

SEXUALLY TRANSMITTED DISEASES

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ABSTRACT:

Sexually transmitted diseases (STDs) are a significant global health concern, affecting millions of people worldwide. These diseases can lead to serious health complications, including infertility, cancer, and pregnancy problems. The most common STDs include gonorrhea, syphilis, chlamydia, trichomoniasis, and HIV. This review highlights the current state of STDs, their symptoms, diagnosis, treatment options, and prevention strategies. This article explores the causes, transmission, and effects of each disease, as well as the importance of early diagnosis and treatment. The review also explores the challenges in treating STDs, including antibiotic resistance and the need for effective prevention strategies. Understanding STDs is crucial for developing effective prevention and treatment programs, and this review aims to provide a comprehensive overview of the current state of STDs.

Keywords: gonorrhea, syphilis, trichomoniasis, Chlamydia, HIV.

INTRODUCTION:

Sexually transmitted infections (STIs), previously known as sexually transmitted diseases, involve the transmission of an organism between sexual partners through different routes of sexual contact, either oral, anal, or vaginal. STIs affect all people and can be prevented with proper education and barrier control. The most common STIs include both curable (gonorrhea, chlamydia, syphilis, trichomonas) and treatable (herpes viruses, human papillomavirus, human immunodeficiency virus) conditions. The correlating symptoms generally fall into 2 categories: discharge/dysuria or ulcerative lesions. The likelihood of contracting these conditions depends on the prevalence of the disease, patient behaviour, and underlying comorbidities. Early screening and recognition of STIs are key to preventing disease spread, morbidity, and mortality. These infections are more frequently underrecognized and have a higher incidence in medically underserved populations.

ETHIOLOGY:

STIs are a worldwide health problem and should be recognized by all public health agencies. STIs are more frequently underrecognized and have a higher incidence in medically underserved populations. The presenting condition or disease depends on the specific organism, route, signs, and symptoms. Risk factors that increase the transmission of STIs include having unprotected sexual contact with multiple partners, having a history of STIs,

sexual assault, prostitution, having a sexual partner who has additional concurrent sexual contacts or a prior history of an STI, and using alcohol or recreational drugs.

Male circumcision appears to significantly reduce the likelihood of acquiring several STIs, including human papillomavirus, genital herpes, and especially human immunodeficiency virus (HIV), where the infective risk decreases by 50% to 60%. The 7 most common STIs include 5 curable infections (chlamydia, gonorrhea, syphilis, and trichomonas) and three incurable but treatable conditions (herpes simplex virus, HIV, and human papillomavirus (HPV). Of note, hepatitis B and hepatitis C can also be transmitted sexually but are more commonly spread through other forms of exposure.

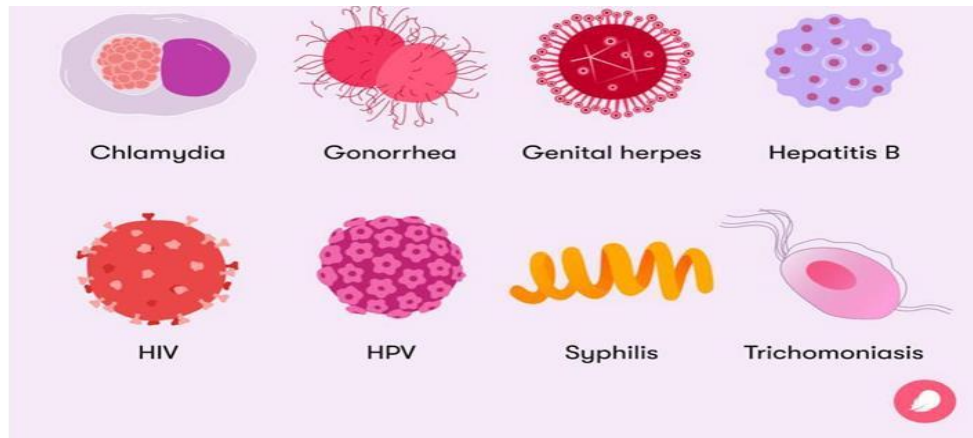


FIGURE 1: Types of STD

1. Gonorrhoea:

Scientifically classified as a gram-negative diplococcus, *Neisseria gonorrhoeae* is the primary cause of the onset of this disease, affecting countless people from various demographic groups. In the United States, this deceptive infection is the second most common sexually transmitted disease, with chlamydia trachomatis holding the title of the most commonly diagnosed disease. In order to penetrate the mucous membrane of epidermal cells that flatten the surface of the human body, the gonorrhoea disease of bacteria receives glucose and grows as a means of fixing the band. When the situation becomes complicated, gonorrhoea disease changes cell proteins into intelligent, contributes to the environment, and stimulates additional bacterial infiltration. Continuous growth of gonorrhoea disease causes local inflammatory reactions and ultimately affects human health and happiness by Preventive Medicine and Health Care showing various symptoms related to STD.

