Lippincott® NursingCenter®

November 2021
www.nursingcenter.com

Sexually Transmitted Infections

About the Guideline

- This guideline was created to assist in the treatment of patients who have or are at risk for sexually transmitted infections (STIs).
- The term "STI" refers to an infection from a pathogen after sexual contact.
- The term "sexually transmitted disease" refers to a recognizable disease state from an infection.
- This guideline is an update of the 2010 version and was updated by the Centers for Disease Control and Prevention (CDC) and a multidisciplinary workgroup.
- Physicians and other health care practitioners can use these guidelines to assist them in the prevention and treatment of STIs.

Key Clinical Considerations

Become familiar with the recommendations and best-practice statements provided in this guideline, especially if you work in an acute care setting.

Strategies for Prevention and Control of STIs

- Accurately assessing STI risk
- Educating and counseling patients on ways to avoid acquiring and transmitting STIs by changing sexual behaviors and using recommended prevention strategies
- Using pre-exposure vaccinations of those at risk for vaccine-preventable STIs
- Identifying patients with STI-associated symptoms and asymptomatically infected patients
- Effective diagnosis, treatment, counseling, and follow-up of infected patients and their sex partners

<u>STI/Human Immunodeficiency Virus (HIV) Risk Assessment</u>

- Assess behavioral and biological risks for acquiring or transmitting STIs and HIV (primary prevention).
    - Obtain a sexual history: partners, practices, pregnancy intention, protection from STIs, and any history of STIs.
    - Inform patients about all STIs they're being tested for and other common STI tests that are available and test results. STI screening should include screening for HIV.
    - Ask open-ended questions that are understandable. Use nonjudgmental and normalizing language to facilitate a rapport with patients and their partners.

<u>STI/HIV Prevention Counseling</u>

- Encourage risk reduction and provide prevention counseling.
- All sexually active adolescents and adults at increased risk for STIs and HIV should receive high-intensity behavioral counseling.
- Information about STIs and reducing disease transmission can be provided via videos, motivational client interviewing, and large-group presentations.

- Group-based strategies can reduce the occurrence of STIs among those at risk.
- Client-centered counseling for prevention and risk reduction interventions involves tailoring information to the individual and their situation. This includes age, culture, gender, developmental level, sexual orientation, and language of the patient.
- Clinical and nonclinical providers should offer or refer patients for regular STI screening, onsite STI treatment, and risk-reduction interventions tailored to the individual's assessed risk.

STI/HIV Prevention Methods

- Pre-exposure Vaccination
    - Human papillomavirus (HPV) vaccination is routinely recommended for boys and girls aged 11 or 12 years through age 26 years for those not previously vaccinated. For those with HIV or men who have sex with men (MSM), the vaccination is recommended through age 26 years.
    - Vaccination can be given as early as 9 years of age.
    - Those who are unvaccinated, not infected with hepatitis B, sexually active with more than one partner, and being evaluated or treated for an STI should receive a hepatitis B vaccine. MSM, injection-drug users (IDUs), persons with chronic liver disease (CLD), and those who have HIV infection and have not yet been infected with hepatitis A or B virus should receive the hepatitis A and B vaccines.
- Abstinence and Reduction of Number of Sex Partners
    - Abstaining from oral, vaginal, and anal sex or being in a mutually monogamous, long-term relationship with an uninfected partner is the most reliable way to avoid the transmission of STIs.
    - For those being treated for an STI other than HIV, abstinence from any sexual activity is critical until completion of the entire course of treatment.
- Male Condoms
    - When used correctly and consistently, male condoms, also known as external latex condoms, are extremely effective in reducing the risk of HIV and other STIs, as well as pelvic inflammatory disease (PID) in women. Be sure to provide correct condom use instructions.
    - Polyurethane male condoms can be used by those who have a latex allergy.
    - Sexual transmission of viruses, including hepatitis B, herpes simplex, and HIV, can occur with natural membrane condoms. Therefore, these condoms are not recommended for the prevention of STIs and HIV (although they may be used for pregnancy prevention).
- Internal Condoms (also known as female condoms)
    - Available condoms include the FC2 Female Condom, the Reddy Female Condom, the Cupid Female Condom, and The Woman's Condom.
    - Efficacy associated with anal intercourse remains unknown.
- Cervical Diaphragms
    - Although they can protect against cervical gonorrhea, chlamydia, and trichomoniasis, cervical diaphragms cannot be used as the sole source of protection against HIV or other STIs.
- Topical Microbicides and Spermicides

  - Nonspecific topical microbicides are not effective in preventing HIV.
  - Spermicides containing N-9 are associated with an increased risk of HIV infection.
  - N-9 alone or in a condom is not recommended for STI or HIV prevention.
- Nonbarrier Contraception, Female Surgical Sterilization, and Hysterectomy
  - Sexually active women who use hormonal contraception, have nonhormonal intrauterine devices (IUDs), have been surgically sterilized, or have had hysterectomies should be counseled to use condoms to reduce the risk of STIs, including HIV infection.
- Emergency Contraception
  - Emergency contraception can be achieved using copper-containing IUDs and emergency contraceptive pills (ECPs).
  - Clients should be educated about emergency contraception if other contraceptive methods were not used or used inappropriately, and pregnancy is not desired.
- Male Circumcision
  - Male circumcision may reduce the risk for HIV and some STIs in heterosexual men.
  - Newborn male circumcision should be an available option for families.
- Postexposure Prophylaxis for HIV and STIs
  - Genital hygiene methods after sexual exposure, such as douching or vaginal washing, are ineffective in protecting against HIV and STIs, and may increase the risk for bacterial vaginosis (BV), some STIs, and HIV infection.
  - Antiretroviral treatment of patients with HIV infection may be beneficial to prevent HIV infection in partners and reduces the risk of continued transmission.
  - HSV treatment of patients with HIV and herpes simplex virus (HSV) infections is not beneficial in reducing HIV transmission to uninfected partners.
- Pre-exposure Prophylaxis for HIV
  - Evaluate HIV-negative men and women who are sexually active or injecting illicit drugs.
  - Consider pre-exposure prophylaxis (PrEP) as a prevention option for patients whose sexual or injection practices and epidemiologic context place them at increased risk for acquiring HIV infection.
  - HIV seroadaptation strategies:
    - *Serosorting* is defined as limiting anal sex without a condom to a partner with the same HIV status or using condoms only with HIV serodiscordant partners; this practice is not recommended.
    - *Seropositioning* refers to positioning the partner with HIV as the receptive partner for anal intercourse; this practice is associated with increased risk of STIs, including chlamydia and gonorrhea.
- Retesting after Treatment to Detect Repeat Infections
  - After a diagnosis of gonorrhea, chlamydia, or trichomoniasis, retesting after several months can detect a repeat infection and may be used to improve population-based prevention.
  - Any patient who tests positive for chlamydia, gonorrhea, or trichomonas should be rescreened 3 months after treatment.
  - Follow-up serologic syphilis testing is recommended for anyone who is diagnosed with syphilis or gonorrhea during the past 6 months.

Partner Services

- The goal of partner services is to increase the number of infected patients brought into treatment and to disrupt transmission of infection by clinical evaluation, counseling, diagnostic testing, and treatment.
- Encourage those with STIs to notify their sex partners and to urge their partners to seek medical evaluation and treatment.
- Provide infected patients with written information and medication to give to their partners. Directly evaluate and treat sex partners, and cooperate with state and local health departments.
- Health departments should provide partner services for those who might have cephalosporin-resistant gonorrhea.
- *Expedited partner therapy (EPT)* or *patient-delivered partner therapy (PDPT)* is treating the sex partners of those who are diagnosed with chlamydia or gonorrhea who are unable or unlikely to seek timely treatment by providing medications or prescriptions to the patient. Patients then provide treatment therapy to their partners without the health care provider having examined the partner.
    - The routine use of PDPT for MSM is not recommended.
    - Medical providers should routinely offer EPT to heterosexual patients with chlamydia or gonorrhea infection when the provider cannot confidently ensure that all of a patient's sex partners from the prior 60 days or the most recent sex partner will be treated.
    - It is preferable to provide patients with properly packaged medication, along with treatment instructions, general health counseling, warnings for taking the medication if the partner has an allergy to the medication or is pregnant, and instructions advising that partners seek medical evaluation for any symptoms of STI.
- Patients diagnosed with a bacterial STI and their partners should also be tested for HIV infection.

Reporting and Confidentiality

- An integral part of assessing morbidity trends, allocating limited resources, and assisting local health authorities in partner treatment and notification is accurate and timely reporting of STIs.
- Syphilis (including congenital syphilis), chlamydia, HIV infection, gonorrhea, chancroid, and acquired immunodeficiency syndrome (AIDS) are reportable diseases in every state.

Special Populations

- Pregnant Women
    - Ask all pregnant women and their sex partners about STIs, provide counseling regarding the likelihood of perinatal infections, and provide access to screening and treatment as needed.
    - All pregnant women should be screened for HIV infection at the first prenatal visit and, if at high risk for HIV, retested in the third trimester.
    - Women in labor who have not been screened for HIV during pregnancy should have a rapid HIV screening performed.
    - All pregnant women should receive a serologic test for syphilis at the first prenatal visit, again early in the third trimester, and at delivery if they are at high risk or live in an area of high syphilis morbidity.

  - Until the syphilis serologic status of the mother is determined, neonates should not be discharged from the hospital.
  - Women delivering stillborn infants should be tested for syphilis.
  - Routine testing for hepatitis B surface antigen (HBsAg) should be performed for all pregnant women at the first prenatal visit, and those who are or who test negative or are at risk for hepatitis B virus (HBV) infection should be vaccinated.
  - The HBsAg-positive status of pregnant women should be reported to the local or state health department to ensure that they are entered into a case-management system and that their infants receive timely and appropriate prophylaxis.
  - Routinely screen all pregnant women younger than age 25, and older women at increased risk, for Chlamydia trachomatis infection at the first prenatal visit, and retest during the third trimester.
  - Screen all pregnant women younger than age 25, and older women at increased risk, for gonorrhea during the first prenatal visit, retest during the third trimester, and rescreen 3 months after treatment.
  - Screen all pregnant women at risk for hepatitis C virus (HCV) infection for hepatitis C antibodies during the first prenatal visit. Those with HCV should be treated with supportive care and counseling and be linked to care.
  - Pregnant women should have a Papanicolaou (Pap) test at the same frequency as nonpregnant women.
  - Routine screening of asymptomatic women for bacterial vaginosis*, Trichomonas vaginalis,* or herpes simplex virus-2 (HSV-2) is not recommended.
- Adolescents
  - Minors are allowed to provide consent for their own STI services in all 50 states and the District of Columbia.
  - Screening recommendations:
    - Annual screening for *C. trachomatis* and *Neisseria gonorrhoeae* should be performed for all sexually active females younger than age 25. In areas with a high prevalence of young males with chlamydia, consider screening them as well.
    - Discuss and offer HIV screening to all adolescents. Those who test positive for HIV should receive prevention counseling and referral to care before leaving the testing site.
    - Screening young MSM and pregnant adolescent females for syphilis is recommended.
    - Cervical cancer screening should begin at 25 years of age.
  - Primary prevention recommendations:
    - For females aged 11 and 12 years, the HPV vaccine (bivalent, quadrivalent, or 9-valent) is recommended. It is also recommended for females aged 13 to 26 years who have not received all doses or completed the vaccine series.
    - For males aged 11 and 12 years, the quadrivalent or 9-valent HPV vaccine is recommended. Vaccination with quadrivalent or the 9-valent HPV vaccine is

recommended for males aged 13 to 21 years who have not received all doses or completed the vaccine series. Males aged 22 to 26 years can also be vaccinated.
    - HPV vaccination is recommended for patients with HIV infection and MSM through age 26.
    - The HBV vaccination series is recommended for all adolescents and young adults.
    - The hepatitis A virus (HAV) vaccination series should be offered to adolescents and young adults.
    - Adolescents should be counseled about sexual behaviors that are associated with the risk of acquiring STIs and educated regarding evidence-based prevention strategies, including a discussion about abstinence and other risk-reduction behaviors.
- Children
    - Close cooperation between clinicians, laboratory staff, and child protection authorities is needed for managing children with STIs.
- Patients in Correctional Facilities
    - Women 35 years of age or younger and men younger than 30 years of age should be screened for chlamydia and gonorrhea at the time of intake.
    - Universal syphilis screening should be conducted based on the local area and institutional prevalence of early (primary, secondary, and early latent) infection.
- Men Who Have Sex with Men (MSM)
    - A detailed sexual history should be taken to determine vulnerability and provide care and counseling.
    - Annual screening tests should be performed on men who have sex with men (MSM) with:
        - HIV and syphilis serology
        - urethral infections with N. gonorrhoeae and C. trachomatis if they have had insertive intercourse during the preceding year
        - rectal infections with N. gonorrhoeae and C. trachomatis if they have had receptive anal intercourse during the preceding year
        - pharyngeal infection with N. gonorrhoeae if they have had receptive oral intercourse during the preceding year
        - HCV if they have HIV
    - For MSM with persistent risky behaviors and multiple sexual partners, more frequent STI screening at 3- and 6-month intervals is indicated.
    - HBsAg testing should be performed for MSM with chronic HBV infection.
    - MSM should be vaccinated against hepatitis A and B.
- Women Who Have Sex with Women (WSW)
    - Routine screening for cervical cancer and HPV vaccination should be offered to WSW.
    - Encourage healthy sexual practices and educate WSW regarding the signs and symptoms of BV. WSW are at risk for acquiring bacterial, viral, and protozoal STIs from current and prior partners, both male and female.
- Transgender Men and Women

  - Assessment based on current anatomy and sexual behaviors is recommended for transgender patients to evaluate for STI- and HIV-related risks. Providers must remain aware of symptoms consistent with common STIs and screen for asymptomatic STIs based on behavioral history and sexual practices.

