to discuss the following points with patients who have been diagnosed with HPV.

- Most sexually active persons get HPV at some time during their lifetime, although most never know it.
- Anogenital HPV infection is common. It usually infects the anogenital area but can infect other areas, including the mouth and throat.
- Partners tend to share HPV, and it is not possible to determine which partner transmitted the original infection.
- Having HPV does not mean that a person or their partner is having sex outside the relationship.
- Persons who acquire HPV usually clear the infection spontaneously with no associated health problems.
- If HPV infection persists, genital warts, precancers, and cancers of the cervix, anus, penis, vulva, vagina, head, or neck might develop. No HPV test can determine which HPV infection will become undetectable and which will persist or progress to disease.
- Many types of HPV are sexually transmitted through anogenital contact, mainly during vaginal and anal sex. HPV also might be transmitted during oral sex and genital-to-genital contact without penetration.
- In rare cases, a pregnant woman can transmit HPV to an infant during delivery.
- Treatments are available for the conditions caused by HPV but not for the virus itself.
- Having HPV does not make it harder for a woman to get pregnant or carry a pregnancy to term.

11.3 Anogenital Warts

Almost all (90%) anogenital warts are caused by nononcogenic HPV types 6 or 11. In addition to anogenital warts, HPV types 6 and 11 have been associated with conjunctival, nasal, oral, and laryngeal warts.

Anogenital warts are usually asymptomatic; however, depending on the size and anatomic location, they can be painful or pruritic. They are usually flat, papular, or pedunculated growths on the genital mucosa. Anogenital warts commonly occur at sites of coital friction. For women external warts can appear on vulva, the vaginal introitus, perineum and perianal area. Women can also develop internal warts involving the vagina, cervix or anal mucosa. For men anogenital warts may occur under the foreskin of the uncircumcised penis, on the shaft of the penis, urethral meatus, scrotum, perineum, perianal area and anal canal. Intra-anal warts are observed

predominantly in persons who have had receptive anal intercourse; however, they also can occur among men and women who have not had a history of anal sexual contact.

Anogenital warts in preadolescent children may be due to sexual abuse and their appearance should prompt an evaluation of other STIs and social risk factors. They may also result from vertical transmission, transmission of non-genital HPV types to the genital surface and possibly fomite transmission.

11.3.1 Diagnosis

Diagnosis of anogenital warts is usually made by visual inspection but can be confirmed by biopsy if the lesions are atypical (e.g., pigmented, indurated, affixed to underlying tissue, bleeding, or ulcerated), the diagnosis is uncertain, the patient is immunocompromised (including patients with HIV), the lesions do not respond to therapy or the lesions worsen during treatment.

11.3.2 Treatment

The aim of treatment is removal of the warts and alleviation of symptoms, if present. If left untreated, anogenital warts can resolve spontaneously, remain unchanged, or increase in size or number. Because warts might spontaneously resolve in <1 year, an acceptable alternative for certain persons is to forego treatment and wait for spontaneous resolution. Available therapies for anogenital warts might reduce, but probably do not eradicate, HPV infectivity

Treatment of anogenital warts should be guided by wart size, number, and anatomic site; patient preference; cost of treatment; convenience; adverse effects; and provider experience. No definitive evidence indicates that any one recommended treatment is superior to another, and no single treatment is ideal for all patients or all warts. Shared clinical decision-making between a patient and a provider regarding treatment algorithms has been associated with improved clinical outcomes and should be encouraged. Because all available treatments have shortcomings, clinicians sometimes use combination therapy (e.g., provider administered cryotherapy with patient-applied topical treatments between visits to provider).

Recommended Treatment Of External Anogenital Warts

Table 26: Recommended Treatment For External Anogenital Warts

Disease	Recommended regimens	
	Patient-applied	**Provider-administered**
External genital warts (penis, groin, scrotum, vulva, perineum, external anus, and perianus)	Imiquimod 3.75% (applied once at bedtime, every night for up to 8 weeks) or 5% cream (applied once at bedtime, three times a week for up to 16 weeks);**OR** Podofilox 0.5% solution or gel- Apply 2 x daily for 3 days followed by 4 days of no treatment, repeating cycle up to 4 x (total volume of podofilox should not exceed 0.5 ml per day; **OR** Sinecatechins 15%ointment – Apply 3x daily until lesions resolve, but for not more than 16 weeks. Should not be used on immunocompromised patients.	Cryotherapy with liquid nitrogen or cryoprobe; local anaesthesia may facilitate therapy if area of warts is large; **OR** Surgical removal either by tangential scissor excision, tangential shave excision, curettage or electrosurgery; **OR** Trichloroacetic acid (TCA) or bichloroacetic acid (BCA) 80–90%: a small amount should be applied only to the warts and allowed to dry before the patient sits or stands. Treatment can be repeated weekly if needed.
Notes- **For Imiquimod**- The treatment area should be washed with soap and water 6–10 hours after the application. The imiquimod cream may weaken condoms and vaginal diaphragms **Podofilox 0.5%soln or gel:** Should be applied to each wart and then allowed to air-dry before the treated area comes into contact with clothing. (Overapplication or failure to air-dry can result in local irritation caused by spread of the compound to adjacent areas and possible systemic toxicity). If necessary can be repeated weekly. Podofilox is contraindicated in pregnancy **Sinecatechins 15% ointment:** Do not wash off after use. May weaken condoms and vaginal diaphragms. Safety in pregnancy is unknown. **Cryotherapy:** Pain during and after application is common. Blistering is a common side effect. **TCA/BCA:** If pain is intense or an excess amount of acid is applied, the area can be covered with sodium bicarbonate (i.e. baking soda), washed with liquid soap preparations, or be powdered with talc to neutralize the acid or remove unreacted acid. TCA or BCA treatment can be repeated weekly if necessary. Note: TCA solution has a low viscosity comparable with that of water and can spread rapidly and damage adjacent tissues if applied excessively.		

**Persons with external anal or perianal warts might also have intra-anal warts. Thus, persons with external anal warts might benefit from an inspection of the anal canal by digital examination, standard anoscopy, or high-resolution anoscopy.*

Source: Workowski KA, Bachmann LH, Chan PA, et al. Sexually transmitted infections treatment guidelines, 2021. Human papillomavirus (HPV) infection: anogenital warts. MMWR Recomm Rep. 2021;70(No. RR-4):1-187. [2021 STI Treatment Guidelines]

Recommended Treatment for Internal Anogenital Warts

Treatment of internal anogenital warts, including warts located in the urethral meatus, vagina, cervix or intra-anal region, is complicated and may require consultation with and/or management by a specialist.

Table 27: Recommended Treatment for Internal Anogenital Warts

Cervical warts*	Cryotherapy with liquid nitrogen; **OR** Surgical removal; **OR** TCA or BCA 80%–90% solution,
Vaginal warts	Cryotherapy with liquid nitrogen; (The use of a cryoprobe in the vagina is not recommended because of the risk for vaginal perforation and fistula formation); **OR** Surgical removal; **OR** TCA or BCA 80% to 90%: a small amount should be applied only to the warts.
Urethral meatus warts	Cryotherapy with liquid nitrogen; **OR** Surgical removal.
Intra- Anal warts	Cryotherapy with liquid nitrogen; **OR** Surgical removal; **OR** TCA or BCA 80–90% to warts.

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015. MMWR. 2015;
64(3) (12). Available from: https://www.cdc.gov/std/tg2015/tg-2015-print.pdf
** Management of cervical warts should include consultation with a specialist. For women who have exophytic cervical warts, a biopsy evaluation to exclude high-grade SIL must be performed before treatment is initiated.*

Note: The removal of a lesion does not mean that the HPV infection has been cured.

11.3.3 Other Management Considerations for Anogenital Warts

- Most anogenital warts respond within 3 months of therapy. Factors that might affect response to therapy include immunosuppression and treatment compliance.
- A new treatment modality should be selected when no substantial improvement is observed after a complete course of treatment or in the event of severe side effects; treatment response and therapy-associated side effects should be evaluated throughout the course of therapy.
- Persons should inform current partners about having genital warts because the types of HPV that cause warts can be passed on to partners.
- Podofilox (podophyllotoxin), podophyllin, and sinecatechins should not be used during pregnancy. Imiquimod appears to pose low risk but should be avoided.

- Anogenital warts can proliferate and become friable during pregnancy. Although removal of warts during pregnancy can be considered, resolution might be incomplete or poor until pregnancy is complete.
- Although rare, HPV types 6 and 11 can cause respiratory papillomatosis in infants and children. The route of transmission and whether caesarean section prevents respiratory papillomatosis in infants and children also is not fully understood. Therefore caesarean delivery is not indicated to prevent transmission of HPV infection to the newborn.
- Immunocompromised persons are more likely to develop anogenital warts than those who do not have HIV infection. The lesions are generally larger in number and size, less responsive to therapy and with more frequent reoccurrences. Treatment however is no different from that of an immunocompetent person.
- Immunocompromised persons also have greater likelihood of squamous cell carcinomas and therefore biopsy for confirmation of diagnosis for suspicious cases is recommended.
- Biopsy of an atypical wart might reveal HSIL or cancer of the anogenital tract. In this instance, referral to a specialist for treatment is recommended.

11.4 Cancers and Precancers Associated with Human Papillomavirus

Persistent infection with high-risk (oncogenic) types of HPV has a causal role in approximately all cervical cancers and in certain vulvar, vaginal, penile, anal, and oropharyngeal cancers (*1238*). However, cervical cancer is the only HPV-associated cancer for which routine screening is recommended.

11.4.1 Cervical cancer

Screening Recommendations

All persons with a cervix should receive cervical cancer screening, regardless of sexual orientation or gender identity (i.e., those who identify as lesbian, bisexual, heterosexual, or transgender).

Screening with Pap test and HPV test

- Routine cervical screening should be performed starting at age 21 years and continue through age 65 years.
- The cervical cytology screening (Pap test) should be performed using either conventional or liquid based cytologic tests. The results must be processed by certified labs and the results reporting system should be based on the following **Bethesda terminology:**
    - Atypical squamous cells (ASC)
    - ASC of undetermined significance (ASC-US)
    - ASC—cannot exclude high-grade squamous intraepithelial lesion (HSIL)
    - Low-grade squamous intraepithelial lesion (LSIL)
    - High grade squamous intraepithelial lesion (HSIL)
- The **CIN (cervical intraepithelial neoplasia)** identifies how much of the lining of the cervix is invaded by abnormal cells. CIN Classifications are as follows:

    - CIN I: Mild dysplasia; abnormal cells can be found in 1/3 of the lining of the cervix
    - CIN II: Moderate dysplasia; abnormal cells can be found in 2/3 of the lining of the cervix
    - CIN III: Severe dysplasia; abnormal cells can be found in more than 2/3 of the lining of the cervix and up to the full thickness of the lining
- Annual cervical cancer screening is no longer recommended for all women. Screening is recommended as follows:
    - Ages 21-29- every 3 years with Pap test.
    - Ages 30–65 years, Pap test every 3 years or a Pap test PLUS HPV test (co-testing) every **5 years**. (An HPV test checks for the virus and a Pap Test checks for abnormal cervical cells)
- Women who have received HPV vaccines, should be screened the same way as the unvaccinated.
- Pregnant women should be screened at the same intervals as non-pregnant women. A swab, Ayre's spatula, or cytobrush can be used for obtaining Pap tests in pregnant women.
- Prevalence of oncogenic HPV types are high among adolescents (<21 years), and oncogenic HPV and squamous intraepithelial lesions caused by HPV in adolescent girls are more likely to regress than those in older women. Therefore, cervical cancer screening and HPV testing are not recommended in this population.
- Women and adolescents with HIV should be screened within 1 year of sexual activity and every year thereafter. There is an increased risk for cervical precancers and cancers in women with HIV infection, and a high rate of progression of abnormal cytology among adolescents with HIV, regardless of mode of HIV infection

Screening with Visual Inspection with Acetic Vinegar (VIA)

VIA is another viable method for cervical cancer screening. It is a low cost technique with the advantage of having immediate results. It is applicable for resource limited settings. It is best used for women up to the age of 45 years.

- VIA is very simple and involves applying a cotton swab dipped in 5% trichloroacetic acid (the same strength found in typical vinegar) to the cervix. The clinician should look for aceto-white changes on the cervix, focusing on the squamocolumnar junction.
- A negative VIA is considered when there is normal squamocolumnar junction. Patients with negative VIA results, who are not considered high risk are asked to return in 1-3 years for screening. Patients who are considered high risk (use hormonal contraceptives, smoke, has high parity, is HIV infected), should return in 1 year.
- A positive VIA is considered when:
    - Lesion extends beyond squamocolumnar junction to transformation zone but <70% of cervix and within limits of probe.
    - Lesion is >70% and 2mm beyond limits of probe.
    - Lesion is ulcerative, bleeds easily, a fungating mass.

Follow-up

- Patients should be provided a copy of their test results; those with normal results should be provided information on follow-up visits and the importance of continued cervical
- Women with abnormal Pap test or VIA should be referred to Gynaecology/oncology for appropriate management.
- Women with positive VIA lesions which extend to the transformation zone can be treated with cryotherapy if the lesion is < 70% of the cervix and within limits of the probe.
- Women with positive VIA lesions > 70% and 2mm beyond the limits of the probe should be referred for colposcopy and biopsy.
- Women with LSIL or HSIL, management should be provided by a specialist.

Other Management Considerations

- Pap tests and VIA tests should not be considered screening tests for STIs.
- The presence of a mucopurulent discharge should not postpone cytology testing. The test can be performed after removal of the discharge with a saline-soaked cotton swab.
- In the absence of other indications, the presence of external genital warts does not warrant more frequent cervical cancer screening.
- Persons who have had a total hysterectomy with removal of the cervix do not require screening unless cervical intraepithelial neoplasia CIN 2, CIN 3, or adenocarcinoma in situ was diagnosed within the previous 20 years. If the cervix remains intact after a supracervical hysterectomy, regularly scheduled Pap tests should be performed as indicated.
- At an initial visit, providers should ask patients about their recent cytology test and HPV results (if done) and any history of evaluation and treatment (e.g., loop electrosurgical excision procedure and colposcopy) to assist with management; effort should be made to obtain copies of recent results. The importance and frequency of screening should be reinforced.
- Providers should educate patients on HPV and counsel them on the benefits, risks and uncertainties of screening.
- Providers also should screen for tobacco use and perform cessation counseling. Smoking contributes to the progression of CIN, with both active and passive smoking associated with squamous cell carcinoma of the cervix in women with HPV 16 or 18 infection.

