Sexually Transmitted Diseases: What Nurses Need to Know
STD/STI Prevention and Treatment

LEARNING OUTCOME AND OBJECTIVES: Upon completion of this course, you will be better prepared to care for patients with sexually transmitted diseases/infections (STDs/STIs). Specific learning objectives include:

- Identify recent trends in STDs/STIs.
- Describe the clinical settings in which patients may present with STDs/STIs.
- Discuss the organisms that cause STDs/STIs and their modes of transmission.
- Explain the general diagnostic process and presenting symptoms of STDs/STIs.
- Summarize diagnostic methods, treatment options, and prevention measures for specific infections.
- Describe public health principles and strategies for preventing the spread of STDs/STIs.
- Discuss specific measures for treating victims of sexual assault.
- Explain emotional and psychological issues affecting patients and their sexual partners.

INTRODUCTION

Ironically, sexual activity, a source of human enjoyment for many, is linked to some of the most feared diseases of humankind. To combat spread of these infections, many cultures have regulated or restricted sexual practices.

Scientific study has revealed the causes of sexually transmitted diseases/sexually transmitted infections (STDs/STIs), the conditions in which they thrive, effective treatments, and means for
preventing their spread. Such knowledge is vital to the health and well-being of people everywhere, particularly for providers of healthcare.

During sexual contact, skin and mucous membranes are rubbed together. These surfaces are warm and moist, and they often have small cuts, fissures, or abrasions. This makes sexual contact an ideal mode for passing certain microorganisms from person to person. Since sexual activity, both consensual and nonconsensual, is common, sexually transmitted diseases and infections are widespread. STDs/STIs are common reasons for patients to visit healthcare practitioners’ offices, clinics, urgent care centers, and emergency departments.

STDs/STIs tend to coexist with one another. Behavior that puts a person at risk for one STD/STI may predispose them to having more than one infection (Biało-Wójcicka et al., 2017). People simultaneously have two or more STDs/STIs more often than would be predicted by chance. Genital warts (condyloma acuminata), for instance, often occur with genital herpes infections, and chlamydial infections are frequently found with gonorrhea.

Direct, individual medical treatment for all sexual partners is a key factor in the attempt to slow the spread of STDs/STIs. As a rule, bacterial infections can be cured by a visit to the doctor’s office or clinic when treated with antibiotics.

But more is needed than the treatment of individual patients and their partners to slow the spread of STDs. The control of STDs/STIs must have both an individual and a societal focus. For individual patients, the medical goal is to protect the patient’s health and to ensure their future ability to have children, if they wish. For society, the medical goal is to protect uninfected people by:

- Making sufficient care available to treat infected individuals quickly, effectively, and affordably
- Encouraging the notification and examination of potentially infected sexual partners, including expedited partner therapy (Nanhoe et al., 2018)
- Teaching people that barrier methods of protection (e.g., condoms), while not 100% effective, are important safeguards during sexual contact

The microorganisms that spread through sexual contact can cause disease at a variety of locations in the body. This course will focus on those sexually transmitted infections that cause most of their clinical problems locally, in the genital and lower urinary tracts. The genital STDs/STIs include, for example, chlamydial, syphilitic, and gonorrheal infections.

In contrast, other STDs/STIs cause most of their clinical problems systemically or at a distance from where the microorganisms first entered the body. HIV/AIDS, for instance, disables the immune system and causes clinical problems throughout the body. Hepatitis B can be spread by sexual intercourse and causes primarily liver diseases.
TERMINOLOGY

The terms STDs and STIs are usually used interchangeably or are in equal usage by healthcare personnel and in healthcare literature. This course groups both sexually transmitted infections and their diseases into one category called STDs/STIs.

The term venereal disease (VD) is more commonly used to refer to historical discussions of STDs/STIs or may be used more commonly in other countries (Merriam-Webster, 2018).

SCOPE OF THE PROBLEM

Statistics on STDs/STIs are particularly concerning because cases are increasing despite educational efforts and readily available condoms. There is also a growing misconception that STDs/STIs cannot be spread by oral and anal routes of administration.

However, statistics only partially represent the actual occurrence and subsequent impacts of STDs/STIs, as many cases go unreported or undiagnosed. Cases that are undiagnosed will go untreated until they are discovered and adverse effects begin to show.

Recent Trends in STD/STI Cases

Any discussion of the current state of affairs of STDs/STIs in the United States must consider recent trends, with data showing that the most common STDs/STIs are rapidly being spread. Chlamydia has been the most commonly reported STD/STI in the United States for the past several years, and the occurrence of chlamydia and the next two most common STDs/STIs (gonorrhea and syphilis) has increased phenomenally in recent years (CDC, 2018a).

According to the Centers for Disease Control and Prevention, a steep (31%) combined increase of chlamydia, gonorrhea, and syphilis was observed from 2013 to 2017. Together, there were 2.3 million newly diagnosed cases of these three diseases in 2017 alone, up from 1.8 million reported cases in 2013.

- **Chlamydia** was the most commonly reported STD/STI in the United States in 2017, with an occurrence of 1.7 million cases.
- In the same 5-year period, **gonorrhea** showed a 67% increase, with 555,608 new cases reported to the CDC in 2017, up from 333,004 in 2013.
- **Syphilis** showed a 76% increase, with 30,644 newly diagnosed cases reported in 2017, up from 17,375 in 2013.

Although not the most common STD/STI, gonorrhea is of particular concern because recent strains are resistant to many antibiotic classifications. Gonorrhea’s ability to develop resistance to treatments such as extended-range cephalosporins raises worries that the infection could become untreatable. It is thus more important than ever to develop new antibiotics to treat the
infection effectively. Other emerging STDs/STIs, although currently low in occurrence, are of similar concern due to resistance to antibiotics (Blank & Daskalakis, 2018; Singh et al., 2018; Taylor et al., 2018).

**MULTI-DRUG RESISTANT AND EXTENSIVELY DRUG-RESISTANT**

A developing problem in the area of infection control is that certain strains of STDs/STIs are becoming resistant to the antibiotics that have been traditionally used to treat them. *Multi-drug resistant* (MDR) refers to organisms that are no longer affected by specific antibiotics to which they were previously sensitive. *Extensively drug-resistant* (XDR) means nonsusceptibility to at least one antibiotic in all but two or fewer antimicrobial categories. *Pan-drug resistant* denotes nonsusceptibility to all antimicrobial drugs (Basak et al., 2016).

The above terms usually refer to tuberculosis or methicillin-resistant *Staphylococcus aureus* (MRSA), but resistant STIs are becoming an ever-increasing problem, particularly gonorrhea. Resistant infections are taken very seriously by those in healthcare, and experts from the National Coalition of STD Directors have called for a radical increase in funding to research incidences of drug-resistant STDs/STIs and promote prophylaxis.

**Emerging STDs/STIs**

There are several infections that are emerging as STDs/STIs because the routes of transmission are sometimes sexual. Because the usual and expected routes are by food, vector, or droplet, rather than sexual, this poses a significant epidemiologic challenge for healthcare workers to anticipate, identify, and contain these infections when they are transmitted sexually. The person transmitting the infection may not realize either that they are infected or that they can transmit the infection to another person via sexual contact.

*Mycoplasma genitalium* is a slow-growing bacterial infection that was first identified in the early 1980s as an STD/STI. *M. genitalium* has a national prevalence as low as 1%. But it has most recently become an STD/STI of concern since a drug-resistant strain has been discovered for which the common drug used for many STDs/STIs, azithromycin, is ineffective. This is a potentially urgent infection control issue, as *M. genitalium* can result in urethritis in men, cervicitis, pelvic inflammatory disease, and preterm birth. However, there are currently no recommended screening parameters for *M. genitalium* in the United States (Allan-Blitz et al., 2018).

There are many other established microorganisms that are beginning to be considered as the cause of STDs/STIs because of their transmission via sexual practices.

*Shigellosis* is a bacterial infection that occurs when the various types of the bacteria shigella cause diarrhea. It is sexually transmitted through the oral-anal or digital-anal routes of contact. Shigella emerged as an STD/STI in the 1970s predominantly in the MSM (men who have sex with men) population.
N. meningitidis causes invasive meningococcal disease (IMD). It is spread principally by droplet transmission and infection of respiratory tissue. Approximately 5% to 10% of the healthy adult population are carriers of this bacterium nasopharyngeally, which explains the emergence of this infection as orally transmitted. The presence of this bacteria in the urogenital tract may be caused by oral-genital sex.

Ebola virus has been increasingly transmitted in male-to-female sex because of the increasing numbers of male Ebola survivors due to more successful treatment. The virus has been found to persist in an active, transmissible form in semen for several months. Female-to-male transmission of the Ebola virus is theoretically possible but has not yet been documented.

The Zika virus has been found to be transmitted orally, anally, and vaginally via infected sexual partners who recently travelled to endemic areas. Although Zika virus infection is usually caused by exposure to the bite of the Aedes mosquito, recent evidence shows that sexual transmission is now well-documented and causes considerable problems with containment (Bernstein et al., 2017).

Epidemiology of STDs/STIs in the United States

Within the United States, some STDs/STIs (such as chlamydia, genital HPV, and genital herpes) are distributed widely and homogeneously. In contrast, gonorrhea, HIV, and hepatitis B are typically concentrated in closely interacting networks of people who have more than one sexual partner.

However, the actual numbers of STD/STI infections can only be estimated. Although the frequency of new cases of certain STDs/STIs is monitored by the CDC, figures for the prevalence and incidence of even the monitored STDs/STIs are inexact because they are asymptomatic or unreported.

BY AGE

Age is an important predictor of STDs/STIs. People of all ages can have STDs/STIs. At one end of the age spectrum, infants can be infected perinatally and children can acquire STDs/STIs through sexual abuse. At the other end, older adults can get STDs/STIs by not using barrier protections (male or female condoms) or unwittingly from unfaithful spouses.

In all areas and groups, adolescents and young adults acquire STDs/STIs at disproportionately high rates. While they represent just over 25% of the sexually active, those ages 15 to 24 account for half of the 20 million new sexually transmitted infections that occur in the United States each year (CDC, 2017a). Approximately 50% of sexually active adolescents (49% of young men and 51% of young women) will have at least one STD/STI by age 25.

