



# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

## A Review On Sexually Transmitted Diseases

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### ABSTRACT

Sexually Transmitted Diseases (STDs) pose significant public health challenges globally, affecting millions of individuals annually. This review aims to provide a comprehensive overview of STDs, encompassing epidemiology, etiology, transmission routes, clinical manifestations, diagnosis, prevention, and treatment modalities. The paper synthesizes current research findings, epidemiological data, and clinical guidelines to offer insights into the multifaceted aspects of STDs. The review begins by outlining the epidemiological landscape of STDs, highlighting the prevalence rates and demographic patterns across various regions. It explores the diverse etiological agents responsible for STDs, including bacteria, viruses, fungi, and parasites, elucidating their modes of transmission and associated risk factors. According to estimates from the World Health Organization, there were 333 million new instances of specific treatable sexually transmitted diseases (STDs) such as gonorrhea, chlamydial infection, syphilis, and trichomoniasis worldwide in 1995.

**Keywords:** *Contagious, Immunodeficiency, Antibacterial, Autoinoculation*

### INTRODUCTION

Physically transmitted illness (genuinely imparted Conveyed Disorder) are social event of infectious conditions that are communicated regularly by sexual contact and achieved by a broad assortment of bacterial, viral, protozoal and parasitic-trained professionals and ecto-freeloaders • Physically transmitted illnesses, or STIs( truly communicated diseases) [1], are tainting conditions that can be spread from one individual to another through sexual contact. In India, the recurrence of truly sent conditions is by and large high. Among the genuinely sent conditions, help is a serious concern. Physically transmitted illnesses, or STIs( actually conveyed defilements), are pollution conditions that can be spread starting with one individual and then onto the next through sexual contact.[ 16] A piece of the truly sent illnesses is similarly conveyed through birth, intravenous needles, or

breastfeeding. Young people and lively adults (15–24) are the age groups at the most noteworthy risk of getting a truly transmitted contamination (a physically communicated infection). Physically transmitted illnesses can have outrageous results if not treated, especially in women.[ 14] It's fundamental to go for physically sent infection testing whenever you suspect that you have gotten a genuinely communicated sickness. Genuinely conveyed illnesses ( STIs) are irresistible conditions that are spread through sexual contact with the penis, vagina, bum, mouth, or sexual fluids of a polluted person. Mucosal apkins in the urethra in men, the vagina in women, the rectum, and the mouth are helpless against the organisms and illnesses that cause STIs. Typical STIs are genital human papillomavirus (HPV), which can spread from direct skin-to-skin contact with a corrupted person. Mortality immunodeficiency sickness( HIV) may be shrunk through blood or blood things or be imparted from mother to child during development, work, or transport. Some STIs can spread through autoinoculation (the spread of defilement by reaching or scratching a corrupted locale and moving it to another piece of the body). STIs can't normally be conveyed through loosened-up contact or oblivious articles. Examinations of actually imparted diseases (STIs), including chlamydia, gonorrhea, and syphilis, have extended universally over the last on various occasions among gay, sexually open, and various men who have relations with men( GBM). Current Australian mate lines, introduced in 2019, propose STI assessment, similar to accuracy for genuinely powerful GBM and consistently for GBM in monogamous affiliations and individuals who aren't actually dynamic. This proposition integrates a butt-driven tar, throat tar, and pee test for chlamydia and gonorrhea, and blood tests for HIV and syphilis.[ 4] It's essential to observe that the past emphasis of these principles in 2014 recommended regular testing only for asymptomatic GBM who satisfied peril-based guidelines that considered condom use [14], number of sexual mates, prescription use, and HIV status," regardless of the way that it isn't sure if this change to overall rules for all truly unique GBM has provoked a lesser testing recurrence."

➤ **CLASSIFICATION:**

- A. BACTERIAL AGENTS.
- B. VIRAL AGENTS.
- C. PROTOZOAL AGENTS.
- D. FUNGAL AGENTS.
- E. ECTOPARASITES.

## A. **BACTERIAL AGENTS:**

A class of substances known as antibacterial agents combats harmful microorganisms. Thus, bacteria's harmful effect in biological contexts will be limited by killing them or lowering their metabolic activity. Additionally, by preventing the buildup of bacterial plaque in the oral environment, these materials help lower the incidence of disorders linked to plaque, like caries. It should be remembered, though, that antibacterial substances do not always have the ability to prevent plaque buildup. The production and application of biomaterials with antibacterial properties in dentistry and medical treatment regimens is currently developing quickly.

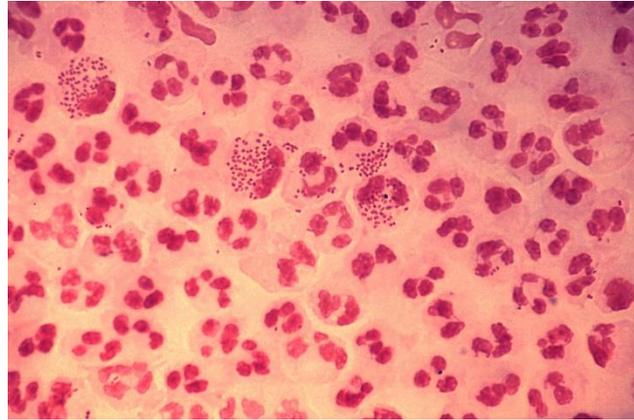
- **Disease:**

- ✓ Neisseria gonorrhoea.
- ✓ Chlamydia trachomatis.
- ✓ Haemophilus ducreyi.
- ✓ Mycoplasma hominis.
- ✓ Ureaplasma urealyticum.
- ✓ Callymmatobacterium granulomatis.
- ✓ Shigella spp.
- ✓ Grp B streptococcus.
- ✓ Bacterial vaginitis associated organisms.

### 1. **Neisseria gonorrhoea:**

*Neisseria gonorrhoeae* is a species of Gram-negative diplococci bacteria that was identified by Albert Neisser in 1879. It is often referred to as gonococcus (plural) or gonococcus (single). In addition to causing septic arthritis, gonococcal ophthalmia neonatorum, and disseminated gonococemia, it also causes gonorrhea, a sexually transmitted genitourinary illness. It is aerobic, oxidase-positive, resistant to phagocytosis, and develops inside neutrophils.[1] It needs to be cultivated on enriched agar (chocolate agar) supplemented with several antibiotics

(Thayer–Martin). Through genetic recombination of its pili and surface proteins that interact with the immune system, it displays antigenic diversity.



**Fig. 1. Neisseria gonorrhoea**

- **Symptoms**

Sexual transmission is through vaginal, butt-centric, or oral sex. Sexual transmission might be forestalled using obstruction security. Perinatal transmission might happen during labor and might be forestalled by anti-microbial treatment of the mother before birth and the use of anti-infection eye gel on the eyes of the infant. After an episode of gonococcal disease, tainted people don't foster invulnerability to future contaminations. Reinfection is conceivable because of *N. gonorrhoeae*'s capacity to avoid the resistant framework by differentiating its surface proteins.[2] *N. gonorrhoeae* can cause contamination of the privates, throat, and eyes. Asymptomatic disease is normal in males and females. Untreated disease might spread to the remainder of the body (scattered gonorrhea contamination), particularly the joints (septic joint pain). Untreated contamination in ladies might cause pelvic provocative sickness and conceivable barrenness due to the subsequent scarring.[ 3] Determination is through culture, Gram stain, or nucleic analyses, for example, polymerase chain response, of a pee test, urethral swab, or cervical swab Chlamydia co-endlessly testing for other STIs is prescribed because of the high pace of co-infection.[3] Neisseria species are fussy, Gram-negative cocci that require supplement supplementation to fill in lab societies. They are facultatively intracellular and ordinarily show up two by two (diplococci), looking like the state of espresso beans. Individuals from this variety are non-spore-framing, equipped for moving, utilize jerking motility, and commit aerobes (expect oxygen to develop). Of these 11 species that colonize people, just two are microbes. *N. gonorrhoeae* is the causative specialist of gonorrhea, and *N. meningitidis* is one reason for bacterial meningitis. • Side effects: Neisseria species are critical, Gram-negative cocci that require supplement supplementation to fill in research center societies. They are facultatively intracellular and normally show up two by two (diplococci), looking like the state of espresso beans. Individuals from this variety are non-spore-shaping, fit for moving utilizing jerking motility, and commit aerobes (expects oxygen to develop). Of these 11 species which colonize people, just two are microorganisms. *N. gonorrhoeae* is the causative specialist of gonorrhea and *N. meningitidis* is one reason for bacterial meningitis. [1][4] Gonococcal ophthalmia neonatorum, when normal in infants, is forestalled by the use of erythromycin (anti-microbial) gel to the eyes of children upon entering the