11.4.2 Anal Cancer

Anal cancer is rare in the general population but incidence is higher among men with HIV (1–2 cases per 100,000 person-years); however, incidence is substantially higher among men and women with HIV infection and MSM with and without HIV infection. Persistent HPV infection might be a risk factor for preventable HPV-associated second primary cancers among survivors of HPV-associated cancers (*1282*).

Data are insufficient to recommend routine anal cancer screening with anal cytology in persons with HIV infection, MSM without HIV infection, and the general population. An annual digital

anorectal examination (DARE) might be useful to detect masses on palpation in persons with HIV infection and possibly in MSM without HIV with a history of receptive anal intercourse (*98*).

HPV tests are not clinically useful for anal cancer screening because of a high prevalence of anal HPV infection among populations at high risk, particularly MSM (*1278*,*1289*,*1290*).

12

Viral Hepatitis

12.1 Hepatitis A Virus (HAV)

Hepatits A is a vaccine preventable liver infection caused by the hepatitis A virus. HAV infection has an incubation period of approximately 28 days. The virus replicates in the liver and is shed in the faeces of the patient. Shedding occurs 2-3 weeks before and 1 week after the onset of the clinical symptoms.

HAV infection is self-limiting and does not cause chronic infection nor chronic liver disease. However about 10% of patients have a relapse of symptoms during the 6 months after acute illness. Acute liver failure is rare.

HAV infection is primarily transmitted by the fecal-oral route, by either person-to -person contact or the consumption of contaminated food or water. Other sources of infection include sexual practices especially among MSM, injection drug users and international travellers.
Symptoms of hepatitis A can last up to 2 months and include fatigue, nausea and vomiting, jaundice and fever.

12.1.1 Diagnosis

HAV infection cannot be diagnosed on a clinical basis alone, it also requires serologic testing. Presence of IgM antibody to HAV is diagnostic of acute HAV infection.

12.1.2 Treatment

Patients with acute HAV infection usually only require supportive care, with no restrictions in diet or activity. Patients who are dehydrated and those who have signs and symptoms of liver failure should be hospitalized. Medications that are metabolized by the liver should be used with caution among persons with HAV infection.

12.1.3 Prevention

Vaccination is the most effective means of preventing HAV transmission among persons at risk for infection who did not receive hepatitis A vaccination during childhood. Two monovalent vaccines (Havrix and Vaqta) are approved for persons aged ≥12 months. Administered IM in a 2-

dose series at 0 and 6–12 months, hepatitis A vaccines induce protective antibody levels among virtually all adults.

Table 28: Hepatitis A vaccine schedule

Vaccine	Age (yrs)	Dose	Volume (mL)	Two dose schedule (months)
HAVRIX	1 -18	720 (EL.U)	0.5	0 (6-12)
	>18	1,440 (EL.U)	1.0	0(6 -12)
VAQTA	1-18	25 (U)	0.5	0(6-18)
	>18	50 (U)	1.0	0(6-18)

Pre-exposure Vaccination

Persons at risk for HAV infection, all children older than 12 months, MSM, injection drug users, international travellers, persons with occupational risk for exposure (*1297*) should be offered the Hepatitis A vaccine . If persons are at risk for both HAV and HBV, the combined hepatitis A and B vaccine can be considered, if available.

Post-exposure Prophylaxis

Persons who have recently been exposed to HAV, and who were not previously vaccinated against hepatitis A, should be given a single dose of monovalent hepatitis A vaccine, ideally <2 weeks after exposure.

12.1.4 Special Considerations

Although persons with HIV who have lower $CD4^+$ T-cell counts or percentages might have a weaker response to the vaccine, vaccination should not be delayed for the $CD4^+$ T-cell count to exceed a certain threshold because of the prolonged risk for HAV exposure created by missed opportunities to vaccinate.

12.2 Hepatitis B Virus Infection (HBV)

Hepatitis B virus causes Hepatitis B infection. Hepatitis B is spread when blood, semen, or other body fluids from a person infected with the virus enters the body of someone who is not infected. This can happen through sexual contact; sharing needles, syringes, or other drug-injection equipment; or from mother to baby at birth. Not all people newly infected with HBV have symptoms, but for those that do, symptoms can include fatigue, poor appetite, stomach pain, nausea, and jaundice. For many people, hepatitis B is a short-term illness. For others, it can become a long-term, chronic infection that can lead to serious, even life-threatening health issues like cirrhosis or liver cancer. Risk for chronic infection is related to age at infection: about 90% of infants with hepatitis B go on to develop chronic infection, whereas only 2%–6% of people who get hepatitis B as adults become chronically infected. Hepatitis B is a vaccine-preventable disease.

For detailed information on Hepatitis B prevention, symptoms, diagnosis, treatment and long term sequalae please see the National Hepatitis B Guidelines.

12.3 Hepatitis C Virus Infection (HCV)

Hepatitis C, which is caused by Hepatitis C Virus (HCV), can be highly contagious, with as much as 30% risk of exposure per contact event. HCV RNA can be detected in blood within 1–3 weeks after exposure.

The average time from exposure to antibody to HCV seroconversion is 4-10 weeks, and anti-HCV can be detected among approximately 97% of persons by 6 months after exposure. Individuals with typical infections have mild symptoms or are asymptomatic. Chronic infection develops in 75–85% of HCV-infected persons, and 10%–20% of persons with chronic infection velop cirrhosis in 20–30 years of active liver disease. Many infected persons remain unaware of their infection because they are not clinically ill. However, infected persons are a source of transmission to others and are at risk for cirrhosis and hepatocellular carcinoma decades after infection.

The primary mode of transmission of Hepatitis C is parenterally, usually through shared needles for drug use, though it can also be transmitted through blood transfusion, so blood donors should be carefully screened as a matter of course. HCV is not efficiently transmitted sexually, however, data indicate that sexual transmission of HCV can occur, especially among persons with HIV infection. Increasing incidence of acute HCV infection among MSM with HIV infection has been reported. High-risk behaviours like unprotected sexual contact and injection drug use increase the likelihood of transmission, particularly within vulnerable groups. For this reason, it is important to consider offering HCV testing to injection drug users who may be accessing care at STI treatment clinics, HIV testing and counselling facilities, or other public health settings where such services are available. Correctional facilities should also perform HCV testing.

Hepatitis C screening is recommended at least once in a lifetime for all adults aged ≥18 years and for all women during each pregnancy. Routine periodic HCV testing is recommended for persons with ongoing risk factors (e.g., injecting drug use or hemodialysis).

12.3.1 Diagnosis

Testing for HCV infection should include use of an approved test for antibody to HCV (i.e., immunoassay, EIA, or enhanced CIA and, if recommended, a supplemental antibody test) followed by NAAT to detect HCV RNA for those with a positive antibody result. Persons with HIV infection with low $CD4^+$ T-cell count may have a false-negative antibody assay.

Persons with HCV infection should be evaluated for treatment. Antibody to HCV remains positive after spontaneously resolving or successful treatment; therefore, subsequent testing for HCV reinfection among persons with ongoing risk factors should be limited to HCV RNA. Persons who have spontaneous resolution or who have undergone successful treatment are not immune to reinfection.

12.3.2 Treatment

HCV infection is curable, and persons with diagnosed HCV infection should be linked to care for further testing (genotype and viral load) and treatment. Please refer to the *National Hepatitis C Guidelines* for further information on the care and treatment of persons living with HCV infection.

12.3.3 Other Management Considerations

All persons with HCV infection whose HIV, HAV and HBV infection status is unknown should be tested for these infections. Persons with negative HAV and HBV results should be offered vaccination. Those who have HIV or HBV infection should be referred for care and treatment.

Management of Sex Partners

Heterosexual persons and MSM with HCV infection especially those with concurrent HIV infection, should protect their partners against HCV and HIV acquisition by using external latex condoms and HIV PrEP. Partners of persons with HCV and HIV should be tested for both infections.

Prevention

No vaccine for hepatitis C is available, and prophylaxis with IG is not effective in preventing HCV infection after exposure. PEP using direct-acting antivirals is not recommended.

Persons with HCV infection should be provided information about how to protect their liver from further harm eg. Persons with HCV infection should be advised to avoid drinking alcohol and taking any new medicines, including over-the-counter or herbal medications, without checking with their clinician.

To reduce the risk for transmission to others, persons with HCV infection should be advised not to donate blood, body organs, other tissue, or semen; not to share any personal items that might have blood on them (e.g., toothbrushes or razors); and to cover cuts and sores on the skin to keep the virus from spreading by blood or secretions. Women with HCV infection do not need to avoid pregnancy or breastfeeding, although children born to women with HCV should be tested for HCV.

Persons who use or inject drugs should be counseled about the importance of stopping drug -use and provided with support to access care at substance abuse treatment centers. Persons who continue to inject drugs should be advised and encouraged to never reuse or share syringes, water, or drug preparation equipment; to only use new, sterile syringes to prepare and inject drugs each time; to use clean water from a reliable source to prepare drugs, to clean the injection site with a new alcohol swab each time and to safely dispose of syringes after one use.

Postexposure Follow up

No PEP has been demonstrated to be effective against HCV infection. Testing for HCV is recommended for health care workers after percutaneous or perimucosal exposures to HCV-

positive blood. Treatment outcomes are improved the earlier infection is identified and treatment started.

HIV Infection and HCV

All persons with HIV infection should undergo serologic screening for HCV at initial evaluation and annually if initial test is negative. Antibody to HCV remains positive after spontaneously resolved infection or successful treatment; therefore testing for potential HCV reinfection should be limited to HCV RNA testing only. Indirect testing (e.g., alanine aminotransferase [ALT]) is not recommended for detecting incident HCV infections because such testing can miss persons who have reverted after acute HCV infection to a normal ALT level at the time of testing. Conversely, ALT can be elevated by antiretroviral and other medications, alcohol, and toxins. If ALT levels are being monitored, persons with HIV infection who experience new or unexplained increases in ALT should be tested for acute HCV infection and evaluated for possible medication toxicity or excessive alcohol use.

Because a minimal percentage of persons with HIV infection do not develop HCV antibodies, HCV RNA testing should be performed for persons with HIV infection and unexplained liver disease who are anti-HCV negative. The course of liver disease is more rapid among persons with HIV and HCV, and the risk for cirrhosis is higher than that for persons with HCV infection alone.

Correct and consistent condom use between partners can prevent the spread of HCV.

13

Clinical Management of Sexually Transmitted Infections in Pregnant Women and Newborns

Intrauterine or perinatally transmitted STIs can have debilitating effects on pregnant women, their fetuses and their partners. All pregnant women and their partners should be asked about STIs, receive counseling about the possibility of perinatal infections and provided with screening and treatment if needed.

13.1 Human Immunodeficiency Virus (HIV)

All pregnant women should be screened for HIV at their initial antenatal visit and during their 3 trimester of pregnancy, preferably before 36 weeks. For women who decline HIV testing, providers should address their concerns and, when appropriate, continue to encourage testing. Partners of pregnant patients should be offered HIV testing if their status is unknown.

Rapid HIV testing should be performed for any woman in labor who has not been tested for HIV during pregnancy or whose HIV status is unknown. If a rapid HIV test result is positive, ART should be administered without waiting for the results of confirmatory testing

Testing pregnant women is crucial because knowledge of infection status can help maintain the woman's health and allows for interventions such as Antiretroviral Therapy (ART) or specialized obstetrical care, that can substantially reduce the risk for perinatal transmission of HIV. Pregnant women with diagnosed HIV infection should be educated about the benefits of ART for their own health and for reducing the risk for HIV transmission to their infant and should be referred to an HIV PMTCT (Prevention of Mother to Child Transmission) clinic for immediate care and treatment. In the absence of ART, a mother's risk for transmitting HIV to her neonate is approximately 30%; however, risk can be reduced to <2% through ART, obstetrical interventions (i.e., elective cesarean delivery at 38 weeks' pregnancy), and breastfeeding avoidance. Detailed and updated recommendations for managing pregnant patients with HIV infection are available in the *National HIV Treatment Guidelines.*

13.1.1 The HIV Exposed Neonate

Diagnosis of HIV infection in a pregnant woman indicates the need for evaluating and managing the HIV-exposed neonate and considering whether the woman's other children, if any, might be infected. Exposed neonates and infants with HIV infection should be managed in consultation with physicians with expertise in neonatal and pediatric HIV management. Detailed and up to date recommendations regarding the management of the HIV exposed neonate and the HIV infected infant are available in *the National HIV Guidelines*

13.2 Syphilis

All pregnant women should be screened for syphilis at their first prenatal visit, and for those women considered at high risk for acquiring infection during pregnancy (eg multiple partners, drug use, bisexual partner, woman or partner incarcerated, homelessness), again at 28 weeks and at delivery. All women who deliver a stillborn infant after 20 gestational weeks should have a syphilis serological test. All women should be screened at each pregnancy.

13.2.1 Diagnosis

Pregnant women seropositive for syphilis should be considered infected unless an adequate treatment history is clearly documented in the medical records and sequential serologic antibody titers have decreased as recommended for the syphilis stage. The risk for fetal infection or congenital syphilis at delivery is related to syphilis stage during pregnancy and though it is the highest during the primary and secondary stages, the risk for fetal infection is still high among pregnant women with late latent syphilis and low titers.

Pregnant women with stable, serofast low nontreponemal titers who have previously been treated for syphilis might not require additional treatment; however, increasing or high antibody titers in a pregnant woman previously treated might indicate reinfection or treatment failure, and treatment should be offered.