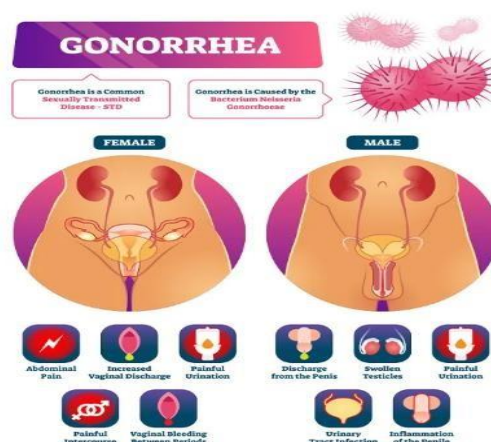


Figure 2: Gonorrhea

2.Syphilis:

The spirochaete *T. pallidum* is the causative agent of syphilis, a bacterial infection that is rather uncommon in the United Kingdom. Antibiotics are easily used to treat early infectious syphilis. Despite being uncommon, localized epidemics among individuals in high-risk sexual networks have been linked to it. With documented rising rates of syphilis among HIV-1-infected individuals over the past ten years, particularly among MSM, syphilis is the second most common cause of GUD among those infected with the virus. Numerous investigations have verified that syphilis infection is linked to a higher risk of contracting and spreading HIV1, through mechanisms such as mucosal damage and CCR5+ cell infiltration. *Treponema pallidum* is bacteria that causes syphilis. In the past, syphilis was also known as the French disease, hard chancre, or lues. Like almost no other STI, syphilis has seen a renaissance in recent years. Three phases can be distinguished in the course of the disease: early-stage syphilis occurs within the first year following infection. Late-stage syphilis refers to all stages of the disease that follow.

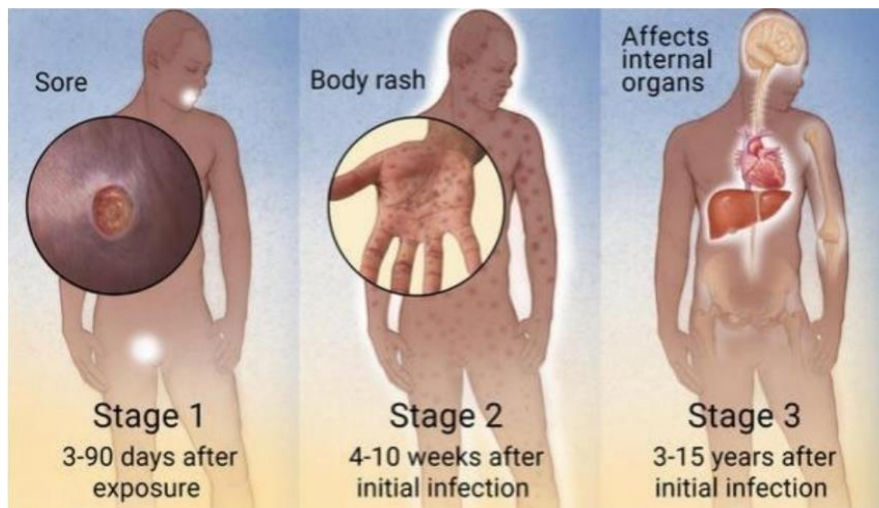


Figure 3: Stages of syphilis

3.Chlamydia:

Chlamydia trachomatis is often referred to by its shorthand *C. trachomatis*, is a Fascinating and complex bacterium that is a gram-negative, obligatory nonmotile microorganism that resides within the cells of its host. Among the Various serotypes identified, the most commonly encountered in clinical settings are those classified under groups D through K. According to World health organisation (WHO) reports and the Centres for Disease Control and Prevention (CDC), has been recognized that the most prevalent and treatable sexually transmitted infection (STI) within the United States is caused by this bacterium. This disease can be divided into two types: reticular plasmic bodies (RB), which multiply inside the host cell, and primary bodies (EB), which are infectious particles that transmit the disease. Once inside the host cell, the reticular plasmic bodies begin a remarkable process that transforms the reticular plasmic bodies into non-infectious forms and produces new infectious stem cells that spread to other host cells.