world as a general wellbeing measure. Silver nitrate is not generally utilized in the US. [2][5] Transmission: N. gonorrhoeae is communicated through vaginal, oral, or butt-centric sex; nonsexual transmission is impossible in grown-up contamination. [5] It can likewise be communicated to the infant during entry through the birth channel assuming the mother has untreated genitourinary contamination. Given the high pace of asymptomatic disease, all pregnant ladies ought to be tried for gonorrhea contamination. [5] Notwithstanding, mutual showers, towels or texture, rectal thermometers and guardians hands have been embroiled as method for transmission in the pediatric setting. Kissing has likewise been ensnared as a hypothetical method for transmission in the gay male populace, in light of fresher studies. Traditionally, the bacterium was remembered to move connected to spermatozoa, however this hypothesis did not make sense of female for male transmission of the sickness. A new report recommends that instead of "surf" on squirming sperm, N. gonorrhoeae microscopic organisms use pili to secure onto proteins in the sperm and travel through coital fluid.

- **Infection:**

For N. gonorrhoeae, the first step after successful transmission is adherence to the epithelial cells found at the mucosal site that is infected. The bacterium relies on type IV pili that attach and retract, pulling N. gonorrhoeae toward the epithelial membrane where its surface proteins, such as opacity proteins, can interact directly. After adherence, N. gonorrhoeae replicates itself and forms microcolonies. While colonizing, N. gonorrhoeae has the potential to transcytose across the epithelial barrier and work its way in to the bloodstream. During growth and colonization, N. gonorrhoeae stimulates the release of cytokines and chemokines from host immune cells that are pro-inflammatory. These pro-inflammatory molecules result in the recruitment of macrophages and neutrophils. These phagocytic cells typically take in foreign pathogens and destroy them.

- **Prevention:**

Transmission is reduced by using latex barriers (e.g. condoms or dental dams) during sex and by limiting sexual partners. Condoms and dental dams should be used during oral and anal sex, as well. Spermicides, vaginal foams, and douches are not effective for prevention of transmission. [4]

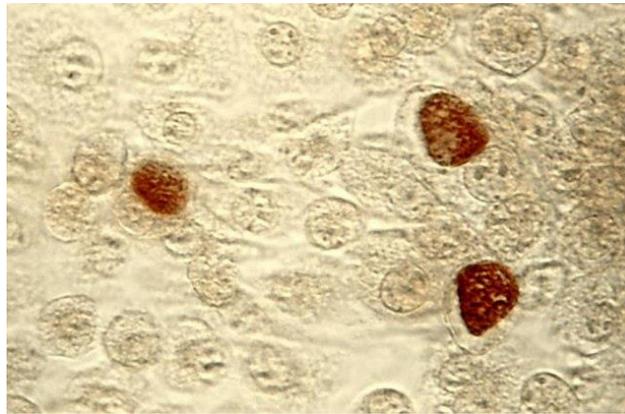
- **Treatment:**

The current treatment recommended by the CDC is an injected single dose of ceftriaxone (a third-generation cephalosporin). Sexual partners (defined by the CDC as sexual contact within the past 60 days) should also be notified, tested, and treated. It is important that if symptoms persist after receiving treatment of N. gonorrhoeae infection, a reevaluation should be pursued.

## **2. Chlamydia Trachomatis:**

(kluh-MID-e-uh) is a common sexually transmitted infection (STI), also known as a sexually transmitted disease (STD). Chlamydia is caused by Chlamydia trachomatis (truh-KOH-muh-tis) bacteria. You might not

know you have chlamydia because many people don't have symptoms, such as genital pain and discharge from the vagina or penis. [6]



**Fig. 2. Chlamydia trachomatis**

- **Symptoms:**

Early-stage Chlamydia trachomatis infections often cause few symptoms. Even when symptoms occur, they're often mild. That makes them easy to overlook, which is why regular screening is important. Symptoms of Chlamydia trachomatis infection can include:

- ✓ Painful urination
- ✓ Vaginal discharge
- ✓ Discharge from the penis
- ✓ Painful sexual intercourse in women
- ✓ Vaginal bleeding between periods and after sex
- ✓ Testicular pain

Depending on a person's sexual activity, Chlamydia trachomatis can infect the eyes, throat or rectum. Eye infections, called conjunctivitis, cause the inside of the eyelid to be red and irritated. In the throat, an infection may have no symptoms, or a person may have a sore throat. An infection in the rectum may have no symptoms or may cause rectal pain, discharge or bleeding. When to see a doctor See your doctor if you have a discharge from your vagina, penis or rectum, or if you have pain during urination. Also, see your doctor if you learn your sexual partner has chlamydia. Your doctor will likely prescribe an antibiotic even if you have no symptoms. [7]

- **Causes:**

The Chlamydia trachomatis bacterium is most commonly spread through vaginal, oral and anal sex. It's also possible for pregnant women to spread chlamydia to their children during delivery, causing pneumonia or a serious eye infection in the newborns.

- **Risk factors:**

Risk factors for chlamydia include: Less condom use. Less use of health services to prevent and treat sexually transmitted infections. Multiple sex partners. Changing sex partners before learning about a chlamydia

infection. People who have sex before age 25 are at higher risk of chlamydia than are older people. That's because younger people are more likely to have more than one risk factor.

- **Treatment:**

Chlamydia trachomatis is treated with antibiotics. You might receive a one-time dose, or you might need to take the medication daily or multiple times a day for seven days.

In most cases, the infection clears up within 1 to 2 weeks after you take the antibiotic. But you can still spread the infection at first. So avoid sexual activity from when you start treatment until all your symptoms are gone.

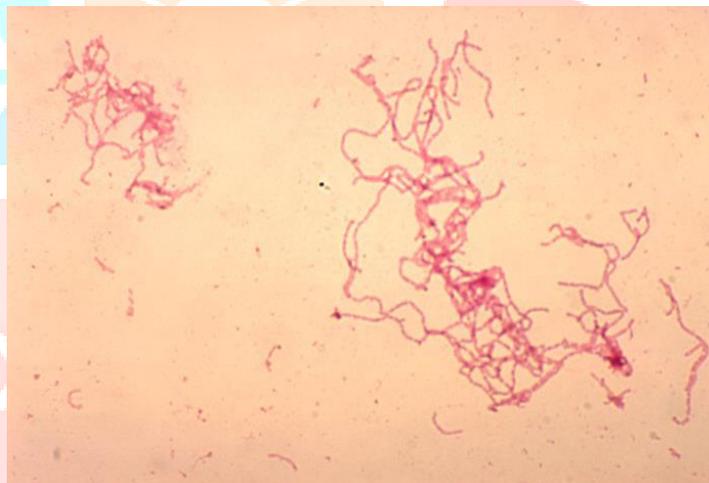
Your sexual partner or partners from the last 60 days also need screening and treatment even if they don't have symptoms. Otherwise, the infection can be passed back and forth between sexual partners. Make sure to avoid sexual contact until all exposed partners are treated. Having chlamydia or having been treated for it in the past doesn't prevent you from getting it again.