Certain activities prevalent in the adolescent population put them at higher risk for exposure to STDs/STIs: new or multiple or anonymous sexual partners, concurrent illicit drug use (especially methamphetamines), men who have sex with men, and HIV-positive status (CDC, 2018b). Rates
of oral and anal sex are also rising among adolescents wishing to avoid pregnancy and the loss of virginity, and these practices may lead to oral, throat, and anorectal STDs/STIs.

All 50 states and the District of Columbia allow minors to consent to treatment for STDs/STIs without informing or obtaining consent from parents (Long et al., 2018).

According to data from the CDC, reported cases of some STDs/STIs have also been rising among adults ages 65 years and older. While the actual number of cases may be low relative to other age groups, the rise in rates of infection may be high. For example, among men in this age group, the number of reported cases for gonorrhea more than doubled from 2.9 per 100,000 in 2012 to 6.7 per 100,000 in 2016.

Despite this trend, stereotypes about aging and sexuality may cause health professionals to overlook the possibility of STDs/STIs, such as HIV/AIDS, among older adult patients, which may put such individuals at greater risk for transmission (Pascoal et al., 2017). One study found that 73% of adults ages 57 to 64, 53% of ages 65 to 74, and 26% of ages 75 to 85 were sexually active (Cirillo, 2018).

Among those STDs/STIs whose rate is increasing, CDC statistics (2018b) show a higher incidence of gonorrhea and syphilis in men (especially MSM) than women and a higher incidence of chlamydia in women than men in newly reported cases.
Gonorrhea—rates of reported cases by sex, United States, 2008–2017. (Source, CDC, 2018b.)

Primary and secondary syphilis—distribution of cases by sex and sexual behavior, 2017. (Source, CDC, 2018b.)
Currently, STDs/STIs occur more frequently in certain identifiable racial/ethnic subpopulations. Rates of new cases of chlamydia, gonorrhea, and syphilis, for instance, are highest in African Americans. African American (black) women show 5 times the rate of chlamydia than white women. African American (black) men show 6.6 times the rate of chlamydia than white men. American Indians/Alaskan Natives show 3.7 times the rate of chlamydia than the white population. Hispanics show 1.9 times the rate of chlamydia than the white population (CDC, 2018b).

(Comparative statistics are not available for all STDs.)
AMONG MSM

The incidence of many STDs/STIs in gay, bisexual, and other men who have sex with men—including primary and secondary syphilis and antimicrobial-resistant gonorrhea—is greater than that reported in women and men who have sex with women only (MSW). In addition to the negative effects of untreated STDs/STIs, elevated STD/STI burden is of concern because it may indicate high risk for subsequent HIV infection. Annual increases in reported STD/STI cases could reflect increased frequency of behaviors that transmit both STDs/STIs and HIV (e.g., condomless anal sex), and having an STD/STI increases the risk of acquisition or transmission of HIV.

The relatively high incidence of STD/STI infection among MSM may be related to multiple factors such as the number of lifetime or recent sex partners, rate of partner exchange, and frequency of condomless sex. Furthermore, experiences of stigma (verbal harassment, discrimination, or physical assault based on attraction to men) are associated with increased sexual risk behavior among MSM.

Disparities among MSM reflect those observed in the general population, with disproportionate incidence of STDs/STIs reported among racial minority and Hispanic MSM, MSM of lower socioeconomic status, and young MSM. The higher burden of STDs/STIs among MSM with these characteristics, relative to the general population of MSM, may suggest distinct mixing patterns in their sexual networks, reduced access to screening and treatment, and differential experiences of stigma and discrimination, rather than greater numbers of sexual partners or frequency of condomless sex.

With the exception of reported syphilis cases, nationally notifiable STD/STI surveillance data do not routinely include information on sexual behaviors, and these data are missing for the majority of gonorrhea and chlamydia cases reported to CDC. Therefore, trends in STDs/STIs among MSM in the United States are based on findings from sentinel and enhanced surveillance systems (CDC, 2018g).

SEXUAL MINORITIES AND STDs/STIs

Adults who report any same-sex contact have higher lifetime counts of STDs/STIs. There is a higher incidence of STDs/STIs among sexual minorities (nonheterosexual) than in the heterosexual population, which is related to several different factors: lower self-perception of STD/STI risk, higher infection rates in earlier life stages, minority stress, and financial barriers (Ritter & Ueno, 2018).
CLINICAL SETTINGS WHERE PATIENTS MAY PRESENT WITH STDs

Maternal-Child Visits

Pregnant women and mothers represent a vulnerable population with regard to education, prevention, and treatment of STDs/STIs. The presence of STDs/STIs in pregnant women and new mothers can have far-reaching maternal-child health consequences, including adverse genital symptoms, complications of pregnancy, infertility, enhanced HIV transmission, and psychosocial effects.

- Many STDs/STIs, such as HIV or herpes, can be transmitted to the fetus or newborn (see below).
- Some STDs/STIs, such as the HIV virus, have been isolated in breast milk, causing seroconversion to HIV positive in infants who tested negative at birth.
- Infertility may result from STDs/STIs such as gonorrhea and chlamydia. Both of these infections may also lead to pelvic inflammatory disease (PID) that can cause scarring in the fallopian tubes.

Women may also experience few or no symptoms with an STD/STI, allowing negative outcomes such as infertility and advanced infections to proceed unchecked.

Data collection on the prevalence and location of large groups of infected or potentially infected women, mothers, and prospective mothers serves to focus allocated education funds in order to better prevent and treat STDs/STIs in this population (Torrone et al., 2018).

PRENATAL CARE

Prenatal care is an essential part of treatment and prevention to ensure the health of the mother and the baby. Testing is performed for early recognition of potentially harmful conditions and outcomes, some that are easily treated or prevented. Prenatal visits are an opportunity for obstetrical practitioners to give the expectant mother or parents information needed for a healthy, successful delivery and postpartum period.

Many STDs/STIs are discovered during prenatal care, and treatment can be initiated or conducted on the spot. Otherwise, many STDs/STIs can have poor outcomes for the fetus or newborn. Untreated HIV infection, especially if women have not had prenatal care, is significantly associated with stillbirths (3.3x), preterm births (1.5x), small for gestational age (1.3x), and low birthweight (1.62x) babies. C. trachomatis and N. gonorrhoeae are also associated with premature rupture of membranes, preterm deliveries, fetal demise, and low birthweight (Moodley et al., 2017).
NEWBORNS

Newborns are subject to many of the STDs/STIs with which the mother is infected. For example, a newborn born of a gonorrhea-infected mother can be born with gonococcal conjunctivitis (ophthalmia neonatorum). Untreated, this can lead to permanent blindness. For this reason, prophylactic eye ointment (erythromycin) is given at birth unless the parents object. A woman who is positive for the herpes simplex virus can transmit this infection to a newborn during a vaginal delivery if she has genital shedding of the virus (Lewis et al., 2017).

MOTHER-TO-CHILD HIV TRANSMISSION

Mother-to-child HIV transmission accounts for over 90% of all pediatric HIV cases, although this is preventable. The most important aspect of prevention is that the mother strictly adhere to her ordered antiretroviral therapy long-term in the prenatal period (Fairbanks et al., 2018).

The risk of in utero or during delivery transmission is 15% to 30% without prophylactic measures. The risk is reduced to 2% with a cesarean section as the method of delivery (if the maternal viral load is >1,000 after 34 weeks’ gestation), withholding breastfeeding, and administration of zidovidine to the newborn for 4 weeks starting in the delivery room (Leopoldino et al., 2017).

The rate of transmission of a child becoming positive for the HIV virus is 24% to 42% through breastfeeding (Leopoldino et al., 2017). Pregnant women who are HIV positive need thoughtful instruction to support healthy practices that will benefit the mother and prevent the child from becoming HIV positive.

CIRCUMCISION AND HIV

In the United States, 55% to 65% of neonatal males are circumcised, a figure that varies by region, with the lowest occurrence in the western states and the largest number in the north/central states (Hirsch, 2016). Male circumcision is among the lesser-known long-term preventive measures for HIV, with males who have been circumcised less likely than uncircumcised males to become infected by the HIV-1 strain. Circumcision may also reduce the person’s later risk of developing penile cancer, urinary tract infections, and genital ulcers. In contrast, circumcision does not appear to provide any protection against HSV-2, syphilis, or gonorrhea.

Although the reduction in HIV-1 infection is as much as 60%, the biological mechanisms that cause this are poorly understood. One hypothesis is that removal of the foreskin exposes the glans to air, removing the subclimate that may cause epithelial barrier disruption, enhanced dendritic cell maturation, and the recruitment/activation of neutrophils and susceptible CD4 T cell subsets such as Th17 cells. In other words, the climate that would promote susceptibility to the HIV virus is removed (Prodger & Kaul, 2017).
Routine Gynecology and Well-Adult Visits

Routine healthcare visits such as annual gynecology visits are an opportune time for the healthcare professional to inquire about preventative measures such as the use of condoms. The female patient can be educated about the use of condoms to prevent most STDs/STIs in addition to unwanted pregnancies.

Male patients undergoing a routine physical examination also can be educated regarding STDs/STIs. For instance, the use of male condoms is an important deterrent for pregnancy and STD/STI transmission, necessitating extensive efforts to teach male sex partners in using condoms consistently, particularly among those with multiple partners. Access to such education programs and condoms is key to preventing unwanted pregnancy and STD/STI transmission (Rink et al., 2017).

(See also “Preventing the Spread of STDs/STIs” later in this course.)

Pediatric Care

It is possible for children to become positive for any of the STDs/STIs. Prevention is a different consideration for this age group, since the sexual act cannot legally be consensual and the usual prevention methods, such as condoms, are not an expectation for children to obtain or use. Each state has its own age of consent that may also consider the difference in age of the participants. Federal law states it is criminal to engage in any sexual act with someone 16 or younger if the other party is at least four years older.

While sexual acts are the primary means for children to contract STDs/STIs, there is the possibility of other means of transmission. Children can contract STDs/STIs from birth, sexual assault, and direct contact with a syphilitic lesion or contaminated articles of daily use. Although sexual activity is the main cause of STDs/STIs in children, close contact with family members who are infected can also be a source of transmission (Long et al., 2018).

Some healthcare personnel, such as sexual assault nurses, are specially trained to perform and assist with sexual assault examinations on children and to conduct forensic evidence collection when a sexual assault is suspected. Privacy and support are important considerations if a child must undergo this procedure. If sexual assault is determined to have occurred, counseling with a trained pediatric practitioner must be arranged. (See also “STD/STI Protection for Victims of Sexual Assault” later in this course.)