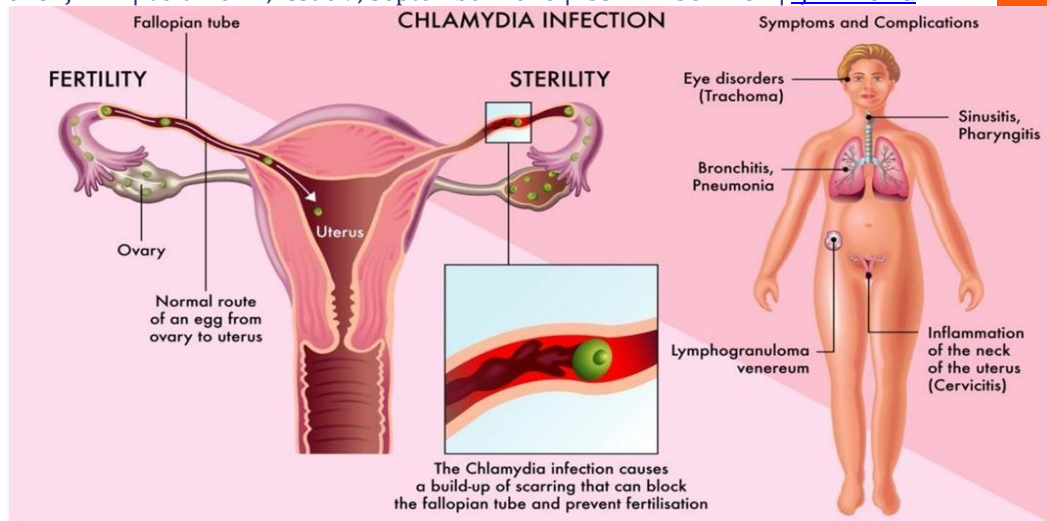


Figure 4: Chlamydia trachomatis infection. Symptoms and possible impact on fertility

4.Trichomoniasis:

In men, infection with *Trichomonas vaginalis* can present with the symptoms and signs of urethritis, epididymitis, or prostatitis; in women, it presents with a vaginal discharge that may be diffuse, ill-smelling, or yellowish green. 70–85% of all infected persons, however, have minimal or no symptoms, and untreated asymptomatic Infection can persist for months or years. *T. vaginalis* Infection elevates the risk of acquiring HIV by a factor of 2 to 3. Even with a normal vaginal pH, *T. vaginalis* can still be present. Approximately 5% of women with a Pelvic examination have colpitis also known as a strawberry cervix, but this number increases to Almost 50% with a colposcopy. *T. vaginalis* complications in women include infection of the Skene and Bartholin Glands, as well as a higher risk of pelvic inflammatory illness in women infected with HIV. It can result in Prostatitis, urethritis, epididymitis, and reduced sperm Motility in men. A single-celled protozoan with four Flagella at one end is the parasite *T vaginalis*.

Both men and Women can contract *T vaginalis* parasites, which are Easily transferred from one sex partner to another, typically during penile-vaginal intercourse *T vaginalis* thrives in certain moist areas of the body:

- Urethra, male or female
- Vagina
- Vulva

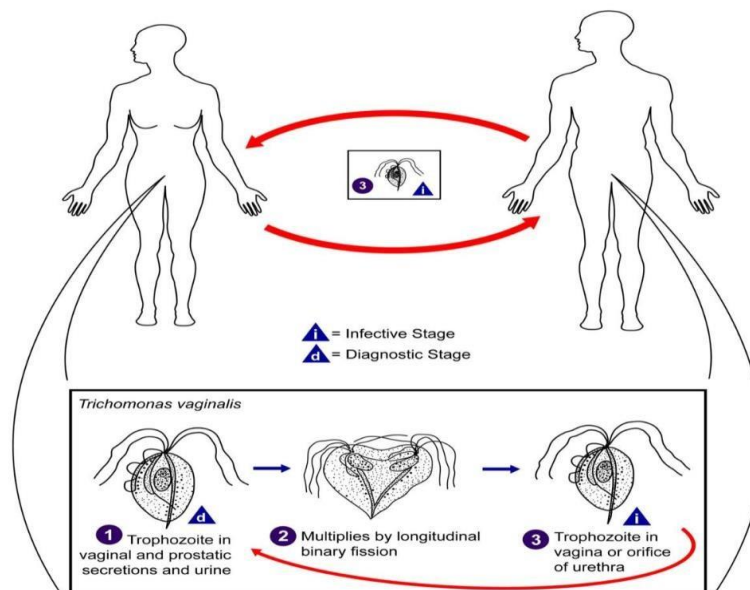


Figure 5: Trichomonas vaginalis

T. vaginalis alters the pH of the vagina, has been connected to a decrease in the amount of helpful vaginal lactobacilli, and is positively associated with a higher Nugent level. Although endo flagellar or pseudocyst forms have been reported under stressed conditions, *T. vaginalis* solely exhibits the trophozoite stage. It is currently unclear how these resistant forms fit into the trichomonad life cycle. Along with its distinct characteristics, *T. vaginalis* has rather than mitochondria, which are organelles involved in metabolism adaption to the hostile infection environment, including particular pathways of cell death.

5. HIV:

HIV is member of the retrovirus class of viruses, which includes the lentiviruses, also referred to as "slow" viruses. There is a significant lag between the initial infection and the development of the course of infection with these viruses. The human immunodeficiency virus (HIV) is the cause of acquired immunodeficiency syndrome (AIDS). One might say that HIV is tv a modernday threat and a curse on humanity. Following an increase in the occurrence of highly rare parasitic infections and cancers among physically healthy homosexual men, the scientific community first became aware of and acknowledged the existence of AIDS as a serious disease.

AIDS:

A- It is not inherited means it cannot be transmitted from one generation to another. It is transmitted to healthy person by infected person.

I- It decreases the immune system.

D- Creates a deficiency of CD4+ cells in the immune system.

S- It is a collection of diseases.

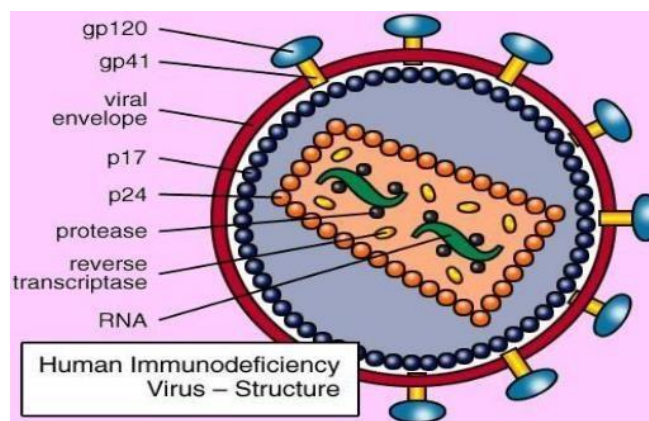


Figure 6: Structure of HIV Virus

6. Genital Herpes:

It is an infection caused by two viruses: herpes simplex virus type 1, or HSV-1, and its counterpart, type 2, or HSV-2. With its double-stranded DNA structure and glycoprotein coat covering it, this sneaky virus has a unique ability to enter specific cells in the human body and establish its presence. Although HSV-1 is responsible for widespread disease worldwide, the Centres for Disease Control and Prevention (CDC) recently announced that this strain is the leading cause of genital cancer in general population, especially among gay men. With this in mind, 50 million Americans have the HSV virus in their bodies, which shows the nature of the virus. These numbers indicate how viruses are spreading and how they are needed to urgently increase their consciousness, so how to deepen the impact on public medicine. It is important because it indicates whether it is necessary. In light of this, 50 million Americans have an HSV virus in the body, indicating how common the viral infection is. Therefore, continuing research and discussion on HSV-1 and HSV-2 is essential to improve understanding and develop practical plans to manage and reduce the risk of this virus.