### **3. Haemophilus ducreiy :**

Sexual transmission is through vaginal, butt-centric, or oral sex. Sexual transmission might be forestalled using obstruction security. Perinatal transmission might happen during labor and might be forestalled by anti-microbial treatment of the mother before birth and the use of anti-infection eye gel on the eyes of the infant. After an episode of gonococcal disease, tainted people don't foster invulnerability to future contaminations. Reinfection is conceivable because of *N. gonorrhoeae*'s capacity to avoid the resistant framework by differentiating its surface proteins.[2] *N. gonorrhoeae* can cause contamination of the privates, throat, and eyes. Asymptomatic disease is normal in males and females. Untreated disease might spread to the remainder of the body (scattered gonorrhea contamination), particularly the joints (septic joint pain). Untreated contamination in ladies might cause pelvic provocative sickness and conceivable barrenness due to the subsequent scarring.[ 3] Determination is through culture, Gram stain, or nucleic analyses, for example, polymerase chain response, of a pee test, urethral swab, or cervical swab Chlamydia co-endlessly testing for other STIs is prescribed because of the high pace of co-infection.[3] *Neisseria* species are fussy, Gram-negative cocci that require supplement supplementation to fill in lab societies. They are facultatively intracellular and ordinarily show up two by two (diplococci), looking like the state of espresso beans. Individuals from this variety are non-spore-framing, equipped for moving, utilize jerking motility, and commit aerobes (expect oxygen to develop). Of these 11 species that colonize people, just two are microbes. *N. gonorrhoeae* is the causative specialist of gonorrhea, and *N. meningitidis* is one reason for bacterial meningitis. • Side effects: *Neisseria* species are critical, Gram-negative cocci that require supplement supplementation to fill in research center societies. They are facultatively intracellular and normally show up two by two (diplococci), looking like the state of espresso beans. Individuals from this variety are non-spore-shaping, fit for moving utilizing jerking motility, and commit aerobes (expects oxygen to develop). Of these 11 species which colonize people, just two are microorganisms. *N. gonorrhoeae* is the causative specialist of gonorrhea and *N. meningitidis* is one reason for bacterial meningitis. [1][4] Gonococcal ophthalmia neonatorum, when normal in infants, is forestalled by the use of erythromycin (anti-microbial) gel to the eyes of children upon entering the

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*Haemophilus ducreyi* is a Gram-negative coccobacillus, and has a shape between a spherical coccus [11] and a rod-shaped bacterium. This species of bacterium has pili, fine and tangled appendages composed predominantly of protein, that allow bacteria to attach to surfaces, including those of cells. [12]

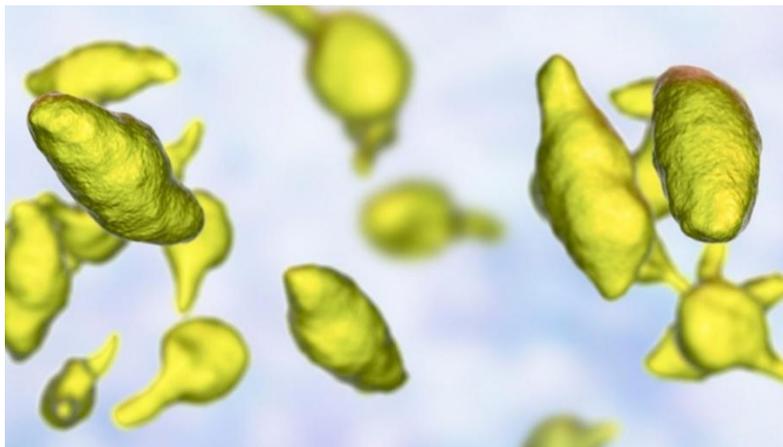


**Fig. 3. *Haemophilus ducreyi***

- **Treatment:**

Single-dose antibiotic treatments using macrolides, third-generation cephalosporins, or fluoroquinolone continue to be effective in treating chancroid. [13] The first line treatments are one of four options : azithromycin 1 gram orally in a single dose, ceftriaxone 250 mg intramuscularly in a single dose, ciprofloxacin 500 mg orally 2 times a day for 3 days, or erythromycin base 500 mg orally 3 times a day for 7 days. Some antibodies were specific to all strains, while others targeted only certain groups of strains *H. ducreyi*, indicating that the outer membrane proteins of *H. ducreyi* can vary in their immune recognition. Infected individuals are still susceptible to reinfection due to the absence of developed protective immunity. A rise in antimicrobial resistance among *H. ducreyi* strains result in a shift away from benzylpenicillin as the preferred treatment. [14]

#### **4. Mycoplasma Hominis:**



**Fig. 4. Mycoplasma hominis**

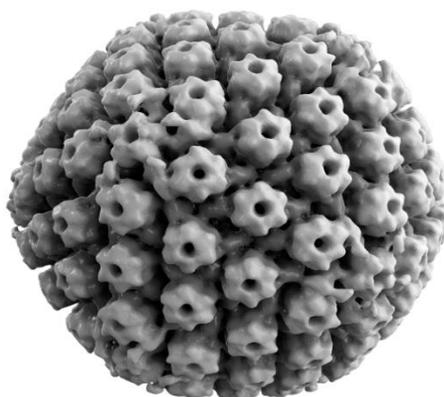
It is an opportunistic human mycoplasma species residing in the lower urogenital tract.[15] It is a common human urogenital Mycoplasma species that lacks a cell wall. Due to the absence of the cell wall, *M. hominis* is innately resistant to  $\beta$ -lactams and to all antibiotics which target the cell wall. Additionally, it is the simplest self-replicating microorganism known. [16] This reaps consequences such as a lack of detection by light microscopy, and complex nutritional requirements. Due to the fact that it does not have a cell wall, Mycoplasma hominis does not gram stain although it is surprisingly often described as gram-negative.

**Treatment:** hominis infections occurring in immunocompromised patients, combination of drugs usually active against the mycoplasmas (such as clindamycin and doxycycline or a fluoroquinolone and doxycycline) have been recommended. [17]

## **B. VIRAL AGENTS:**

1. Human (alpha) Herpes virus.
2. Hepatitis B virus.
3. Human Papilloma Virus.
4. Molluscum contagiosum virus.
5. Human Immunodeficiency virus.

### **1. Human (alpha) Herpes virus.:**



### Fig. 5. Human (alpha) Herpes virus

Both types of herpes simplex virus, HSV-1 and HSV-2, can cause oral or genital infection. Most often, HSV-1 causes gingivostomatitis, herpes labialis, and herpes keratitis. HSV-2 usually causes genital lesions. (See Overview of Herpesvirus Infections.) [16] Herpes simplex viruses (human herpesviruses types 1 and 2) commonly cause recurrent infection affecting the skin, mouth, lips, eyes, and genitals. Common severe infections include encephalitis, meningitis, neonatal herpes, and, in patients who are immunocompromised, disseminated infection. Mucocutaneous infections cause clusters of small painful vesicles on an erythematous base. Diagnosis is clinical; laboratory confirmation by culture, polymerase chain reaction, direct immunofluorescence, or serologic testing can be done. [17]

Meningitis, neonatal herpes, and, in patients who are immunocompromised, disseminated infection. Mucocutaneous infections cause clusters of small painful vesicles on an erythematous base. Diagnosis is clinical; [18] laboratory confirmation by culture, polymerase chain reaction, direct immunofluorescence, or serologic testing can be done. Treatment is symptomatic; antiviral therapy with acyclovir, valacyclovir, or famciclovir is helpful for severe infections and, if begun early, for recurrent or primary infections. [19]

## 2. Hepatitis B:

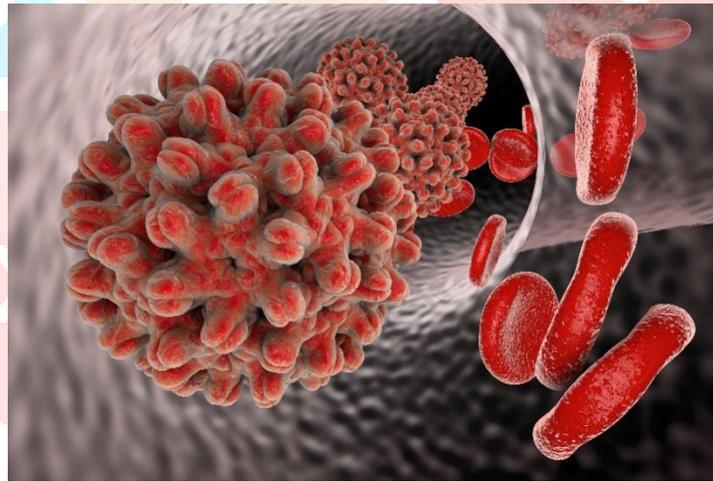


Fig. 6. Hepatitis B

Hepatitis B is an infection of the liver caused by the hepatitis B virus. The infection can be acute (short and severe) or chronic (long term). Hepatitis B can cause a chronic infection and puts people at high risk of death from cirrhosis and liver cancer. It can spread through contact with infected body fluids like blood, saliva, vaginal fluids and semen. It can also be passed from a mother to her baby. Hepatitis B can be prevented with a safe and effective vaccine. The vaccine is usually given soon after birth with boosters a few weeks later. It offers nearly 100% protection against the virus. Hepatitis B is a major global health problem Most people do not experience any symptoms when newly infected. [16]

Some people have acute illness with symptoms that last several weeks:

- ✓ yellowing of the skin and eyes (jaundice)
- ✓ dark urine
- ✓ feeling very tired
- ✓ nausea
- ✓ vomiting
- ✓ pain in the abdomen.