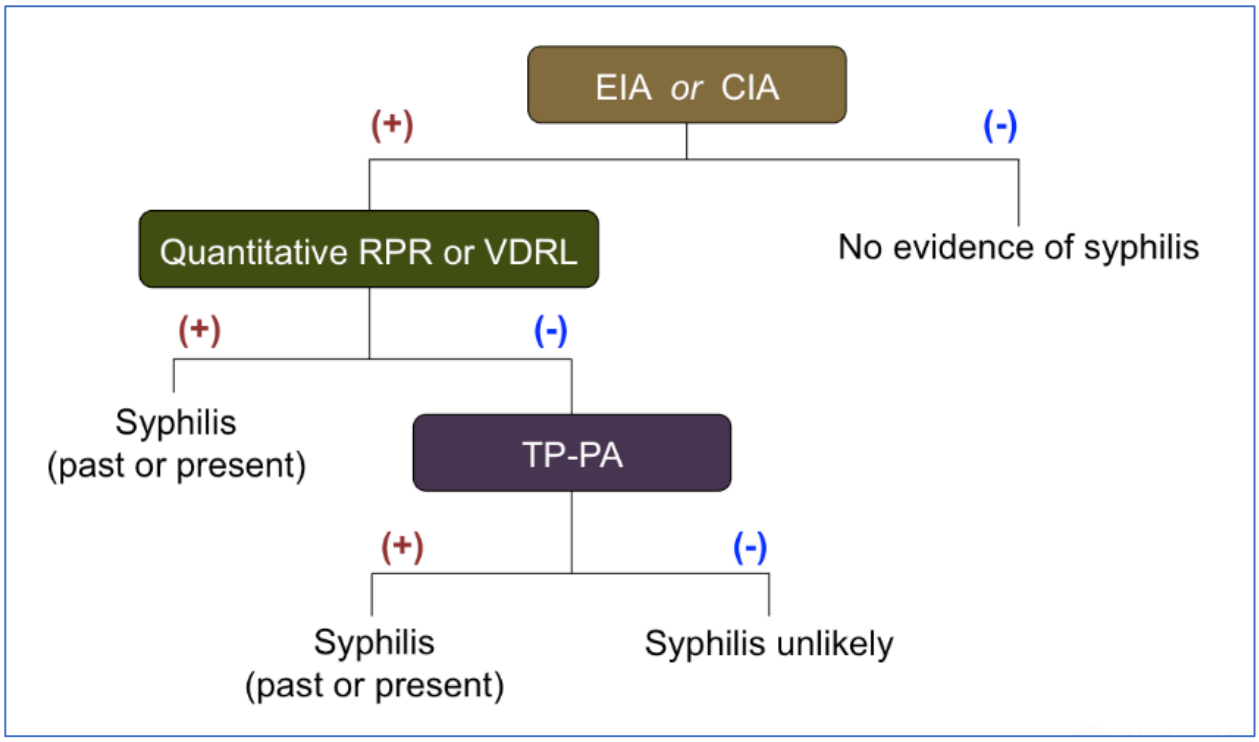
Pregnant women with positive treponemal screening tests should have additional quantitative nontreponemal testing because titers are essential for monitoring treatment response.

If the nontreponemal test is negative, the results are considered discrepant and a second treponemal test (TP-PA is preferred) should be performed, preferably on the same specimen.

If the second treponemal test is positive (e.g., EIA positive, RPR negative, or TP-PA positive), current or previous syphilis infection can be confirmed. For women with a history of adequately treated syphilis who do not have ongoing risk, no further treatment is necessary. Women without a history of treatment should have the syphilis stage determined and should be treated accordingly with a recommended penicillin regimen.

If the second treponemal test is negative (e.g., EIA positive, RPR negative, or TP-PA negative), the positive EIA or CIA is more likely to represent a false-positive test result for women who are at low risk for syphilis, have no signs nor symptoms of primary syphilis, have an uninfected

partner, have no history of treated syphilis. If follow up is possible, repeat serologic testing within 4 weeks. If both the RPR and TP-PA remain negative, no further treatment is necessary. If follow-up is not likely, women with an isolated reactive treponemal test and without a history of treated syphilis should be treated according to the syphilis stage.



13.2.2 Treatment

Penicillin G is the only known effective antimicrobial for treating fetal infection and preventing congenital syphilis. Evidence is insufficient to determine the optimal penicillin regimen during pregnancy. Pregnant women should be treated with the recommended penicillin regimen for their stage of infection.

The following recommendations should be considered for pregnant women with syphilis infection:

Certain evidence indicates that additional therapy is beneficial for pregnant women to prevent congenital syphilis. For women who have primary, secondary, or early latent syphilis, a second dose of benzathine penicillin G 2.4 million units IM can be administered 1 week after the initial dose.

- When syphilis is diagnosed during the second half of pregnancy, management should include a sonographic fetal evaluation for congenital syphilis. This evaluation should not delay therapy. Sonographic signs of fetal or placental syphilis (e.g., hepatomegaly, ascites, hydrops, fetal anemia, or a thickened placenta) indicate a greater risk for fetal treatment failure. Cases accompanied by these signs should be managed in consultation with obstetric specialists. A second dose of benzathine penicillin G 2.4 million units IM after the initial dose might be beneficial for fetal treatment in these situations.

- Women treated for syphilis during the second half of pregnancy are at risk for premature labor or fetal distress if the treatment precipitates the Jarisch-Herxheimer reaction. These women should be advised to seek obstetric attention after treatment if they notice any fever, contractions, or decrease in fetal movements. Stillbirth is a rare complication of treatment; concern for this complication should not delay necessary treatment. No data are available to support that corticosteroid treatment alters the risk for treatment-related complications during pregnancy.
- Missed doses >9 days between doses are not acceptable for pregnant women receiving therapy for late latent syphilis. An optimal interval between doses is 7 days for pregnant women. If a pregnant woman does not return for the next dose on day 7, every effort should be made to contact her and link her to immediate treatment within 2 days to avoid retreatment. Pregnant women who miss a dose of therapy should repeat the full course of therapy.
- All women who have syphilis should be offered testing for HIV at the time of diagnosis.

13.2.3 Follow-Up

Coordinated prenatal care and treatment are vital because providers should document that women are adequately treated for the syphilis stage and ensure that the clinical and antibody responses are appropriate for the patient's disease stage. If syphilis is diagnosed and treated at or before 24 weeks' gestation, serologic titers should not be repeated before 8 weeks after treatment (e.g., at 32 weeks' gestation) but should be repeated again at delivery. Titers should be repeated sooner if reinfection or treatment failure is suspected. For syphilis diagnosed and treated after 24 weeks' gestation, serologic titers should be repeated at delivery.

Many women will not achieve a fourfold decrease in titers before delivery, this does not indicate treatment failure. However, a fourfold increase in titer after treatment (e.g., from 1:8 to 1:32) that is sustained for >2 weeks is concerning for reinfection or treatment failure. Nontreponemal titers can increase immediately after treatment. Therefore, unless symptoms and signs exist of primary or secondary syphilis, follow-up titer should not be repeated until approximately 8 weeks after treatment. Inadequate maternal treatment is likely if delivery occurs within 30 days of therapy, clinical signs of infection are present at delivery, or the maternal antibody titer at delivery is fourfold higher than the pre-treatment titer.

13.2.4 Other Management Considerations

Management of Sex Partners

Sex Partners should be managed as outlined in *Syphilis: Management of Sex Partners*

Penicillin Allergy

No proven alternatives to penicillin are available for treatment of syphilis during pregnancy. Pregnant women who have a history of penicillin allergy should be desensitized and treated with penicillin G. Skin testing or oral graded penicillin dose challenge might be helpful in identifying women at risk for acute allergic reactions (see Management of Persons Who Have a History of Penicillin Allergy).

Tetracycline and doxycycline are to be avoided in the second and third trimesters of pregnancy. Erythromycin and azithromycin should not be used because neither reliably cures maternal infection nor treats an infected fetus. Data are insufficient to recommend ceftriaxone or other cephalosporins for treatment of maternal infection and prevention of congenital syphilis.

HIV Infection

Placental inflammation from congenital syphilis infection might increase the risk for perinatal transmission of HIV. All women with HIV infection should be evaluated for syphilis and receive a penicillin regimen appropriate for the syphilis stage. Data are insufficient to recommend any alternative regimens for pregnant women with syphilis and HIV infection (see Syphilis Among Persons with HIV).

13.2.5 Congenital Syphilis

The rate of reported congenital syphilis in the United States and the Americas has increased dramatically in recent times. In 2020, countries in the Americas reported 29,147 cases of congenital syphilis, and more than 30,000 cases in 2021.

Effective prevention and detection of congenital syphilis depends on identifying syphilis among pregnant women.

Maternal risk factors for syphilis during pregnancy include sex with multiple partners, transactional sex, late entry to prenatal care or no prenatal care, drug use, incarceration of the woman or her partner, and unstable housing or homelessness.

No mother or newborn infant should leave the hospital without maternal serologic status having been documented at least once during pregnancy. Any woman who had no prenatal care before delivery or is considered at increased risk for acquiring syphilis during pregnancy should have the results of a syphilis serologic test documented before she or her neonate is discharged.

13.2:5.1 Evaluation of the Neonate

Diagnosis of congenital syphilis can be difficult because the presence of maternal nontreponemal and treponemal immunoglobulin G (IgG) antibodies which can be transferred through the placenta to the fetus, complicates the interpretation of reactive serologic tests for syphilis among neonates. The decision of whether to treat is frequently made on the basis of: 1) identification of syphilis in the mother, 2) adequacy of maternal treatment; 3) presence of clinical, laboratory, or radiographic evidence of syphilis in the neonate; and 4) comparison of maternal (at delivery) and neonatal nontreponemal serologic titers (using the same test). Any neonate at risk for congenital syphilis should receive a full evaluation and testing for HIV.

All neonates born to mothers who have reactive nontreponemal and treponemal test results should be evaluated with a quantitative nontreponemal serologic test (RPR or VDRL) performed on the neonate's serum. The nontreponemal test performed on the neonate should be the same type of nontreponemal test performed on the mother.

All neonates born to women who have reactive nontreponemal serologic tests for syphilis at delivery should be examined thoroughly for evidence of congenital syphilis (e.g., nonimmune hydrops, conjugated or direct hyperbilirubinemia† or cholestatic jaundice or cholestasis, hepatosplenomegaly, rhinitis, skin rash, or pseudoparalysis of an extremity). Pathologic examination of the placenta or umbilical cord using specific staining (e.g., silver), Darkfield microscopic examination or PCR testing of suspicious lesions or body fluids (e.g., bullous rash or nasal discharge) should be performed. For stillborn infants, skeletal survey demonstrating typical osseous lesions might aid in the diagnosis of congenital syphilis because these abnormalities are not detected on fetal ultrasound.

The evaluation and treatment of neonates born to women who had reactive nontreponemal and treponemal serologic tests for syphilis during pregnancy and have a reactive nontreponemal test at delivery is described below. Maternal history of infection with *T. pallidum* and treatment for syphilis should be considered when evaluating and treating the neonate, except when congenital syphilis is proven or highly probable.

Scenario 1: Confirmed or Highly Probable Congenital Syphilis

Any neonate with

- an abnormal physical examination that is consistent with congenital syphilis;
- a serum quantitative nontreponemal serologic titer that is fourfold (or greater) higher than the mother's titer at delivery (e.g., maternal titer = 1:2, neonatal titer ≥1:8 or maternal titer = 1:8, neonatal titer ≥1:32); or
- a positive darkfield test or PCR of placenta, cord, lesions, or body fluids or a positive silver stain of the placenta or cord.

Recommended Evaluation

- CSF analysis for VDRL, cell count, and protein
- Complete blood count (CBC) and differential and platelet count
- Long-bone radiographs
- Other tests as clinically indicated (e.g., chest radiograph, liver function tests, neuroimaging, ophthalmologic examination, and auditory brain stem response)

Recommended Treatment **

Aqueous crystalline penicillin G 100,000–150,000 units/kg body weight/day, administered as 50,000 units/kg body weight/dose by IV every 12 hours during the first 7 days of life and every 8 hours thereafter for a total of 10 days

OR

Procaine penicillin G 50,000 units/kg body weight/dose IM in a single daily dose for 10 days

** If >1 day of therapy is missed, the entire course should be restarted.

Scenario 2: Possible Congenital Syphilis

Any neonate who has a normal physical examination and a serum quantitative nontreponemal serologic titer equal to or less than fourfold of the maternal titer at delivery (e.g., maternal titer = 1:8, neonatal titer ≤1:16) and **one** of the following:

- The mother was not treated, was inadequately treated, or has no documentation of having received treatment.
- The mother was treated with erythromycin or a regimen other than those recommended in these guidelines (i.e., a nonpenicillin G regimen).
- The mother received the recommended regimen but treatment was initiated <30 days before delivery.

Recommended Evaluation

- CSF analysis for VDRL, cell count, and protein
- CBC, differential, and platelet count
- Long-bone radiographs

Recommended Treatment

Aqueous crystalline penicillin G 100,000–150,000 units/kg body weight/day, administered as 50,000 units/kg body weight/dose by IV every 12 hours during the first 7 days of life and every 8 hours thereafter for a total of 10 days
OR
Procaine penicillin G 50,000 units/kg body weight/dose IM in a single daily dose for 10 days
OR
Benzathine penicillin G 50,000 units/kg body weight/dose IM in a single dose*
* Before using the single-dose benzathine penicillin G regimen, the recommended evaluation should be normal, and follow-up should be certain. If any part of the neonate's evaluation is abnormal or not performed, if the CSF analysis is uninterpretable because of contamination with blood, or if follow-up is uncertain, a 10-day course of penicillin G is required.

If the neonate's nontreponemal test is nonreactive and the provider determines that the mother's risk for untreated syphilis is low, treatment of the neonate with the single-dose benzathine penicillin G regimen for possible incubating syphilis can be considered without an evaluation.

Neonates born to mothers with untreated early syphilis at the time of delivery are at increased risk for congenital syphilis, and the 10-day course of penicillin G should be considered even if the neonate's nontreponemal test is nonreactive, the complete evaluation is normal, and follow-up is certain.

Scenario 3: Congenital Syphilis less likely

Any neonate who has a normal physical examination and a serum quantitative nontreponemal serologic titer equal or less than fourfold of the maternal titer at delivery (e.g., maternal titer = 1:8, neonatal titer ≤1:16) and both of the following are true:

- The mother was treated during pregnancy, treatment was appropriate for the infection stage, and the treatment regimen was initiated ≥30 days before delivery.
- The mother has no evidence of reinfection or relapse.

Recommended Evaluation

No evaluation is recommended.