7. Human Papillomavirus:

Human papillomaviruses, or HPV for short, are a class of viruses that are distinguished by their double-stranded deoxyribonucleic acid and grow in an orderly and complex manner in the basal layer of stratified squamous

epithelial cells, a process that plays a major role in the complex biological processes that occur in the human body. This intricate replication cycle is not merely a routine cellular procedure; rather, it instigates hyperplasia—a condition marked by an abnormal increase in the number of cells—which, over time, can escalate into a more serious condition known as conversion carcinoma, a transformation that carries profound implications for health. Among the different HPV types, cancer types, especially types 16 and 18, are known to be the main causes of cell carcinoma, leading to various cancers. Harm to Human Health Understanding the mechanisms underlying these stresses and their impact on cellular integrity is essential to the continued fight against HPV-related diseases, and demonstrates the urgent need for health and prevention research.

Other Emerging STDs

Granuloma Inguinale: Previously referred to in scientific literature as bacterium granulomatous, this condition is instigated by a Gram- negative intracellular pathogen known as Klebsiella granulomatous, which plays a crucial role in this disease. (Donovanosis is a term that is often utilized as an alternative name for this condition.) Although the inguinal granuloma is a serious health problem in certain parts of the world, it is relatively rare in the United States and is mainly considered in the fields which are classified as developing countries, where access to treatment can be limited.

Chancroid:

The disease that causes a sexually transmitted disease known as a skin infection has been identified as Haemophilus decry, a bacterium important in the field of infectious diseases. This creature, characterized by a difficult negative reaction to coccobacilli, is a very small strain, certain environmental parameters that contribute to its specific growth, survival and survival.

In order to reproduce successfully in culture laboratories. It is important to understand that the presence of these bacteria not only increases the risk of HIV infection in certain areas, but also increases the overall vulnerability to infection. Understanding the complex relationship between Haemophilus decry and the host immune response is important to develop effective prevention strategies and treatments and to reduce the incidence of PM and its associated problems.

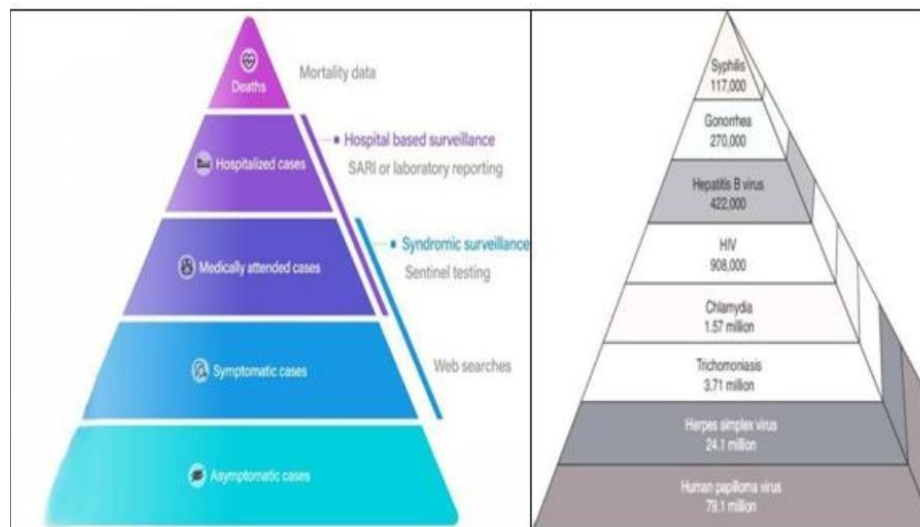


Figure 7: Hierarchal Representation of Different Sexually Transmitted Diseases

Viral STIs

Chronic infections such as HIV, herpes simplex virus (HSV) and HPV remain a serious problem, affecting millions of people worldwide. STIs, HIV and sexually transmitted infections remain a major health problem worldwide, killing 2. 5 million annually: syphilis will be responsible for 230,000 deaths by 2022 and more than 1 million new cases among 15-49-year-olds. In order to investigate and fully comprehend the occurrence, distribution, development, and treatment of all sexually transmitted diseases (STIs), a single method of data collecting would

be ideal. Physicians, public health authorities, legislators, international and regional health groups, and other healthcare professionals would all be involved in this system.

EPIDEMIOLOGY:

Each year, there are an estimated 127 million new cases of chlamydia, 87 million new cases of gonorrhea, and 6 million new cases of syphilis. Trichomoniasis affects approximately 156 million people annually. Around 500 million individuals worldwide are living with herpes simplex type 2.