When severe, acute hepatitis can lead to liver failure, which can lead to death. Although most people will recover from acute illness, some people with chronic hepatitis B will develop progressive liver disease and complications like cirrhosis and hepatocellular carcinoma (liver cancer). These diseases can be fatal.

#### • **Treatment:**

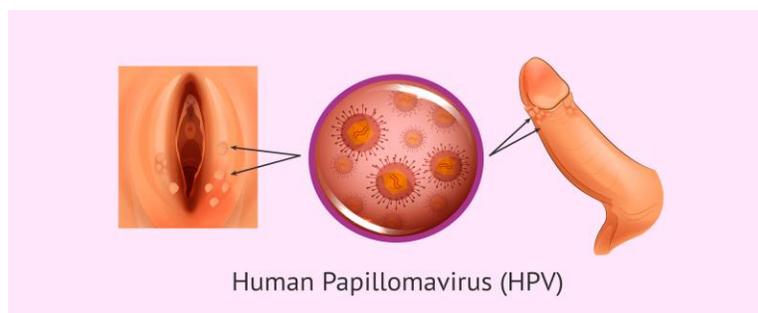
There is no specific treatment for acute hepatitis B. Chronic hepatitis B can be treated with medicines. Care for acute hepatitis B should focus on making the person comfortable. They should eat a healthy diet and drink plenty of liquids to prevent dehydration from vomiting and diarrhoea. Chronic hepatitis B infection can be treated with oral medicines, including tenofovir or entecavir. Treatment can.. [20]

- Slow the advance of cirrhosis
- reduce cases of liver cancer
- improve long term survival.

Most people who start hepatitis B treatment must continue it for life. It is estimated that 12-25% of people with chronic hepatitis B infection will require treatment, depending on setting and eligibility criteria. The ongoing 2023 update of the WHO Hepatitis B treatment guidelines will expand treatment eligibility and increase the proportion of people on treatment.

### **3. Human Papillomavirus HPV:**

Its a common virus that can affect different parts of your body. There are over 100 types of HPV, including strains of HPV that cause warts on your hands, feet, face, etc. About 30 HPV strains can affect your genitals, including your vulva, vagina, cervix, penis and scrotum, as well as your rectum and anus. [21]



**Fig. 7. Human papillomavirus**

HPV that affects your genitals is a sexually transmitted infection (STI) that gets passed through skin-to-skin contact. Many people cringe at the thought of STIs, but the majority of genital HPV strains are harmless. This includes the type of HPV that causes genital warts.

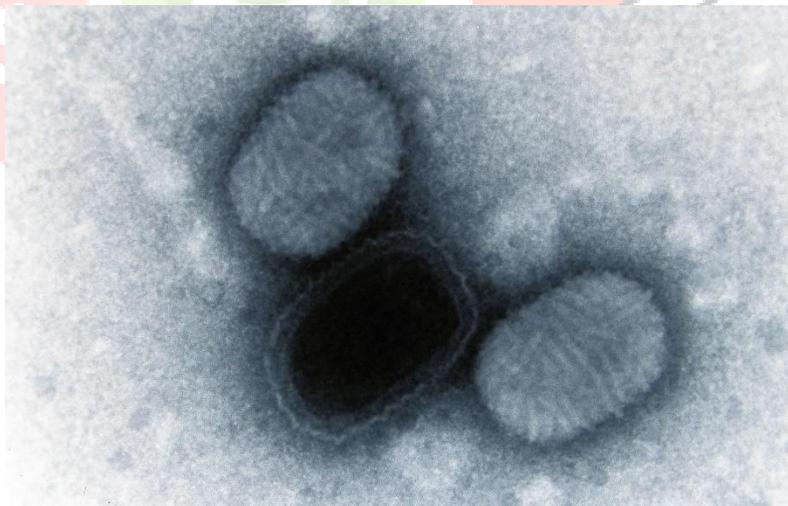
### **Symptoms and Causes:**

HPV that affects your genitals doesn't usually cause symptoms. When symptoms do occur, the most common sign of the virus is warts in your genital area. Genital warts are rough, cauliflower-like lumps that grow on your skin[22]. They may appear weeks, months or even years after you've been infected with HPV. Genital warts are contagious (like all forms of HPV), but they're harmless. High-risk forms of HPV often don't cause symptoms until they've progressed to cancer. Cervical cancer is the most common type of HPV-related cancer. Other types of cancer are much rarer. They include: common type of HPV-related cancer. Other types of cancer are much rarer. They include:

- ✓ Anal cancer.
- ✓ Penile cancer.
- ✓ Throat cancer.
- ✓ Vaginal cancer.
- ✓ Vulvar cancer.

As with cervical cancer, it's important to remember that having HPV - even a high-risk strain - doesn't mean that you'll develop these cancers.<sup>[23]</sup>

### **4. Moluscum contagiosum virus:**



**Fig. 8. Moluscum Contagiosum Virus**

Molluscum contagiosum (LUS-kum kun-tay-jee-OH-sum) is a fairly common skin infection caused by a virus. It causes round, firm, painless bumps ranging in size from a pinhead to a pencil eraser. If the bumps are scratched or injured, the infection can spread to nearby skin. Molluscum contagiosum also spreads through person-to-person contact and contact with infected objects. Though most common in children, molluscum

contagiosum can affect adults as well - particularly those with weakened immune systems. Adults with a healthy immune system can develop molluscum contagiosum from sexual activity with an infected partner. Left untreated, the bumps usually disappear in 6 months to 2 years. [16]

- **Symptoms:**

Molluscum contagiosum signs and symptoms include:

- ✓ Raised, round, skin-colored bumps
- ✓ Small bumps - typically under about 1/4 inch (smaller than 6 millimeters) in diameter
- ✓ Bumps with a small dent or dot at the top near the center
- ✓ Itchy, pink bumps
- ✓ Bumps on the face, trunk, arms or legs of children
- ✓ Bumps on the genitals, lower abdomen or inner thighs of adults if the infection was sexually transmitted. [18]

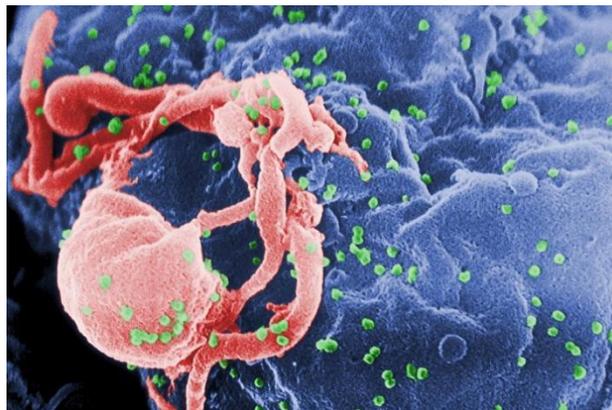
- **Causes:**

The virus that causes molluscum contagiosum spreads easily through:

- ✓ Skin-to-skin contact
- ✓ Contact with infected objects, such as towels, kickboards and wrestling mats • Swimming in pools or hot tubs contaminated with the virus
- ✓ Sexual contact with an affected partner
- ✓ Scratching or rubbing the bumps, which spreads the virus to nearby skin.