Recommended Treatment:

Benzathine penicillin G 50,000 units/kg body weight/dose IM in a single dose*

* Alternatively, if close follow-up is ensured, the clinician may defer penicillin and do nontreponemal serologic testing monthly for 3 months and then at 6 months; antibiotics are given if titers rise or are positive at 6 months.

Scenario 4: Congenital Syphilis Unlikely

Any neonate who has a normal physical examination and a serum quantitative nontreponemal serologic titer equal to or less than fourfold of the maternal titer at delivery and both of the following are true:

- The mother's treatment was adequate before pregnancy.
- The mother's nontreponemal serologic titer remained low and stable (i.e., serofast) before and during pregnancy and at delivery (e.g., VDRL ≤1:2 or RPR ≤1:4).

Recommended Evaluation

No evaluation is recommended.

Recommended Treatment

No treatment is required.

However, any neonate with reactive nontreponemal tests should be followed serologically to ensure the nontreponemal test returns to negative.

Benzathine penicillin G 50,000 units/kg body weight as a single IM injection might be considered, particularly if follow-up is uncertain and the neonate has a reactive nontreponemal test.

13.2.5.2 Follow Up

All neonates with reactive nontreponemal tests should receive thorough follow-up examinations and serologic testing (RPR/VDRL) every 2–3 months until the test becomes nonreactive.

For a neonate who was not treated because congenital syphilis was considered less likely or unlikely, nontreponemal antibody titers should decrease by age 3 months and be nonreactive by age 6 months, indicating that the reactive test result was caused by passive transfer of maternal IgG antibody. At age 6 months, if the nontreponemal test is nonreactive, no further evaluation or treatment is needed; if the nontreponemal test is still reactive, the infant is likely infected and should be treated.

Treated neonates who exhibit persistent nontreponemal test titers by age 6–12 months should be reevaluated through CSF examination and managed in consultation with an expert. Retreatment with a 10-day course of a penicillin G regimen might be indicated.

Neonates with a negative nontreponemal test at birth and whose mothers were seroreactive at delivery should be retested at age 3 months to rule out serologically negative incubating congenital syphilis at the time of birth. Treponemal tests should not be used to evaluate treatment

response because the results are qualitative, and passive transfer of maternal IgG treponemal antibody might persist for >15 months.

Neonates whose initial CSF evaluations are abnormal do not need repeat lumbar puncture unless they exhibit persistent nontreponemal serologic test titers at age 6–12 months. Persistent nontreponemal titers and CSF abnormalities should be managed in consultation with an expert.

Penicillin Allergy

Neonates who have a history of penicillin allergy or develop an allergic reaction presumed secondary to penicillin should be desensitized and then treated with penicillin G (see Management of Persons Who Have a History of Penicillin Allergy).

13.2.5.3 Evaluation and Treatment of Infants and children with Congenital Syphilis

Infants and children aged ≥1 month who are identified as having reactive serologic tests for syphilis should be examined thoroughly and have maternal serology and records reviewed to assess whether they have congenital or acquired syphilis. In the case of extremely early or incubating syphilis at the time of delivery, all maternal serologic tests might have been negative and infection would have been undetected until a diagnosis is made later in the infant or child. Any infant or child at risk for congenital syphilis should receive a full evaluation and testing for HIV infection.

Recommended Evaluation:

- CSF analysis for VDRL, cell count, and protein
- CBC, differential, and platelet count
- Other tests as clinically indicated (e.g., long-bone radiographs, chest radiograph, liver function tests, abdominal ultrasound, ophthalmologic examination, neuroimaging, and auditory brain-stem response)

Recommended Treatment

Aqueous crystalline penicillin G 200,000–300,000 units/kg body weight by IV, administered as 50,000 units/kg body weight every 4–6 hours for 10 days

If the infant or child has no clinical manifestations of congenital syphilis and the evaluation is normal, treatment with up to 3 weekly doses of benzathine penicillin G 50,000 units/kg body weight IM can be considered. A single dose of benzathine penicillin G 50,000 units/kg body weight IM in a single dose can be considered after the 10-day course of IV aqueous penicillin G to provide more comparable duration for treatment in those who have no clinical manifestations and normal CSF.

Follow-Up

Thorough follow-up examinations and serologic testing (i.e., RPR or VDRL) of infants and children treated for congenital syphilis after the neonatal period should be performed every 3 months until the test becomes nonreactive or the titer has decreased fourfold.

The serologic response after therapy might be slower for infants and children than neonates. If these titers increase at any point >2 weeks or do not decrease fourfold after 12–18 months, the infant or child should be evaluated, treated with a 10-day course of parenteral penicillin G, and managed in consultation with an expert.

Infants or children whose initial CSF evaluations are abnormal do not need repeat lumbar puncture unless their serologic titers do not decrease fourfold after 12–18 months. After 18 months of follow-up, abnormal CSF indices that persist and cannot be attributed to other ongoing illness indicate that retreatment is needed for possible neurosyphilis and should be managed in consultation with an expert.

Penicillin Allergy

Infants and children who require treatment for congenital syphilis but who have a history of penicillin allergy or develop an allergic reaction presumed secondary to penicillin should be desensitized and treated with penicillin G (see Management of Persons Who Have a History of Penicillin Allergy).

13.3 Hepatitis B Virus (HBV)

HBV infection can be either self-limited or chronic. Among adults, approximately half of newly acquired HBV infections are symptomatic, and approximately 1% of reported cases result in acute liver failure and death. Risk for chronic infection is inversely related to age at acquisition; approximately 90% of infected infants and 30% of infected children aged <5 years become chronically infected, compared with 2%–6% of persons who become infected as adults. Among persons with chronic HBV infection, the risk for premature death from cirrhosis or hepatocellular carcinoma is 15%–25%.

The primary risk factors associated with infection among adolescents and adults are unprotected sex with an infected partner, having multiple partners, men having sex with men, having history of other STIs, and injecting drug use.

In order to achieve the Millennium Development Goals to end preventable mother to child transmission of Hepatitis B by 2030; routine screening of all pregnant women for HBsAg and immunoprophylaxis of infants born to mothers with HBsAg or mothers whose HBsAg status is unknown, routine infant vaccination, vaccination of previously unvaccinated children and adolescents through age 18 years, and vaccination of previously unvaccinated adults at increased risk for infection has been recommended. High vaccination coverage rates with subsequent decreases in acute HBV infection incidence have been achieved among infants and adolescents. All pregnant women should be tested for HBsAg at the first prenatal visit and again at delivery if at high risk for HBV infection. Pregnant women at risk for HBV infection and without

documentation of a complete hepatitis B vaccine series should receive hepatitis B vaccination. All pregnant women with HBsAg should be referred for treatment. Please refer to *National Hepatitis B Guidelines* for further information on treatment options.

13.3.1 Neonatal Hepatitis B Virus (HBV) Infection

Neonatal HBV infection occurs during delivery from an infected mother. Women seropositive for hepatitis B surface antigen (HBsAg) and hepatitis B e antigen (HBeAg) at the time of delivery have a 70-90% chance of transmitting to their infant, while women without the e antigen or with anti-HBe transmit the infection only 5 to 20% of the time. Up to 90% of infants infected perinatally will develop chronic infection.

Symptoms of Neonatal HBV Infection

Most neonates with HBV infection are asymptomatic but develop chronic, subclinical infection characterized by persistent HBsAg antigenemia and variably elevated transaminase activity. Many neonates born to women with acute hepatitis B during pregnancy are of low birth weight, regardless of whether they are infected.

Rarely, infected neonates develop acute, symptomatic hepatitis B, which is usually mild and self-limited. They develop jaundice, lethargy, failure to thrive, abdominal distention, and clay-colored stools. Occasionally, severe infection with hepatomegaly, ascites, and hyperbilirubinemia (conjugated bilirubin) occurs. Rarely, the disease is fulminant and even fatal. Fulminant disease occurs more often in neonates whose mothers are chronic carriers of hepatitis B.

Diagnosis of Neonatal HBV Infection

Diagnosis of neonatal HBV infection is by serologic testing, including measurement of HBsAg, HBeAg, antibody to hepatitis B e antigen (anti-HBe), and quantitation of HBV DNA in blood.

Treatment of Neonatal HBV Infection

Supportive care: symptomatic care and adequate nutrition are needed. Neither corticosteroids nor hepatitis B immune globulin (HBIG) is helpful for acute infection. No therapy decreases the likelihood of developing chronic, subclinical hepatitis once infection is acquired.

All children with chronic HBV infection should be immunized with hepatitis A vaccine. Children with chronic HBV infection may benefit from antiviral drugs (eg, interferon alfa, lamivudine, tenofovir) but these should be used only in consultation with a pediatric hepatologist/Infectious Disease Specialist.

13.3.1.2 Prevention

Prevention of Neonatal HBV Infection – Post Exposure Prophylaxis

Neonates whose mothers are HBsAg-positive should be given 1 dose of HBIG 0.5 mL IM within 12 hours of birth and recombinant HBV vaccine should be given in a series of 3 doses.

- The 1st dose is given concurrently with HBIG but at a different site.

- The 2nd dose is given at 1 to 2 months.
- The 3rd dose is given 6 to 18 months after the first.
- If the infant weighs < 2 kg, the first dose of vaccine may be less effective. Subsequent vaccine doses are given at age 30 days (or when discharged from the hospital), and then 2 other doses are given at 1 to 2 months and 6 months after the 30-day dose.

Neonates whose mothers have unknown HBsAg status at the time of delivery should also receive their first dose of vaccine within 12 hours of birth.

- For infants < 2 kg, the first dose is given concurrently with HBIG (0.5 mL IM) at a different site.
- For infants ≥ 2 kg and whose mothers can be tested for HBsAg and in whom follow up is ensured, HBIG (0.5 mL IM) can be delayed up to 7 days pending a positive maternal test for HBsAg.
- Testing for HBsAg and anti-HBs at 9 to 15 months is recommended for all infants born to HBsAg-positive mothers.

Neonates whose mothers are known HBsAg–negative should receive their first dose of vaccine within 24 hours of birth if they are medically stable and weigh ≥ 2 kg.

- For infants < 2 kg, administer 1 dose at age 1 month or before hospital discharge.
- Subsequent doses should be administered in accordance with the National Vaccination Schedule.
- It is safe for HBsAg-positive mothers to breastfeed. Breastfeeding does not seem to increase the risk of postpartum HBV transmission, especially if HBIG and HBV vaccine have been given. However, if a mother has cracked nipples, abscesses, or other breast pathology, breastfeeding could potentially transmit HBV.

13.4 Hepatitis C Virus (HCV) Infection

HCV infection is the most common chronic bloodborne infection in the United States, with an estimated 2.4 million persons living with chronic infection. There are an estimated 600 people living with HCV infection in Guyana, this is data based on screening from the National Blood Bank. All pregnant women should be screened with each pregnancy for HCV antibodies at the first prenatal visit. Although the rate of transmission is highly variable, more than six of every 100 infants born to women with HCV infection become infected; infection occurs predominantly during or near delivery, and no treatment or delivery method (e.g., cesarean delivery) has been demonstrated to decrease this risk. Risk of infection is increased by the presence of maternal HCV viremia at delivery and is two to three times greater if the woman has HIV infection. Although no recommendations are available for HCV treatment during pregnancy, discussion about the individual risks and benefits of postpartum treatment can be considered in accordance with existing *National Hepatitis C Guidelines.*

13.4.1 Neonatal Hepatitis C Virus (HCV) Infection

The risk of transmission from infected to mother to newborn is estimated to be 4-7%. This risk increases if there is maternal viremia at delivery and if the mother is also HIV infected.

Infants born to mothers who are HCV positive should have HCV RNA testing at 1-2 months and anti-HCV testing no sooner than 18months (maternal anti-HCV may persist for up to 18 months). Children who test positive after the age of 2 are considered to have chronic HCV infection.

Symptoms

Many infants with HCV have no symptoms, but they may grow more slowly and fail to gain weight, and on examination may have an enlarged liver or spleen. Most children who acquire HCV in the neonatal period have mild liver disease. Up to 80% have little to no scarring by the time they are 18 years old. However, 20–25% develop a more aggressive form of the disease and may have severe scaring by the time they are 8 years of age.

Treatment

For children aged 3 years and older, there are effective antiviral treatments available.
The current standard therapy for HCV-infected children is combination pegylated interferon-alpha and ribavirin for six to 12 months in children age 3-18 years of age,

Other Considerations

HCV has not been reported to be transmitted through breast milk, although mothers with HCV infection should consider abstaining from breastfeeding if their nipples are cracked or bleeding.

13:5 Genital Herpes During Pregnancy

Prevention of neonatal herpes depends both on preventing acquisition of genital herpes during late pregnancy and avoiding exposure of the neonate to herpetic lesions and viral shedding during delivery. Mothers of newborns who acquire neonatal herpes often lack histories of clinically evident genital herpes.

The risk for transmission to the neonate from an infected mother is high (30%–50%) among women who acquire genital herpes near the time of delivery and low (<1%) among women with prenatal histories of recurrent herpes or who acquire genital herpes during the first half of pregnancy.

Women who acquire HSV in the second half of pregnancy should be managed in consultation with obstetrics, neonatology and infectious disease specialists.

All pregnant women should be asked whether they have a history of genital herpes or genital symptoms concerning for HSV infection at their antenatal visits and before labor and delivery. Routine HSV-2 serologic screening of pregnant women is not recommended.

Although cesarean delivery does not eliminate the risk for HSV transmission to the neonate, women with recurrent genital herpetic lesions at the onset of labor should have a cesarean delivery to reduce the risk for neonatal HSV infection.

Acyclovir is believed to be safe for use during all trimesters of pregnancy and during breastfeeding.

Acyclovir can be administered orally to pregnant women with first-episode genital herpes or recurrent herpes and should be administered IV to pregnant women with severe HSV.

Suppressive acyclovir treatment starting at 36 weeks' gestation reduces the frequency of cesarean delivery among women who have recurrent genital herpes by diminishing the frequency of recurrences at term.

Recommended Regimen for Suppression of Recurrent Genital Herpes Among Pregnant Women*

Acyclovir 400mg orally 3x/day
OR
Valacyclovir 500mg orally 2x/day

*Treatment recommended starting at 36 weeks' gestation.
Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

13.5.1 Neonatal Herpes

Newborn infants exposed to HSV during birth, should be followed clinically in consultation with a pediatric infectious disease specialist.