Adolescent Care

Adolescents may receive healthcare and advice for STDs/STIs in a variety of settings: a physician’s office, the school nurse’s office, an urgent care clinic, or a community or public health clinic. Healthcare professionals may introduce adolescents to websites specifically for that age group that provide education on birth control, use of condoms, signs and symptoms of STDs/STIs, routes of transmission, and available treatment.
A health belief model approach to STD/STI education has proved to be effective in teaching adolescents about STDs/STIs and to result in changed long-term attitudes and beliefs. According to this model, a person is more likely to seek healthcare if they perceive a health risk, believe the suspected disease is severe, trust that the treatment will be beneficial, understand any barriers or limits to the proposed treatment, and are following a suggestion to be seen. The instruction is also more effective if the person’s knowledge and attitudes are assessed before the instruction. A short-term class can prove more effective, with better attention paid to the topic and better retention of the information (Jalilian et al., 2014; Vassou & Lavranos, 2017).

**Urgent/Emergent Care**

STDs/STIs are not always treated in the physician’s offices, as was more common in the past. The rise of urgent care centers as a more convenient method for the delivery of healthcare attracts patients in large numbers. The wait is often shorter than making an appointment with a physician, the cost is often less, and reporting and obtaining treatment for an STD/STI may be less embarrassing if the healthcare practitioner is someone unfamiliar. Thus, urgent care has become an important venue for the treatment of STDs/STIs. Some facilities advertise STD/STI testing and treatment or promise “judgment-free care” (practicevelocity, 2016).

Similarly, and often in the absence of health insurance, emergency departments (EDs) are the “safety net” for obtaining healthcare diagnosis and treatment. The use of EDs for the diagnosis and treatment of STDs/STIs has increased 39% from 2008 to 2013. However, this setting is an unnecessarily expensive one for obtaining the simple diagnostic and treatment parameters required for this diagnosis. Other problems identified with STD/STI treatment in this clinical setting include inadequate prescribing of antibiotics, leading to possible drug resistance in the microorganism, and insufficient follow-up care and partner notification (Rosa, 2017).

**SEXUAL ASSAULT / SEX TRAFFICKING / INTIMATE PARTNER VIOLENCE CARE SITES**

Victims of sexual assault, sexual trafficking, and intimate partner violence (IPV) will often seek help or be taken to the closest ED for diagnosis and treatment. In the case of sexual assault, the police or physician (depending on state laws) may call in a Sexual Assault Nurse Examiner (SANE) or Sexual Assault Response Team (SART) clinician who is trained in forensic evidence collection. If the victim of sexual trafficking is underage, Child Protective Services will be notified. All persons visiting the ED are asked, “Is anyone at home hurting you?” or “Do you feel safe at home?” to determine whether there is a case of IPV. All of these patients will be tested for STDs/STIs.

Trichomoniasis, HBV, gonorrhea, and chlamydial infection are the most frequently diagnosed infections among women who have been sexually assaulted. Part of the treatment for such patients in the ED is to test for all of these STDs/STIs. In some states the perpetrator will be tested for STDs/STIs as well. If such an assault will result in a trial, evidentiary privilege in some states prevents the need for revealing what tests and treatment were performed (CDC, 2015a).
Elder Care

Older adults (≥65 years) are often incorrectly presumed to be postsexual, and physicians have been found to be less likely to question the elderly about sexual activity and the use of condoms (McDaniel, 2016). However, understanding has evolved in regard to sexual activity, sexual orientation, and STD/STI risk among older adults.

Although the frequency of sexual activity typically declines with age, many older adults continue to engage in sexual activities. Between 20% and 30% of men and women continue to be sexually active into their 80s. Sexual activity among older adults is supported by pharmacologic advances in the availability of medications to treat erectile dysfunction and vaginal dryness.

Continued sexual activity into the elder years has been accompanied by a steep rise in STDs/STIs in this population. One cause of this increase is a lower usage of condoms due to the lack of risk for unwanted pregnancy (Goldberger, 2018; Ritter & Ueno, 2017). But unless a couple is monogamous, unprotected sex increases the risk of infection with HIV or other sexually transmitted diseases from multiple sexual partners. Thus, prevention education and assessment for STDs/STIs remains a concern in this practice setting.

ORGANISMS THAT CAUSE GENITAL STDs/STIs

<table>
<thead>
<tr>
<th>COMMON GENITAL STDs</th>
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<tr>
<td><strong>Bacterial infections</strong></td>
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<tr>
<td>• Chlamydial (<em>Chlamydia trachomatis</em>)</td>
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<td>• Gonorrhea (<em>Neisseria gonorrhoeae</em>)</td>
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<tr>
<td>• Syphilis (<em>Treponema pallidum</em>)</td>
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<tr>
<td><strong>Viral infections</strong></td>
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<td>• Genital herpes (herpes simplex virus HSV-1 or -2)</td>
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<tr>
<td>• Genital warts (condylomata acuminata) (human papilloma virus, or HPV)</td>
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<td>• Human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS)</td>
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<tr>
<td><strong>Parasitic/Protozoan infections</strong></td>
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<tr>
<td>• Pubic lice (<em>Phthirus pubis</em>)</td>
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<td>• Itch mite (<em>Sarcoptes scabiei</em>)</td>
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<tr>
<td>• Trichomoniasis (<em>Trichomonas vaginalis</em>)</td>
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Bacteria

Fewer Americans have bacterial and protozoal STDs/STIs than viral infections. Bacterial infections are curable. The three bacteria discussed below are frequent causes of genital STDs/STIs in the United States:

**CHLAMYDIA TRACHOMATIS**

*C. trachomatis* is an intracellular parasitic bacterium that infects the lining of the urethra, cervix, epididymis, and Fallopian tubes and causes chlamydial urethritis, cervicitis, and pelvic inflammatory disease, potentially leading to infertility or ectopic pregnancies. Rarely, chlamydia can also cause preterm delivery or peri-hepatitis (Fitz-Hugh-Curtis Syndrome). In the lining of the urethra, it causes the most common form of nongonococcal urethritis. In young men, chlamydial infections are the most common cause of epididymitis (CDC, 2015q, 2018a).

**NEISSERIA GONORRHOEAE**

*N. gonorrhoeae* is a diplococcus that causes gonorrhea, which can infect the urethra, Bartholin’s glands, cervix, epididymis, and Fallopian tubes. Oral sex can lead to gonococcal pharyngitis and anal sex to gonococcal proctitis. Untreated gonococcal infections can cause PID, potentially leading to infertility or ectopic pregnancies in women and epididymitis in men. In the newborn, it manifests as a conjunctivitis that can cause blindness.

**TREPONEMA PALLIDUM**

*T. pallidum* is the bacterium that causes syphilis. The disease usually begins with a single, painless skin chancre (i.e., an ulcer) that appears on the genitals or mouth, which, if untreated, can progress. The progression of the disease is slow but potentially fatal if untreated because of potential damage to the brain, heart, or nervous system. Congenital syphilis is now referred to as a mother-to-child transmission and is projected to be eliminated from countries with limited resources by rapid method testing and a single injection of penicillin given antepartum (WHO, 2015a).

Viruses

Viral STDs/STIs do not always produce overt symptoms. Estimates suggest that tens of millions of Americans (perhaps one fifth of the American population) have viral sexually transmitted infections, mainly HPV and HSV, with genital HPV being the most common sexually transmitted microbe in the country. The following three viruses cause most of the viral genital STDs/STIs in the United States:

**HERPES SIMPLEX VIRUS**

HSV comprises two types: HSV-1 and HSV-2. People with genital HSV infections can have recurring outbreaks of the disease (genital herpes), which are typically shallow erosions that appear as clusters of vesicular lesions that rupture into painful ulcers. As they heal, herpetic
ulcers become crusty. Genital herpes can occur throughout the anogenital and perineal region as well as the mouth in the case of oral sex. People infected with genital HSV can shed the virus and transmit the disease even when they have no apparent skin lesions. The frequency of outbreaks can be decreased by antiviral drugs (Ritter & Ueno, 2018).

HUMAN IMMUNODEFICIENCY VIRUS

HIV infections deplete the immune system of a subclass of T lymphocytes called CD4 cells. Eventually, the immune system can become so ineffective that cancers and opportunistic infections (OIs) by other organisms can get a foothold and spread. At this stage, the HIV-infected person is said to have developed AIDS (AVERT, 2018b). HIV can be transmitted through sexual contact, and in the case of AIDS, the secondary urinary and genital tract diseases that can develop include OIs of the vulva, vagina, cervix, prostate, epididymis, and testes, and cancers of the cervix and testes. An HIV infection also makes the acquisition of other STDs/STIs more likely (US. DHHS, 2018b). The disease progression in HIV/AIDS can be slowed by antiretroviral drugs (Ritter & Ueno, 2018).

HUMAN PAPILLOMAVIRUS

More than 40 types of HPV infect humans. HPV infections can be sexually transmitted even when an infected person has no visible symptoms and even if a condom is used. The common types of genital HPV infections can cause anogenital warts, called condyloma acuminata. Less common types of genital HPV infections appear to cause cervical, vulvar, or penile cancer. HPV infections often disappear spontaneously or may need to be excised (CDC, 2017l). However, HPV is uncurable.

CASE: HPV

Regina works as a nurse in an urgent care clinic and teaches classes in the evenings for young women in the local community. At the beginning of a class on STDs/STIs, she overhears two teenage girls arguing as she walks around the room handing out pamphlets:

Girl #1: “I didn’t get anything from him. He didn’t have anything on him when we had sex. I checked when I put on the condom!”

Girl #2: “You can still get warts from someone even if they don’t have any that show.”

Girl #1: “No you can’t. That’s so lame!”

Regina hadn’t planned to cover this topic in class tonight, but she decides this is a good opportunity to incorporate content that will counteract this misinformation without singling out Girl #1. She will let everyone know that some STDs/STIs, including genital warts caused by HPV, can be transmitted to a sexual partner even if the infected partner is asymptomatic. Other STDs/STIs, such as HPV, that are transmitted skin-to-skin can also be acquired even if a condom is used (Merck, 2018).
Protozoa

One protozoan, *Trichomonas vaginalis*, commonly causes genital STDs/STIs. Globally, this is the most common nonviral STD/STI. *T. vaginalis* lives inside cells along the lower genital tract of females and along the urethra and the prostate of males. Symptoms of trichomoniasis are more common in women; vaginitis is the typical clinical manifestation but symptoms can also include vaginal discharge, bleeding, itching, or pain on urination. It is usually asymptomatic in men, but when they do have symptoms, they will appear as urethral discharge or pain upon urination or ejaculation. Trichomoniasis can be cured with oral antiprotozoal drugs such as metronidazole (Flagyl) or tinidazole (Tindamax) (Reed-Guy & Jewell, 2016).