## 5. Human immunodeficiency virus :

(AIDS) is a chronic, potentially life- threatening condition caused by the human immunodeficiency virus (HIV). By damaging your immune system, HIV interferes with your body's ability to fight infection and disease. [24]



**Fig. 9. Acquired immunodeficiency syndrome**

HIV is a sexually transmitted infection (STI). It can also be spread by contact with infected blood and from illicit injection drug use or sharing needles. It can also be spread from mother to child during pregnancy, childbirth or breastfeeding. Without medication, it may take years before HIV weakens your immune system to the point that you have AIDS. There's no cure for HIV/AIDS, but medications can control the infection and prevent progression of the disease. Antiviral treatments for HIV have reduced AIDS deaths around the world, and international organizations are working to increase the availability of prevention measures and treatment in resource-poor countries. [25]

- **Primary infection (Acute HIV)**

Some people infected by HIV develop a flu-like illness within 2 to 4 weeks after the virus enters the body. This illness, known as primary (acute) HIV infection, may last for a few weeks.

Possible signs and symptoms include:

- ✓ Fever
- ✓ Headache
- ✓ Muscle aches and joint pain
- ✓ Rash
- ✓ Sore throat and painful mouth sores
- ✓ Swollen lymph glands, mainly on the neck
- ✓ Diarrhea
- ✓ Weight loss
- ✓ Cough
- ✓ Night sweats

- **Symptomatic HIV infection**

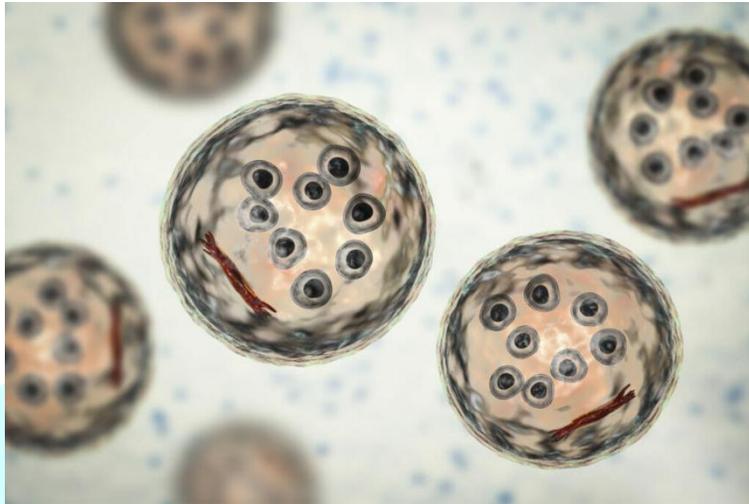
As the virus continues to multiply and destroy your immune cells - the cells in your body that help fight off germs - you may develop mild infections or chronic signs and symptoms such as:

- ✓ Fever
- ✓ Fatigue
- ✓ Swollen lymph nodes - often one of the first signs of HIV infection
- ✓ Diarrhea
- ✓ Weight loss
- ✓ Oral yeast infection (thrush)
- ✓ Shingles (herpes zoster)
- ✓ Pneumonia

## **C. PROTOZOAL AGENTS:**

1. Entamoeba histolytica.
2. Giardia lamblia.
3. Trichomonas vaginalis

## 1. Entamoeba histolytica:



**Fig. 10. Entamoeba histolytica**

Entamoeba histolytica is a pathogenic amoeba that is often associated with intestinal and extraintestinal infections in humans. It belongs to the phylum Protozoa, class Sarcodina, and order Lobosa. It infects the human mucosa and submucosa layers of the large intestine, causing dysentery. It is typically found in tropical and subtropical regions.

Let's look at the Entamoeba histolytica to get a better understanding.

**Cyst - Stage 1** - Infection occurs by ingestion of mature cysts through fecally contaminated water or food. Due to protection from walls, cysts survive several days and sometimes weeks. They are responsible for transmission.

**Excystation - Stage 2** - Excystation is the process by which cysts transform into trophozoites. When the cysts enter the ileum of the small intestine of the host, the process of excystation begins. Trophozoites are released in the small intestine and from here they migrate to the large intestine.

**Trophozoite - Stage 3** - Trophozoites are unicellular parasites that measure from 14 to 18 mm in diameter. They multiply in the small intestine by binary fission to produce cysts that exit via human stool. Several trophozoites remain in the small intestine. The intestinal mucosa is entered, and they further grow in the extraintestinal region of the host like lungs, liver, brain.

## 2. Giardia lamblia:



**Fig. 11. Giardia Lamblia**

An intestinal infection called a giardiasis is characterized by diarrhea that is watery, nausea, bloating, and stomach cramps. A microscopic parasite that is present across the world, particularly in places with inadequate sanitation and contaminated water, is the source of giardia infection. In the US, one of the most frequent causes of waterborne illness is giardiasis, or giardia infection [18]. The parasites can be found in wells, public water sources, swimming pools, whirlpool spas, and wilderness streams and lakes. Food and interpersonal contact are two ways that giardia infections can spread.

Giardia infections usually clear up within a few weeks. But you may have intestinal problems long after the parasites are gone. Several drugs are generally effective against giardia parasites, but not everyone responds to them. Prevention is your best defense.

- **Symptoms:**

Some people with giardia infection never develop signs or symptoms, but they still carry the parasite and can spread it to others through their stool. For those who do get sick, signs and symptoms usually appear one to three weeks after exposure and may include:

- ✓ Watery, sometimes foul-smelling diarrhea that may alternate with soft, greasy stools
- ✓ Fatigue
- ✓ Stomach cramps and bloating
- ✓ Gas
- ✓ Nausea
- ✓ Weight loss

Signs and symptoms of giardia infection may last two to six weeks, but in some people they last longer or recur.

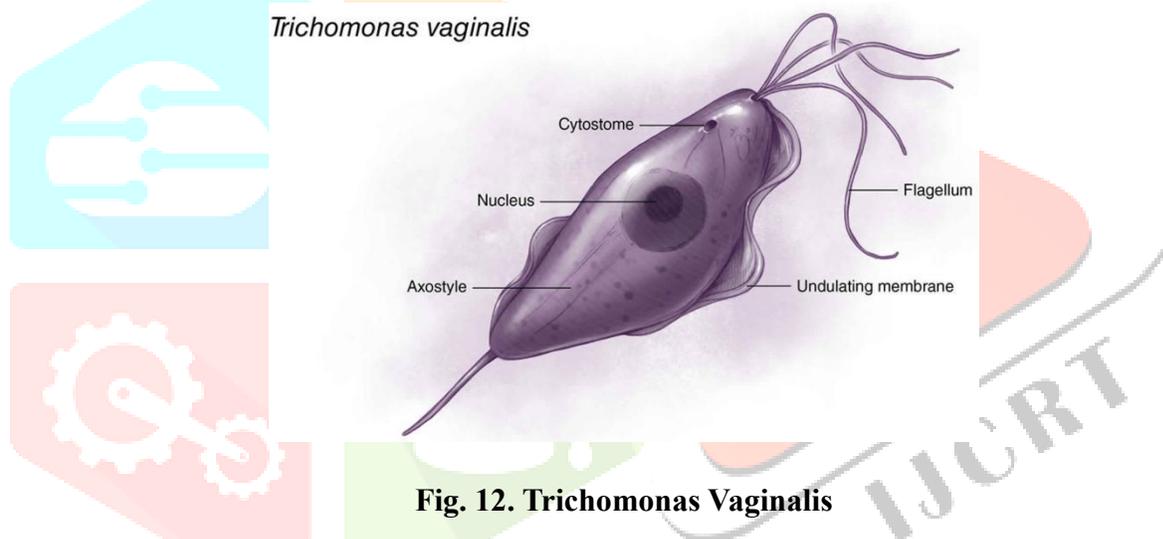
- **Cause:**

Giardia parasites live in the digestive tracts of individuals and creatures. Before the microscopic parasites are passed in stool, they become encased inside hard shells called blisters, which permit them to make due external the digestive organs for quite a long time. When inside a host, the growths disintegrate and the parasites are released. Giardia parasites live in the digestive tracts of individuals and creatures. Before the tiny parasites are

passed in stool, they become encased inside hard shells called sores, which permits them to make due external the digestion tracts for a really long time. When inside a host, the sores break up and the parasites are delivered. Disease happens when you accidentally swallow the parasitic pimples. This can happen by gulping perilous water, by eating contaminated food, or through one individual's next contact. Gulping sullied water The most widely recognized method for becoming tainted with giardia is to gulp perilous (polluted) water. Giardia parasites are found in lakes, streams, and streams around the world, as well as in open water supplies, wells, reservoirs, pools, water parks, and spas. Ground and surface water can become tainted with giardia from horticultural spillover, waste disposal, or creature feces.[ 26] Youngsters in diapers and individuals with looseness of the bowels may unintentionally taint pools and spas.