Administration of acyclovir might be considered for neonates born to women who acquired HSV near term because the risk for neonatal herpes is high for these newborn infants. All newborn infants who have neonatal herpes should be promptly evaluated and treated with systemic acyclovir.

Recommended regimen for infants treated for known or suspected neonatal herpes

Acyclovir 20 mg/kg body weight IV every 8 hours
For 14 days if disease is limited to the skin and mucous membranes For 21 days for disseminated disease and disease involving the CNS

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

13.6 Chlamydia Infection in Pregnancy

Chlamydial infection is the most frequently reported bacterial infectious disease in the United States, and prevalence is highest among persons aged ≤24 years. Sequelae from *C. trachomatis* infection among women include PID, ectopic pregnancy, and infertility. Asymptomatic infection is common among both men and women.

All pregnant women should be screened for *C.trachomatis* on their antenatal visit and again in the third trimester if they are under the age of 25 years or are considered to be at risk (those who have a new sex partner, more than one sex partner, a sex partner with concurrent partners, or a sex partner who has an STI).

Women with chlamydial infection should have a test of cure 4 weeks after completion of treatment and be re-tested within 3 months.

Treatment for Chlamydial Infection during Pregnancy

Recommended Regimen	Preferred Regimen
Azithromycin* 1g orally as a single dose	Amoxicillin 500mg orally 3 x daily for 7 days

*Clinical experience and published studies have proven that Azithromycin is safe and effective during pregnancy.

Erythromycin is no longer recommended because of non-adherence issues associated with its gastrointestinal side effects.

Doxycycline is contraindicated during the second and third trimesters of pregnancy because of risk for tooth discoloration.

Levofloxacin has potential for toxicity during breastfeeding; and in animal studies cartilage damage to neonates was seen.

Test of cure (i.e., repeat testing after completion of therapy) to document chlamydial eradication at approximately 4 weeks after therapy completion during pregnancy is recommended as severe sequelae can occur among both mother and neonate if the infection persists. All pregnant women who have been treated for chlamydial infection should be retested 3 months after treatment.

Women aged <25 years and those at increased risk for chlamydia (i.e., those who have a new sex partner, more than one sex partner, a sex partner with concurrent partners, or a sex partner who has an STI) should be rescreened during the third trimester as detection of *C.trachomatis* infection in the third trimester is not uncommon among adolescent and young adult women.

13.6.1 Chlamydial Infection in the Neonate

C. trachomatis infection of neonates results from perinatal exposure to the mother's infected cervix. Initial *C. trachomatis* neonatal infection involves the mucous membranes of the eye, oropharynx, urogenital tract, and rectum. *C. trachomatis* infection among neonates is most frequently recognized by conjunctivitis that develops 5–12 days after birth. *C. trachomatis* also can cause a subacute, afebrile pneumonia with onset at ages 1–3 months.

13.6.1.1 Chlamydial Ophthalmia Neonatorum

Chlamydial Opthalmia, caused by *C.trachomatis,* is the most common bacterial conjunctivitis among neonates, accounting for up to 40% of conjunctivitis among neonates.

A chlamydial etiology should be considered for all infants aged ≤30 days who experience conjunctivitis, especially if the mother has a history of chlamydial infection. These infants should receive evaluation and age-appropriate care and treatment.

Preventing Chlamydial Ophthalmia Neonatorum

Prenatal screening and treatment of pregnant women is the best method for preventing chlamydial infection among neonates.

- Screen pregnant women at risk for *C. trachomatis* infection at the first prenatal visit (e.g., women aged <25 years and those aged ≥25 years who have a new sex partner, more than one sex partner, a sex partner with concurrent partners, or a sex partner who has an STI)
- Treat all pregnant women with *C. trachomatis* during pregnancy and perform a test of cure 4 weeks after treatment to verify chlamydial eradication; along with retesting 3 months after treatment and again in the third trimester or at time of delivery. Partners should also be tested and treated
- Retest pregnant women during the third trimester who initially tested negative but remained at increased risk for acquiring infection (e.g., women aged <25 years and those aged ≥25 years who have a new sex partner, more than one sex partner, a sex partner with concurrent partners, or a sex partner who has an STI); and
- Screen at delivery those pregnant women who were not screened for *C. trachomatis* during pregnancy if at risk or who had no prenatal care.
- Physicians and other health care workers caring for the mother and the newborn should communicate to ensure follow-up on the results of laboratory tests performed at delivery, and prompt and age-appropriate treatment for the newborn and the mother if necessary.

Neonates born to mothers whose prenatal chlamydia screening and negative results were documented are not at high risk for infection.

Symptoms

Symptoms usually present between day 5-12 of birth.

- Initial watery discharge, which may become purulent
- Erythema and edema of the eyelid
- Palpebral conjunctivae

Diagnosis

Conjunctival material is Gram stained and tested for chlamydia (eg, by culture, direct immunofluorescence, or enzyme-linked immunosorbent assay). Specimens for culture isolation should be obtained from the everted eyelid by using a Dacron (DuPont)-tipped swab, specimens must contain conjunctival cells, not exudate alone. Ocular specimens from neonates being evaluated for chlamydial conjunctivitis also should be tested for *N. gonorrhoeae.*

Conjunctival scrapings can also be examined with Giemsa stain; if blue intracytoplasmic inclusions are identified, chlamydial ophthalmia is confirmed.

Treatment**

Recommended Regimen For Neonatal Chlamydial Infection
Erythromycin base or **ethylsuccinate** 50 mg/kg body weight/day orally, divided into 4 doses daily for 14 days*

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

**An association between oral erythromycin and azithromycin and infantile hypertrophic pyloric stenosis (IHPS) has been reported among infants aged <6 weeks.*
Infants treated with either of these antimicrobials should be followed for IHPS signs and symptoms.

***Available data regarding use of azithromycin for treating neonatal chlamydial infection show that a short therapy course might be effective.*

Topical antibiotic therapy alone is inadequate for treating chlamydial ophthalmia neonatorum and is unnecessary when systemic treatment is administered.

Follow-Up

The efficacy of erythromycin treatment for ophthalmia neonatorum is approximately 80%. Therefore, follow-up of infants is recommended to determine whether the initial treatment was effective and whether a second course of therapy might be required. The possibility of concomitant chlamydial pneumonia should be considered (see Infant Pneumonia Caused by *C. trachomatis*).

Management of Mothers and their Sex Partners

Mothers of infants who have chlamydial ophthalmia and their sex partners should be evaluated and presumptively treated for chlamydia.

13.6.1.2 Infant Pneumonia Caused by *C. trachomatis*

Chlamydial pneumonia among infants typically occurs at age 1–3 months and is a subacute pneumonia. All infants aged 1–3 months suspected of having pneumonia, especially those whose mothers have a history of, are at risk for (e.g., aged <25 years and those aged ≥25 years who have a new sex partner, more than one sex partner, a sex partner with concurrent partners, or a sex partner who has an STI), or suspected of having a chlamydial infection should be tested for *C. trachomatis* and treated if infected.

Signs and symptoms

- Repetitive staccato cough
- Tachypnea
- Hyperinflation and bilateral diffuse infiltrates on chest x-ray.
- Peripheral eosinophilia (≥ 400 cells/mm³)

Diagnosis

Specimens for chlamydial testing should be collected from the nasopharynx. Tissue culture is the definitive standard diagnostic test for chlamydial pneumonia.

Treatment

Treatment for *C. trachomatis* pneumonia frequently is based on:

- Clinical and radiologic findings,
- Age of the infant (i.e., 1–3 months)
- Risk for chlamydia in the mother

Test results for chlamydia are often unavailable at the time initial treatment decisions are being made.

Recommended Regimen for Chlamydial Pneumonia in Infants	Alternative Regimen for Chlamydial Pneumonia in Infants*
Erythromycin base or **ethylsuccinate** 50 mg/kg body weight/day orally divided into 4 doses daily for 14 days	**Azithromycin** suspension 20 mg/kg body weight/day orally, 1 dose daily for 3 days

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

**In the absence of laboratory results in a situation with a high degree of suspicion of chlamydial infection and the mother is unlikely to return with the infant for follow-up, exposed infants can be presumptively treated with the shorter-course regimen of azithromycin.*

Follow-Up

Follow-up to determine if the pneumonia has resolved is recommended. Erythromycin effectiveness in treating *C. trachomatis pneumonia* is approximately 80%, and a second course of therapy might be required.

Some infants with chlamydial pneumonia continue to have abnormal pulmonary function tests later during childhood.

Management of Mothers and their Sex Partners

Mothers and their sex partners should be evaluated, tested and presumptively treated for chlamydia

13.6.1.3 Chlamydial Infections Among Infants and Children

Though perinatally transmitted *C. trachomatis* infection of the nasopharynx, urogenital tract, and rectum can persist for 2–3 years, sexual abuse should be considered a cause of chlamydial infection among infants and children. (*See Sexual Assault or Abuse of Children).*

Diagnosis

Culture specimens from urethral or vaginal swabs can be used to diagnose chlamydial infections in children. NAATs can be used to test vaginal and urine specimens from girls and urine in boys (*see Sexual Assault or Abuse of Children).* Because of the high incidence of false positives and negatives with rapid tests in children and because of the implications of a diagnosis of *C. trachomatis* in a child, all test results should be verified with culture or NAATS.

Treatment

Age/Weight	Recommended Regimens for Chlamydial Infections in Infants and Children
For Infants and Children Weighing <45 kg*	**Erythromycin** base or **ethylsuccinate** 50 mg/kg body weight/day orally divided into 4 doses daily for 14 days
For children weighing ≥45 kg but aged <8 years:	**Azithromycin** 1 g orally in a single dose
For children aged ≥8 years	**Azithromycin** 1 g orally in a single dose ***or*** **Doxycycline** 100 mg orally 2 times/day for 7 days

Source: Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2021.

**Data are limited regarding the effectiveness and optimal dose of azithromycin for treating chlamydial infection among infants and children weighing <45 kg.*

Follow-Up

A test of cure should be obtained at a follow-up visit approximately 4 weeks after treatment is completed.

13.7 Neisseria Gonorrhoeae Infection in Pregnancy

All pregnant women aged <25 years and pregnant women ≥25 years who are considered to be at increased risk for gonorrhea (e.g., those with other STIs during pregnancy or those with a new sex partner, more than one sex partner, a sex partner with concurrent partners, or a sex partner who has an STI or is exchanging sex for money or drugs) should be screened for *Neisseria*

gonorrhoeae at the first prenatal visit and during the third trimester to prevent maternal postnatal complications and gonococcal infection in the neonate. Pregnant women identified as having gonorrhea should be treated immediately. All persons diagnosed with gonorrhea should be rescreened 3 months after treatment.

Diagnosis

A bacterial culture is the historical standard for detecting *N. gonorrhoeae*.
NAAT is used for endo-cervical swabs, vaginal swabs and urine.

Treatment of Uncomplicated Gonococcal Infection of the Cervix or Rectum during Pregnancy

	Recommended Regimen	Alternative Regimen
Uncomplicated Gonococcal Infection without Chlamydial Infection	**Ceftriaxone**500 mg* IM in a single dose for persons weighing <150 kg	**Gentamicin**** 240 mg IM in a single dose PLUS **Azithromycin** 2 g orally in a single dose
Uncomplicated Gonococcal Infection with Chlamydial Infection	**Ceftriaxone**500 mg* IM in a single dose for persons weighing <150 kg **PLUS** **Azithromycin 1**g orally in a single dose	

**For persons >150kg: Ceftriaxone 1g IM in a single dose*
*** Gentamicin use is cautioned during pregnancy because of risk for neonatal birth defects, nephrotoxicity, or ototoxicity*.

Treatment of Uncomplicated Gonococcal Infection of the Pharynx

The majority of gonococcal infections of the pharynx are asymptomatic and can be more difficult to eradicate than infections at urogenital and anorectal sites. They are reported to be a major source of community transmission and might be a driver of antimicrobial resistance.

Uncomplicated Gonococcal Infection without Chlamydial Infection	**Ceftriaxone** 500 mg* IM in a single dose for persons weighing <150 kg
Uncomplicated Gonococcal Infection with Chlamydial Infection	**Ceftriaxone**500 mg* IM in a single dose for persons weighing <150 kg **PLUS** **Azithromycin 1**g orally in a single dose

* For persons weighing ≥150 kg, 1 g ceftriaxone should be administered.

For persons with pharyngeal infection a test-of -cure is recommended 7-14 days after completion of treatment.

Management of Sex Partners

All recent sex partners, within 60 days preceding diagnosis, should be referred for evaluation, testing and presumptive treatment of gonorrhea. If the most recent sexual contact was more than 60 days preceding diagnosis, that partner should be referred for evaluation and treatment.

Sex partners should be advised to abstain from sexual activity for 7 days after completion of treatment.

Expedited Partner Therapy

In settings where prompt referral and treatment are unavailable or impractical, expedited partner therapy should be considered. Both appropriate antibiotics and educational information about the importance of treatment, signs and symptoms of potential complications, and possible therapy-related allergic reactions and adverse effects.

Recommended Regimen

The expedited partner therapy regimen is: **Cefixime** 800 mg orally in a single dose.

If Chlamydia infection was not excluded in the source individual, then the expedited partner therapy should include**: Doxycycline** 100 mg for 7 days orally; if there is concern regarding adherence to a multidose regimen then: **Azithromycin** 1 gram orally as a single dose can be given

13.7.1 Gonococcal Infection Among Neonates

Gonococcal infection among neonates results from perinatal exposure to the mother's infected cervix. It is usually an acute illness that manifests 2–5 days after birth. The most severe manifestations of *N. gonorrhoeae* infection among neonates are ophthalmia neonatorum and sepsis, which can include arthritis and meningitis.

Preventing Opthalmia Neonatorum caused by N. gonorrhoeae

Prenatal screening and treatment of pregnant women for gonorrhea is the best method for preventing *N. gonorrhoeae* infection among neonates.

- Routine ocular prophylaxis of the neonate within 24hrs of birth.
- Screening pregnant women for N. gonorrhoeae at their first prenatal visit and retesting in the third trimester, for those who tested negative initially and for those who remained at risk for infection.
- Screening at delivery for women who were not screened during pregnancy and/or did not receive antenatal care.