HIV Infection

Screening

- Screen all patients who seek evaluation or treatment for STIs for HIV infection.
- Screen all patients aged 15 to 64 years in all health care settings for HIV infection.
- Preliminary positive screening tests must be followed by additional testing to definitively establish the diagnosis.
- The availability of opt-out HIV screening is recommended in all health care settings.

Diagnosis

- HIV testing must be voluntary and free from coercion. Consent must be received from patients before testing.
- HIV infection is diagnosed by serologic tests that detect antibodies against HIV-1 and HIV-2 and by virologic tests that detect HIV antigens or ribonucleic acid (RNA).
- The use of antigen/antibody (Ag/Ab) combination tests is encouraged for patients who are likely to return for their HIV test results.
- Providers should be aware of the possibility of an acute HIV infection, and perform either an Ag/Ab immunoassay or an HIV RNA test in conjunction with an antibody test.
- Those suspected of having recently acquired an HIV infection should be immediately referred to an HIV clinical-care practitioner.

Acute HIV Infection

- Acute HIV is highly infective due to high levels of the virus in plasma and genital secretions.
- If acute retroviral syndrome is suspected:
  - Perform an immediate assessment, including an Ag/Ab immunoassay, or HIV RNA in conjunction with an antibody test.
  - If the immunoassay is indeterminate or negative, test for HIV RNA.
- Antiretroviral therapy, started as soon as possible during acute HIV infection, is recommended.
- Immediately refer patients with an acute HIV infection diagnosis to an HIV clinical-care practitioner, provide prevention counseling, and screen for STIs.
- When the most recent contact was within the 72 hours preceding HIV diagnosis, provide information on the availability of postexposure prophylaxis for sexual partners and needle-sharing partners who are not known to have HIV infection.

Other HIV Management Considerations

- Inform patients with a newly diagnosed HIV infection about promptly initiating medical care for their own health and to reduce further transmission of HIV.
- Promptly connect patients to an experienced health care practitioner or a facility experienced in caring for patients with HIV.

Counseling for Persons with HIV Infection and Referral to Support Services

- Provide on-site or referral counseling concerning the behavioral, psychosocial, and medical implications of HIV infection.
- Assess any immediate need for medical care and psychosocial support.
- Link patients with newly diagnosed HIV to services provided by health care personnel experienced in the management of HIV infection.
    - Additional services needed include substance abuse counseling and treatment, mental health disorder or emotional distress treatment, reproductive and risk-reduction counseling, and case management.
    - Practitioners should follow up to ensure that patients have received services for any needs that have been identified.
- Educate patients regarding the importance of ongoing medical care and what to expect from these services.

STI Testing during HIV Care

- Test all sexually active patients with HIV for STIs at the initial HIV care visit, and repeat testing at least annually during the course of HIV care. Specific testing includes syphilis serology and the nucleic acid amplification test (NAAT) for N. gonorrhoeae and C. trachomatis at the anatomic site of exposure.
- Screen women with HIV infection for trichomonas at the initial visit and annually.
- Screen women for cervical cancer precursor lesions by cervical Pap tests per existing guidelines.
- Provide more frequent screening for curable STIs, as appropriate, depending on individual risk behaviors and the local epidemiology of STIs.

Partner Services and Reporting

- Inform patients with HIV infection about services for their partners.
- Encourage patients with HIV to notify their partners of their HIV status, and refer them for counseling and testing.
- Assist in the partner-notification process, directly or by referral to health department partner-notification programs.
- For patients who are unwilling to notify their partners or cannot ensure that their partners will seek counseling, confidential partner notification procedures may be used.
- Offer postexposure prophylaxis to partners who have been notified and are not known to have HIV infection. Postexposure prophylaxis may include combination antiretrovirals if the partner was exposed to genital secretions or blood of a patient with HIV infection through sex or injection-drug use within the preceding 72 hours.

Special Considerations

- HIV and Pregnancy
    - Test all pregnant women for HIV infection during the first prenatal visit.
    - Consider a second test during the third trimester, preferably at less than 36 weeks' gestation.
    - A second test is also recommended for the following women:

        - Those at high risk for acquiring HIV
        - Those who receive health care in areas with a higher incidence of HIV or AIDS among women
        - Those in clinical locations where prenatal screening identifies at least, or less than, one pregnant woman with HIV per 1,000 women screened
    - Inform pregnant women that HIV testing is part of the prenatal panel of tests. Women who decline HIV testing should have their concerns addressed, with testing encouraged at subsequent prenatal visits.
    - If no prenatal care has occurred, women should be tested for HIV at the time of delivery.
    - Educate HIV-positive women regarding the benefits of antiretroviral treatment, which include reducing the risk of transmission to the newborn.
    - Connect pregnant women with HIV to an HIV care practitioner, and provide appropriate antenatal and postpartum treatment and education.
- HIV Infection among Neonates, Infants, and Children
    - Refer HIV-exposed neonates and children with HIV to a practitioner with expertise in HIV management.

Diseases Characterized by Genital, Anal, or Perianal Ulcers

- A test for *Haemophilus ducreyi* should be performed in settings where chancroid is present.
- Specific evaluation of genital, anal, or perianal ulcers includes:
    - syphilis serology, polymerase chain reaction (PCR) testing, or darkfield examination
    - PCR testing or culture for genital herpes
    - serologic testing for type-specific HSV antibody.
- Presumptively treat any patient with a suspected case of infectious syphilis or a suspected first episode of genital herpes at the initial visit.
- Presumptive treatment is based on clinical presentation and epidemiologic circumstances.

<u>Chancroid</u>

- Diagnosis
    - Definitive diagnosis requires the identification of *H. ducreyi* on special culture media.
    - Tender suppurative inguinal adenopathy and a painful genital ulcer suggest a diagnosis of chancroid.
    - A probable diagnosis of chancroid can be made if all of the following criteria are met:
        - One or more painful genital ulcers exist.
        - There is an appearance of genital ulcers and regional lymphadenopathy.
        - No evidence exists of Treponema pallidum infection by darkfield examination of ulcer exudate or by a serologic test for syphilis performed at least 7 days after the onset of ulcers.
        - HSV PCR test or HSV culture performed on the ulcer exudate is negative.
- Treatment
    - Recommended regimen (only one):
        - Azithromycin 1 g orally in a single dose, or

        - Ceftriaxone 250 mg IM in a single dose, or
        - Ciprofloxacin 500 mg orally twice a day for 3 days, or
        - Erythromycin base 500 mg orally three times a day for 7 days
    - Test for HIV infection when chancroid is diagnosed. If the initial test results are negative, consider offering HIV PrEP and serologic testing more frequently.
    - Re-examine patients 3 to 7 days after initiation of therapy. Ulcers usually improve symptomatically within 3 days and objectively within 7 days after therapy if treatment is successful.
    - If no clinical improvement is evident, consider these possibilities:
        - The initial diagnosis was incorrect.
        - There is coinfection with another STI.
        - The patient has HIV infection.
        - Treatment directions were not followed, or treatment was not completed.
        - The patient is infected with a resistant *H. ducreyi* strain.
    - Sex partners who have had sexual contact with the patient during the 10 days preceding the patient's onset of symptoms should be examined and treated.
    - Ciprofloxacin presents a low risk to the fetus during pregnancy; however, this medication poses a potential for toxicity during breastfeeding. Alternate treatment should be used for women who are breastfeeding.
    - Suspect sexual abuse in children with a diagnosis of chancroid ulcers.

<u>Genital HSV Infections</u>

- Virologic Tests
    - Clinical diagnosis is confirmed by type-specific laboratory testing.
    - Patients with genital herpes should be tested for HIV infection.
    - Cell culture and PCR are the preferred tests for HSV for patients seeking medical treatment for genital ulcers or other mucocutaneous lesions.
    - Nucleic acid amplification methods, including PCR assays for HSV deoxyribonucleic acid (DNA), are more sensitive.
    - PCR is the test of choice for diagnosing HSV infections affecting the central nervous system and systemic infections.
- Type-Specific Serologic Tests
    - HerpeSelect HSV-2 Elisa test results might be falsely positive at low index values and should be confirmed with another test, such as Biokit or the Western blot. The HerpeSelect HSV-2 Immunoblot should not be used for confirmation.
    - Repeat testing is indicated if there is suspicion of recently acquired genital herpes.
    - The HerpeSelect HSV-1 Elisa is not sensitive for detection of the HSV-1 antibody.
    - Immunoglobulin-M (IgM) testing for HSV-1 or HSV-2 is not useful.
    - Use type-specific HSV serologic assays for:
        - recurrent atypical or genital symptoms with negative HSV PCR or culture
        - clinical diagnosis of genital herpes without laboratory confirmation
        - a patient whose partner has genital herpes.

    - Consider HSV serologic testing for patients seeking an STI evaluation, patients with HIV, partners of patients with genital herpes, and MSM.
- Management of Genital Herpes
    - Recommended regimen for the first clinical episode of genital herpes (only one):
        - Acyclovir 400 mg orally three times a day for 7 to 10 days, or
        - Valacyclovir 1 g orally twice a day for 7 to 10 days, or
        - Famciclovir 250 mg orally three times a day for 7 to 10 days.
        - Note: Treatment can be extended if healing is incomplete after 10 days of therapy.
    - Recommended regimen for established HSV-2 infection:
        - Antiviral therapy for recurrent genital herpes can be administered either as suppressive therapy to reduce the frequency of recurrences, or episodically to improve or shorten the duration of lesions.
    - Suppressive therapy for recurrent genital herpes (only one):
        - Acyclovir 400 mg orally twice a day, or
        - Valacyclovir 1 g orally once a day, or
        - Famciclovir 250 mg orally twice a day, or
        - Valacyclovir 500 mg orally once a day (might be less effective than other valacyclovir or acyclovir dosing regimens in patients who have very frequent recurrences [that is, 10 episodes or more per year]).
    - Episodic therapy for recurrent genital herpes (only one):
        - Acyclovir 400 mg orally three times a day for 5 days, or
        - Acyclovir 800 mg orally twice a day for 5 days, or
        - Acyclovir 800 mg orally three times a day for 2 days, or
        - Valacyclovir 500 mg orally twice a day for 3 days, or
        - Valacyclovir 1 g orally once a day for 5 days, or
        - Famciclovir 125 mg orally twice daily for 5 days, or
        - Famciclovir 1 g orally twice daily for 1 day, or
        - Famciclovir 500 mg once, followed by 250 mg twice daily for 2 days.
    - Therapy for severe disease:
        - IV acyclovir therapy may be used for severe HSV disease or complications that require hospitalization (for example, disseminated infection, pneumonitis, or hepatitis) or central nervous system complications (for example, meningoencephalitis). Impaired renal function warrants an adjustment in acyclovir dosage.
        - The recommended treatment is acyclovir 5 to 10 mg/kg/body weight IV every 8 hours until clinical improvement is noted, followed by oral antiviral therapy to complete at least 10 to 14 days of total therapy.
        - HSV encephalitis requires 14 to 21 days of intravenous therapy.
    - Hepatitis
        - Fever and unexplained severe hepatitis in pregnant women should be suspect for disseminated HSV infection.
        - PCR is used for confirmation of a diagnosis of HSV.