### 3. Trichomonas Vaginalis:

One prevalent and treatable sexually transmitted illness (STI) is trichomoniasis, also known as "trich". During sexual activity, trichomoniasis spreads by vaginal secretions and semen (cum). *Trichomonas vaginalis*, the parasite that causes the infection, is the source of the term. [27]



**Fig. 12. Trichomonas Vaginalis**

Since most trich patients don't have any symptoms, you could be infected without realizing it. Since trich is viral, having intercourse with someone could unintentionally infect them. One of the main reasons trich spreads so quickly is that up to 70% of those who are infected never show symptoms. Before you even realize you have the illness, you might infect others. In most cases, symptoms start to show up five to 28 days after exposure. Symptoms are more prevalent in women and AFAB individuals. The exact reason why some people experience symptoms while others do not is unknown to researchers. *Trichomonas vaginalis* is a tiny parasite that causes trich. Once infected, you can transfer the virus to another person by vaginal-vaginal or vaginal-penile contact. Anal intimacy. verbal intercourse. genital contact (skin-to-skin contact without ejaculation).<sup>[28]</sup>

- **Symptoms and Causes:**

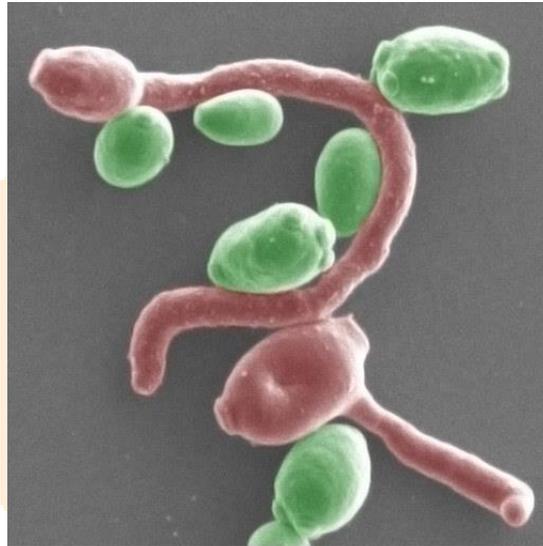
Can inadequate hygiene be the cause of trichomoniasis? No. *Trichomonas* won't result from poor hygiene. Rich is caused by a parasite. During sexual intercourse, the parasite is transferred from partner to partner [19]. Can trichomonas cause UTIs? No, trichomoniasis is not brought on by a urinary tract infection (UTI).Is there a spread

of trichomoniasis, or trich? Indeed, trich can spread. Many people share it to their sexual partners without realizing they have it.

## **D. FUNGAL AGENTS:**

### **1. Candida albicans:**

A fungus called Candida albicans can be found in trace levels in your mouth, skin, and intestines. If the yeast Candida is out of balance with the good bacteria in your body, it can cause diseases like thrush and vaginal yeast infections. Antifungal drugs are used to treat infections, which are frequent.[29]



**Fig.13. Candida Albicans**

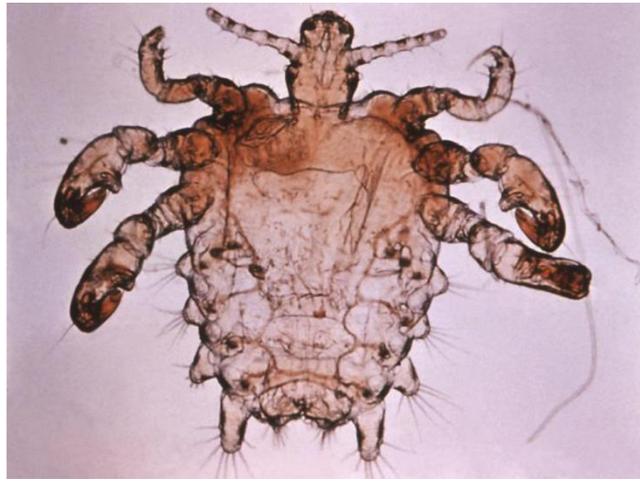
#### **• Symptoms and Causes:**

Where will my Candida albicans infection symptoms manifest? Candida albicans infections typically manifest as the following symptoms in environments where Candida naturally exists: within your throat and mouth, within the rectum and vagina, in the vicinity of an infant's diaper area (genitalia, buttocks, thighs), on skin folds such as those beneath your breasts, groin, and armpits.

## **E. ECTOPARASITES:**

1. Phthirus pubis
2. Sarcoptes scabiei

### **1. Phthirus pubis:**



**Fig. 14. Pththirus Pubis**

## **2. Sarcoptes Scabiei:**

Phthirus pubis, the pubic mite, is a sucking arthropod moved by close actual contact. Nibbles can bring about extraordinary bother for a few days, with each chomp causing a red papule. The parasites are effectively distinguished by nits and, additionally, upon visual examination of the organic entity in the research facility. Accommodation of the parasite in a perfect compartment and perception by light microscopy will yield the particular diagnosis [18]. The inclination of pubic lice and body lice for their specific specialties has to do with the length of the parasite legs with appended paws and the capacity to get a handle on the particular hair at that body site. Pubic lice, in light of their more limited leg and paw length compared to body lice, are simply ready to connect to hair in the genital region or eyelashes. Lice distinguished in both of these regions means a plausible, physically communicated disease that ought to be researched. Lice in youngsters is normal, and transmission happens among family members and classmates. Consequently, verifying the meaning of this microbe as an STI is necessary.[ 30]



**Fig. 15. Sarcoptes Scabiei**

*Sarcoptes scabiei* (/sar'koptiz sker'bi:a1/ Traditional English pronunciation of Latin) or the itch mite is a parasitic mite that burrows into skin and causes scabies. The mite is found in all parts of the world. Humans are not the only mammals that can become infected. Other mammals, such as wild and domesticated dogs and cats (in which

it is one cause of mange) as well as ungulates, wild boars, bovids, wombats, koalas, and great apes are affected. [31]

### Scientific classification

- Domain: Eukaryota
- Kingdom: Animalia
- Phylum: Arthropoda
- Subphylum: Chelicerata
- Class: Arachnida
- Order: Sarcoptiformes
- Family: Sarcoptidae

Genus: Sarcoptes The Italian biologists Giovanni Cosimo Bonomo and Diacinto Cestoni showed in the 17<sup>th</sup> century that scabies is caused by *Sarcoptes scabiei*; this discovery of the itch mite in 1687 marked scabies as the first disease of humans with a known microscopic causative agent. The disease produces intense, itchy skin rashes when the impregnated female tunnels into the stratum corneum of the skin and deposits eggs in the burrow. The larvae, which hatch in three to 10 days, move about on the skin, moult into a nymphal stage, and then mature into adult mites. The adult mites live three to four weeks in the host's skin. [32]