Exoparasites

Two body surface parasites cause common STDs/STIs: pubic lice (*Phthirus pubis*) and itch mite (*Sarcoptes scabiei*) infestations.

Pubic lice, also called *crabs* or *pediculus pubis*, live alongside coarse human hairs on which they lay their eggs (nits). Pubic lice cause itching and skin irritation, and an infestation of pubic lice is treated with topical insecticides (MDH, 2018).

Itch mites cause the skin disease scabies. In scabies, mites burrow into the upper layer of the skin, where they lay eggs and cause a rash and intense itching. Scabies is also treated with topical insecticides. This disease is not confined to genital areas and is usually diagnosed by visual inspection and history (MDH, 2018).

Characteristics of Organisms Causing STDs/STIs

STDs/STIs are infections that can be acquired through genital, anal, and oral sexual contact. They have at least two special characteristics. First, the microbes causing these STDs/STIs are not normal residents of the human urogenital tract. Second, STD/STI microbes are especially dependent on sexual contact for transmission (CDC, 2017f).

Non-STD/STI urogenital infections usually do not have these two characteristics. For example, *Candida albicans* causes vaginitis (a yeast infection), and it can sometimes be transmitted sexually; nonetheless, candida is not usually categorized as an STD/STI. This is because candida is normally found in the human urogenital tract, where it is a normal inhabitant of the vagina (as well as the rectum and the mouth).

STDs/STIs tend to be fastidious, and they thrive only in limited environments. Their dependence on sexual contact derives from:

- The nature of sexual contact, in which warm, moist skin and mucous membranes are rubbed together
- The potential porosity of the contacting body surfaces, which easily acquire small abrasions, cuts, tears, or fissures
Coexistent Genital Infections

The presence of one STD/STI makes the coexistence of another STD/STI more likely. For example, gonorrhea and chlamydia are found together so often that a patient diagnosed with gonorrhea is routinely treated for chlamydia with no other supporting evidence.

STD/STI clinics and other medical facilities that specialize in treating these infections know that typical STD/STI symptoms can be caused by non-STD/STI organisms and that the identification of one STD/STI does not rule out the concurrent existence of others or of non-STD/STI infections.

Risky behaviors such as condomless sex, multiple sex partners, and leaving STDs/STIs untreated can result in having two or more STDs/STIs. Embarrassment may also cause these diseases to go unreported, increasing the possibility of contracting another STD/STI while infected. Since many of these have subclinical or no symptoms, particularly in women, multiple STDs/STIs are a frequent occurrence.

Although not one of the more common STDs/STIs, *Mycoplasma genitalium* (*M. genitalium*) occurs much more frequently in people with HIV/AIDS than it occurs alone. Women with *M. genitalium* tend to shed more HIV-positive cells in their vaginal fluid, causing a greater possibility of transmitting the HIV virus to sexual partners. The cervical inflammation caused by *M. genitalium* may also leave the woman more susceptible to contracting HIV (Madsen, 2017). Similarly, women who are seropositive for HIV are 2.5 times more likely to test positive for HSV-2 genital shedding (Moodley et al., 2017).

Comorbidities Associated with STDs/STIs

Many STDs/STIs are associated with various comorbidities (two or more diseases or conditions existing simultaneously in a person).

**HIV/AIDS** causes a compromised immune system and is therefore most likely to lead to comorbidities and opportunistic infections (otherwise ordinary infections that occur when one’s immune system is compromised). Some commonly experienced infections, such as those caused by *Candida albicans* or salmonella, become much more debilitating in patients with HIV infection, since they add an even greater burden to an overtaxed immune system. Another common comorbidity for those with HIV/AIDS is tuberculosis.

A study comparing the occurrence of cervical cancer in women with HIV/AIDS to those without the virus found that HIV-infected women were at higher risk for cervical cancer (Barnes et al., 2018). In another study of people over age 50 with HIV/AIDS, those found with a higher incidence of the frailty phenotype (weakened physical characteristics) than the general, noninfected population had greater concurrent diagnoses of hepatitis B and C, cancers, cardiovascular diseases, chronic kidney disease, chronic obstructive pulmonary disease, lipodystrophy, dyslipidemia, diabetes, hypertension, osteoarthritis, and psychiatric conditions (Petit et al., 2018).
GENERAL DIAGNOSIS AND SYMPTOMS

Worrisome symptoms usually send patients to a healthcare professional, and since people with sexually transmitted infections often have symptoms, they will seek medical care. On the other hand, many sexually transmitted infections are asymptomatic. Advice to seek care may come as a result of a routine screening test that suggests a person has an asymptomatic STD/STI. Another common source of the advice to see a clinician is when a person’s sexual partner is diagnosed with an STD/STI.

Whether symptomatic or asymptomatic, a patient’s medical care begins the same way. For a person with a possible STD/STI, the initial work-up has these three parts:

- **History.** The medical care of a person with a possible STD/STI begins with a medical history that puts extra emphasis on assessing the patient’s risk of having a sexually transmitted infection.

- **Physical examination.** When a patient may have a genital STD/STI, their anogenital region is examined thoroughly, and when appropriate, their mouth and pharynx is also examined.

- **Laboratory tests.** With STDs/STIs, lab tests (microbiological, serological, or genetic) are usually needed for a definitive diagnosis.

**History**

The medical history begins with a chief complaint and then examines the nature and duration of this problem.

**CHIEF COMPLAINT**

People with symptomatic genital STDs/STIs usually present complaining of discharges or dermatologic lesions. The discharges can come from the urethra, vagina, penis, or occasionally the rectum. The dermatologic lesions can cause pain, tenderness, bumps, or itching in the inguinal or anogenital region. Some genital STDs/STIs also cause swollen and tender inguinal lymph nodes. In addition, genital STDs/STIs can cause discomfort during intercourse, urination, or defecation. Most genital STDs/STIs do not produce a fever or other systemic symptoms.

**QUESTIONS TO ASK**

The medical history will often point toward the cause of the patient’s problem. For any complaint, it is important to ascertain:

- A complete description of the problem

- What the patient tried to do to relieve the symptoms and whether these attempts have helped
• Whether other people around the patient have similar symptoms
• Whether the patient has ever had this problem before
• What the patient thinks may be the cause of the problem

For **genitourinary complaints**, these specific questions often generate useful diagnostic information:

• Has the patient noticed sores, bumps, or warts in the anogenital region?
• Has the patient had unusual discharge from the penis, urethra, vagina, or anus?
• Does the patient have burning, itching, or other discomfort when urinating?
• Does the patient’s urine contain blood or have an unusual color or odor?
• Does the patient have pain or other discomfort during intercourse?
• What birth control methods does the patient use? (List various methods of birth control to obtain a precise answer, e.g., birth control pills, diaphragm, spermicidal cream, patch, ring, rhythm, withdrawal, etc.)
• For men, is there pain or an unusual mass in the scrotum?
• For women, is there bleeding between periods or after intercourse?
• For women, is it possible that they are pregnant?
  (Mendiratta & Lentz, 2016)

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**PATIENTS WITH NONBINARY GENDER IDENTITIES**

*Transgender* is an umbrella term for persons whose gender identity or expression (masculine, feminine, other) is different from their sex (male, female) at birth. *Gender identity* refers to one’s internal understanding of one’s own gender, or the gender with which a person identifies. *Gender expression* is a term used to describe people’s outward presentation of their gender.

Gender identity and sexual orientation are different facets of identity. Everyone has a gender identity and a sexual orientation, but a person’s gender does not determine a person’s sexual orientation. Transgender people may identify as heterosexual, homosexual, bisexual, or none of the above.

With transgender patients, it is important to ask questions necessary to assess the pertinent issue but to avoid unrelated probing. For example: “To help assess your health risks, can you tell me about any history you have had with hormone use?”

When assessing the sexual history of transgender patients, clinicians can also:
• Refrain from making assumptions about patients’ sexual behavior or bodies based on their presentation
• Ask patients if they have had any gender confirmation surgeries to understand what risk behaviors might be possible
• Understand that discussions of genitals or sex acts may be complicated by patients’ disassociation with their bodies, which can make examinations particularly sensitive or stressful to patients

(CDC, 2017m; GLMA, 2006)

INTERVIEW SETTING

Any discussions concerning sexual behavior should be appropriate to the patient’s age and developmental level. Inquiries should be aimed at identifying risk behaviors (e.g., unprotected oral, anal, or vaginal sex and drug-use behaviors). Ideally, the patient can be clothed during the initial interview to reduce the vulnerability they feel when wearing an examination gown.

Careful, nonjudgmental counseling is vital for patients who might not feel comfortable acknowledging their engagement in behaviors that place them at risk for STDs/STIs. Adolescents in particular may be more comfortable with filling out surveys than face-to-face interviews (CDC, 2018e). It has been found that adolescent subjects feel more like talking if they are not rushed, the provider is of the same gender, the provider introduces the subject, and they are told that screening is routine.

It is helpful to remember three important principles:

• Spend time alone with the patient.
• Explain the confidentiality of the entire medical visit, from interview through treatment.
• Ask about and listen carefully to the patient’s concerns.

THE FIVE Ps

The CDC recommends that a detailed sexual history include information pertaining to the “Five Ps.” Clinicians can ask patients the following questions:

Partners

• Do you have sex with men, women, or both?
• In the past 2 months, how many partners have you had sex with?
• In the past 12 months, how many partners have you had sex with?

• Is it possible that any of your sex partners in the past 12 months had sex with someone else while they were in a sexual relationship with you?

**Practices**

• To understand your risks for STDs/STIs, I need to understand the kind of sex you have had recently. Have you had vaginal sex, meaning “penis in vagina sex”? If yes, do you use condoms: never, sometimes, or always?

• Have you had anal sex, meaning “penis in rectum/anus sex”? If yes, do you use condoms: never, sometimes, or always?

• Have you had oral sex, meaning “mouth on penis/vagina”? If yes, do you use condoms: never, sometimes, or always?

**Prevention of Pregnancy**

• What are you doing to prevent pregnancy?

**Protection from STDs/STIs**

• What do you do to protect yourself from STDs/STIs and HIV?