    - Counseling topics:
        - The natural history of the disease, emphasizing the potential for recurrent episodes, asymptomatic viral shedding, and the risks of sexual transmission
        - Suppressive therapy effectiveness
        - Shortening the duration of recurrent episodes using episodic therapy
        - Informing current sex and future sex partners about genital herpes
        - Possibility of sexual transmission during asymptomatic periods
        - Abstaining from sexual activity when lesions or prodromal symptoms are present
        - Daily use of valacyclovir: reduces the risk for transmission of HSV-2 but is not effective in reducing transmission in those susceptible to HSV-2 from those with HIV and HSV using daily valacyclovir for episodic or suppressive therapy
        - Male latex condom use: effective in reducing transmission when used consistently and correctly
        - HSV infection in the absence of symptoms
        - Neonatal HSV infection risk
        - Increased risk of acquiring HIV among HSV-2 seropositive individuals who are exposed to HIV
        - Suppressive therapy for persons with asymptomatic HSV-1/2 genital herpes.
- Management of Sex Partners
    - Question asymptomatic sex partners concerning their history of genital lesions and offer type-specific serologic testing for HSV infection.
- Special Considerations
    - HSV Therapy for Those with HIV
        - Suppressive therapy (only one):
            - Acyclovir 400 to 800 mg orally two to three times a day, or
            - Valacyclovir 500 mg orally twice a day, or
            - Famciclovir 500 mg orally twice a day
        - Episodic therapy (only one):
            - Acyclovir 400 mg orally three times a day for 5 to 10 days, or
            - Valacyclovir 1 g orally twice a day for 5 to 10 days, or
            - Famciclovir 500 mg orally twice a day for 5 to 10 days
        - Therapy for antiviral-resistant HSV:
            - Suspect HSV resistance if lesions persist or reappear in patients receiving antiviral treatment; obtain a viral isolate for sensitivity testing.
            - Manage a resistant infection in consultation with an infectious-disease specialist and use an alternate therapy.
            - All acyclovir-resistant strains are also resistant to valacyclovir, and most are resistant to famciclovir.
            - Foscarnet (40 to 80 mg/kg/body weight IV every 8 hours until clinical resolution is attained) is often effective for treatment of acyclovir-resistant genital herpes.

- IV cidofovir 5 mg/kg once weekly might also be effective for treatment of acyclovir-resistant genital herpes.
- Imiquimod 5% gel for 8 hours three times per week and cidofovir gel 1% two to four times daily are topical alternatives and should be applied to the lesions.

- Genital Herpes in Pregnancy
  - Manage women who acquire genital HSV during late pregnancy in consultation with maternal-fetal medicine and infectious disease specialists.
  - Counsel pregnant women to abstain from vaginal intercourse during the third trimester with partners who have or are suspected of having genital herpes, and to abstain from receptive oral sex during the third trimester with partners who have or are suspected to have orolabial herpes.
  - Routine HSV-2 serologic screening is not recommended.
  - Women can deliver vaginally if they do not have any symptoms or signs of genital herpes. Women with recurrent genital herpetic lesions at the onset of labor should deliver by cesarean delivery to reduce the risk of neonatal HSV infection.
  - The recommended regimen for suppressive therapy for pregnant women with recurrent genital herpes (starting at 36 weeks' gestation) is as follows:
    - Acyclovir 400 mg orally three times a day, or
    - Valacyclovir 500 mg orally twice a day.
- Neonatal Herpes
  - Newborn infants exposed to HSV during birth should be followed carefully by a pediatric infectious-disease specialist.
  - Consider acyclovir for neonates born to women who acquired HSV near term.
  - All infants with known or suspected neonatal herpes should be immediately evaluated and treated with systemic acyclovir: 20 mg/kg of body weight IV every 8 hours for 14 days if disease is limited to the skin and mucous membranes, or for 21 days for disseminated disease and that involving the central nervous system.

<u>Granuloma inguinale (donovanosis)</u>

- Genital ulcerative disease caused by the intracellular gram-negative bacterium *Klebsiella granulomatis*
- Characterized by painless, highly vascular, slowly progressive bleeding ulcerative lesions on the genitals or perineum without regional lymphadenopathy
- Primarily seen in some tropical settings (that is, the Caribbean Islands, India, and southern Africa) but rarely in the United States
- Diagnosed by biopsy or visualization of dark-staining Donovan bodies on tissue crush preparation
- Treatment
  - Recommended treatment regimen: Azithromycin 1 g orally once per week, or 500 mg daily for more than 3 weeks and until all lesions have completely healed

- Alternative regimens (only one):
  - Doxycycline 100 mg orally twice a day for at least 3 weeks and until all lesions have completely healed, or
  - Erythromycin base 500 mg orally four times a day for at least 3 weeks and until all lesions have completely healed, or
  - Trimethoprim-sulfamethoxazole, one double-strength (160 mg/800mg) tablet orally twice a day for more than 3 weeks and until all lesions have completely healed (avoid in the third trimester of pregnancy and when breastfeeding)
- Addition of other antibiotics is an option if no evident improvement within the first few days of therapy or if patient also has HIV.
- Patients should be followed clinically until signs and symptoms resolve and the patient is tested for HIV infection.
- Examine and offer therapy to those who have had sexual contact with a patient who has granuloma inguinale within 60 days before onset of the patient's symptoms.
- Pregnant and lactating women should be treated with a macrolide regimen (erythromycin or azithromycin).

Lymphogranuloma venereum (LCV)

- LCV is caused by *C. trachomatis* serovars L1, L2, or L3.
- This infection manifests as unilateral tender inguinal or femoral lymphadenopathy.
- Rectal exposure in women or MSM can result in proctocolitis that may mimic inflammatory bowel disease. *Lymphogranuloma venereum* (LGV) proctocolitis can lead to chronic colorectal fistulas and strictures if treatment is delayed.
- Diagnosis is based on clinical suspicion, epidemiologic information, and the exclusion of other causes of proctocolitis, inguinal lymphadenopathy, or genital or rectal ulcers. Lesions and rectal and lymph node specimens can be tested for *C. trachomatis.*
- Recommended treatment: Doxycycline 100 mg orally twice a day for 21 days
- Alternative treatment: Erythromycin base 500 mg orally four times a day for 21 days or azithromycin 1 g once weekly for 3 weeks
- Follow patients until signs and symptoms resolve and test for HIV, syphilis, and gonorrhea.
- Presumptively treat sex partners with azithromycin 1 g orally single dose, or doxycycline 100 mg orally twice a day for 7 days.
- Treat pregnant and lactating women with erythromycin and test for cure at 4 weeks after initial treatment is started.

Syphilis

- Stages
  - Primary: Chancre or ulcers are noted at the infection site.
  - Secondary: Infection manifests and may include skin rash, mucocutaneous lesions, and lymphadenopathy.
  - Tertiary: This stage may include general paresis, gummatous lesions, tabes dorsalis, and cardiac manifestations.
  - Latent: No signs or symptoms are exhibited; infection is detected by serologic testing.

- Diagnosis
    - Detecting *T. pallidum* directly from lesion exudate or tissue and darkfield examinations tests are the definitive methods for diagnosing early syphilis.
    - A presumptive diagnosis requires a nontreponemal test (that is, Venereal Disease Research Laboratory [VDRL] or rapid plasma regain [RPR]) and a treponemal test.
    - Use of only one type of serologic test is insufficient for diagnosis.
    - Further testing is warranted for persons with clinical signs of neurosyphilis. The diagnosis of neurosyphilis depends on a combination of cerebrospinal fluid (CSF) tests (CSF cell count or protein and a reactive CSF-VDRL) in the presence of reactive serologic test results and neurologic signs and symptoms.
    - Penicillin G parenterally is preferred for treatment of all stages of syphilis.
- Jarisch-Herxheimer Reaction
    - This acute febrile reaction is frequently accompanied by headache, myalgia, and other symptoms; it occurs within the first 24 hours after the initiation of any therapy for syphilis.
    - Antipyretics can be used for managing symptoms.
    - Although the Jarisch-Herxheimer reaction may induce early labor, anticipation of this reaction should not delay or prevent therapy.
- Sex Partner Management
    - Presumptive treatment should be offered to patients who have had sexual contact within 90 days of their partner receiving a diagnosis of primary, secondary, or early latent syphilis.
    - Presumptive treatment should also be offered to patients who have had sexual contact with a partner who has been diagnosed with primary, secondary, or early latent syphilis, and the diagnosis is more than 90 days since their last sexual contact, and testing results are not available or follow-up is uncertain.
    - The sex partners of persons with syphilis should be confidentially notified of the exposure and the need for evaluation if they have had sexual contact within:
        - 3 months plus the duration of symptoms with individuals who receive a diagnosis of primary syphilis
        - 6 months plus the duration of symptoms with those with secondary syphilis
        - 1 year with individuals with early latent syphilis.
- Primary and Secondary Syphilis
    - Treatment:
        - Adults: Benzathine penicillin G 2.4 million units IM in a single dose
        - Infants and children: Benzathine penicillin G 50,000 units/kg of body weight IM, up to the adult dose of 2.4 million units in a single dose
    - Test all patients for HIV infection.
    - Patients with signs or symptoms that suggest neurologic disease or ophthalmic disease should have an evaluation that includes CSF analysis, ocular slit-lamp, cranial nerve examination, ophthalmologic examination, and otologic examination. Routine CSF analysis is not recommended for patients with primary or secondary syphilis unless they show signs of neurologic or ophthalmic involvement.

  - Perform clinical and serologic evaluation at 6 and 12 months after treatment, and more frequently if needed.
  - Treatment failure may be indicated by lack of decline of titers within 6 to 12 months after therapy.
  - Treatment failure may be the result of unrecognized central nervous system infection, and an examination of CSF should be considered.
  - Retreatment: Weekly injections of benzathine penicillin G 2.4 million units IM for 3 weeks unless CSF examination indicates neurosyphilis.
  - The following treatment alternatives may be used for those with penicillin allergies:
    - Doxycycline 100 mg orally twice daily for 14 days, or
    - Tetracycline 500 mg four times daily for 14 days, or
    - Ceftriaxone 1 g daily either IM or IV for 10 days, or
    - Azithromycin 2 g orally as a single dose
  - Desensitize pregnant women with penicillin allergies and then treat with penicillin.
- Latent Syphilis
  - Latent syphilis is evidenced by seroreactivity without other evidence of primary, secondary, or tertiary disease.
  - Latent syphilis is not transmitted sexually. The objectives of treatment are preventing complications and transmission to a fetus.
  - Treatment for adults:
    - Early latent syphilis: Benzathine penicillin G 2.4 million units IM in a single dose
    - Late latent syphilis or latent syphilis of unknown duration: Benzathine penicillin G 7.2 million units total, administered as three doses of 2.4 million units IM each at 1-week intervals
  - Treatment for infants older than 1 month and children:
    - Early latent syphilis: Benzathine penicillin G 50,000 units/kg IM, up to the adult dose of 2.4 million units in a single dose
    - Late latent syphilis: Benzathine penicillin G 50,000 units/kg IM, up to the adult dose of 2.4 million units, administered as three doses at 1-week intervals (total 150,000 units/kg up to the adult total dose of 7.2 million units)
  - Evaluate children with the acquisition of latent syphilis for sexual abuse.
  - Refer children older than 1 month to a pediatric infectious disease specialist and obtain a CSF examination.
  - Test all persons for HIV infection.
  - If a patient misses a weekly dose, it is suggested to wait 10 to 14 days between doses before restarting the sequence of injections. Pharmacologic considerations suggest an interval of 7 to 9 days between doses.
  - If a pregnant woman misses a dose of therapy, the full course of therapy must be repeated.
  - The treatment for persons with penicillin allergies is doxycycline 100 mg orally twice daily for 28 days, or tetracycline 500 mg orally four times daily for 28 days.
  - Ceftriaxone may also be effective.
  - Desensitize pregnant women with penicillin allergies and then treat with penicillin.