Recommended Regimen to Prevent Opthalmia Neonatorum caused *N. gonorrheae*
Erythromycin 0.5% ophthalmic ointment in each eye in a single application at birth

Signs and Symptoms of Opthalmia Neonatorum caused *N. gonorrheae*

Gonococcal infection causes an acute purulent conjunctivitis that appears 2 to 5 days after birth or earlier with premature rupture of membranes. The neonate has severe eyelid edema followed by chemosis and a profuse purulent exudate that may be under pressure. If untreated, corneal ulcerations and blindness may occur.

Diagnosis

Newborns at increased risk for gonococcal ophthalmia include those who did not receive ophthalmic prophylaxis and whose mothers had no prenatal care, have a history of STIs during pregnancy, or have a history of substance misuse. Gram Stain of conjunctival exudate: Gonococcal ophthalmia is strongly suspected when intracellular gram-negative diplococci are identified on Gram-Stain.

Treatment of Gonococcal Opthalmia Neonatorum

Recommended Regimen for Gonococcal Opthalmia Neonatorum
Ceftriaxone* 25–50 mg/kg body weight IV or IM in a single dose, not to exceed 250 mg **OR** **Cefotaxime**** 100mg/kg body weight IV or IM as a single dose

***** Ceftriaxone should be administered cautiously to neonates with hyperbilirubinemia, especially those born prematurely.

** Cefotaxime can be given to those infants receiving IV calcium.

Topical antibiotic therapy alone is inadequate and unnecessary if systemic treatment is administered.

Disseminated Gonococcal Infection and Gonococcal Scalp Abscesses in Neonates

Cultures of blood, CSF, or joint aspirate are needed to detect gonococcal infection among neonates who have sepsis, arthritis, meningitis, or scalp abscesses. Localized gonococcal infection of the scalp can result from fetal monitoring through scalp electrodes.

Conjunctival, vaginal, oropharyngeal, and rectal specimens are useful for identifying the primary site or sites of infection. Antimicrobial susceptibility testing of all isolates should be performed. Positive Gram-stained smears of abscess exudate, CSF, or joint aspirate provide a presumptive basis for initiating treatment for *N. gonorrhoeae*.

Treatment

Recommended Regimens for Disseminated Gonococcal Infection among Neonates
Ceftriaxone* 25–50 mg/kg body weight/day IV or IM in a single daily dose for 7 days, with a duration of 10–14 days if meningitis is documented **OR** **Cefotaxime**** 25 mg/kg body weight/day IV or IM every 12 hours for 7 days, with a duration of 10–14 days if meningitis is documented

** Ceftriaxone should be administered cautiously to neonates with hyperbilirubinemia, especially those born prematurely.*
*** Cefotaxime can be given to those infants receiving IV calcium*.

Neonates Born to Mothers Who Have Gonococcal Infection

Neonates born to mothers who have untreated gonorrhea are at high risk for infection, they should be tested for gonorrhea at exposed sites (e.g., conjunctiva, vagina, rectum, and oropharynx) and treated presumptively for gonorrhea.

Treatment For Neonates without Signs of Gonococcal Infection

Recommended Regimen
Ceftriaxone* 25-50 mg/kg body weight by IV or IM in a single dose, not to exceed 250 mg

***** Ceftriaxone should be administered cautiously to neonates with hyperbilirubinemia, especially those born prematurely.

Other Management Considerations:

- Chlamydial testing should be performed simultaneously in all neonates with suspected and/or confirmed Gonococcal Infection.
- Newborns who have gonococcal ophthalmia should be evaluated for signs of disseminated infection (e.g., sepsis, arthritis, and meningitis).
- Newborns who have gonococcal infection should be managed in consultation with an infectious disease specialist.

Management of Mothers and their Sex Partners

Mothers of infants who have Gonococcal Infection should be evaluated, tested and presumptively treated, along with their sex partners.

Gonococcal Infections Among Infants and Children

Sexual abuse is the most frequent cause of gonococcal infection among infants and children (*see Sexual Assault or Abuse of Children*). Anorectal and pharyngeal infections with *N. gonorrhoeae* are frequently asymptomatic among children who have been sexually abused.
For preadolescent girls, vaginitis is the most common manifestation of this infection.

Diagnosis

Culture can be used to test urogenital and extragenital sites for girls and boys. NAAT can be used to test for *N. gonorrhoeae* from vaginal and urine specimens from girls and urine for boys (see Sexual Assault or Abuse of Children).

Gram stains should not be used to diagnose or exclude gonorrhea in prepubertal children.
In cases of DGI, gonorrhea culture and antimicrobial susceptibility testing should be obtained from relevant clinical sites (see Disseminated Gonococcal Infection).

Treatment Regimens

Uncomplicated Gonococcal Vulvovaginitis, Cervicitis, Pharnygitis, Urethritis or Proctitis in infants and children <45kg	**Ceftriaxone** 25–50 mg/kg body weight IV or IM in a single dose, not to exceed 250 mg IM
Uncomplicated Gonococcal Vulvovaginitis, Cervicitis, Pharnygitis, Urethritis or Proctitis in children >45kg	**Ceftriaxone**500 mg IM in a single dose for persons weighing <150 kg

Recommended regimen for Bacteremia or Arthritis in infants and children <45kg	**Ceftriaxone** 50 mg/kg body weight (maximum dose: 2 g) IM or IV in a single dose daily every 24 hours for 7 days
Recommended regimen for Bacteremia or Arthritis in infants and children >45kg	**Ceftriaxone** 1 g IM or IV in a single dose daily every 24 hours for 7 days

Other Management Considerations

- Only parenteral cephalosporins (i.e. ceftriaxone) are recommended for use among children.
- All children identified as having gonococcal infections should be tested for *C. trachomatis*, syphilis, and HIV (see Sexual Assault or Abuse of Children).
- Follow-up cultures are unnecessary.

13.8 Bacterial Vaginosis (BV)

Bacterial Vaginosis is a vaginal dysbiosis resulting from replacement of normal hydrogen peroxide and lactic-acid–producing *Lactobacillus* species in the vagina with high concentrations of anaerobic bacteria. A notable feature is the appearance of a polymicrobial biofilm on vaginal epithelial cells.

Some women experience transient vaginal microbial changes, whereas others experience them for longer intervals. BV is a highly prevalent condition and the most common cause of vaginal discharge worldwide.

Management of Symptomatic Bacterial Vaginosis in Pregnant Women

Symptomatic BV has been associated with adverse pregnancy outcomes, including premature rupture of membranes, preterm birth, intra-amniotic infection, and postpartum endometritis. BV treatment is recommended for all symptomatic pregnant women.

Oral therapy has not been reported to be superior to topical therapy for treating symptomatic BV in effecting cure or preventing adverse outcomes of pregnancy. Pregnant women can be treated with any of the recommended regimens for nonpregnant women (oral metronidazole,

Metronidazole gel, Clindamycin cream), in addition to the alternative regimens of oral clindamycin and clindamycin ovules.

Although metronidazole crosses the placenta and is excreted in breast milk, it has not been linked to teratogenicity nor mutagenic effects among infants in multiple cross-sectional, case-control, and cohort studies of pregnant women. However, some clinicians recommend deferring breastfeeding for 12–24 hours if the mother was treated with a single 2-g dose of metronidazole. Lower doses produce a lower concentration in breast milk and are considered compatible with breastfeeding.Visit

Tinidazole is not recommended during pregnancy due to evidence of fetal harm in animal studies. Data are insufficient regarding efficacy and adverse effects of Clindesse 2% vaginal cream, metronidazole 1.3% vaginal gel, and 750-mg vaginal metronidazole tablets during pregnancy; it is recommended to avoid using them in pregnancy.

Management of Asymptomatic Bacterial Vaginosis in Pregnant Women

Routine screening for BV among asymptomatic pregnant women is not recommended. Available data suggest no benefit for the treatment of asymptomatic BV in pregnant women who are considered at low risk for preterm delivery.

Treatment of asymptomatic BV among pregnant women at high risk for preterm delivery has been evaluated by multiple studies and the data are conflicting - seven trials were evaluated: one showed harm, two showed no benefit, and four showed benefit with treatment.

13.9 Trichomonas Vaginalis

Trichomoniasis, caused by *Trichomonas Vaginalis* is the most common curable STI worldwide. In contrast to Chlamydia and Gonorrhea, *T. vaginalis* is more prevalent in women older than 20 years of age. All women diagnosed with *T.vaginalis* should be treated.
The benefit of routine screening for *T. vaginalis* in asymptomatic pregnant women has not been established.

T. vaginalis infection among pregnant women is associated with adverse pregnancy outcomes, premature rupture of membranes, preterm delivery, and small for gestational age infants.

3.9.1 Diagnosis

Wet Mount: In the clinical setting diagnosis of trichomoniasis can be made by microscopic visualization of motile trichomonads on a vaginal wet mount slide. However sensitivity is 44-68%.

Culture: Culture was the previous gold standard for diagnosis of trichomoniasis. Culture is more sensitive than wet mount, but results are not available immediately. A sample of vaginal secretion is necessary for culture. If *T. vaginalis* is isolated in culture, drug susceptibility testing can be done.

Nucleic Acid Amplification Testing (NAAT): If available, NAAT is the gold standard for diagnosing trichomoniasis. There are several NAAT-based methods – transcription-mediated amplification and polymerase chain reaction.

3.9.2 Treatment

All pregnant women with symptomatic trichomoniasis, regardless of stage of pregnancy, should be tested and treated. Treatment of *T. vaginalis* infection can relieve symptoms of vaginal discharge for pregnant women and reduce sexual transmission to partners.

Treatment of *T. vaginalis* in Pregnancy
Metronidazole: 500mg orally twice daily for 7 days

Although metronidazole crosses the placenta and is excreted in breast milk, it has not been linked to teratogenicity nor mutagenic effects among infants in multiple cross-sectional, case-control, and cohort studies of pregnant women. However, some clinicians recommend deferring breastfeeding for 12–24 hours if the mother was treated with a single 2-g dose of metronidazole. Lower doses produce a lower concentration in breast milk and are considered compatible with breastfeeding.Visi

Perinatal transmission of trichomoniasis is uncommon, but treatment might prevent respiratory or genital infection in the newborn.

Treatment of Sex Partners

Clinicians should counsel symptomatic pregnant women with trichomoniasis about the importance of partner treatment and condom use in the prevention of sexual transmission.

All women diagnosed with T.vaginalis infection should refer all sex partners in the prior 60 days for evaluation, testing and presumptive treatment. Expedited partner treatment may be considered.

Post-Treatment Follow -Up

All women should be retested 3 months after initial treatment.
Sexual activity should be avoided for 7 days after completion of treatment.

13.10 Vulvovaginalis Candidiasis (VVC)

Vulvovaginal candidiasis is caused by an abnormal proliferation of *Candida* species in the vaginal tract, it is commonly referred to as a “yeast infection”. It often occurs in pregnancy.
Although VVC is not a sexually transmitted infection, it often causes symptoms which overlap with other sexually transmitted infections.

3.10.1 Treatment

Only topical azole therapies, applied for 7 days, are recommended for use among pregnant women.

Oral Fluconazole should not be used during pregnancy. Several studies indicate a single 150-mg dose of fluconazole might be associated with spontaneous abortion and congenital anomalies.

13.11 Human Papilloma Virus

Anogenital Warts in Pregnancy

Anogenital warts are a common disease, and 90% are caused by nononcogenic HPV types 6 or 11. Anogenital warts are usually asymptomatic; however, depending on the size and anatomic location, they can be painful or pruritic. Anogenital warts can proliferate and become friable during pregnancy. Although removal of warts can be considered, resolution might be incomplete or poor until pregnancy is complete.

Treatment

Treatment of Anogenital warts in pregnancy is difficult as Podofilox, podophyllin, and sinecatechins should not be used during pregnancy, and though Imiquimod appears to pose low risk there is little data to support this.

Rarely, HPV types 6 and 11 can cause respiratory papillomatosis among infants and children. The route of transmission (i.e., transplacental, perinatal, or postnatal), and whether a caesarean delivery prevents respiratory papillomatosis in infants is unclear.

Cesarean delivery is indicated for women with anogenital warts only if the pelvic outlet is obstructed or if vaginal delivery would result in excessive bleeding. It is not recommended to be performed solely to prevent transmission of HPV infection to the newborn.

Pregnant women with anogenital warts should be counseled about the low risk for warts on the larynx of their infants or children (recurrent respiratory papillomatosis).

13.12 Viral Hepatitis Infection

All pregnant women should be screened for Hepatitis B and C antibodies at the first antenatal visit of each pregnancy again in the third trimester or at delivery if considered to be at high risk for infection.

Pregnant women at risk for HBV and without documentation of a complete Hepatitis B vaccine series should be offered vaccination.

The rate of transmission of HCV to the unborn infant is variable, infection usually occurs during or near delivery and no treatment nor delivery method seems to decrease the risk. Risk is increased if viral load is high at delivery or if mother is HIV positive.

HCV is not transmitted through breast milk, though if the mother's nipples are cracked or bleeding breast feeding should be avoided.

Infants of mothers with HCV infection should be tested for HCV infection no sooner than age 18 months because anti-HCV from the mother might last until that age. If diagnosis is desired before 18 months testing HCV-RNA testing can be performed at or after the infant's first well-child visit at age 1–2 month and can be repeated at subsequent visits.

All pregnant women with HBsAg and positive HCV antibodies should be referred to Infectious Disease Specialists and their care should be managed in accordance with the existing *Hepatitis B and Hepatits C National Guidelines.*

14

Sexual Assault and Abuse and STIs

14.1 Adolescent and Adults

This section of the guidelines is primarily limited to the identification, prophylaxis, and treatment of STIs and conditions among adolescent and adult female sexual assault survivors. However, some of the following guidelines might still apply to male sexual assault survivors.

Examinations of survivors of sexual assault should be conducted by an experienced clinician in a way that minimizes further trauma to the person. The decision to obtain genital or other specimens for STI diagnosis should be made on an individual basis. Although collection of specimens at initial examination for laboratory STI diagnosis gives the survivor and clinician the option of deferring empiric prophylactic antimicrobial treatment, compliance with follow-up visits is typically poor (*1423–1425*). Among sexually active adults, identification of an STI might represent an infection acquired before the assault, and therefore might be more important for the medical management of the patient than for legal purposes.