For condom answers:

• If never, why don’t you use condoms?

• If sometimes, in what situations (or with whom) do you use condoms?

**Past History of STDs/STIs**

• Have you ever had an STD/STI?

• Have any of your partners had an STD/STI?

Additional questions to identify HIV and viral hepatitis risk include:

• Have you or any of your partners ever injected drugs?

• Have any of your partners exchanged money or drugs for sex?

Is there anything else about your sexual practices that I need to know about?

(CDC, 2017o)
CONFIDENTIALITY AND CONSENT WITH ADOLESCENTS

Adolescents often hesitate to seek medical care for sexual problems because they fear that their parents will have to be informed. Adolescents in the United States are not required to obtain parental consent for treatment of STDs/STIs, and organizations treating them are not required to report this (CDC, 2017d). However, when such care is covered under private health insurance, parents may learn about their dependents having obtained such services.

This is a complicated issue, and laws and regulations vary state by state, so healthcare providers must know the rules in their own states. Clinics and medical offices treating adolescents need to have formulated a clear policy about the degree of confidentiality that they can maintain consistent with the laws of their state.

Office visits provide adolescents the opportunity to learn about STDs/STIs, unwanted pregnancies, methods of prevention and treatment, healthy relationships, and sexual health and development. Forty-five percent of 15- to 19-year-old males and females stated already having had vaginal sex. Adolescents considered the presence of parents in the examination room or caregiver’s office restricting to discussion. The mean number of subjects discussed was increased when the visit was at least partially confidential.

The American Academy of Pediatrics and the American Medical Association have supported adolescent time alone with a clinician for at least part of the visit (Marcell & Burstein, 2017).

CASE: Confidentiality

Georgia is a nurse in a local high school. She notices a budding romance starting between Dwayne, one of her favorite student office workers, and Heidi, a student in his grade. Dwayne is very shy, and Georgia suspects this may be his first romantic relationship. Heidi is very outgoing and flirts with Dwayne whenever she comes into the office. Heidi is well known to Georgia, as she has seen the nurse on several occasions for counseling and referrals for symptoms of likely STDs/STIs.

Georgia would like to warn Dwayne about the possibility of contracting an STD/STI from Heidi as the relationship continues. But she knows this would be a violation of patient confidentiality and the federal Health Insurance Portability and Accountability Act (HIPAA) and that she could lose her license for exposing a patient’s private medical information. Georgia decides to partner with the human sexuality course teacher in providing pamphlets on STDs/STIs for use in the course, as allowed by the school district. She asks Dwayne to deliver them to the classroom, offering him a copy.

Physical Examination

When the presenting complaint is genital, the physical examination of the inguinal and anogenital region should be thorough. Gloves are required, and good illumination is important. In addition, a hand lens is often helpful.
EXAMINATION OF FEMALE GENITALIA

For genital exams, the examiner should always explain in detail what will be happening, beginning by explaining the steps of the exam and allowing patients to ask questions. Male clinicians should have a female staff member present during the exam.

The exam begins by closely inspecting the anogenital area. This is difficult when the patient is sitting on the exam table, even when at a 45° angle, so it is usually best for patients to be lying on their back. The lithotomy position with patients’ legs in stirrups gives the best view of the entire perineum.

The genital exam is also an opportunity to educate patients about their anatomy and physiology. Patients can better see what is happening when the head of the exam table is raised and they are provided with a hand mirror.

The examiner first studies the pubic hair, looking for evidence of lice or mites. Then, the clinician examines the skin from the front (the mons pubis) to the back (the perianal region and between the buttocks), looking for redness, cuts, ulcers, vesicles, warts, and scratches (excoriations).

Next is an examination of the urethral opening (meatus), including palpating and “milking” the urethra, taking a specimen of any exuded mucus or pus. The examiner feels for tender or enlarged Skene’s glands and Bartholin’s glands and checks for enlarged or tender inguinal lymph nodes.

After palpation is a speculum exam. The speculum (warmed up, if metal) can be held by the patient if they agree. The patient can also observe how it is gently opened. To help educate the patient and allay any fears, it may be useful for the clinician to explain why a speculum exam is essential for a complete visual view of the interior walls of the vagina and cervix.

A speculum exam includes looking at the vaginal walls and taking samples of exudates or secretions. Next is an inspection of the cervix. When appropriate, the exam includes a Pap smear and a swabbing of the endocervical canal for samples of discharge to send to the lab. After removing the speculum, the examiner bimanually palpates the cervix, uterus, and adnexa; and lastly, with a fresh glove, palpates the rectal canal (Mendiratta & Lentz, 2007).

EXAMINATION OF MALE GENITALIA

The clinician begins by sitting down with the patient to explain how the exam will be conducted and to answer the patient’s questions. It may also be prudent for a female clinician examining a male patient to have another male present.

There is no standard position for examining the male anogenital region. However, the anterior inguinal region, penis, scrotum, and pubic area are best examined with the patient standing facing the clinician, who is seated on a low stool. The perianal region and the areas between the
The clinician begins by inspecting the skin of the inguinal region, genitals, and perineum, looking for redness, cuts, ulcers, vesicles, warts, and scratches (excoriations). This includes palpating the inguinal areas for enlarged or tender lymph nodes.

Next is an examination of the glans of the penis, pulling back the foreskin when it is present. A swab of the inner urethral wall is taken and sent to the lab. The penis is palpated for tenderness, which, among other things, can be a symptom of urethritis or periurethritis. The pubic hair at the base of the shaft of the penis is examined for evidence of lice or mites.

The clinician then examines the skin of the scrotum. Next, each testis is gently palpated for swelling, tenderness, or internal hard spots or densities.

Finally, the patient is asked to bend over the exam table. The perianal area and the skin between the buttocks are inspected. With a fresh, lubricated glove, the examiner palpates the prostate digitally for tenderness, fluctuant areas, general enlargement, irregularities, or hard spots and densities (Busti, 2016). If it is the patient’s first digital prostate gland exam, it is important to describe the procedure beforehand.

**TESTICULAR SELF-EXAM**

A patient may also be educated on conducting a testicular self-exam to detect any problems that might arise in the future. Instructions to the patient include:

1. Perform the exam after a warm shower/bath if possible since heat relaxes the scrotum, which makes it easier to examine.

2. Standing in front of a mirror, check for any swelling of the scrotal skin.

3. Examine each testicle separately.

4. Cup the testicle between your thumb and fingers with both hands and roll it gently between the fingers. (Note: one testicle may be larger than the other, which is normal.)

5. Find the soft, tube-like structure at the back of the testicle (the epididymis).

6. Report to your primary care provider immediately if you find any abnormalities (e.g. lumps, painful areas, skin changes, or swelling).

(Busti, 2016)

**Diagnostic Laboratory Tests**

The history and the physical exam will usually lead to a small list of possible diagnoses for a sexually transmitted disease. Definitive diagnoses and diagnoses of infections in asymptomatic people require laboratory tests. Confirmation of the disease is often done by biopsy or culture.
Specific diagnostic tests for STDs/STIs may be ordered based on the patient’s symptoms. Since STDs/STIs may present without symptoms, more than one test may be ordered. Some newer diagnostic tests allow results to be immediately available.

**THE ADVANTAGE OF RAPID TESTS**

To prevent the spread of STDs/STIs, it is ideal to diagnose and treat the diseases during the same visit. This immediacy safeguards against patients not returning for a second visit. It also reduces the time during which patients are infective, thus decreasing the spread of the infection.

Definitive lab diagnoses are the steps that slow treatment. Many standard tests, such as cultures of organisms, require more than a day to produce results, and when using these tests, patients must return for a second visit to learn the diagnosis and to receive treatments. Thus, efforts are being made to devise faster lab tests.

An advantage of rapid tests is increasing the number of individuals who are aware of being infected, with subsequent treatment reducing adverse effects and decreasing the possibility of infecting others. Rapid tests that can be done in a clinic in less than 30 minutes are available for syphilis, gonorrhea, chlamydia, HIV, and genital herpes. For example, a highly sensitive and economic nucleic acid test now uses mobile phone and Bluetooth technology and can be performed at the point of care, such as in emergency departments, where personnel can quickly test a droplet sample for chlamydia and provide treatment and instruction immediately (Shin et al., 2017).

There are also several types of syphilis rapid tests that can return results within 15 minutes and can be performed and interpreted by nonlaboratory personnel. One test involves obtaining whole blood via fingerstick and then applying it to the testing device. This sort of testing can be done in settings without a standing laboratory, such as clinics, thereby allowing much quicker results (Vaulet et al., 2018).

A noted disadvantage of over-the-counter tests, such as for HIV, is not linking results to information about necessary treatment and available resources.

**COLLECTING TEST SAMPLES**

In testing for genital STDs/STIs, specimens are usually taken on swabs from the cervix, urethra, vagina, anal canal, throat, or skin lesions. In addition, blood samples, urine samples, or samples of vaginal or urethral discharge can be taken. It is important to provide sufficient sample material for the tests, and when more than one test is requested (e.g., microscope slides and cultures or simultaneous tests for two different infectious agents), more than one swab of each sample is sent.

Most swab and discharge specimens for STD/STI testing are packaged in media or containers appropriate for the suspected organism, and these specimens should then be sent to the lab as soon as possible. Therefore, appropriate containers need to be on hand for all examinations.
For urine samples, the amount needed and the storage conditions (e.g., refrigeration) both depend on the particular test being used, so the examiner needs to have guidelines available ahead of time.

In general, clinicians are advised to ask the laboratory in advance for written instructions on specimen collection, storage, and transport. These requirements are then reviewed and understood by providers and sufficient supplies (swabs, blood drawing equipment, and containers) are stocked in all exam rooms.

**PREGNANCY TESTING**

Beyond tests for a range of STDs/STIs and non-STD/STI infections, specific situations call for additional lab tests. For instance, when treating a woman for an STD/STI, as for many other medical conditions, it is important to know if she could be pregnant. Therefore, a blood or urine pregnancy test is commonly added to other STD/STI tests for women in their reproductive years.

**Common Presenting Syndromes of Genital STDs/STIs**

Sexually transmitted infections give rise to a range of anogenital and lower urinary tract diseases. The signs and symptoms of these diseases cluster into about eight clinical syndromes. These are:

- Genital itching
- Genital ulcers
- Genital warts
- Urethritis
- Vaginal and cervical infections
- Epididymitis
- Pelvic inflammatory disease
- Anorectal infections

Following is a brief overview of each of these presentations.