- Tertiary Syphilis
    - Obtain CSF before treatment. Treat persons with CSF abnormalities with a neurosyphilis regimen.
    - Treatment: Benzathine penicillin G 7.2 million units total, administered as three doses of 2.4 million units IM each at 1-week intervals.
    - Test all patients for HIV.
    - Consult with an infectious disease specialist for persons with a penicillin allergy.
    - Desensitize pregnant women with penicillin allergies and then treat with penicillin.
- Neurosyphilis, Ocular Syphilis, and Otosyphilis
    - Perform a CSF examination for clinical evidence of neurologic involvement. Syphilitic uveitis or other ocular manifestations can be associated with neurosyphilis. Perform a CSF examination in all cases of ocular syphilis, and manage patients in collaboration with an ophthalmologist. Perform follow-up CSF examination for ocular syphilis and abnormal CSF results to assess treatment response.
    - CSF examination is not recommended for diagnosis of otosyphilis.
    - Treatment:
        - Neurosyphilis and ocular syphilis are treated with aqueous crystalline penicillin G 18 to 24 million units per day, administered as 3 to 4 million units IV every 4 hours, or continuous infusion, for 10 to 14 days.
        - An alternative regimen is procaine penicillin G 2.4 million units IM once daily plus probenecid 500 mg orally four times a day, both for 10 to 14 days.
        - Consider benzathine penicillin, 2.4 million units IM once per week for up to 3 weeks, after the completion of neurosyphilis treatment to provide a comparable total duration of therapy as to that of latent syphilis.
    - Test patients for HIV and if negative, HIV PrEP should be offered.
    - Repeat a CSF examination every 6 months until the cell count is normal, if CSF pleocytosis was present initially.
    - Consider retreatment if the leukocyte cell count has not decreased after 6 months or the CSF protein or cell count has not normalized after 2 years.
    - For patients with a penicillin allergy, ceftriaxone 2 g daily, either IM or IV, for 10 to 14 days can be used as an alternative treatment.
    - When serologic tests are nonreactive or interpretation is unclear, and clinical findings are suggestive of syphilis, alternative serologic tests might be useful for diagnosis.
    - Those with HIV infection and early syphilis are at an increased risk for neurologic complications and may have higher rates of serologic treatment failure and should be treated with benzathine penicillin G.
- Syphilis during Pregnancy
    - All women should have a serological screening for syphilis early in pregnancy (that is, at the first prenatal visit).
    - Women at high risk for infection and who live in communities with a high syphilis prevalence should have serologic testing performed at 28 to 32 weeks' gestation and at delivery.
    - Women who have a fetal death after 20 weeks' gestation should be tested for syphilis.

  - Women should be considered infected if seropositive, unless an adequate treatment history is clearly documented in the medical record and sequential serologic antibody titers have decreased.
  - Treat with penicillin appropriate for the stage of infection. A second dose of benzathine penicillin 2.4 million units IM can be administered 1 week after the initial dose in primary, secondary, or latent syphilis.
  - Evaluate for congenital syphilis via ultrasound if syphilis is diagnosed in the second half of pregnancy. These women are at risk for premature labor and fetal distress if the treatment causes a Jarisch-Herxheimer reaction.
  - If a pregnant woman misses a dose of therapy, the full course of therapy must be repeated.
  - Repeat serologic titers at 28 to 32 weeks' gestation and at delivery. Check titers monthly in women at high risk or in those who live in areas with a high syphilis prevalence.
  - There are no alternatives to penicillin in pregnant women. Desensitize pregnant women with penicillin allergies and then treat with penicillin.
- Congenital Syphilis
  - Prevention and detection depends on serologic screening at the first prenatal visit.
  - Screen the neonate for congenital syphilis if the mother has a reactive serologic test.
  - Base treatment decisions on syphilis identification in the mother, adequacy of maternal treatment, comparison of maternal and fetal serologic titers, and neonatal evidence of clinical, laboratory, or radiographic syphilis.
  - Treatment (only one):
    - Aqueous crystalline penicillin G 100,000 to 150,000 units/kg/day, administered as 50,000 units/kg/body weight/dose 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/dose IM in a single dose.
  - Neonates with reactive tests should receive examinations and serologic testing every 2 to 3 months until the test becomes nonreactive.
  - Persistent titers at 6 to 12 months should be re-evaluated through CSF examination and managed in consultation with an expert. Retreatment with a 10-day course of a penicillin G regimen may be indicated.
  - Negative testing at birth with mothers that are seroreactive at delivery should be retested at 3 months to rule out serologically negative incubating congenital syphilis.
  - Neonates with initial abnormal CSF evaluations should have a repeat lumbar puncture approximately every 6 months until normal results are maintained.
  - Infants and children who have a history of penicillin allergy or who develop a penicillin allergy should be desensitized and treated with penicillin.
  - In the event of a penicillin shortage, check local resources and substitute with procaine penicillin G 50,000 U/kg/body weight/dose IM a day in a single daily dose for 10 days, or ceftriaxone (used with caution).

  - Recommended evaluation and treatment for infants and children older than 1 month with reactive serologic test:
    - CSF analysis for VDRL, cell count, and protein
    - Complete blood count (CBC), differential, and platelet count
    - Other tests as clinically indicated
    - Aqueous crystalline penicillin G 200,000 to 300,000 units/kg/body weight/day IV, administered as 50,000 units/kg every 4 to 6 hours for 10 days
    - A single dose of benzathine penicillin G 50,000 units/kg/body weight/IM up to the adult dose of 2.4 million units in a single dose can be considered after the 10-day course of IV aqueous penicillin.
  - Infants and children treated for congenital syphilis after the neonatal period (30 days of age) should have examinations and serologic testing performed every 3 months until the test becomes nonreactive or the titer has decreased fourfold.
  - Evaluate and treat infants and children with a 10-day course of parenteral penicillin G if titers increase for more than 2 weeks or if they do not decrease fourfold after 12 to 18 months.
- Management of Persons Who Have a History of Penicillin Allergy
  - Avoid administering penicillin to patients with a known allergy to penicillin unless they undergo desensitization to temporarily eliminate immunoglobulin-E (IgE)-mediated hypersensitivity.
  - Recommendations:
    - Thorough medical history including exposure to penicillin
    - Allergy skin testing
    - Oral or IV desensitization for a positive skin test (can be completed in approximately 6 to 12 hours and must be done in a hospital setting because serious allergic reactions and anaphylaxis can occur)

Diseases Characterized by Urethritis and Cervicitis

Urethritis

- Characterized by urethral inflammation, dysuria, and urethral pruritus along with mucoid, mucopurulent, or purulent discharge
- Can be caused by *N. gonorrhoeae, C. trachomatis,* and *M. genitalium*
- Diagnosed by symptoms, mucoid, mucopurulent, or purulent discharge on examination, Gram stain of urethral secretions, and positive leukocyte esterase test or analysis of spin on first-void urine

Nongonococcal Urethritis (NGU)

- If nongonococcal urethritis has been confirmed, also test for chlamydia and gonorrhea using NAATs.
- Recommended presumptive treatment should begin once NGU is confirmed: Doxycycline 100 mg orally twice a day for 7 days or 500 mg single dose, then 250 mg orally daily for 4 days
  - Alternative treatment: Azithromycin 1 g orally in a single dose

- Alternative treatments may also be considered, such as erythromycin base, erythromycin ethylsuccinate, levofloxacin, or ofloxacin.
- Educate men to abstain from sex until they and their partners have been treated and return for repeat testing after 3 months.
- Refer men with persistent pain and symptoms to a urologist.
- If treatment with azithromycin fails, consider moxifloxacin 400 mg orally once daily for 7 days.

Cervicitis

- Cervicitis is diagnosed by a purulent or mucopurulent endocervical exudate visible in the endocervical canal or endocervical swab specimen and sustained endocervical bleeding induced by gentle passage of a cotton swab through the cervical os.
- Women may complain of vaginal discharge and intermenstrual bleeding (sometimes after intercourse).
- Assess for pelvic inflammatory disease, bacterial vaginosis, gonorrhea, and trichomoniasis.
- Treatment (only one)
    - Recommended: Doxycycline 100 mg orally twice a day for 7 days
    - Alternative: Azithromycin 1 g orally in a single dose
- Counseling
    - Educate women to abstain from sex until they and their partners have been treated and symptoms resolve.
    - Refer all sex partners from the past 60 days for evaluation, testing, and presumptive treatment if chlamydia, gonorrhea, or trichomoniasis was identified or suspected.
    - Treat persistent or recurrent cervicitis with antibiotics.
    - Women with HIV infection and cervicitis should be treated the same as those without HIV.
    - IUDs should not be placed in women with active cervicitis.

Chlamydial Infections

Chlamydial Infections among Adults and Adolescents

- Screen all sexually active women younger than 25 and older women at increased risk for infection, annually.
- Consider screening sexually active young men in clinical settings with a high prevalence of chlamydia, such as correctional facilities or STI clinics.
- Diagnosis is by endocervical or vaginal swabs and first-voided urine in women, and urethral swabs and first-voided urine in men.
- Recommended treatment (only one):
    - Recommended: Doxycycline 100 mg orally twice a day for 7 days.
    - Alternatives: Azithromycin 1 g orally in a single dose, or levofloxacin 500 mg orally once daily for 7 days
- Educate patients to abstain from sexual intercourse for 7 days after single-dose therapy, or a 7-day regimen therapy is complete and symptoms resolve, and all sex partners have been treated.

- Any patient diagnosed with chlamydia should also be tested for HIV, gonococcal (GC) infection, and syphilis.
- Retest for chlamydia 3 months after treatment completion.
- Refer sexual partners for evaluation, testing, and presumptive treatment if they had sexual contact with the patient within 60 days preceding the patient's onset of symptoms or chlamydia diagnosis.
- Pregnant women should be treated with azithromycin 1 g orally in a single dose and retested 3 months after treatment. Alternative treatments include amoxicillin 500 mg orally 3 times a day for 7 days.

Chlamydial Infections among Neonates

- The best method to prevent chlamydial infection in neonates is prenatal screening and treatment of pregnant women.
- Administer ocular prophylaxis with erythromycin ophthalmic ointments.
- Ophthalmia neonatorum caused by *C. trachomatis:*
    - Determine the etiology for all neonates with conjunctivitis.
    - Obtain specimens for culture from an inverted eyelid and test for chlamydia and gonorrhea.
    - Recommended treatment: Erythromycin base or ethylsuccinate 50 mg/kg/day orally divided into four doses daily for 14 days
    - Alternative treatment: Azithromycin suspension, 20 mg/kg/day orally, one dose daily for 3 days
    - Follow up to determine if treatment was effective.
    - Presumptively treat the mother of an infant with ophthalmia caused by chlamydia.
- Infant pneumonia caused by *C. trachomatis*
    - A repetitive staccato cough with tachypnea, hyperinflation, and bilateral diffuse infiltrates on a chest X-ray are signs of pneumonia.
    - Test infants 1 to 3 months old for *C. trachomatis* if they are suspected of having chlamydia. The standard diagnostic test is a tissue culture.
    - Recommended treatment: Erythromycin base or ethylsuccinate 50 mg/kg/day orally divided into four doses daily for 14 days
    - Alternative treatment: Azithromycin 20 mg/kg/day orally, one dose daily for 3 days
    - Follow up to determine if pneumonia has resolved.

Chlamydial Infections among Infants and Children

- Consider sexual abuse in infants and children with chlamydia.
- Chlamydial infection can be diagnosed with vaginal and urine specimens, but a culture is the preferred method.
- Treatment:
    - Infants and children who weigh less than 45 kg: Erythromycin base or ethylsuccinate 50 mg/kg/day orally divided into four doses daily for 14 days
    - Children who weigh 45 kg or more but who are younger than 8: Azithromycin 1 g orally in a single dose

    - Children age 8 years and older:
        - Azithromycin 1 g orally in a single dose, or
        - Doxycycline 100 mg orally twice a day for 7 days
- Obtain a follow-up culture 4 weeks after completion of treatment.