In 2016, about one million pregnant women were diagnosed with a sexually transmitted infection (STI), leading to approximately 350,000 complications during childbirth or while caring for newborns. HPV infections are thought to contribute to more than 310,000 deaths from cervical cancer each year. Additionally, syphilis is the second leading cause of stillbirth globally. Every year, about six percent of the Indian population faces sexually transmitted infections and reproductive tract infections.

PATHOGENESIS AND CLINICAL FEATURES:

Sexually transmitted diseases (STDs), also referred to as sexually transmitted infections (STIs), are caused by bacteria, viruses, parasites, and fungi that are transmitted primarily through vaginal, anal, or oral sexual contact. Bacterial pathogens such as *Chlamydia trachomatis* and *Neisseria gonorrhoeae* attach to epithelial cells through specific adhesins and trigger inflammatory responses, leading to tissue damage, pelvic inflammatory disease, infertility, and ectopic pregnancy if untreated. Viral pathogens, including Human Immunodeficiency Virus (HIV), Herpes Simplex Virus (HSV), and Human Papillomavirus (HPV), establish persistent or latent infections by evading immune surveillance. HIV progressively destroys CD4⁺ T lymphocytes, resulting in immunodeficiency, HSV remains latent in sensory ganglia with periodic reactivation, and HPV infects basal epithelial cells, where persistent infection with high-risk types may induce malignant transformation through viral oncogenes.

DIAGNOSIS:

A broad differential should be approached when evaluating a patient, whether in an emergency department or a primary care setting. STIs can be localized to the oropharynx, integumentary system, external and internal genitals. Clinicians should initially establish a primary or preliminary diagnostic impression and differential diagnosis, then formulate a confirmatory plan. The history, physical exam, and clinical presentation should all support the definitive diagnosis and also rule out your differential diagnosis.

When approaching a differential diagnosis specifically for sexually transmitted infections, each system should be evaluated separately cardiovascular, respiratory, gastrointestinal, genitourinary, central nervous system, musculoskeletal, and integumentary systems. Breaking the signs and symptoms down into systems specifically for each STI will help differentiate a primary associated infectious process from a secondary, unrelated disorder or coinfection.

Differential STIs should be assessed by system and symptomatology:

- Cardiovascular: HIV, syphilis, HSV-1/HSV-2
- Central nervous system: HIV, syphilis, HSV-1/HSV-2, gonorrhea, HPV
- Gastrointestinal: HIV, HSV-1/HSV-2, chlamydia, gonorrhea, HPV
- Genitourinary: HIV, HSV-1/HSV-2, chlamydia, gonorrhea, HPV
- Integumentary system: HIV, HSV-1/HSV-2, chlamydia, gonorrhea, HPV

- Musculoskeletal: HIV, HSV-1/HSV-2, chlamydia, gonorrhea, HPV
- Respiratory: HIV, chlamydia

The use of different resources, diagnostic methods, and laboratory tests should be optimized to quickly arrive at the proper diagnosis and better serve the patient population.

TREATMENT/ MANAGEMENT:

Chlamydia: Coinfections with the most common STIs should be considered and treated simultaneously.

- Doxycycline 100 mg twice daily by mouth for 7 days is preferred.
- Alternative therapy would be one dose of azithromycin 1 g or levofloxacin 500 mg daily for 7 days.
- In pregnancy, azithromycin 1 g orally or amoxicillin 500 mg 3 times daily for 7 days is recommended.
- Other formulations can be taken but should be evaluated case-by-case, considering the patient's concerns.
- For persistent or recurrent nonspecific urethritis, specific *Mycoplasma genitalium* testing is recommended. If unavailable, the course of doxycycline 100 mg 2 times daily for 7 days should be repeated, followed by oral moxifloxacin 400 mg daily for 7 days.
- After initial treatment, follow-up testing should be scheduled with the patient.

Genital Herpes: Treatment and management of a primary infection should include systemic infection with antivirals and treatment for symptomatic pain or itching. The clinician and patient should discuss medication options, including any financial strain that may hinder appropriate treatment.