### ➤ COMMON STDS:

#### 1. Chlamydia:

Chlamydia trachomatis infection is the most frequently reported sexually transmitted infectious disease in the United States and continues to be an important risk factor for pelvic inflammatory disease [1], ectopic pregnancies, urethritis, cervicitis, chronic pelvic pain, and infertility. In 2007, there were 1,108,374 cases of chlamydia reported to the . [6] Black patients had an 8 times higher incidence than white patients. In women, the highest age-specific rates were among patients aged 15 to 19 years (3,004.7 cases per 100,000) and those aged 20 to 24 years (2,948.8 cases per 100,000). [33]



Fig. 16. Chlamydia

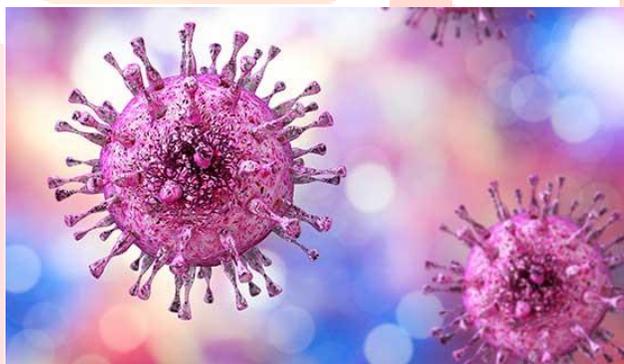
Typically, patients are asymptomatic and are unaware of an infection with *C trachomatis*. If symptoms are present in women, they typically include an odorless, mucoid vaginal discharge, usually with no external pruritus. In men, symptoms can include a clear to white urethral discharge usually observed in the morning before the first void of the day. Because other infections can present with the same symptoms, healthcare providers cannot use symptoms alone to diagnose a chlamydial infection.

Screening is recommended in sexually active nonpregnant and pregnant women aged  $\leq 24$  years and in nonpregnant and pregnant women aged  $\geq 25$  years who are at increased risk for STDs. The benefits of screening men versus the potential harms have not been established. [7]

Diagnosis can be performed via laboratory testing or point-of-care testing depending on the setting, sensitivity, specificity, ease of collection, and cost. Laboratory testing has a higher sensitivity but is not ideal for settings in which patient follow-up is not consistent; therefore, point-of-care testing is typically used in these cases.

## 2. Genital herpes:

Herpes simplex virus type 1 (HSV-1) and type 2 (HSV-2) infections are both chronic, lifelong viral infections. Approximately 50 million people in the United States are infected with HSV.4 Historically, HSV-2 has been the causative agent in the majority of genital herpes cases, but HSV-1 has become more prevalent, causing approximately half of first episode outbreaks.



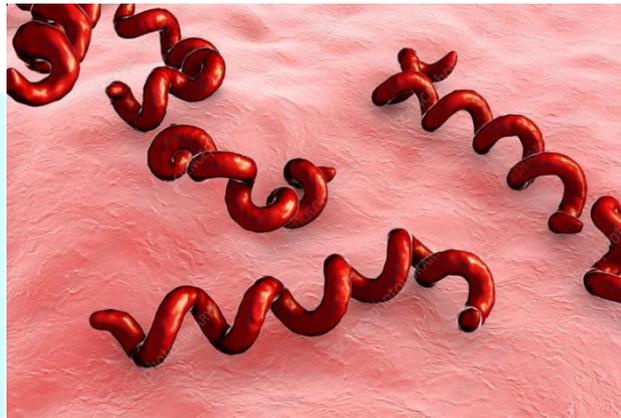
**Fig. 17. Genital herpes**

There is no difference in the symptoms of HSV-1 and HSV-2 infections in genital herpes. Prodromal symptoms, such as tingling, itching, paresthesias, and pain, are frequently felt by patients one to two days prior to the outbreak. For certain patients, antiviral therapy started at this time can reduce the likelihood of an epidemic. Antiviral therapy can be started as soon as lesions are detected. In five to ten days, the lesions usually heal without therapy. The six to twelve months following the initial outbreak are when HSV sheds the most, indicating the significance of early diagnosis and treatment commencement. In individuals who do not get antiviral medication, the first year following the outbreak may see 4 to 10 outbreaks. Generally speaking, patients with HSV-1 infections experience fewer outbreaks than screening for HSV is not routinely performed unless patients are at high risk, have a partner diagnosed with herpes, or have symptoms. Other infections presenting with genital ulcers include syphilis and chancroid.

Diagnostic testing for HSV is readily available; these tests include viral culture, polymerase chain reaction (PCR), and serology testing. Each test has limitations and advantages. Viral cultures are most useful in symptomatic patients with active lesions but within 2 to 3 days after an outbreak, lose sensitivity and are associated with a high rate of false negatives. Serology testing is important in distinguishing HSV-1 from HSV-2. If the patient has been recently infected, there is a chance of a false negative, so these patients need to be retested at a later date.<sup>[35]</sup>

### 3. Syphilis:

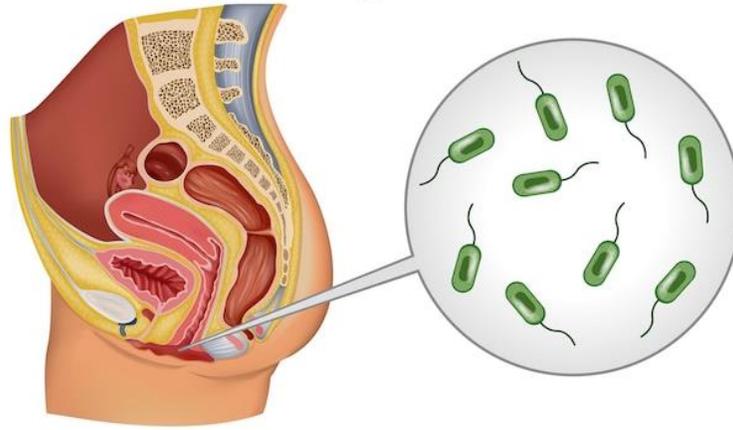
Syphilis is caused by the bacterium *Treponema pallidum*. Although syphilis incidence had decreased by 2000, the incidence of the disease has since increased; in 2007, a total of 11,466 cases were reported, an increase of 15% from 2006. The population most affected is MSM.



**Fig. 18. Syphilis**

Syphilis is characterized by different stages in light of the patient's introduction. The commencement of treatment is basic in essential and optional syphilis, which are the irresistible stages. Essential syphilis happens roughly 21 days after the openness and regularly presents as a chancre, generally nonpainful, at the site of the openness. Assuming it is left untreated, the chancre will recuperate all alone. Auxiliary syphilis presents roughly 4 to 10 weeks after the chancre; in 70% of patients, rash is the introducing side effect of patients looking for treatment.[ 36] Assuming that untreated during these stages, the side effects will self-resolve, yet the patient may then encounter early dormant or late idle syphilis. Separation between early idle and late dormant syphilis depends on when the patient's side effects happen; early inactive syphilis happens in something like 1 year of contamination, though late inactive syphilis happens later. Patients who have any focal sensory system (CNS) inclusion are considered to have neurosyphilis. Evaluating for syphilis is commonly performed when the patient presents with side effects, has had sex with a known tainted accomplice, has been determined to have different sexually transmitted diseases, or has taken part in other high-risk ways of behaving. In pregnant women, screening is ordinarily performed at the patient's most memorable pre-birth visit. The finding of syphilis is exceptionally mind-boggling and isn't within the scope of this article. The 2 kinds of tests utilized are nontreponemal and treponemal, and both are regularly utilized for determination and follow-up.[ 37]

#### 4. Bacterial vaginosis:



**Fig. 19. Bacterial Vagionisis**

A polymicrobial disease known as bacterial vaginosis (BV) accounts for 10% to 30% of instances of infectious varicella-vitis in women who are fertile. Gardnerella vaginalis, hominis, Mobiluncus species, Bacteroides species (apart from Bacteroides fragilis), and Peptostreptococcus species overgrowth is the cause of bacterial vaginosis. About half of women with BV may experience itching, burning, and frictional dyspareunia, and although 50% of them are asymptomatic, some of them complain of a malodorous vaginal discharge. It is unknown if there is a connection between BV and a sexually transmitted infection. On the other hand, women who do not engage in sexual activity do not typically have BV.<sup>38</sup> BV is typically linked to douching, having several partners or meeting someone new, and having little vaginal flow.