Gonococcal Infections

Gonococcal Infections in Adolescents and Adults

- Screen all sexually active women aged 25 or younger, and older women at increased risk for infection, annually.
- Diagnosis is by endocervical swabs in women and urethral swabs in men.
- Recommended treatment of uncomplicated gonococcal infections of the cervix, urethra, and rectum: Ceftriaxone 500 mg IM in a single dose if the patient weighs less than 150 kg or 1 g IM if the patient weighs more than 150 kg.
- Alternative treatment of uncomplicated gonococcal infections of the cervix, urethra, and rectum if ceftriaxone not available:
    - Gentamicin 240 mg IM in single dose plus azithromycin 2 g orally in single dose, or
    - Cefixime 800 mg orally in single dose.
- Treatment of uncomplicated gonococcal infections of the pharynx:
    - Ceftriaxone 500 mg IM in a single dose
        - Educate patients diagnosed with gonorrhea to abstain from sexual activity for 7 days after treatment and until all sex partners are adequately treated.
        - Retest in 3 months.
        - Treat and evaluate sex partners.
    - Alternative treatment for allergic persons (only one):
        - Oral gemifloxacin 500 mg plus oral azithromycin 2 g, or
        - Dual treatment with single doses of intramuscular gentamicin 240 mg plus oral azithromycin 2 g
        - Spectinomycin may be used for urogenital and anorectal gonorrhea if available.
        - Consult an infectious disease specialist when treating patients with a cephalosporin or IgE-mediated penicillin allergy.
        - Patients should follow up after 14 days of the alternative treatment regimen for a test-of-cure to evaluate treatment success.
    - Treat pregnant women with ceftriaxone 500 mg in a single IM dose.
- Suspected cephalosporin treatment failure for chlamydia:
    - Persistent infection after appropriate cephalosporin treatment indicates cephalosporin-resistant gonorrhea in persons whose partners were adequately treated and whose risk for reinfection is low.
    - To get advice on obtaining cultures, antimicrobial susceptibility testing, and treatment, consult an infectious disease specialist, the health department STI program, or the CDC.
    - Re-treat with ceftriaxone 500 mg IM.
- Other treatment options include:
    - dual, single-dose treatment with gentamicin 240 mg IM and oral azithromycin 2g.
    - Retest after 7 to 14 days of treatment with a culture and NAAT.

Gonococcal Conjunctivitis

- Consult with an infectious disease specialist for treatment.
- Treatment:
    - One-time eye lavage with saline solution
    - Ceftriaxone 1 g IM in a single dose or azithromycin 1 g orally in a single dose
    - Sex partners should be treated.

Disseminated Gonococcal Infection (DGI)

- Signs and symptoms include petechial or pustular acral skin lesions, asymmetric polyarthralgia, tenosynovitis, and oligoarticular septic arthritis.
- Patients who may be noncompliant with treatment and those who have an uncertain diagnosis or purulent synovial effusions should be hospitalized and have a consultation with an infectious disease specialist.
- Treatment of arthritis and arthritis-dermatitis syndrome:
    - Recommended treatment: Ceftriaxone 1 g IM or IV every 24 hours and if chlamydial infection not excluded, doxycycline 100 mg orally twice daily for 7 days
    - Alternative treatment (only one):
        - Cefotaxime 1 g IV every 8 hours, or
        - Ceftizoxime 1 g IV every 8 hours and, if chlamydial infection not excluded, doxycycline 100 mg orally twice daily for 7 days
    - Switching to an oral agent is an option after susceptibility testing drawn 24 to 48 hours after signs of improvement.
- Treatment of gonococcal meningitis and endocarditis:
    - Ceftriaxone 1 to 2 g IV every 12 to 24 hours and a single dose of azithromycin 1 g orally
    - Continue meningitis therapy with recommended parenteral therapy for 10 to 14 days.
- Sexual partners should be referred for testing, evaluation, and presumptive treatment.

Gonococcal Infections among Neonates

- The best method for preventing infection in neonates is prenatal screening and treatment of pregnant women.
- Manifestations occur 2 to 5 days after birth with ophthalmia neonatorum and sepsis, and may include arthritis and meningitis. Less severe symptoms are rhinitis, vaginitis, urethritis, and infection at sites of fetal monitoring.
- Neonates born to mothers who have gonococcal infection should be tested for gonorrhea at exposed sites and treated presumptively with ceftriaxone 25 to 50 mg/kg IV or IM in a single dose, not to exceed 250 mg.
- Ophthalmia Neonatorum Prophylaxis
    - Administer erythromycin (0.5%) ophthalmic ointment in each eye in a single application at birth.
    - If erythromycin ointment is unavailable or the mother is at high risk for gonococcal infection, administer ceftriaxone 25 to 50 mg/kg IV or IM, not to exceed 250 mg in a single dose.

  - Suspect gonococcal ophthalmia in cases where intracellular gram-negative diplococci are identified on a Gram stain of conjunctival exudate, justifying presumptive treatment after appropriate cultures and antimicrobial susceptibility testing have been collected.
  - Provide presumptive treatment for newborns at an increased risk for gonococcal ophthalmia who have increased white blood cells (WBCs) in a Gram-stained smear of conjunctival exudate.
  - Evaluate for signs of disseminated infection.
- DGI and Gonococcal Scalp Abscesses
  - DGI presents in neonates as sepsis, arthritis, or meningitis.
  - Localized scalp infection can result from fetal monitoring via scalp electrodes.
  - Diagnosis requires cultures of blood, CSF, and joint aspirate.
  - Treatment (only one):
    - Ceftriaxone 25 to 50 mg/kg/day IV or IM in a single daily dose for 7 days, with an increase in duration to 10 to 14 days if meningitis is diagnosed, or
    - Cefotaxime 25 mg/kg IV or IM every 12 hours for 7 days, with an increase in duration to 10 to 14 days if meningitis is diagnosed
    - Administer cautiously to infants with hyperbilirubinemia, especially if premature.

Gonococcal Infections among Infants and Children

- The most frequent cause is sexual abuse.
- Vaginitis is the most common symptom in preadolescent girls.
- Diagnosis is determined with vaginal and urine specimens from girls using NAAT; extragenital (pharynx or rectum) cultures may be collected from girls or boys.
- Treatment
  - Recommended treatment for infants and children who weigh 45 kg or less and who have uncomplicated gonococcal vulvovaginitis, cervicitis, urethritis, pharyngitis, or proctitis: Ceftriaxone 25 to 50 mg/kg IV or IM in a single dose, not to exceed 250 mg IM
  - Recommended treatment for children who weigh more than 45 kg and who have uncomplicated gonococcal vulvovaginitis, cervicitis, urethritis, pharyngitis, or proctitis: Adult treatment regimen
  - Recommended treatment for children who weigh 45 kg or less and who have bacteremia or arthritis: Ceftriaxone 50 mg/kg (maximum dose: 1 g) IM or IV in a single dose daily every 24 hours for 7 days
  - Recommended regimen for children who weigh more than 45 kg and who have bacteremia or arthritis: Ceftriaxone 1 g IM or IV in a single dose daily every 24 hours for 7 days
  - Follow-up cultures are not necessary.

Mycoplasma Genitalium

- *M. genitalium* causes symptomatic and asymptomatic urethritis among men and cervicitis, PID, preterm delivery, spontaneous abortion, and infertility among women.

- Cultures can take up to 6 months and usually only research laboratories are capable of processing them.
- Screening is not recommended in men and women who are asymptomatic.
- When testing is not available in clinical practice, *M. genitalium* should be suspected in cases of persistent or recurrent urethritis or cervicitis and considered for PID.
- Treatment
    - Recommended if *M. genitalium* resistance testing is available if macrolide sensitive:
        - Doxycycline 100 mg orally twice a day for 7 days, followed by azithromycin 1 g orally initial dose, followed by 500 mg orally daily for 3 additional days (2.5 g total)
        - If macrolide resistant: Doxycycline 100 mg orally twice a day for 7 days followed by moxifloxacin 400 mg orally once daily for 7 days
    - Recommended regimen if *M. genitalium* resistance testing is not available if M. genitalium is detected by a Food and Drug Administration-cleared NAAT:
        - Doxycycline 100 mg orally twice a day for 7 days, followed by moxifloxacin 400 mg orally once daily for 7 days
    - Recommended PID treatment for *M. genitalium:*
        - Doxycycline 100 mg orally twice a day for 14 days, when presenting for care
    - Test of cure is not recommended for asymptomatic persons who received treatment with a recommended regimen.
    - Sexual partners should be tested and treated, if needed.
    - Persons who have *M. genitalium* and HIV infection should receive the same treatment regimen as those without HIV.

Diseases Characterized by Vaginal Discharge

- Obtain a careful history, physical examination, and laboratory testing to determine the etiology of vaginal symptoms.
- *G. vaginalis, Prevotella bivia, A. vaginae, Megasphaera* type 1, and numerous other fastidious or uncultivated anaerobes, trichomoniasis, and vulvovaginal candidiasis (VVC) are most frequently associated with infections associated with vaginal symptoms.
- Cervicitis can also cause an abnormal discharge.

<u>Bacterial Vaginosis</u>

- Clinical Diagnostic Criteria
    - Gram stain
    - Thin, white, homogeneous discharge
    - Microscopic examination revealing clue cells
    - Vaginal fluid pH greater than 4.5
    - Vaginal discharge with fishy, amine odor
- Treatment
    - Recommended treatment (only one):
        - Metronidazole 500 mg orally twice a 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
    - Alternative treatments include tinidazole or secnidazole orally, or clindamycin orally or intravaginally.
    - Educate patients to avoid alcohol consumption during and up to 3 days after treatment with certain medications, refrain from sexual activity or use condoms, and to avoid douching.
    - Follow-up is unnecessary if symptoms resolve. If they don't resolve, 0.75% metronidazole gel or 750 mg metronidazole vaginal suppository twice weekly for more than 3 months is recommended. Monthly oral metronidazole 2 g administered with fluconazole 150 mg may also be considered.
    - Treat pregnant patients with the metronidazole 250 mg regimen, or metronidazole 500 mg twice daily.
    - Treat symptomatic pregnant women with oral or vaginal regimens that are recommended for nonpregnant women.
    - Metronidazole crosses the placenta and is secreted in breast milk.
    - Women with HIV infection should receive the same regimen as those without HIV.

Trichomoniasis

- Trichomoniasis is the most prevalent worldwide nonviral STI.
- Test for *T. vaginalis* by obtaining cultures of vaginal, endocervical, or urine specimens from women, and urine or penile-meatal swab specimens from men.
- Treatment
    - Recommended treatment (only one):
        - Metronidazole 2 g orally in a single dose for men, or metronidazole 300 mg orally twice a day for 7 days for women
    - Alternative treatment: Tinidazole 2 g orally in a single dose for men and women
    - Persistent or recurrent trichomoniasis:
        - Treat with metronidazole 500 mg orally twice daily for 7 days.
        - If this therapy fails, treat with tinidazole at 2 to 3 g for 14 days, possibly in combination with intravaginal tinidazole.
    - Education should include abstaining from sex and alcohol until treatment is complete.
    - Retest all women within 3 months following initial treatment.
    - All current sexual partners should be treated.
    - Pregnant Women
        - Recommended treatment is metronidazole 2 g orally in a single dose.
        - Treatment failure:
            - Use metronidazole 500 mg orally twice daily for 7 days.
            - If the above treatment fails, treat with metronidazole or tinidazole at 2 g orally for 7 days.

- If several 1-week regimens fail, treat with tinidazole at 2 to 3 g for 14 days, possibly in combination with intravaginal tinidazole, and consult with a specialist.
- Metronidazole is secreted through breast milk.

- Patients with Concurrent HIV Infection
  - Perform routine screening for trichomoniasis and offer prompt treatment.
  - Treat with metronidazole 500 mg orally twice daily for 7 days.
  - Retest within 3 months after the completion of treatment.

Vulvovaginal Candidiasis

- Uncomplicated VVC
  - Symptoms and signs include external dysuria and vulvar pruritus; pain, swelling, and redness; vulvar edema, fissures, and excoriations; and thick, curdy vaginal discharge.
  - Diagnosis is by wet preparation or Gram stain of vaginal discharge, culture, or other tests that yield a positive result for a yeast species.
  - Treatment choices:
    - Clotrimazole intravaginally
    - Miconazole intravaginally or vaginal suppository
    - Tioconazole intravaginally
    - Butoconazole intravaginally
    - Terconazole intravaginally or vaginal suppository
    - Fluconazole 150 mg orally in a single dose
    - Intravaginal and vaginal suppository strength, frequency, and duration of therapy varies.
- Complicated VVC
  - Obtain vaginal cultures to confirm diagnosis and identify unusual species.
    - Recurrent VVC:
      - Three or more episodes of symptomatic VVC within 12 months
      - Treatment: Oral fluconazole (that is, 100-mg, 150-mg, or 200-mg dose) every 3 days for three doses or weekly for 6 months
    - Severe VVC:
      - Manifests as extensive vulvar erythema, edema, excoriation, and fissure formation
      - Treatment (only one):
        - 7 to 14 days of topical or oral azole, or
        - 150 mg of fluconazole in two consecutive oral doses (second dose 72 hours after initial dose)
    - Nonalbicans VVC:
      - Optimal treatment remains unknown.
      - Treatment options:
        - Longer duration of therapy (7 to 14 days) with a non-fluconazole azole regimen (oral or topical) is recommended.