Trichomoniasis, BV, gonorrhea, and chlamydia are the most frequently diagnosed infections among women who have been sexually assaulted. Chlamydial and gonococcal infections are of particular concern because of the possibility of ascending infection. Postexposure vaccination for HBV and HPV are recommended for survivors as they are at risk for acquiring both HBV and HPV infections. Reproductive-aged female survivors should be evaluated for pregnancy and offered emergency contraception.

Evaluating Adolescents and Adults for STIs

14.1.1 Initial Examination

An initial examination after a sexual assault might include the following:

- Testing for *C. trachomatis* and *N. gonorrhoeae* at the sites of penetration or attempted penetration should be performed. MSM should be offered screening if they report receptive oral or anal sex during the preceding year regardless of where contact occurred during the assault.
- Testing for *T. vaginalis* from a urine or vaginal specimen.

- POC or wet mount with measurement of vaginal pH and KOH application for the whiff test from vaginal secretions should be performed for evidence of BV and candidiasis, especially if vaginal discharge, malodor, or itching is present.
- A serum sample should be performed for HIV, HBV, and syphilis infection.

14.1.2 Treatment

Routine presumptive treatments after a sexual assault are recommended:

- An empiric antimicrobial regimen for chlamydia, gonorrhea, and trichomonas for women and chlamydia and gonorrhea for men.
- Emergency contraception should be considered for all women of childbearing age.
- Postexposure hepatitis B vaccination:
    - In cases where the hepatitis status of the assailant is unknown and the survivor has not been previously vaccinated postexposure hepatitis B vaccine should be given (without HBIG) at the initial examination. Follow -up doses ahould be administered 1-2 and 4-6 months after the first dose.
    - If the assailant is known to be HBsAg positive, unvaccinated survivors should receive both hepatitis B vaccine and HBIG at the initial examination and follow up doses administered 1–2 and 4–6 months after the first dose.
    - Survivors who were previously vaccinated but did not receive postvaccination testing should receive a single vaccine booster dose.
- HPV vaccination:
    - Female and male survivors aged 9–26 years who have not been vaccinated or are incompletely vaccinated should be vaccinated at the time of the initial examination, and follow-up doses should be administered at 1–2 months and 6 months after the first dose.
    - A 2-dose schedule (0 and 6–12 months) is recommended for persons initiating vaccination before age 15 years.
- Recommendations for HIV PEP are made on a case-by-case basis according to risk (see Risk for Acquiring HIV Infection; Recommendations for Postexposure HIV Risk Assessment of Adolescents and Adults <72 Hours After Sexual Assault).

Recommended Regimens For Adolescent and Adult Sexual Assault Survivors

Female	Male
Ceftriaxone 500mg* IM in a single dose PLUS Doxycycline 100mg orally twice daily for 7 days PLUS Metronidazole 500mg orally twice daily for 7 days	Ceftriaxone 500mg* IM in a single dose PLUS Doxycycline 100mg orally twice daily for 7 days
*For persons ≥150kg, 1g Ceftriaxone should be administered	*For persons ≥150kg, 1g Ceftriaxone should be administered

Patients should be counselled on the possible benefits and toxicities especially gastrointestinal, associated with these treatment regimens.

14.1.3 Other Management Considerations

Patients should be counseled regarding symptoms of STIs and the need for immediate examination if symptoms occur and to abstain from sexual intercourse until STI prophylactic treatment is completed.

Follow-up visits provide an opportunity to detect new infections acquired during or after the assault, complete hepatitis B and HPV vaccinations, complete counseling and treatment for other STIs, and monitor side effects and adherence to PEP, if prescribed. If initial test were negative serologic tests for syphilis can be repeated at 4–6 weeks and 3 months; HIV testing can be repeated at 6 weeks and at 3 months by using methods to identify acute HIV infection.

Risk of Acquiring HIV Infection

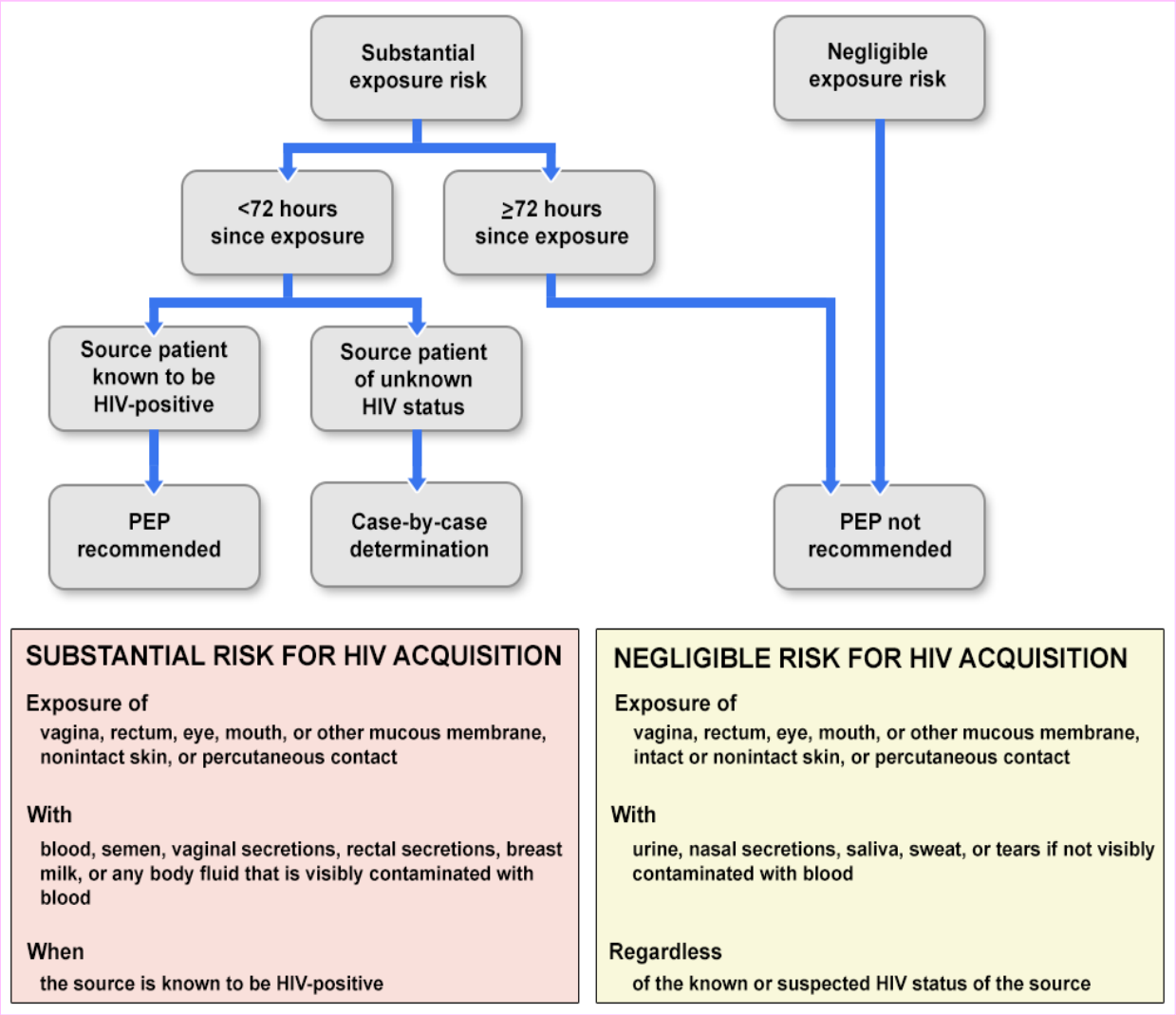
HIV seroconversion has occurred among persons whose only known risk factor was sexual assault or sexual abuse; however, the frequency of this occurrence likely is low (*1428*,*1429).* Specific circumstances of an assault (e.g., trauma and bleeding) might increase risk for HIV transmission in cases involving vaginal, anal, or oral penetration.

Recommendation for Postexposure HIV Risk Assessment of Adolescents and Adults <72 hrs after Sexual Assault

Health care providers should do the following:

- Assess risk for HIV infection in the assailant, and test that person for HIV whenever possible.
- Use the algorithm below to evaluate the survivor for the need for HIV PEP .
- Consult with a specialist in HIV treatment if PEP is being considered.
- If the survivor appears to be at risk for acquiring HIV from the assault, discuss PEP, including benefits and risks.
- If the survivor chooses to start PEP, provide a prescription for an entire 28-day course. Schedule an early follow-up visit to discuss test results and provide additional counseling.
- If PEP is started, obtain serum creatinine, creatinine clearance, AST, and ALT at baseline.
- Perform an HIV antibody test at original assessment; repeat at 6 weeks and 3 months.
- Counsel the survivor regarding ongoing risk for HIV acquisition and about HIV PrEP, and provide referrals to a PrEP provider.

Figure 12: Algorithm for evaluation and treatment of possible non-occupational HIV exposures



Source: *Updated Guidelines for Antiretroviral Postexposure Prophylaxis after Sexual, Injection-Drug Use, or Other Nonoccupational Exposure to HIV – United States, 2016. MMWR Morb Mortal Wkly Rep, 2016. 65(17): p. 458*

14.2 Sexual Assault or Abuse of Children

This section of the guidelines is limited to the identification and treatment of STIs in prepubertal children. Management of the psychosocial or legal aspects of the sexual assault or abuse of children is beyond the scope of these guidelines.

Identification of STIs in children past the neonatal period strongly indicates sexual abuse. Postnatally acquired gonorrhea, syphilis, chlamydia, and *T. vaginalis* infection and nontransfusion, nonperinatally acquired HIV infection are indicative of sexual abuse. Sexual

abuse should be suspected when anogenital herpes or anogenital warts are diagnosed. The general rule that STIs beyond the neonatal period are evidence of sexual abuse has exceptions. For example, genital infection with *T. vaginalis* or rectal or genital infection with *C. trachomatis* among young children might be the result of perinatally acquired infection that has persisted for as long as 2–3 years. Genital warts have been diagnosed among children who have been sexually abused but also among children who have no evidence of sexual abuse; lesions appearing for the first time in a child aged >5 years are more likely to have been caused by sexual transmission. BV has been diagnosed among children who have been abused but its presence alone does not prove sexual abuse. The majority of HBV infections among children result from household exposure to persons who have chronic HBV infection rather than sexual abuse.

Investigation of sexual abuse among children should be conducted in compliance with recommendations by clinicians who have experience and training in all elements of the evaluation of child abuse, neglect, and assault. When any STI has been diagnosed in a child, efforts should be made in consultation with a specialist to evaluate the possibility of sexual abuse, including conducting a history and physical examination for evidence of abuse and diagnostic testing for STIs.

The laws of Guyana require that all cases of child abuse be reported to the child protection agency and to the local police department.

14.2.1 Evaluating Children for STIs

Evaluating children for sexual assault or abuse should be conducted in a manner designed to minimize pain and trauma to the child.

Examinations and collection of vaginal specimens in prepubertal girls can be extremely uncomfortable and should be performed by an experienced clinician to avoid psychological and physical trauma to the child. Children who received a diagnosis of one STI should be screened for other STIs. History and reported type of sexual contact might not be a reliable indicator, and urogenital, pharyngeal, and rectal testing should be considered for preverbal children and children who cannot verbalize details of the assault.
Factors that should lead the physician to consider testing for STIs include the following:

- The child has experienced penetration or has evidence of recent or healed penetrative injury to the genitals, anus, or oropharynx.
- The child has been abused by a stranger.
- The child has been abused by an assailant known to be infected with an STI or at high risk for STIs (e.g., injecting drug user, MSM, person with multiple sex partners, or person with a history of STIs).
- The child has a sibling, other relative, or another person in the household with an STI.
- The child lives in an area with a high rate of STIs in the community.
- The child has signs or symptoms of STIs (e.g., vaginal discharge or pain, genital itching or odor, urinary symptoms, or genital lesions or ulcers).
- The child or parent requests STI testing.
- The child is unable to verbalize details of the assault.

If a child has symptoms, signs, or evidence of an infection that might be sexually transmitted, the child should be tested for common STIs before initiation of any treatment that might interfere with diagnosing other STIs. Because of the legal and psychosocial consequences of a false-positive diagnosis, only tests with high specificities should be used. The potential benefit to the child of a reliable STI diagnosis justifies deferring presumptive treatment until specimens for highly specific tests are obtained by providers with experience in evaluating sexually abused and assaulted children.

Evaluations should be performed on a case-by-case basis, according to history of assault or abuse and in a manner that minimizes the possibility for psychological trauma and social stigma. If the initial exposure was recent, the infectious organisms acquired through the exposure might not have produced sufficient concentrations to result in positive test results or examination findings. Alternatively, positive test results after a recent exposure might represent the assailant's secretions (which would still be an indication for treatment of the child). A second visit approximately 2–6 weeks after the most recent sexual exposure should be scheduled to include a repeat physical examination and collection of additional specimens to identify any infection that might not have been detected at the time of initial evaluation.

A single evaluation might be sufficient if the child was abused for an extended period and if a substantial amount of time elapsed between the last suspected episode of abuse and the medical evaluation. Compliance with follow-up appointments might be improved when social services or child protective services are involved.

14.2.2 Initial Examination

Visual inspection of the genital, perianal, and oral areas for genital discharge, odor, bleeding, irritation, warts, and ulcerative lesions should be performed during initial examination. The clinical manifestations of certain STIs are different for children than for adults. For example, typical vesicular lesions might be absent even in the presence of HSV infection.
The following should be performed during the initial examination, if STI testing is indicated:

- Testing for *N. gonorrhoeae* and *C. trachomatis* can be performed from specimens collected from the pharynx and rectum, as well as the vagina for girls and urine for boys.
- Cervical specimens are not recommended for prepubertal girls.
- For boys with a urethral discharge, a meatal specimen discharge is an adequate substitute for an intraurethral swab specimen.
- Culture can be used to test for *N. gonorrhoeae* and *C. trachomatis.* Specimens obtained before treatment should be preserved for further validation if needed. When a specimen is positive, the result should be confirmed either by retesting the original specimen or obtaining another. Because of the overall low prevalence of *N. gonorrhoeae* and *C. trachomatis* among children, false-positive results can occur, and all specimens that are initially positive should be confirmed.
- Culture and wet mount of a vaginal swab specimen should be used to test for *T. vaginalis.* Testing for *T. vaginalis* should not be limited to girls with vaginal discharge because evidence indicates that asymptomatic sexually abused children might be infected with *T.*

vaginalis and might benefit from treatment. In the case of a positive specimen, the result should be confirmed either by retesting the original specimen or obtaining another. Because of the overall low prevalence of *T. vaginalis* among children, false-positive results can occur, and all specimens that are initially positive should be confirmed.