BV is analyzed using explicit clinical standards known as the Amsel rules. The 4 measures are: slender, homogenous, white release covering vaginal walls; presence of hint cells on minuscule assessment; pH of vaginal liquid  $>4.5$ ; and off-putting scent of vaginal release previously or after use of 10% KOH (i.e., the whiff test). Patients who meet three of the 4 rules have a 90% probability of having BV. Despite the fact that it is normally unreasonable in a center setting, a Gram stain of vaginal release can likewise be predictive of BV.<sup>[ 39]</sup> BV has been related to PID and numerous different complexities; in this manner, treatment of ladies who are suggestive is required (see Table 1 for treatment proposals). Generally, ladies will encounter repetitive BV. These ladies can be treated with similar suggested or elective regimens (metronidazole and clindamycin), but for longer timeframes (i.e., 10–14 days). Changing the treatment routine for a repeat of BV can likewise be thought of. Ladies with various repeats ought to be overseen by a subject matter expert. One review exhibited that ladies with intermittent BV who were treated with two times week after week metronidazole 0.75% vaginal gel for a considerable length of time effectively kept a clinical remedy for a very long time. Different examinations have surveyed oral or vaginal substitution of lactobacillus; however, no proof of a diminishing in repeat rates has been demonstrated.<sup>[ 40]</sup>

#### 5. Trichomoniasis:

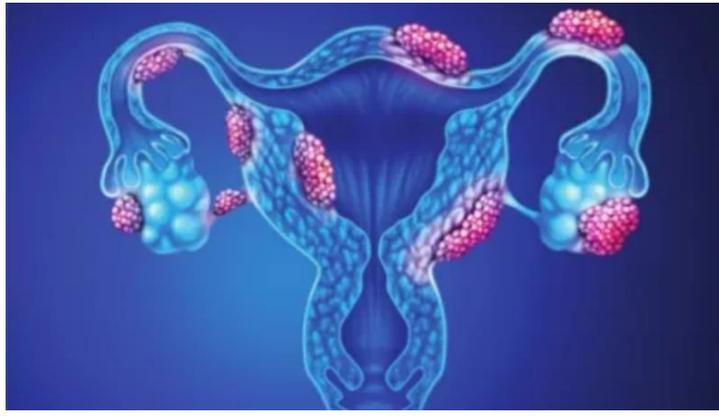


**Fig. 20. Trichomoniasis**

There are >170 million instances of trichomoniasis every year around the world, including >7.4 million new cases a year in North America. Trichomoniasis vaginalis [38] is the protozoan that causes trichomoniasis. Men who are contaminated might be asymptomatic or may have nongonococcal urethritis. Ladies who are tainted may have no or insignificant side effects. Ladies who are indicative have a diffuse, rank, yellow-green release alongside vulvar bothering. Microscopy of vaginal emissions is utilized most often as a symptomatic instrument, although this technique is simply 60% to 70% delicate for trichomoniasis. Many place-of-care tests are accessible for screening; however, these tests frequently bring about misleading outcomes, especially in low-predominance populations. For women [38], a culture of vaginal emissions is the most delicate and open strategy for determination when microscopy isn't decisive. For men, wet prep microscopy isn't valuable. A culture for *T. vaginalis* from urethral swabs, pees, and semen has the most elevated responsiveness. [37]

Just the nitroimidazoles metronidazole [39] and tinidazole are successful in treating trichomoniasis. Studies have exhibited that tinidazole 2 g is equal to or better than metronidazole 2 g. Tinidazole has been shown to have a more extended half-life than metronidazole and can accomplish higher fixations in genitourinary tissues. Metronidazole vaginal gel isn't as compelling as oral metronidazole [39], as it doesn't arrive at restorative levels in the urethra and vaginal organs. In spite of the fact that it has been exhibited that trichomoniasis is related to unfavorable results in pregnancy, there is no information supporting the speculation that treatment diminishes the possibilities of dismalness. At any rate, treatment will assist with lightening side effects in pregnant ladies, decrease the risk of additional sexual transmission, and may forestall disease in the infant. Patients being treated for trichomoniasis [40] should guarantee that their sexual accomplices are all additionally treated to stay away from additional contamination and transmission. Patients ought to likewise be instructed to stay away from sex until they and their accomplices have finished treatment and are asymptomatic.

## 6. PID : ( Pelvic Inflammatory disease ):



**Fig. 21. Pelvic Inflammatory Disease**

Pelvic inflammation of the upper female genital system, encompassing pelvic peritonitis, tubo-ovarian abscesses, endometritis, and salpingitis. It has been shown that *N gonorrhoeae* and *C trachomatis* are the causes of many PID cases. However, a number of microorganisms that are a component of the typical vaginal flora, including *Streptococcus agalactiae*, *Haemophilus influenzae*, enteric gram-negative rods, and *G vaginalis*, can also induce PID. PID may occasionally be brought on by the cytomegalovirus, *Mycoplasma genitalium*, *Ureaplasma urealyticum*, and *M hominis*. Testing for HIV, *C trachomatis*, and *N gonorrhoeae* is advised for all women diagnosed with acute PID.[41]

Contamination with PID can include many signs and side effects, so finding them can be troublesome. In any case, ideal determination and treatment are vital, as a deferral can result in provocative sequelae in the upper conceptive plot. Laparoscopy is exceptionally compelling for diagnosing salpingitis and explicit bacterial diseases. In any case, it isn't normal to utilize laparoscopy when the patient's side effects are obscure, and laparoscopy isn't promptly accessible in each center. Conclusions in light of clinical discoveries aren't exact, as there is certainly not a single key verifiable physical or lab finding that is explicit for PID, and blends of these could reject genuine instances of PID. Evaluating for PID ought to thusly incorporate the capacity to perceive when the sickness ought to be thought; other demonstrative strategies can then be used.[ 41][42] As a rule, all medicines for intense PID ought to cover *N. gonorrhoeae* and *C. trachomatis*, regardless of whether these organic entities are distinguished, since they might be available in the upper regenerative lot. Annihilation of anaerobes might forestall obliteration of tubal and epithelial cells; thus, antianaerobic treatment ought to be added to treatment regimens. Likewise, BV is oftentimes present alongside PID, so treatment regimens ought to incorporate metronidazole if fitting. Azithromycin has been read up as of late for this sign; clinical fix rates were shown to be equivalent to the rates seen with other treatment regimens, and azithromycin was related to preferred consistency over multidrug regimens. Despite the fact that ladies with gentle to-direct intense PID benefit from one or the other oral or parenteral therapy, the CDC proposes that ladies be hospitalized for parenteral therapy assuming any of the accompanying models are available: a careful crisis (e.g., an infected appendix) can't be precluded; the patient is pregnant; the patient has no clinical reaction to oral anti-microbials; the patient can't follow or endure a short-term oral routine; the patient is seriously sick with queasiness, spewing, or high fever; or the patient has a tubo-ovarian boil. The CDC's suggested treatment regimens for PID have been shown to have

a 90%, generally speaking, fixed rate.[ 42] The CDC's treatment suggestions recently included the utilization of fluoroquinolones, for example, levofloxacin and ofloxacin. In light of the irresistible idea of the causative specialists of PID, male sex accomplices ought to be dealt with assuming they have included sexual contact within the 60 days going before the lady's beginning of side effects. In spite of the fact that they might be asymptomatic, sex accomplices are probably going to have urethral gonococcal or chlamydial contamination. In this manner, treatment regimens for the accomplice ought to be viable against *N. gonorrhoeae* and *C. trachomatis*, too.

## CONCLUSION:

The number of STD cases reported in the US has increased despite numerous attempts to raise patient awareness of these conditions. Patients who have a high risk of sexually transmitted infections (STDs) should get regular counseling and education on the lifestyle choices that increase their risk. Patients' partners should receive therapy in addition to themselves for STDs. In general, screening and counseling should be done often on patients, particularly the younger population, in order to guarantee early diagnosis and treatment.

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