- If infection recurs, treat with 600 mg of boric acid in a gelatin capsule administered vaginally once daily for 2 weeks.
- If recurrence is persistent, consult with a specialist.
- Treatment during pregnancy: Topical azole applied for 7 days
- HIV infection: Same therapy as for seronegative women

Pelvic Inflammatory Disease

- Inflammatory disorders of the upper female genital tract including any combination of endometritis, salpingitis, tubo-ovarian abscess, and pelvic peritonitis.
- Diagnosis is based on clinical findings, and is difficult because of the wide variety of symptoms.
- Specific diagnosing includes:
  - histopathologic evidence of endometritis via biopsy
  - thickened, fluid-filled tubes with or without free pelvic fluid or tubo-ovarian complex on transvaginal ultrasound or magnetic resonance imaging (MRI)
  - Doppler studies suggesting pelvic infection
  - laparoscopic findings consistent with PID
- Treatment
  - Initiate presumptive treatment in sexually active women and other high-risk women with pelvic or lower abdominal pain if other etiologies have been ruled out and if one or more of the following criteria are present on clinical examination and testing:
    - Cervical motion tenderness
    - Uterine tenderness
    - Adnexal tenderness
    - 101°F (38.3°C) or higher oral temperature
    - Abnormal cervical mucopurulent discharge or cervical friability
    - Saline microscopy of vaginal fluid with increased WBC
    - Elevated erythrocyte sedimentation rate (ESR)
    - Elevated C-reactive protein (CRP)
    - Documented cervical infection with *N. gonorrhoeae* or *C. trachomatis*
  - Recommended parenteral treatment (only one):
    - Ceftriaxone 1 g every 24 hours plus doxycycline 100 mg orally or IV every 12 hours plus metronidazole 500 mg orally or IV every 12 hours, or
    - Cefotetan 2 g IV every 12 hours plus doxycycline 100 mg orally or IV every 12 hours or cefoxitin 2 g IV every 6 hours plus doxycycline 100 mg orally or IV every 12 hours
    - Alternative parenteral treatment: Ampicillin/sulbactam 3 g IV every 6 hours and doxycycline 100 mg orally or IV every 12 hours, or clindamycin 900 mg IV every 8 hours plus gentamicin loading dose IV or IM (2 mg/kg body weight), followed by a maintenance dose (1.5 mg/kg body weight) every 8 hours; single daily dosing (3 to 5 mg/kg body weight) can be substituted
  - Recommended intramuscular/oral regimens (only one):

        - Ceftriaxone (500 mg for patients who weigh 150 kg or less, 1 g for patients who weigh over 150 kg) IM in a single dose plus doxycycline 100 mg orally twice a day for 14 days with metronidazole 500 mg orally twice a day for 14 days, or
        - Cefoxitin 2 g IM in a single dose and probenecid 1 g orally administered concurrently in a single dose plus doxycycline 100 mg orally twice a day for 14 days with metronidazole 500 mg orally twice a day for 14 days, or
        - Other parenteral third-generation cephalosporin (for example, ceftizoxime or cefotaxime) and doxycycline 100 mg orally twice a day for 14 days with or without metronidazole 500 mg orally twice a day for 14 days
        - Alternative IM/oral regimens are available and effective.
- Counseling
    - Educate women to abstain from sex until treatment is completed, and symptoms resolve. All sexual partners should be treated as well.
- Follow-up
    - If there is no clinical improvement within 72 hours after outpatient IM/oral therapy, consider hospitalizing the patient, assessing the antimicrobial regimen, and performing additional diagnostics (for example, diagnostic laparoscopy).
    - Retest 3 months after completion of treatment.
    - Hospitalize pregnant women and treat with IV antibiotics.
    - There is no recommendation regarding the need for more aggressive treatment of women with HIV and PID.
- Intrauterine Contraceptive Devices
    - The risk for PID is usually confined to 3 weeks after insertion. Women diagnosed with PID do not have to remove the IUD.
    - Consider removing the IUD if there is no clinical improvement 48 to 72 hours after beginning treatment.

Epididymitis

- Signs and symptoms of acute infection manifest as pain, swelling, unilateral testicular pain, tenderness, hydrocele, and palpable swelling and inflammation of the epididymis lasting less than 6 weeks.
- Epididymo-orchitis occurs when the testis is involved. Suspect spermatic cord (testicular) torsion with a sudden onset of symptoms associated with epididymitis; this a surgical emergency.
- Men with a sudden onset of unilateral pain whose test results do not support a diagnosis of urethritis or urinary tract infection, and in whom the diagnosis of acute epididymitis is questionable, should be referred to a urologist immediately for evaluation of testicular torsion, because testicular viability may be compromised.
- Use ultrasound to rule out torsion. Ultrasound should also be used for those with scrotal pain who cannot receive an accurate diagnosis based on history, physical examination, and objective laboratory findings.
- Evaluate for objective evidence of inflammation by:
    - Gram or methylene blue/gentian violet (MB/GV) stain of urethral secretions demonstrating two WBC or more per oil immersion field

  - positive leukocyte esterase test on first-void urine
  - microscopic examination of sediment from a spun first-void urine demonstrating 10 WBC or more per high-power field.
- Test all men for *C. trachomatis* and *N. gonorrhoeae* by urine NAAT if epididymitis is suspected.
- Treatment
  - Acute epididymitis is most likely caused by sexually transmitted chlamydia and gonorrhea.
  - Severe pain and fever suggest a complicated infection, for which hospitalization is recommended.
  - Goals of treatment include microbiologic cure of infection, symptom improvement, preventing transmission of chlamydia and gonorrhea, and decreased potential for chlamydia/gonorrhea epididymitis complications.
  - Recommended treatment for acute epididymitis most likely caused by sexually transmitted chlamydia and gonorrhea:
    - Ceftriaxone 500 mg IM in a single dose and doxycycline 100 mg orally twice a day for 10 days
  - For acute epididymitis most likely caused by sexually transmitted chlamydia and gonorrhea and enteric organisms (men who practice insertive anal sex) (only one treatment):
    - Ceftriaxone 500 mg IM in a single dose and levofloxacin 500 mg orally once a day for 10 days, or
  - For acute epididymitis most likely caused by enteric organisms only:
    - Levofloxacin 500 mg orally once daily for 10 days
  - Bed rest, elevating the scrotum, and nonsteroidal anti-inflammatory drugs are also recommended.
  - Educate male patients to abstain from sexual intercourse until symptoms resolve and both they and their partners have been treated.
  - All sexual partners should be treated.
  - Consult an infectious disease specialist if the patient has a penicillin allergy, intolerance to treatment, or adverse reaction.
  - Men with HIV should receive the same treatment as those who are HIV negative.

Human Papillomavirus (HPV)

- HPV is diagnosed by HPV testing in the context of cervical screening.
- The majority of HPV infections are self-limited and either asymptomatic or unrecognized.
- Treatment
  - HPV may clear spontaneously; antiviral medications are not recommended.
  - Treat HPV-related precancer according to the appropriate guidelines.
- Counseling
  - HPV is very common and can infect the anogenital area, mouth, and throat. Most sexually active people get HPV but never know it.
  - It is not possible to determine which partner transmitted the original infection, and having HPV does not indicate that a partner is having sex outside the relationship.

  - HPV infection can clear spontaneously without associated health problems. When the infection does not clear, genital warts, precancers, and cancers of the cervix, anus, penis, vulva, vagina, head, and neck can develop.
  - The type of HPV that causes genital warts is different than the type that can cause cancer.
  - HPV is usually sexually transmitted through anogenital contact during vaginal and anal sex and can be transmitted without penetration or oral sex.
  - Pregnant women can transmit HPV to an infant during delivery.
  - HPV does not make it harder to get pregnant or carry to term. However, some of the precancers or cancers caused by HPV, and their treatments, may lower a woman's ability to get pregnant or have an uncomplicated delivery.
  - Treatments are available for the conditions caused by HPV, but not for the virus itself.
  - No HPV test can determine if the infection will clear or progress. HPV tests can determine an increased risk for cervical cancer but they are not able to detect other HPV-related problems. They are not useful in women younger than 25 years of age or in men.
- Prevention
  - The most reliable method of preventing HPV is abstinence.
  - Vaccines can prevent diseases and cancers caused by HPV:
    - Cervarix and Gardasil vaccines protect against cervical cancer.
    - Gardasil vaccine can protect against genital warts.
    - Gardasil vaccine is recommended for boys and men as well as girls and women.
    - Only 9-valent HPV vaccine is available in the United States.
  - HPV vaccine recommendations:
    - Routine for adolescents aged 11 to 12 years, and those aged 13 to 26 years who have not started or completed the vaccine series
    - Two doses (at 0 and 6 to 12 months) are recommended if vaccination initiated before 15 years of age
    - Three doses (at 0, 1 to 2, and 6 months) are recommended for those who are immunosuppressed regardless of age of vaccination initiation
  - Pregnant women should not receive the HPV vaccine.
  - Consistent and correct condom use can lower the chances of acquiring and transmitting HPV and developing HPV-related diseases, but do not fully protect against HPV.
  - Limiting the number of sexual partners can lower the chances of acquiring and transmitting HPV.

Anogenital Warts

- Anogenital warts are flat, papular, or pedunculated growths on the genital mucosa that are usually asymptomatic but can be painful or pruritic.
- They commonly occur at the vaginal introitus, under uncircumcised penile foreskin, and on the shaft of a circumcised penis. They can also occur in the cervix, vagina, urethra, perineum, perianal skin, anus, and scrotum.
- They may resolve spontaneously, remain unchanged, or increase in size or number.

- Persons with HIV can have larger or more lesions and may not have the same response to therapy as those who are immunocompetent. They may also have more frequent recurrences after treatment.
- Diagnosis is by visualization or biopsy.
- Treatment
    - Anogenital warts are treated by removing the wart or by ameliorating symptoms.
    - Recommended regimens for external anogenital warts (only one):
        - Patient applied: Imiquimod, podofilox, or sinecatechins topical creams or gels, or
        - Provider applied: Cryotherapy with liquid nitrogen or cryoprobe, or
        - Surgical removal by tangential scissor excision, tangential shave excision, curettage, laser, or electrosurgery, or
        - Trichloroacetic acid (TCA) or bichloracetic acid (BCA) 80% or 90% solution
    - Treatment does not eradicate HPV infectivity.
- Follow-up
    - Response usually occurs in 3 months from most therapies.
    - When no substantial improvement is observed after a complete course of treatment or if there are severe side effects, a new treatment modality should be selected.
- Counseling
    - Women with genital warts do not need Pap tests more often than women who do not have them.
    - Genital warts can develop months or years after getting HPV. Genital warts can be passed on in the absence of visible signs of warts.
    - Some people can experience a considerable psychosocial impact after receiving their diagnosis.
    - Treatment does not cure the virus itself.
    - Patients with genital warts can benefit from being tested for other STIs.
    - Patients should avoid sexual activity until the warts are gone or removed.
    - HPV can affect areas that are not covered by a condom, and condoms might not fully protect against HPV.
    - Gardasil vaccine can be used to prevent genital warts but will not treat existing warts.
    - Persons should inform their sexual partners about genital warts, and their partners may benefit from additional STI testing.
    - Treatment is not different for persons who are HIV positive.
- Pregnancy
    - Cesarean delivery is indicated for pregnant women if vaginal delivery would result in excessive bleeding from warts.
    - Podofilox (podophyllotoxin), podophyllin, imiquimod, and sinecatechins should not be used during pregnancy.