- Acyclovir, famciclovir, and valacyclovir are three primary antiviral treatments that can be started on patients for initial therapy.
 - Acyclovir 400 mg 3 times daily for 7 to 10 days or
 - Famciclovir 250 mg 3 times daily for 7 to 10 days or
 - Valacyclovir 1 g 2 times daily for 7 to 10 days
- There are various formulations and treatment courses that should be started after the best management plan is discussed with the patient.
- Suppressive therapy for recurrent outbreaks is effective at the following dosages:
 - Acyclovir 400 mg 2 times daily
 - Famciclovir 250 mg 2 times daily
 - Valacyclovir 500 mg to 1 g daily
- A higher dose schedule of these same agents can be used for episodic outbreaks, and IV therapy is utilized for particularly severe cases.
- Topical antiviral therapy is not recommended due to its minimal proven clinical effectiveness.
- Patients who are asymptomatic who test positive on serological testing only do not need antiviral therapy.
- The efficacy of antiviral therapy in preventing viral transmission in asymptomatic individuals has not been adequately studied.
- Neonatal herpes is generally treated with systemic acyclovir at 20 mg/kg intravenously every 8 hours.

Gonorrhea: The history, physical exam, and clinical presentation should support primary treatment and management. Consideration of coinfections with the most common sexually transmitted infections should be considered and treated simultaneously.

- One dose of a 3rd generation of cephalosporin, specifically ceftriaxone 500 mg, should be given IM or IV.
- Complicated or disseminated infections will need ceftriaxone 1 g once or every 24 hours, depending on the clinical presentation.

- If the patient is allergic to ceftriaxone or cephalosporins, the recommended alternative regimen is a single dose of gentamicin 240 mg IM plus a single oral dose of 2 g of azithromycin.
- If ceftriaxone is unavailable, the recommended alternative is a single oral dose of cefixime 800 mg.
- Doxycycline 100 mg 2 times daily for 1 week is recommended for chlamydial coinfections. □ After initial treatment, follow-up tests should be discussed with the patient.

Chancroid: Subjective and objective improvement are typically noted within 1 to 2 weeks. Failure to respond suggests an incorrect initial diagnosis, a coinfection such as HIV, treatment noncompliance, or drug resistance.

- Azithromycin 1 g, orally as a single dose
- Ceftriaxone 250 mg, IM as a single dose ○ Azithromycin and ceftriaxone have the benefit of single-dose therapy.
- Erythromycin 500 mg, orally 3 times per day for 7 days
- Ciprofloxacin 500 mg, orally twice a day for 3 days

Patients should be evaluated for treatment response 3 to 7 days after therapy. Some resistance to erythromycin and ciprofloxacin has been reported, but data on antimicrobial resistance is limited. **HIV:** Primary treatment and management consist of establishing viral load and CD4 count and starting a patient on highly active antiretroviral therapy (HAART). Advice from an infectious disease specialist experienced in HIV treatments is suggested to help determine whether antiretroviral therapy is necessary and the optimal regimen. If a patient is seen for an acute concern, such as sexual assault or exposure to an STI through high-risk sexual activity with a concern for HIV, a single combination medication should be started with close follow-up. Antiviral therapy should be started as soon as possible. A viral load of fewer than 200 copies/mL is essentially nontransmission.

- Pre-exposure prophylaxis is recommended for all high-risk, sexually active patients who test negative for HIV-1.
- HAART includes the following classes:
 - Nucleoside/nucleotide reverse transcriptase inhibitors
 - NRTI fixed-dose combinations
 - Non-nucleoside reverse transcriptase inhibitors
 - Integrase inhibitors
 - Protease Inhibitors
 - Fusion inhibitors
 - Chemokine receptor 5 antagonist.

HPV and Genital Warts:

- The CDC recommends HPV vaccinations for all children starting at age 12 and up to age 21 in men and 26 in women.
- Treatment of genital warts depends on location, size, physician experience, and patient preference.
- The application of acetic acid will tend to make HPV-affected skin turn white.
- High-grade cervical dysplasia in older women or any persistent cervical dysplasia is treatable with cryotherapy, loop electrosurgical excision, or cold knife cone resection.
- If the lesion progresses to a malignancy, additional resection, surgery, chemotherapy, or radiation may be required.
- Accepted treatment methods for anogenital warts include surgical removal, cryotherapy (freezing the infected tissue), laser vaporization, and topical medications.
- Available topical therapies for venereal and anogenital warts include the following:

Syphilis:

Treatment and management of secondary, latent, and tertiary syphilis should be independent of treatment of the primary syphilitic infection.

- Primary, secondary, and early syphilis infection can be treated with benzathine penicillin G 2.4 million units to be given by a single intramuscular injection.[\[21\]](#)
- Treatment for infants and children is also benzathine penicillin G 50,000 units/kg body weight IM as a single dose up to a maximum of 2.4 million units.