**GENITAL ITCHING**

One manifestation of genital STDs/STIs is the new appearance of genital itching. When patients describe itching, they sometimes include the sensations of irritation, pricking, or crawling. A new onset of genital itching can signal an infection; however, in women, mild itching, irritation, or inflammation of the external genital area, vulva, or vaginal vestibule may often result from dermatitis, folliculitis, or psoriasis rather than an infection (Gottlieb et al., 2018).

The common STDs/STIs that cause genital itching include genital herpes, genital warts, pubic lice, scabies, and other STDs/STIs that cause urethritis or vaginitis. Of these, pubic lice and scabies tend to cause the most intense itching (Mayo Clinic, 2018a; MDH, 2018).
Anogenital infections that are not STDs/STIs also cause itching. Common examples are bacterial vaginosis, group B streptococci, pinworms, *Staphylococcus aureus*, and yeast (*Candida spp.*). Acute anogenital itching can be caused by problems other than infections, such as irritation of the anogenital skin, an allergic reaction to something that contacts the anogenital skin, and chronic skin diseases. Therefore, even in an STD/STI clinic, a broad set of causes should be considered when evaluating a complaint of anogenital itching.

When evaluating genital itching, the medical history will usually give important clues, but a careful, methodical examination of the pubic hair, skin, and mucous membranes is necessary for a diagnosis.

Nonspecific treatments can be given to relieve the itching temporarily, however, any underlying infection should be diagnosed and treated.

**GENITAL ULCERS**

Genital ulcers are sores on the skin or mucous membranes. If caused by an STD/STI, the ulcers are usually shallow. In women, ulcers from STDs/STIs can also be found on the lining of the vagina and on the surface of the cervix as viewed by vaginal examination with a speculum. In both genders, oral sex can lead to ulcers of the lips and mouth, especially from HSV or syphilis (Lewis et al., 2017).

In the United States, most genital ulcers are caused by one of three infectious agents: HSV (genital herpes), HPV (genital warts), and *Treponema pallidum* (syphilis). Each microbe is associated with a different typical presentation (Lewis et al., 2017). These are the three most common ulcerative genital STDs, but there can be considerable variation. When identifying the cause of genital sores, it is important to remember that more than one type of microbe can simultaneously be causing the lesions.

Infections are the most common causes of genital ulcers. Other causes include Behçet syndrome (rare disorder causing blood vessel inflammation), psoriasis, drug eruptions, sexual or mechanical trauma, or chemical burns.

Some form of lab testing, history, and physical examination are usually needed for a definitive diagnosis of a case of genital ulcers. Certain presentations of genital ulcers can be diagnosed clinically as genital herpes. When genital ulcers are present, syphilis and HIV testing should be included in the lab work. While awaiting definitive lab results, genital ulcers are frequently treated based on the tentative clinical diagnosis (Lewis et al., 2017).

**GENITAL WARTS**

Genital warts are also called *condyloma acuminata* or *venereal warts*. Genital warts are pink or flesh-colored growths on the skin or mucous membranes of the anogenital region—the groin, thigh, penis, scrotum, vulva, vagina, cervix, and perianal areas. The warts can take many different forms, from tiny flat “tags” to wrinkled papules to masses that look like small cauliflowers.
Although genital warts are usually asymptomatic and nontender, they may itch or burn. When rubbed, they can get irritated and sometimes bleed. Most genital warts will eventually disappear without treatment, but the general practice is to remove them. Genital warts are caused by certain forms of HPV. HPV infections are common, and they can be sexually transmitted even when an infected person has no visible signs of an infection (Lewis et al., 2017).

**URETHRITIS**

Infections of the urethra do not always present symptoms. When symptoms are present, they include a whitish-yellowish mucus discharge from the urethra, and on urination there can be pain, irritation, or itching. In women, when these symptoms occur in combination with urinary urgency or frequency, there is often a concurrent bladder infection.

STDs/STIs cause some of the common forms of urethritis. The classical presentation of gonorrhea is as urethritis, and infectious urethritis has been traditionally divided into gonococcal and nongonococcal urethritis (NGU) (CDC, 2015b). In the United States and other parts of the developed world, nongonococcal is more common than gonococcal urethritis. However, in patients of urban American STD/STI clinics, gonorrhea can be the most common cause of urethritis.

*Chlamydia trachomatis* causes most cases of NGU; however, two other bacteria, *Ureaplasma urealyticum* and *Mycoplasma genitalium*, are also common causes of NGU. Urethritis due to these bacteria is often classified as an STD/STI (Lewis et al., 2017).

To definitively diagnose the cause of urethritis, urethral discharge must be examined microscopically or with specific lab tests. Samples of discharge are obtained either by expressing the discharge from the urethra or by swabbing the inner walls of the urethra. (Urination will temporarily wash the discharge from the urethra; therefore, recent urination can defeat an attempt at obtaining a discharge sample.) To identify the organism causing a case of urethritis, the discharge sample can be spread on a microscope slide and stained subjected to microbiologic tests, or cultured.

Both bacterial and protozoal urethral infections are treated with oral antimicrobials. Sexual partners of patients with urethritis should also be treated even when the partner is asymptomatic.

**VAGINAL AND CERVICAL INFECTIONS**

In women, lower genital tract infections, vaginitis, and cervicitis typically produce a vaginal discharge, irritation of the vulvae, and sometimes a bad odor. There can be pain or discomfort during urination or during intercourse, and there is occasional postcoital bleeding. On the other hand, some infections of the vagina and cervix are asymptomatic.

The STDs/STIs that most commonly cause vaginitis or cervicitis are chlamydia, gonorrhea, trichomoniasis, and HSV. Common non-STD/STI infections causing vaginitis or cervicitis include yeast infections (*Candida spp.*). As a general principle, a pelvic exam is recommended for diagnosing lower genital tract infections in women.
Vaginitis will produce reddened, edematous vaginal walls with exudate. Common causes include bacterial vaginosis, vulvovaginal candidiasis, and trichomoniasis. Risk factors include being African American, having multiple or new sex partners, douching, not using barrier protection, and absence of lactobacilli (Kinney & Spach, 2017).

Cervicitis appears as a reddened edematous cervix with purulent, yellowish exudate, and gently rubbing a cotton swab in the cervical os may produce bleeding. Definitive diagnoses usually require examining and testing swab specimens of exudate or discharge (CDC, 2015b).

Normally, the cervix is an effective barrier between the bacteria-filled vagina and the microbe-free upper genital tract (uterus and Fallopian tubes). Cervical infections, however, can infiltrate the uterus and lead to pelvic inflammatory disease.

**Sexually Transmitted Bacteria That Cause Vaginitis or Cervicitis**

*Chlamydia trachomatis* and *Neisseria gonorrhoeae* can cause mucopurulent cervicitis. Typically, neither infection produces a particularly bad odor in the vaginal discharge.

Although chlamydial infections are common, in 40% to 60% of women with mucopurulent cervicitis, no pathogenic bacteria are found in the cervical exudate. To prevent PID and to slow the transmission of STDs/STIs, it is recommended that certain patients be treated for bacterial cervicitis solely on clinical criteria. The CDC (2015b) recommends treating at-risk women (i.e., those under 25 years old, with new or multiple sex partners, or having unprotected sex) if they have clinical signs and symptoms of bacterial cervicitis.

**Sexually Transmitted Viruses That Cause Vaginitis or Cervicitis**

During the primary infection, and sometimes during recurrent outbreaks, herpes simplex virus can cause cervicitis that includes vesicles and ulcers. There is usually no mucopurulent exudate with herpes cervicitis.

**Sexually Transmitted Protozoa That Cause Vaginitis or Cervicitis**

*Trichomonas vaginalis* infections can produce a profuse, frothy, and purulent (yellow or yellow-green) discharge that has a “fishy” odor. This exudate is sufficiently copious that it will usually be seen at the vaginal opening before a speculum examination. As with candidiasis, trichomoniasis often irritates the vulvae, causing an itching or burning sensation.

In a speculum exam, the vaginal walls and cervix appear reddened in trichomoniasis. Occasionally, the cervix has pinpoint hemorrhages, making it look like a strawberry. Rapid lab tests for trichomoniasis allow a definitive diagnosis on the first visit, and oral, single-dose drugs can be given at the time of diagnosis. (The protozoa flagella can be viewed by the patient and partner on a saline slide; it often helps them take their medication with full compliance.) The partner should be treated as well.
EPIDIDYMITIS

The epididymis is a coiled tube that caps each testis and in which sperm mature and attain the capability of fertilizing ova. Infections of the epididymis produce unilateral pain and swelling of the scrotum and fever. Epididymitis arises when untreated urethritis spreads back through the male genital system, and the same microbes causing urethritis also cause epididymitis.

The most common STD/STI causing epididymitis in young sexually active men is chlamydia; gonorrheal epididymitis infections are less common. Bacterial epididymitis is treated empirically with antibiotics (ceftriaxone, doxycycline, levofloxacin, or olofloxacn) before the causative microorganism is identified. For a specific diagnosis, the exudate must be sampled for best treatment results (CDC, 2015q). Male counseling may be needed, as epididymitis is painful and looks very unusual.

UPPER FEMALE GENITAL TRACT INFECTIONS

Infections of the upper female genital tract, the endometrium and Fallopian tubes, are usually grouped under the umbrella term PID (pelvic inflammatory disease), a condition that can also include infection of the surrounding peritoneum. Upper genital tract infections do not always produce dramatic symptoms, but there is usually lower abdominal tenderness, cervical tenderness, and tenderness of the adnexa when palpated bimanually. Sometimes, PID will produce a fever (greater than 38.3 °C), an elevated white blood cell count, an elevated erythrocyte sedimentation rate (ESR), or elevated C-reactive protein (CRP) in blood tests.

PID can lead to infertility, tubo-ovarian abscesses, scar tissue formation resulting in infertility, and ectopic pregnancies (Helicon, 2018). All genders should be counseled that some STDs/STIs can cause the inability to become pregnant.

A discussion of infections of the upper female genital tract is beyond the scope of this course. Nonetheless, the specter of PID looms over many STDs/STIs in women. PID often results from untreated lower genital tract STDs, notably chlamydial infections and gonorrhea. PID can also be caused by infectious agents that are not primarily transmitted sexually.