- HSV can be indicative of sexual abuse; therefore, specimens should be obtained from all vesicular or ulcerative genital or perianal lesions and sent for culture.
- Wet mount for a vaginal swab specimen for BV if discharge is present.
- HIV rapid test -Children might be at higher risk for HIV acquisition than adolescent and adult sexual assault / abuse survivors because the sexual abuse of children is frequently associated with multiple episodes of assault and mucosal trauma might be more likely.
- The decision to test for HIV infection should involve the family, if possible, and be made on a case by-case basis depending on the likelihood of infection among assailant(s).
- Collection of serum samples should be evaluated, preserved for subsequent analysis, and used as a baseline for comparison with follow-up serologic tests.
- Sera can be tested for antibodies to *T. pallidum*, HIV, and HBV. Decisions regarding the infectious agents for which to perform serologic tests should be made on a case-by-case basis.

14.2.3 Treatment

Presumptive treatment for children who have been sexually assaulted or abused is not recommended, because: 1) the incidence of most STIs among children is low after abuse or assault, 2) prepubertal girls appear to be at lower risk for ascending infection than adolescent or adult women, 3)Regular follow-up of children usually can be ensured. However, certain children or their parent or guardian might be concerned about the possibility of infection with an STI, even if the health care provider has perceived the risk to be low. Such concerns might be an indication for presumptive treatment in certain settings and might be considered after all relevant specimens for diagnostic tests have been collected.

14.2.4 Other management Considerations

Children who are survivors of sexual assault or abuse are at increased risk for future unsafe sexual practices that have been linked to higher risk for HPV acquisition and are more likely to engage in these behaviors at an earlier age; if they are ≥9years and have not initiated or completed HPV vaccination they should be vaccinated.

Follow-Up

Follow up visit 2 weeks after the initial examination is recommended in cases where no infections were identified or where no physical examination nor diagnostic testing was done at the initial examination.

If baseline tests for syphilis, HIV, and HBV are negative and examinations for genital warts are negative, follow-up serologic testing and examination approximately 6 weeks and <3 months after the last suspected sexual exposure is recommended to allow time for antibodies to develop and signs of infection to appear. Results of HBsAg testing should be interpreted carefully because

HBV can be transmitted non-sexually. Decisions regarding which tests should be performed should be made on a case-by-case basis.

Risk for Acquiring HIV Infection

HIV has been reported among children for whom sexual abuse was the only known risk factor. Serologic testing for HIV should be considered for all sexually abused children. The decision to test for HIV should involve the family, if possible, and be made on a case-by-case basis depending on the likelihood of infection in the assailant. HIV PEP is well tolerated by infants and children with and without HIV, and children have a minimal risk for serious adverse reactions because of the short period recommended for prophylaxis.

Recommendations for Post-exposure HIV Risk Assessment of Children <72 hours after Sexual Assault

Providers should do the following:

- Review local HIV epidemiology, assess risk for HIV in the assailant, and test for HIV.
- Evaluate the circumstances of the assault or abuse that might affect risk for HIV transmission.
- Perform HIV antigen or antibody testing during the original assessment and again at follow-up visits, in accordance with National HIV guidelines
- In considering whether to offer PEP, health care providers should consider whether the child can be treated soon after the sexual exposure (i.e., <72 hours), the likelihood that the assailant has HIV infection, and the likelihood of high compliance with the prophylactic regimen. Potential benefit of treating a sexually abused child should be weighed against the risk for adverse reactions.
- Consult with a provider specializing in evaluating or treating children with HIV infection to determine age-appropriate dosing and regimens and baseline laboratory testing, if PEP is being considered.
- Discuss PEP with the caregivers, including its toxicity, unknown efficacy, and possible benefits, for children determined to be at risk for HIV transmission from the assault or abuse.

Provide adequate doses of medication, if PEP is begun, to last until the follow-up visit 3–7 days after the initial assessment, at which time the child should be reevaluated and tolerance of and adherence to medication assessed.

15

Surveillance and Research

15.1 Surveillance

Surveillance—the process by which behaviour is monitored for the purpose of influencing, managing, directing, or protecting the health of the individual and the public—is an important part of STI management.

Surveillance is done at all levels of the health care system. Examining the various STI trends in the community enables clinicians to identify high-risk groups and also to employ programmatic interventions that aim to improve quality of life for patients and the public.

Routine STI surveillance should include the monitoring of STI complications. The complications of STIs are another component that adds to the disease burden.

STI surveillance in key populations (KPs) remains key, since STI prevalence among KPs is a significant contributor to the STI epidemic. Collaboration with NGOs should be strengthened and data should be shared in an effort to provide information for effective interventions.

Capacity-building is necessary for STI surveillance and monitoring. Laboratories need strengthening; more human resources and access to affordable STI diagnostic tests are needed. Annual surveillance reports which are compiled by the Epidemiology Department, detailing the incidence and prevalence of various diseases around the country should be shared with all stakeholders, both public and private, so that everyone is aware of trends in all regions of the country

The challenges in STI surveillance include:

- Difficulty in conducting surveillance when laboratory testing to detect STIs and to understand the causes of STI syndromes are not always available
- Many STIs are asymptomatic, which means that a number of infections are missed because of the lack of diagnostic testing.
- Many times there is limited linking of laboratory data to epidemiological data.

Data collection and reporting on observed trends are needed for clinical monitoring and programme performance evaluation.

It is important that registers are updated to keep records of key clinical and programme indicators, such as attendance and STIs diagnosed, and to capture demographic information, such as age and sex of patients.

This information, when cross-tabulated, serves to answers questions like who is accessing care and which STIs are most affecting certain groups.
Based on this data, targeted interventions can then be planned, organized, and implemented to more effectively control the spread of STIs.

Data can also be used to measure the success of programmes as well as to improve programme activities to better deliver services to the community.

15.2 Research Needs

There are outstanding questions regarding the role of some organisms and their relevance and need for strategic control that require more research. Some of the key ones are the following.

- The role of overtreatment in developing or accelerating antimicrobial resistance, especially for *N. gonorrhoeae* and *M. genitalium*.

  ***M. genitalium*:**
  - The role and impact on sexual and reproductive health, and need for effective control, of M. genitalium in urethritis among men, in pelvic inflammatory disease among women and proctitis among women and men.
  - Research on best treatments for *M. genitalium*?

  ***H. ducreyi*:** this pathogen though largely controlled, it is still occasionally detected in some settings.
  - What mechanisms should be put in place to ensure that the infection does not re-emerge, and if it does, how to detect it and prevent its spread?
  - How can we determine whether *H. ducreyi* has been eliminated?

  ***C. trachomatis* genovar L1–L3:**
  - What are the specific clinical manifestations that should alert the health-care provider to this infection?
  - What is the burden of this infection among men who have sex with men and people engaging in anal sex?
  - What are the long-term consequences of untreated lymphogranuloma venereum?
  - How can the diagnosis of lymphogranuloma venereum be made more affordable and improved?

Overall, rapid,accurate, low-cost point-of-care tests for diagnosing *N. gonorrhoeae* and *C. trachomatis* need to be developed.

Appendices and References

Figure 13: Algorithm for Syndromic Management – Genital Discharge Syndrome

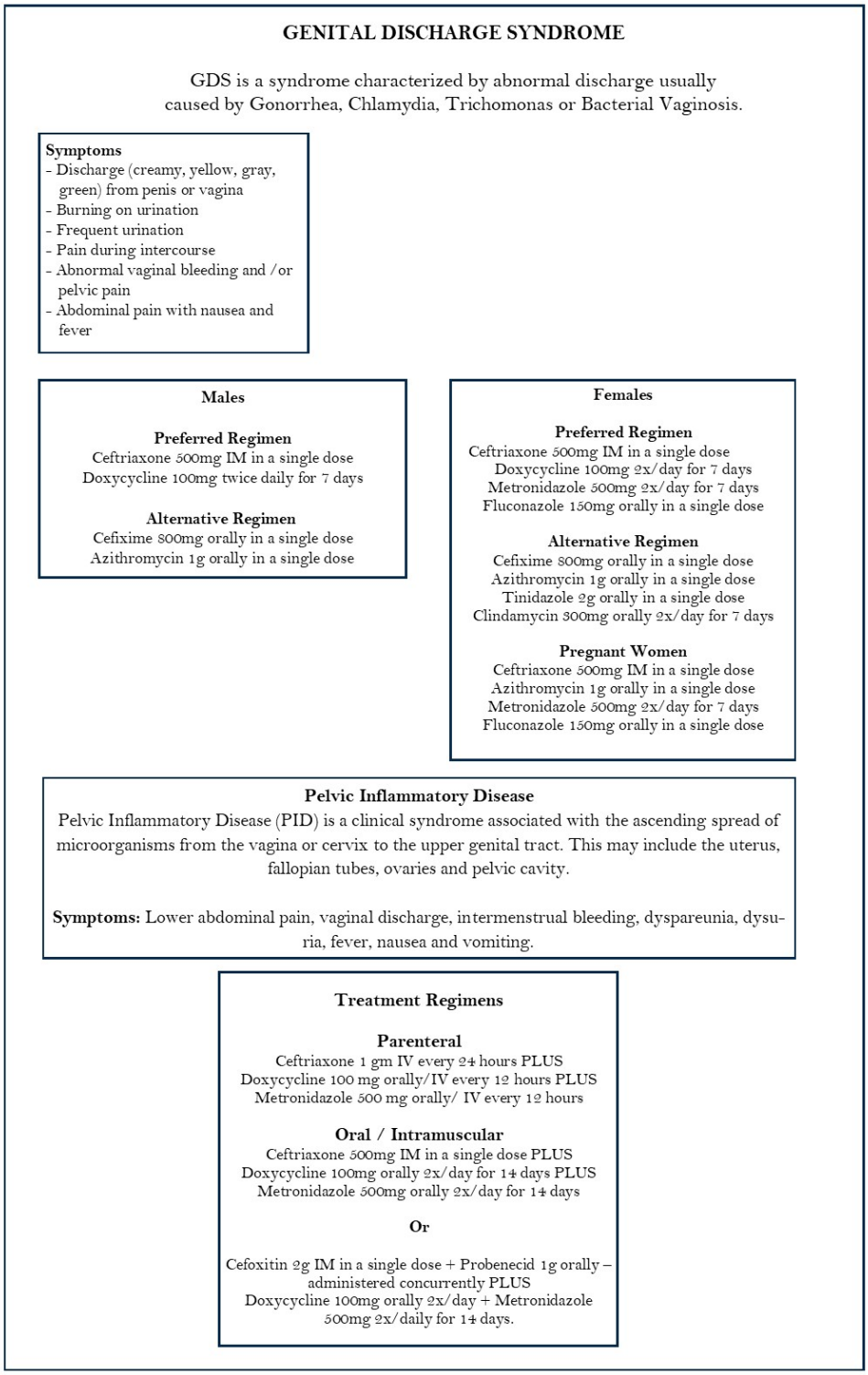
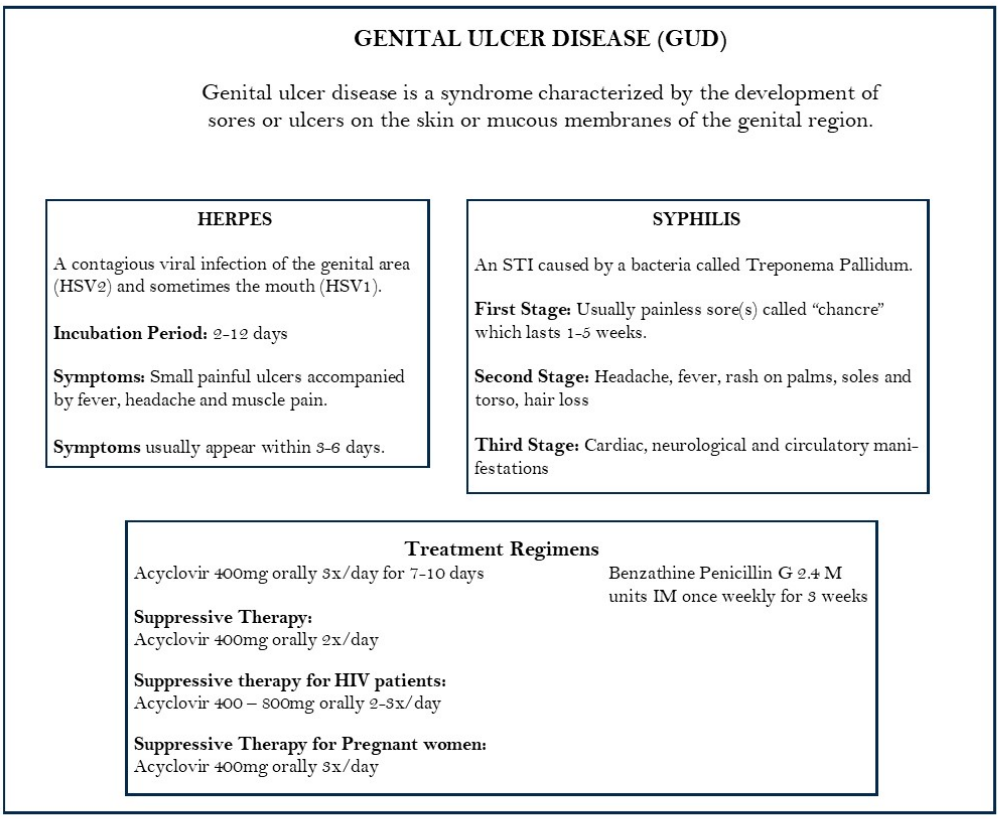


Figure 14: Algorithm for Syndromic Management – Genital Ulcer Disease (GUD)



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