HPV-Associated Cancers and Precancers

Cervical Cancer

- Screening

  - Routinely screen women aged 21 to 65 years to prevent invasive cervical cancer.
  - For women age 30 or older, oncogenic or high-risk HPV tests are available.
  - Annual cervical cancer screening is no longer recommended.
  - Women aged 21 to 29 years should receive a Pap test every 3 years.
  - Women aged 30 to 65 years should receive a Pap test every 3 years or a Pap test plus HPV test every 5 years.
  - Women with negative HPV and Pap tests should not be screened again for 5 years.
  - Screen pregnant women at the same intervals as nonpregnant women.
  - Screen women with HIV using a conventional or liquid-based Pap test within 1 year of sexual activity or with the initial HIV diagnostic visit, and again 6 months later.
  - Cervical cancer screening and HPV testing are not recommended in adolescents.
- Additional Management Considerations
  - Do not use Pap tests to screen for STIs.
  - All women with a cervix should have cervical cancer screening.
  - If STIs are identified at the visit, repeat the Pap test after treatment of STIs.
  - Do not postpone Pap testing if there is mucopurulent discharge.
  - Women with external genital warts do not need Pap tests more frequently than women who do not have warts.
  - A routine Pap test is not required for women who have had a hysterectomy unless the hysterectomy was performed because of cervical cancer or precursor lesions. If the cervix remains intact after a hysterectomy, perform regularly scheduled Pap tests as indicated.
  - Liquid-based cytology is an acceptable alternative to conventional Pap tests.
  - During initial visits, ask women about their most recent Pap test, the results, and history of evaluation and treatment.
- HPV Tests for Cervical Cancer Screening
  - HPV testing is used for cervical cancer screening along with a Pap test, the triage of abnormal cervical cytology, and follow-up after the treatment of cervical precancers.
  - HPV testing can be performed using the same swab as the Pap test.
  - Do not perform HPV testing when:
    - making the decision on whether to vaccinate against HPV
    - screening for STIs in women or men at risk for STIs
    - caring for patients with genital warts or their partners
    - screening for cervical cancer as a stand-alone test
    - testing women less than 30 years old as a part of routine cervical cancer screening
    - testing oral or anal specimens.
- Follow-up
  - Women aged 21 to 24 years should be treated more conservatively than other women because of the potential harm of overtreatment and the low cancer risk.
  - For women who have had atypical squamous cells of undetermined significance (ASC-US) or low-grade squamous intraepithelial lesion (LSIL), cytology should be repeated in 12 months, or HPV testing may be performed.

    - For women with ASC-US who are HPV negative, a repeat HPV and Pap test are recommended in 3 years.
    - Women with normal cytology without endocervical cells do not require a repeat Pap test.
    - Women with unsatisfactory cytology should have a repeat cytology test in 2 to 4 months.
    - Women with discordant results (normal Pap test accompanied by a positive HPV test) can be followed up with HPV 16/18 testing. If the test result is positive, immediately perform a colposcopy. If negative, repeat the HPV co-test in 1 year.
- Counseling
    - Counsel women on the risks, uncertainties, and benefits of screening.
    - Regular screening tests such as the Pap test and the HPV DNA test can prevent cervical cancer. Regular Pap testing can find abnormal cells that could lead to cervical cancer over time, and detects HPV infection of the cervix.
    - For women aged 30 and older, HPV testing can be used at the same time as the Pap test.
    - Positive Pap and HPV tests are signs of early cervical cancer. Appropriate follow-up is vital to ensure that cervical cancer does not develop.
    - HPV is common and often cleared from the body without any medical interventions. A positive test does not mean that a person has cancer.
    - HPV can lie dormant for many years and does not imply infidelity, nor should it necessarily raise concerns about a partner's health.
    - Sex partners do not need to be tested for HPV. Correct and consistent condom use can prevent HPV infection.

Anal Cancer

- There is no recommendation for routine anal cancer screening with anal cytology in those with HIV infection, HIV-negative MSM, or the general population.
- Conducting a digital anorectal examination annually may be useful in detecting masses by palpation in those with HIV, and possibly HIV-negative MSM with a history of receptive anal intercourse.
- HPV tests are not clinically useful for anal cancer screening.

Viral Hepatitis

Hepatitis A Virus (HAV)

- HAV has an incubation of approximately 28 days.
- HAV replicates in the liver and is shed in feces 2 to 3 weeks before to 1 week after the onset of clinical illness. The infection is self-limited, without causing chronic infection or liver disease.
- HAV is transmitted by the fecal-oral route through person-to-person contact or ingestion of contaminated food or water. Transmission during sexual activity generally results from fecal-oral contact.
- Hepatitis A is diagnosed by serologic testing and IgM antibody.
- Treatment

  - Care is supportive, with hospitalization of dehydrated patients.
  - Avoid medication metabolized by the liver.
- Prevention
  - The most effective way to prevent hepatitis A in at-risk patients is vaccination with a hepatitis A vaccine (two doses for patients aged 1 to 18 or older than 19 years of age, IM at 0 and 6 to 18 months) or a combined hepatitis A and hepatitis B vaccine (two or three doses for patients 18 years of age or older, IM at 0, 1, and 6 months).
  - Immunoglobulin (IG) administered IM can be used as postexposure prophylaxis against HAV.
  - HAV vaccine should be offered to all MSM, those who use injection and noninjection illicit drugs, and patients with CLD having occupational risk, homeless, and pregnant women at risk.
  - Serologic testing for immunity postvaccination is not indicated.
  - Patients who have not received a hepatitis A vaccine and have recently been exposed should receive an HAV vaccine or IG.
  - Children aged 1 year or younger, immunocompromised persons, those with CLD, and patients for whom vaccine is contraindicated should receive IG.
  - Monovalent HAV vaccine is preferred for healthy individuals aged 12 months to 40 years over IG because of the advantages associated with vaccination, including long-term protection and ease of administration.

Hepatitis B Virus (HBV)

- HBV incubation period is from exposure to symptoms from 6 weeks to 6 months.
- HBV is found in blood and other bodily fluids and transmitted percutaneously or by mucous membranes.
- HBV can be self-limited or chronic for those with primary risk factors, such as MSM, those who engage in unprotected sex with someone who is infected, those with multiple sex partners, and those with a history of other STIs or injection-drug use.
- Strategies to eliminate transmission include:
  - screening all pregnant women for HBsAg
  - immunoprophylaxis for infants born to mothers with HBsAg or mothers whose HBsAg status is unknown
  - routinely vaccinating infants
  - vaccinating unvaccinated children and adolescents through age 18
  - vaccinating unvaccinated adults at increased risk for infection.
- HBV is diagnosed by serologic testing: HBsAg is present in acute and chronic infections, and IgM antibody to hepatitis B core antigen presence (IgM anti-HBc) is diagnostic of acute or recently acquired HBV infection.
- Treatment is supportive, as no specific therapy is available. Refer patients for an evaluation to a practitioner experienced in the management of chronic HBV infection.
- Prevention
  - There is no specific treatment for HVB; treatment is supportive.

  - Hepatitis B immune globulin (HBIG) is administered for postexposure prophylaxis and as hepatitis B vaccine.
  - For persons age 18 years and older, a combination hepatitis A and hepatitis B vaccine is available.
  - The vaccination schedule is product- and age-based.
  - Unvaccinated children and adolescents as well as unvaccinated adults at risk for HBV infection should receive a hepatitis B vaccine.
  - Consider serologic testing for susceptibility prevaccination to reduce the cost of completing the vaccination series in adult populations that have an expected high prevalence of HBV infection.
  - Testing for susceptibility prevaccination is recommended for sexual and needle-sharing contacts of HBsAg-positive persons and for those in the household who are unvaccinated.
  - Administer the first dose of the vaccine immediately after collecting the blood sample for serologic testing.
  - Adolescents and adults do not need postvaccination serological testing after routine vaccination.
  - Postvaccination testing is recommended for the following patients:
    - Those whose subsequent clinical management depends on knowledge of their immune status
    - Those with HIV and other immunocompromised patients to determine the need for revaccination
    - Those who share needles with and those who are sexual partners of HBsAg-positive individuals (to determine the need for revaccination as well as the need for using other methods to protect themselves from HBV infection).
  - Perform anti-HBs testing 1 to 2 months after administration of the last dose of the vaccine series, and revaccinate if indicated.
  - The following are highly effective in preventing transmission after exposure to HBV:
    - Passive-active postexposure prophylaxis: Administering HBIG and hepatitis B vaccine at separate sites simultaneously
    - Active postexposure prophylaxis: Administration of hepatitis B vaccination alone
    - HBIG alone is effective in preventing HBV transmission, but is typically used as an adjunct to vaccination.
- Postexposure Prophylaxis
  - Provide both HBIG and hepatitis vaccine as soon as possible (preferably 24 hours or less) after exposure to blood or body fluids from an infected person to an unvaccinated person or those known not to have responded to the complete hepatitis B vaccine.
  - Administer HBIG and hepatitis B vaccine simultaneously at separate injection sites and complete the vaccine series according to the age-appropriate vaccination schedule.
  - Those who are in the process of being vaccinated and have not completed the vaccine series should receive HBIG and complete the vaccine series.
  - Patients exposed to HBsAg and who are known to have responded to vaccination are considered protected and do not need additional doses of the vaccine or HBIG.

  - Those with written documentation of a completed hepatitis B vaccine series who did not receive postvaccination testing should receive a single vaccine booster dose.
  - Exposure to a source with unknown HBsAg status:
    - Unvaccinated patients and those with previous nonresponse to hepatitis B vaccination who have an identifiable exposure to blood or body fluids containing blood from a person with unknown HBsAg status should receive the hepatitis B vaccine series, with the first dose initiated as soon as possible after exposure (preferably less than 24 hours) and the series completed using the age-appropriate dose and schedule.
    - Complete the vaccine series for patients who are not fully vaccinated.
    - Those with written documentation of a completed hepatitis B vaccine series who did not receive postvaccination testing require no further treatment.
    - Test all pregnant women for HBsAg at the first prenatal visit; also test high-risk women at delivery.
    - Test HIV-infected patients for anti-HBs 1 to 2 months after their third vaccine dose. A modified dosing regimen may increase the response rate.
- Management of HBsAg-Positive Persons
  - Report lab results to the state or local health department.
  - Retest to verify HBV infection. The absence of IgM anti-HBc or the persistence of HBsAg for 6 months or more indicates chronic HBV infection.
  - Refer for evaluation to a specialist experienced in the management of chronic HBV infection.
  - Evaluate household, sexual, and needle-sharing contacts of chronically infected persons and test them for susceptibility to HBV infection. They should receive the first dose of hepatitis B vaccine immediately after collecting the blood sample for serologic testing. Susceptible persons should complete the vaccine series.
  - Counsel patients to use latex condoms unless they have been demonstrated to be immune after vaccination or after being previously infected.
  - Educate patients to:
    - protect nonimmune sex partners until their partners can be vaccinated and their immunity documented
    - prevent the spread of infectious secretions or blood by covering cuts and skin lesions
    - not donate blood, plasma, body organs, other tissue, or semen
    - not share household articles that could become contaminated with blood
    - not premasticate food for others
    - protect the liver from additional harm by avoiding or limiting alcohol consumption, refraining from starting any new medications without consulting with a health care practitioner, and obtaining vaccination against hepatitis
    - inform their health care practitioners of their HBsAg status.
  - Inform patients that:
    - HBV is not spread by hugging, coughing, food, water, sharing eating utensils or drinking glasses, or casual contact

        - there is no need to be excluded from work, school, play, child care, or other settings
        - a support group may help with coping
    - All pregnant women should be tested for HBsAG at the first prenatal visit and at delivery.
    - All persons with HIV should be tested for anti-HBs 1 to 2 months after the third vaccine dose.

Hepatitis C virus (HCV)

- Most common infection in the United States
- Transmission is primarily parenterally, usually through shared drug-injecting needles and paraphernalia, but can also be transmitted through exposures in health care settings as a result of inadequate infection control practices.
- Reporting of HCV is required in 49 states.
- Screening is recommended:
    - at least once in a lifetime for all adults aged 18 years or older and for all women during each pregnancy, except in settings where the prevalence of HCV infection is very low.
    - One time regardless of age, setting, or recognized conditions or exposures (for example, HIV infection, history of injection drug use, or children born to women with HCV infection).
    - Routine periodic HCV testing is recommended for persons with ongoing risk factors (for example, injection drug use or hemodialysis).
- Diagnosis
    - Immunoassay, enzyme immunoassay, or enhanced chemiluminescence assay and, if recommended, a supplemental antibody test followed by NAAT to detect HCV RNA for those with a positive antibody result.
    - After spontaneously resolving or successful treatment, the antibody to HCV remains positive, so subsequent testing for HCV reinfection among persons with ongoing risk factors should be limited to HCV RNA.
- Treatment
    - HCV infection is curable, and persons with diagnosed HCV infection should be linked to care and treatment with hepatitis specialists.
    - Latest treatment guidelines can be found at https://www.hcvguidelines.org.
- Prevention
    - Partners of persons with HCV and HIV should be tested for both infections.
    - Persons with HCV infection for whom HIV and HBV infection status is unknown should be tested for these infections and treated accordingly.
    - HCV vaccines are not available, and prophylaxis with IG is not effective in preventing HCV infection after exposure.
    - PEP using direct-acting antivirals is not recommended.
- Counseling
    - Provide information about how the person can protect the liver from further harm.