ANORECTAL INFECTIONS

Anal intercourse can transmit infections that lead to proctitis in the receptive partner. Proctitis is an infection of the anorectal walls. It produces anorectal pain, irritation, itching, rectal discharge, bleeding, and tenesmus (the feeling of incomplete rectal evacuation and the frequent urge to defecate). If the infection invades farther, it can cause proctocolitis, which includes the additional symptoms of diarrhea and abdominal cramps.

In a patient with proctitis, anoscopy, sigmoidoscopy, or colonoscopy will show local inflammation and exudate, and the intestinal walls will bleed when gently swabbed. For a specific diagnosis, the exudate must be cultured for evidence of infection. In both men and women, the most common STDs/STIs causing anorectal infections are chlamydia, gonorrhea, genital herpes, and syphilis.
Besides proctitis, anorectal STDs/STIs include HPV infections, which cause anogenital warts (condyloma acuminata) or, rarely, anorectal cancers (NHS, 2016).

**CASE: Proctitis**

Sherry visited her primary healthcare provider’s office with complaints of prolonged diarrhea, rectal itching and pain, and tenesmus. She was seen by Angela, a FNP, who noticed Sherry was embarrassed and hesitant to discuss her symptoms. Angela led her into a private office before Sherry changed into a patient gown. “When did you notice the symptoms?” she asked gently. Sherry proceeded to tell the FNP about her new boyfriend, who had a history of genital ulcers but was asymptomatic since the relationship began.

During her calm, direct questioning, Angela learned that Sherry and her new boyfriend occasionally engaged in anal intercourse without the use of condoms. Angela explained that an infection can be transmitted without the symptoms of an infection. Sherry agreed to bring her boyfriend to the office for testing and counseling.

**DISEASE-SPECIFIC DIAGNOSIS, TREATMENT, AND PREVENTION**

Most STDs/STIs are a threat to both the health of the patient and the health of the community, and treatment is always recommended. STDs/STIs present with a variety of syndromes, but their treatment depends on the specific agent causing the problems.

Following are the current recommended treatments for common genital STDs. For some, early treatment may be essential. The drugs and administration regimens offered here are examples of common recommendations based on CDC guidelines, but actual treatments must be tailored to the specific patient.

(The most current and up-to-date treatment recommendations are available at cdc.gov/std/treatment.)

**TWO TREATMENT PRINCIPLES**

1. **Treat As Soon As Possible**

Medical care for STDs/STIs often shortens the time that would have been expended in screening, diagnosing, treating, and educating. In offices, clinics, and emergency departments, the treatment for an STD/STI is frequently given early. These early treatments are based on three types of information: the patient’s symptoms, the STD/STI risk assessment from the medical history, and the signs observed during the physical exam. If rapid lab tests are available, their results are included when formulating a diagnosis, but when the lab tests take a day or more to produce results, treatment is often given before a diagnosis has been definitively verified.
Quick treatments are given for STDs/STIs to reduce the time during which the disease can be spread farther. When available, medications are given in single-dose regimens that are dispensed during the initial visit, and the patient is asked to take the medicine immediately. Treatment of STDs/STIs is aggressive, and standard recommendations often advise treatment even when diagnoses have not been completely confirmed.

The aggressive treatment of an infectious disease may seem at odds with an important trend in modern medicine—as part of the effort at slowing the development of antibiotic-resistant microbes, clinicians have been encouraged to use antibiotics conservatively. The quick treatment of STDs/STIs, however, is driven by public health concerns. When patients come to a clinic, urgent care center, or emergency department, a follow-up visit for treatment cannot be guaranteed. Sometimes, the best assurance that diseases will not be spread farther is treatment at the first visit to the health system.

2. Extend Treatments Beyond the Individual Patient

Public health efforts should continue after the patient leaves the clinic. First, the patient is instructed to avoid sexual contact for the appropriate period of time depending on the infection and the treatment regimen. Second, the patient is told to avoid sexual contact with their partners until the partners have also been treated.

This last instruction introduces the request that the patient notify recent sexual partners about the patient’s STD/STI, and the partners should be encouraged to have STD/STI testing. These instructions should be given to the patient with the understanding that the confidentiality of all parties’ medical records will be strictly preserved.

(Mayo Clinic, 2018b)

Chlamydial Infections

Of the reportable diseases, chlamydial infections were the most common STDs/STIs in the United States in 2017. Chlamydial infections were more prevalent among young women, with 670 cases per 100,000, but the infections are not always symptomatic, resulting in underreporting. The prevalence among males was lower, at 320 cases per 100,000. Both genders show a decrease in the occurrence of chlamydia as age increases (CDC, 2018a, 2018c). However, most cases go undiagnosed because most people with chlamydia are asymptomatic and do not seek testing.

Chlamydia can be prevented by using male latex condoms, abstinence, and monogamy (CDC, 2017b).

CHLAMYDIA SCREENING

The CDC recommends annual chlamydia screening for all sexually active females 25 and under and for women older than 25 with risk factors such as a new sex partner or multiple partners.
Pregnant women should be screened during their first prenatal care visit or during their third trimester if they are 25 and younger or at high risk.

Chlamydial infections are frequently asymptomatic; only 10% of men and 5% to 30% of women with laboratory-confirmed chlamydial infection develop symptoms. For women, screening for asymptomatic cases is important because 40% of untreated chlamydial infections develop into PID (CDC, 2017b), and routine screening has been shown to reduce the number of cases of PID.

To make widespread screening practical, urine specimens and self-obtained vaginal swabs can be used because they provide effective samples for chlamydia screening tests, although examinations by a licensed provider are optimal. Urine samples are the test of choice for diagnosing chlamydia in men.

Women diagnosed with chlamydial infection should be retested approximately three months after treatment. Cultures can be used to diagnose rectal and pharyngeal chlamydia. Chlamydia cultures are also often combined with Pap smears (CDC, 2017b).

**PAP SMEAR RECOMMENDATIONS**

Recommendations for clinical screening via Pap smear state that:

- Women ages 21 to 29 should get a Pap smear every three years.
- Women ages 30 to 65 can get an HPV test every five years, a Pap test every three years, or a combination every five years.
- In women over 65 who have had recent clear tests, testing is no longer indicated.
- In women under 21, testing is not indicated.

Sexual activity does not affect the need for Pap smears (Fox, 2018).

**DIAGNOSIS OF CHLAMYDIAL INFECTIONS**

**Typical Course**

Chlamydial infections are sexually transmitted, and they produce genital or lower urinary tract infections. After a person acquires a chlamydial infection, there is an incubation period of several weeks before the organism produces symptoms, but about 90% of infected men and 70% to 95% of infected women remain asymptomatic.

In men, symptomatic chlamydial infections show up as urethritis or epididymitis. They may also remain asymptomatic, potentially causing reinfection of sexual partners.

In women, symptomatic chlamydial infections show up most often as cervicitis (mucopurulent). When untreated, chlamydial cervicitis can spread and cause PID, which can then lead to infertility or ectopic pregnancies. During vaginal births, pregnant women
can pass chlamydial infections to their newborns. The resulting infection can cause pneumonia (3% to 16% of the time) or conjunctivitis in the infant (18% to 44%) (CDC, 2017b).

**Clinical Signs**

Chlamydial urethritis produces a mucoid, mucopurulent, or purulent discharge; inflammation; pain on urination; and urethral itching. Men sometimes also get epididymitis, with pain and swelling around a testicle.

Chlamydia urethritis produces a mucopurulent, purulent discharge in the endocervical canal; pain on urination or during intercourse; and vaginal bleeding after intercourse or between periods. Alternately, chlamydial cervicitis sometimes gives no other findings than a friable cervix on speculum examination.

If the chlamydia infection is not diagnosed and treated, women may eventually develop lower abdominal pain, lower back pain, nausea and vomiting, fever, painful sex, and breakthrough bleeding during the menstrual cycle.

Chlamydia and gonorrhea can appear clinically similar, and lab tests are needed to distinguish them. It is also common for people to have both infections simultaneously (CDC, 2015b).

![Colposcopic view of a female patient’s cervix with signs of erosion and erythema due to a Chlamydia trachomatis infection.](image)

Colposcopic view of a female patient’s cervix with signs of erosion and erythema due to a *Chlamydia trachomatis* infection. If left untreated, chlamydia infection can cause severe, costly reproductive and other health problems. Both short- and long-term consequences can ensue, including pelvic inflammatory disease, infertility, and potentially fatal ectopic tubal pregnancies. (Source: CDC/Dr. Lourdes Fraw, Jim Pledger, Public Health Image Library.)

**Lab Tests**

Diagnostic tests include urine sample, nucleic acid amplification, culture, and serology. Nucleic acid amplification tests (NAATs) are the most sensitive and can identify
Chlamydia grows inside human cells, and to be certain that test samples will give accurate results, the samples should contain mucosal cells. Cell samples can be obtained by rubbing a slightly abrasive swab (Dacron, rayon, or calcium alginate) along the urethra or the endocervix. A sample of only the discharge will not always provide sufficient \textit{C. trachomatis} for a diagnosis.

**TREATMENT OF CHLAMYDIAL INFECTIONS**

Oral antibiotics are the standard treatment for chlamydial infections, with cure rates of approximately 95%. Patients with chlamydial infections should not have sexual intercourse until a week after the beginning of their treatment regimen.

**CHLAMYDIA TREATMENT REGIMES**

**Typical single-dose treatment:**

- Azithromycin 1 g orally in a single dose

**Typical multiple-dose treatment:**

- Doxycycline 100 mg orally 2x/day for 7 days

**Alternative treatment:**

- Erythromycin base 500 mg orally 4x/day for 21 days

**For pregnant patients,** the FDA Pregnancy Risk Categories (A=lowest risk, D=highest risk) of these drugs are:

- Doxycycline: D (contraindicated in the second and third trimesters of pregnancy because of discoloration of teeth and bones; compatible with breastfeeding)
- Erythromycin ethylsuccinate: B

(McCuistion et al., 2018)

The clinician’s best opportunity to help prevent the recurrence of a chlamydial infection is at the time of the patient’s diagnosis. Clinicians should explain to the patient that barriers (e.g., condoms) are needed to protect against this and other STDs/STIs and that other birth control methods will not prevent such infections. Patients should also be reminded that if their partners are not monogamous, then STDs/STIs can enter the relationship between two previously uninfected people (CDC, 2017g).
Healthcare providers need to describe the long-term risks of chlamydial infections. Patients should also be told that, although antibiotics will cure them, there is a high risk of reinfection. Therefore, patients are to return to the clinic or office to be retested in three to four months.