- Tertiary syphilis should be treated with benzathine penicillin G 2.4 million units IM once a week for a total of 3 weeks.
- Neurosyphilis should be treated as an inpatient with intravenous aqueous penicillin G 18 to 24 million units daily administered as 3 to 4 million units every 4 hours or by continuous infusion for a total of 14 days.
- After neurosyphilis treatment, normal rapid plasma reagin (RPR) titers correlate well with negative cerebral spinal fluid findings so that further lumbar punctures can be safely avoided in immunocompetent patients.
- Alternative therapies would include ceftriaxone or doxycycline. Azithromycin is no longer recommended due to increasing resistance in the US and elsewhere.
- Follow-up clinical examinations and serological testing are recommended at 6, 12, and 24 months after treatment or every 3 months for the first year and at 24 months in high-risk populations.
- A nontreponemal titer (VDRL or RPR) increased 4-fold or more from previous levels suggests a reinfection or treatment failure.
- A high initial titer that does not fall fourfold by 24 months after therapy suggests a treatment failure, reinfection, or central nervous system involvement.

Trichomoniasis: Treatment and management should be established with patients after diagnosis.

- For men, a single dose of metronidazole 2 g is taken orally.
- For women, metronidazole 500 mg by mouth twice daily with food for 7 days.
- Alternate therapy for both men and women is a single dose of tinidazole 2 g to be taken by mouth.
- Desensitization therapy is recommended for patients allergic to nitroimidazoles (which include both metronidazole and tinidazole).
- Retesting all women (but not men) 3 months after therapy is recommended.

PREVENTION AND CONTROL MEASURES:

Health Education and Awareness: Health education is one of the most effective strategies for STD prevention. Awareness should provide information about modes of transmission, symptoms, complications, and available preventive measures. Improving sexual health knowledge encourages individuals to adopt safer sexual practices and seek timely medical care.

Safe Sexual Practices: Consistent and correct use of barrier methods, particularly male and female condoms, significantly reduces the risk of transmission of many STDs, including HIV, gonorrhea, chlamydia, and syphilis. Limiting the number of sexual partners and maintaining mutually monogamous relationships with an uninfected partner can further decrease the risk of infection. **Early Diagnosis and Screening:** Early detection of STDs is essential for preventing transmission and long-term complications. Routine screening is recommended for high-risk populations, pregnant women, and individuals with multiple sexual partners. Modern diagnostic techniques such as nucleic acid amplification tests (NAATs), serological assays, and molecular methods improve the accuracy of STD detection.

Effective Treatment: Early treatment of infected individuals helps prevent disease progression and reduces transmission to sexual partners. Bacterial STDs such as syphilis, gonorrhea, and chlamydia can often be treated effectively with appropriate antibiotics. Viral infections such as HIV, herpes simplex virus, and hepatitis B require antiviral therapy and long-term management. **Vaccination:** Vaccination provides effective protection against certain sexually transmitted infections. Vaccines are available against human papillomavirus (HPV) and hepatitis B virus (HBV). HPV vaccination is particularly important for preventing cervical cancer and other HPV-associated diseases.

Prevention of Mother-to-Child Transmission: Screening and treatment of pregnant women are essential to prevent congenital and neonatal infections. Appropriate interventions, including antiretroviral therapy for HIV-positive mothers, antibiotic treatment for syphilis, and neonatal preventive measures, help reduce vertical transmission.

Avoidance of Risk Factors: Reducing alcohol and substance abuse, avoiding unsafe sexual practices, and promoting healthy communication between partners can contribute to lowering STD risk. Healthcare providers should provide counselling and support to individuals at increased risk.

CONCLUSION:

Sexually transmitted diseases are a major public health concern that requires attention and action. The high prevalence of STDs worldwide necessitates comprehensive prevention and control measures, including education, screening, and treatment. Early diagnosis and treatment can significantly reduce the risk of long-term complications and transmission to others. Healthcare providers should be aware of the latest treatment guidelines and recommendations for each type of STD. Furthermore, research into new treatments and prevention strategies, such as vaccines and microbicides, is essential to controlling the spread of STDs. By working together, reduce the burden of STDs and improve the health and well-being of individuals worldwide. Effective management of STDs requires a multifaceted approach that includes healthcare providers and individuals.

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