- Advise patients not to donate blood, body organs, other tissue, or semen; not to share any personal items that might have blood on them (for example, toothbrushes or razors); and to cover cuts and sores on the skin to keep the virus from spreading via blood or secretions.
- Advise health care workers to be tested after percutaneous or perimucosal exposures to HCV-positive blood.
- Mothers with HCV infection should consider abstaining from breastfeeding if their nipples are cracked or bleeding.
- HIV-infected persons should undergo serologic screening for HCV at initial evaluation.

Proctitis, Proctocolitis, and Enteritis

- Proctitis, proctocolitis, and enteritis are sexually transmitted gastrointestinal syndromes.
- Proctitis
  - Proctitis is inflammation of the distal third of the rectum that occurs usually among those who receive anal intercourse. Signs include anorectal pain, tenesmus, and rectal discharge.
  - Examine anorectal exudate for polymorphonuclear leukocytes via anoscopy.
  - Evaluate for HSV, *N. gonorrhoeae, C. trachomatis,* and *T. pallidum*
  - Perform a PCR molecular test for LGV if the test result for *C. trachomatis* is positive.
  - Recommended treatment:
    - Ceftriaxone 500 mg IM in a single dose and doxycycline 100 mg orally twice a day for 7 days
  - Offer presumptive treatment for:
    - MSM with acute proctitis and bloody discharge, perianal ulcers, or mucosal ulcers
    - those with a positive test result for rectal chlamydia
    - patients with HIV (doxycycline 100 mg twice daily orally for a total of 3 weeks)
  - Those with HIV should be treated with a regimen for genital herpes and LGV.
  - Test all patients presenting with proctitis for HIV and syphilis.
  - Educate men to abstain from sexual intercourse until treatment is completed.
  - Retest 3 months after completion of treatment for proctitis associated with chlamydia and gonorrhea.
  - Treat sexual partners.
- Proctocolitis
  - Proctocolitis is inflammation of the colon mucosa; patients present with the same symptoms as proctitis, along with diarrhea and abdominal cramps.
  - Depending on the pathogen, fecal leukocytes may be noted in the stool sample.
  - Evaluate for *Campylobacter* species, *Shigella* species, *Entamoeba histolytica*, and LGV.
  - Treatment is according to the causative microbe.
- Enteritis
  - Diarrhea and abdominal cramping may occur among persons who have oral-anal contact with no signs of proctitis or proctocolitis noted.
  - In otherwise healthy patients, enteritis is most often caused by *Giardia lamblia.*

- Treatment is according to the causative microbe.

Ectoparasitic Infections

Pediculosis Pubis

- Pruritus, lice, and nits in the pubic hair
- Diagnosis is based on symptoms.
- Recommended treatment (only one):
  - Permethrin 1% cream rinse applied to affected areas and washed off after 10 minutes, or
  - Pyrethrins with piperonyl butoxide applied to the affected area and washed off after 10 minutes
- Alternative treatment (only one):
  - Malathion 0.5% lotion applied to affected areas and washed off after 8 to 12 hours, or
  - Ivermectin 250 µg/kg orally, repeated in 7 to 14 days
- Do not apply any treatment to the eyes. Eyelashes should be treated with ophthalmic ointment or petroleum jelly to the eyelid twice a day for 10 days.
- Decontaminate bedding and clothing, or remove from body contact for at least 72 hours.
- Treat sex partners.
- Treat pregnant persons with permethrin or pyrethrins with piperonyl butoxide.

Scabies

- Scabies is a skin infestation caused by the mite *Sarcoptes scabiei,* which causes pruritus.
- Diagnosis is by identifying burrows, mites, eggs, or the mites' feces from affected areas through microscopic examination of skin scrapings.
- Additional noninvasive examination of the affected skin can be done by using videodermatoscopy, videomicroscopy, or dermoscopy.
- Recommended treatment (only one):
  - Permethrin 5% cream applied to all areas of the body from the neck down and washed off after 8 to 14 hours, or
  - Ivermectin 200 µg/kg orally, repeated in 2 weeks or
  - Ivermectin 1% lotion applied to all areas of the body from the neck down and washed off after 8 to 14 hours; repeat treatment in 1 week if symptoms persist
- Alternative treatment:
  - Lindane (1%) 1 oz of lotion or 30 g of cream applied in a thin layer to all areas of the body from the neck down and thoroughly washed off after 8 hours. (Note: Infants and children 10 years of age or younger should not be treated with Lindane.)
- Seizures have been noted after using lindane immediately after a bath or shower, or in those with extensive dermatitis.
- Decontaminate bedding and clothing, or remove from body contact for at least 72 hours.
- Crusted scabies:
  - Treat with topical scabicide, either 25% topical benzyl benzoate or 5% topical permethrin cream (full-body application to be repeated daily for 7 days, then twice

weekly until discharge from hospital or cure is noted) and oral ivermectin 200 µg/kg on days 1, 2, 8, 9, and 15.
    - Ivermectin treatment on days 22 and 29 may be required for severe cases.
- Consider retreatment for those who are still symptomatic or when live mites are observed.
- Examine any person who has had sexual, personal, or household contact with the patient or the patient's living area within the month preceding scabies infestation.
- Consider ivermectin and a specialty consult for at-risk persons in nursing homes, hospitals, residential facilities, and other communities.
- Treat infants and young children with permethrin. Do not treat infants and young children under 10 years of age with lindane.
- Permethrin is the preferred treatment in pregnant and lactating women.
- Those with HIV should receive the same treatment as those who are HIV negative.

Sexual Assault or Abuse

Sexual Assault or Abuse of Adolescents and Adults

- An experienced practitioner should examine sexual assault survivors.
- Laws in all 50 states limit the use of survivors' previous sexual history to undermine the credibility of their testimony.
- The most common diagnoses among women who have been sexually assaulted are trichomoniasis, BV, gonorrhea, and chlamydial infection.
- An HPV vaccine is recommended for females through age 26.
- Initial Exam
    - Obtain specimens at the sites of penetration for *C. trachomatis* and *N. gonorrhoeae* testing.
    - A urine or vaginal specimen should be obtained for the NAAT or point-of-care testing for T. vaginalis.
    - Point-of-care testing or wet mount measurement of vaginal pH and vaginal secretions (or both) should be performed for evidence of BV and candidiasis.
    - HIV, hepatitis B, and syphilis testing should be performed.
- Treatment
    - Treat chlamydia, gonorrhea, and trichomonas.
    - Offer and provide emergency contraception.
    - If the survivor has not been previously vaccinated, provide postexposure hepatitis B vaccination if the assailant's status is unknown.
    - Unvaccinated survivors should receive both hepatitis B vaccine and HBIG if the assailant is known to be HBsAg-positive.
        - Administer the vaccine and HBIG to sexual assault survivors at the time of their initial examination.
        - Administer follow-up doses at 1 to 2 and 4 to 6 months after their first dose.
    - HPV vaccination is recommended for female survivors aged 9 to 26 years and male survivors aged 9 to 21 years.
        - The vaccine can be administered through age 26 for MSM who have not received a HPV vaccine or who have been incompletely vaccinated.

        - Administer the vaccine at the time of the initial examination.
        - Follow-up doses should be administered at 1 to 2 months and 6 months after the first dose.
    - Recommended treatment: Ceftriaxone 500 mg IM in a single dose plus doxycycline 100 mg twice a day orally for 7 days plus metronidazole 500 mg twice a day orally for 7 days
    - Alternative treatment: Ceftriaxone (500 mg for patients who weigh 150 kg or less, or 1 g for patients who weigh more than 150 kg) IM in a single dose plus doxycycline 100 mg twice a day orally for 7 days
    - In cases where alcohol has recently been ingested or emergency contraception is provided, metronidazole or tinidazole may be taken at home instead of as directly observed therapy to minimize potential side effects and drug interactions.
    - Counsel patients regarding the possible benefits and toxicities associated with treatment.
- Follow-up
    - If initial testing was completed, follow-up evaluation should occur within 1 week to ensure any results of positive tests can be discussed promptly with the survivor, treatment can be provided, and any follow-up can be arranged.
    - STI examinations should be performed within 1 to 2 weeks of the assault if initial tests were negative and treatment was not provided initially.
    - Consider a follow-up examination at 1 to 2 months to reevaluate for development of anogenital warts, especially among those who received a diagnosis of other STIs.
    - Serologic tests for syphilis can be repeated at 4 to 6 weeks and at 3 months; HIV testing can be repeated at 6 weeks and at 3 and 6 months, using methods to identify acute HIV infection if initial results were negative and the assailant's infection status is unknown.
    - Risk for acquiring HIV infection:
        - Frequency of HIV seroconversion is low.
        - The risk may be greater in cases involving vaginal, anal, or oral penetration, and the level of risk may be related to the site of exposure to ejaculate, the viral load in ejaculate, and the presence of an STI or genital lesions in the assailant or survivor.
        - Health care workers who have had an occupational exposure to HIV should receive postexposure prophylaxis.
    - Recommendations for postexposure HIV risk assessment of adolescent and adult survivors within 72 hours of sexual assault:
        - Assess risk for HIV infection in the assailant, and test that individual for HIV whenever possible.
        - Evaluate the survivor for the need for HIV nonoccupational postexposure prophylaxis (nPEP) and consult with a specialist in HIV treatment.
        - Discuss nPEP benefits and risks if the survivor is at risk for HIV. Perform baseline CBC and serum chemistry.
        - Plan for a follow-up visit in 3 to 7 days after initial assessment and provide the survivor enough medicine to last until the follow-up visit.
        - Perform an HIV antibody test initially, at 6 weeks, and at 3 months.

Sexual Assault or Abuse of Children

- Postnatally acquired gonorrhea, syphilis, chlamydia infection, genital herpes, anogenital warts, and nontransfusion and nonperinatally acquired HIV suggest sexual abuse, although there may be other causes of these infections.
- Reporting child abuse is required in all U.S. states and territories.
- Screen children for all STIs after one STI is diagnosed.
- Consider STI screening if:
    - the child has experienced penetration or there is evidence of recent or healed penetrative injury to the genitals, anus, or oropharynx
    - a stranger has abused the child
    - the perpetrator is known to be infected with an STI or is at high risk for STIs
    - there is a sibling, other relative, or another person in the household with an STI
    - there is a high rate of STI in the community
    - the child or parent requests an STI test
    - signs and symptoms of an STI are present.
- The initial examination should include:
    - inspecting the genital, perianal, and oral areas for genital discharge, odor, bleeding, irritation, warts, and ulcerative lesions
    - *N. gonorrhoeae* culture specimens from the pharynx and anus in boys and girls, the vagina in girls, and the urethra in boys
    - *C. trachomatis* culture specimens collected from the anus in boys and girls, and the vagina in girls
    - *T. vaginalis* culture and a vaginal swab wet mount
    - vaginal swab wet mount for BV
    - serologic test samples for evaluation and preservation for subsequent analysis and comparison with baseline specimens.
- Treatment
    - Children who have been sexually assaulted or abused should not be treated presumptively.
    - HPV vaccination is recommended for children 9 years of age or older who have not begun or completed immunization and who have been victims of sexual abuse or assault.
    - Consider a follow-up evaluation at 2 weeks from the last exposure if there were no infections identified at the initial examination.
    - Recommendations for postexposure HIV risk assessment of children within 72 hours of sexual assault:
        - Review HIV/AIDS local epidemiology, assess the risk for HIV infection in the assailant, and test for HIV infection.
        - Evaluate circumstances of assault that might affect the risk for HIV transmission.
        - Consult with a specialist in treating children with HIV infection.
        - Discuss nPEP with the caregivers, including its toxicity, unknown efficacy, and possible benefits for children at risk for HIV transmission.

- Perform baseline CBC and serum chemistry if nPEP is used.
- Test HIV antibodies during the original assessment and at 6 weeks, 3 months, and 6 months after the assault.
- If nPEP is started, plan for a follow-up visit at 3 to 7 days after initial assessment and provide the survivor with enough medicine to last until then. Re-evaluate the child at the follow-up visit to assess the child's tolerance of the medication.
- After initial HIV antibody testing, retest at 6 weeks, 3 months, and 6 months after the assault.

Reference:

Workowski, K. A., Bachmann, L. H., Chan, P. A., Johnston, C. M., Muzny, C. A., Park, I., Reno, H., Zenilman, J. M., & Bolan, G. A. (2021). Sexually Transmitted Infections Treatment Guidelines, 2021. *MMWR. Recommendations and reports: Morbidity and mortality weekly report. Recommendations and reports*, *70*(4), 1–187. https://doi.org/10.15585/mmwr.rr7004a1