**REVISED DRUG LABELING FOR PREGNANT AND BREASTFEEDING WOMEN**

Women and their healthcare providers can look forward to getting more useful and up-to-date information over the next few years about the effects of medications during pregnancy and breastfeeding.

The FDA has categorized the risks of taking a drug or biological product during pregnancy under a five-letter system (A, B, C, D and X) based on what is known about that product. In 2014, the FDA decided to eliminate those pregnancy categories because they are often viewed as confusing and overly simplistic and do not effectively communicate the risk a drug may have during pregnancy and lactation and in females and males of reproductive potential. Revised labeling will replace the old five-letter system with more helpful information about a medication’s risks to the expectant mother, the developing fetus, and the breastfed infant.

Over the coming years, companies will remove the pregnancy letter categories from the labeling for all prescription drugs and biological products and revise the labeling with updated information (FDA, 2014).

**TREATING SEXUAL PARTNERS**

For chlamydial infections, the patient’s sexual partners should be tested and, if appropriate, treated for any STDs/STIs. Ideally, the partners should be medically evaluated in person, however this is not always feasible. When sexual partners do not present for treatment, patients can sometimes be enlisted to deliver antibiotic therapies as medicines or prescriptions. Studies have shown that patient-delivered therapy is more effective than having the patients simply advise their sexual partners to seek medical evaluation (Wood et al., 2018).

**Gonorrhea**

Gonorrhea is about one third as common as chlamydial infection, although the two infections are frequently found to coexist in an infected person. Untreated gonorrhea can also increase a person’s risk of acquiring or transmitting HIV. In the United States, approximately 820,000 new cases of gonorrhea occur every year, and it is the second most commonly reported STD/STI. Women 15 to 24 years of age are at the highest risk for infection (CDC, 17f; CDC, 2018a).
GONORRHEA SCREENING

Two subpopulations should have regular gonorrheal screenings and be counseled about the importance of using condoms:

- Sexually active women younger than 25 who have had STDs, have new or multiple partners, are sex workers, are drug users, or do not always use condoms
- Men who have sex with men and who live in locations with relatively high rates of gonorrhea (here, the screening should be for rectal and pharyngeal gonorrhea)

Routine screening is also recommended for:

- Sexually active teens and young women in areas with a high prevalence of gonorrhea
- Teens and young women presenting to STD/STI clinics for any reason
- Patients with newly diagnosed chlamydial infections
  (CDC, 2017e)

People younger than 25 years, including sexually active adolescents, are at highest risk for gonorrhea infection, however there are no recommendations for screening due to insufficient evidence of its effectiveness in that age group.

Vaginal culture, NAAT, urine, urethral specimens, and hybridization tests are used for screening. Tests that combine screening for gonorrhea and chlamydia are commonly available (AHRQ, 2018).

DIAGNOSIS OF GONORRHEA

Typical Course and Clinical Signs

Gonorrhea is an infection of mucous membranes that can be transmitted vaginally, orally, and anally (CDC, 2017e). In men, \textit{N. gonorrhoeae} causes gonorrheal urethritis. Most men with gonorrheal urethritis have symptoms, which include pain or discomfort on urination and a purulent urethral discharge. Untreated gonorrheal urethritis can develop into epididymitis.

In women, \textit{N. gonorrhoeae} that have invaded the urethral opening produce gonorrheal urethritis, and \textit{N. gonorrhoeae} that have invaded the vagina produce gonorrheal cervicitis. Most women with urethral or cervical gonorrhea have mild or no symptoms. Approximately 50% of women with gonorrhea are asymptomatic and may infect sexual partners unwittingly. When symptoms do occur, they can include purulent and sometimes odorous vaginal discharge, vaginal bleeding after intercourse, and pain or discomfort on urination (CDC, 2017e; McCuistion et al., 2018).
Gonorrhea can also infect the Bartholin’s glands. Untreated gonorrhea cervicitis sometimes ascends into the uterus and leads to PID, which typically presents with lower abdominal pain. The untreated disease can cause scarring of the Fallopian tubes, causing infertility or tubal pregnancies. On speculum examination, gonorrheal cervicitis appears as a swollen, friable cervix with a mucopurulent exudate.

Fewer than 3% of patients with a gonorrheal infection develop gonorrheal bacteremia with fever and, occasionally, septic arthritis. Gonorrheal bacteremia is also known as disseminated gonococcal infection (DGI). DGI is usually characterized by arthritis, tenosynovitis, and/or dermatitis. This condition can be life threatening (CDC, 2017e).

Gonorrhea and chlamydial infections are difficult to distinguish clinically. Traditionally, a gonorrheal discharge has been said to be more purulent than a chlamydial discharge, but this distinction is not reliable, and lab tests are needed to make a definitive diagnosis. It is also common for patients with gonorrhea to have trichomoniasis.
Lab Tests

Light microscopic examination of a sample of urethral discharge can be used to diagnose gonorrhea in men. NAATs may also be used. In male gonorrheal urethritis, stained microscope slides will show Gram-negative diplococci. For women, a more sensitive and specific test is needed, and NAATs of urine or of a swab of the affected area are the preferred test techniques (CDC, 2018c).

Urine samples can be used to test for urethritis in all genders. Recent urination will have washed gonorrheal discharge from the urethra. Therefore, to collect sufficient discharge, urine samples should be taken at least an hour after the patient’s last urination.

Vaginal swab specimens are used to test for cervicitis. Gonorrheal cervicitis produces sufficient discharge that swabs need not be taken by speculum examination. Instead, they can be collected blindly by the patient herself.

For oral or anal gonorrhea, pharyngeal or rectal swabs are taken and sent to the lab for culturing. N. gonorrhoeae is a relatively fragile organism, so all swab samples must be put in the appropriate media, transported to the lab quickly, and never refrigerated.

TREATMENT OF GONORRHEA

As with many STDs/STIs, the highest rates of successful treatments come when the antimicrobial medicines can be taken in single doses administered at the time of diagnosis. For oral medicines, it is best to have the patient take the drug in the office, because people with STDs/STIs sometimes fail to fill the prescription or fail to take the drug as directed.

Only one regimen—dual treatment with ceftriaxone and azithromycin—is recommended for treatment of gonorrhea in the United States. Fluoroquinolones (i.e., ciprofloxacin, levofloxacin, or ofloxacin), which were previously the first-line drugs, are no longer recommended in the United States because strains resistant to penicillin, tetracycline, ciprofloxacin, or a combination of those antimicrobials have become increasingly common over the past 15 years (McCuistion et al., 2018). Azithromycin used in conjunction with gentamicin or spectinomycin is recommended when standard treatment fails (Singh et al., 2018).

GONORRHEA TREATMENT REGIMES

For uncomplicated urogenital or anorectal gonorrhea (including for pregnant patients), typical single-dose treatments:

- Ceftriaxone 250 mg intramuscularly (this can be reconstituted in 1% lidocaine to reduce pain in the injection area), and

- Azithromycin 1 g orally in a single dose (although 2-dose therapy is preferred, as it is thought to delay resistance to the drugs)
For **patients with penicillin or cephalosporin allergies**, typical single-dose treatment:

- Dual treatment with single doses of oral gemifloxacin 320 mg plus oral azithromycin 2 g, **or**
- Dual treatment with single doses of intramuscular gentamicin 240 mg plus oral azithromycin 2 g

For **pharyngeal gonorrhea**, the 2-dose treatment above is the preferred method, as oral cephalosporins are found to be less effective against pharyngeal gonorrhea.

(McCuistion et al., 2018; CDC, 2015d)

Patients with gonorrhea often have other STDs/STIs and should also be tested for HIV, chlamydia, trichomoniasis, and syphilis. They should be offered hepatitis B vaccination if they have not already been vaccinated.

Although treatment for gonorrhea is usually successful, gonorrhea patients may become reinfected. Therefore, as for people with chlamydial infections, patients treated for gonorrhea are advised to return in three months for rescreening.

### TREATING SEXUAL PARTNERS

The sexual partners of gonorrhea patients should be tested for a range of STDs/STIs, including gonorrhea, syphilis, and HIV infection. If test results will be delayed, then the sexual partners should be treated prophylactically for gonorrhea and chlamydia during their first medical evaluation.

### Syphilis

*Treponema pallidum* is the bacterium that causes syphilis, which if untreated can seriously damage organs throughout the body many years after the infection, eventually causing death. *T. pallidum* is a motile bacterium that is too thin to be seen in the standard Gram-stained smears used to identify chlamydia or *N. gonorrhoeae* (CDC, 2017h). A notable characteristic of *T. pallidum* is that it grows quite slowly; this makes it necessary to continue treating the infection for a relatively long period.

In the United States, a total of 30,644 new cases of syphilis were reported in 2017, a 10.5% increase over the previous year. The majority (57.5%) of all reported cases are in the MSM population. By age group, the greatest percentage of infection is among 20- to 29-year-olds (CDC, 2018b).
**SYMPHILIS SCREENING**

Routine screening is recommended for:

- Patients with any newly diagnosed STD/STI
- Patients at high risk for STDs/STIs
- All pregnant women

The laboratory tests to screen for syphilis include Venereal Disease Research Laboratory (VDRL), rapid plasma reagin (RPR), fluorescent treponemal antibody absorbed (FTA-ABS), and *T. pallidum* particle agglutination (TPPA). Diagnoses are more likely to be made using blood tests (CDC, 2017i).

The RPR and VDRL are called *nontreponemal* serologic tests because they are not specific for syphilis. False-positive nontreponemal serologic tests occur in patients with autoimmune disorders such as systemic lupus erythematosus and in a few other special populations. It usually takes at least a week after a patient acquires syphilis for these antibody tests to become positive.

People who have syphilis are more likely to have acquired other STDs/STIs. Therefore, patients with syphilis should also be tested for HIV, hepatitis B and C, chlamydia, and gonorrhea.

**DIAGNOSIS OF SYMPHILIS**

*Typical Course*

Syphilis is transmitted by sexual contact. Pregnant women with syphilis can also transmit the disease to their newborn baby at the time of birth. The infant can then develop congenital syphilis, which when untreated can delay development, cause seizures, or even be fatal.

A syphilis infection begins locally and slowly spreads systemically. Over time, untreated syphilis will go through stages that give different signs and symptoms. Initially, a person may come to a clinician with primary syphilis (i.e., a local genital infection) or a few months later with secondary syphilis (i.e., a systemic infection). The stages of syphilis infection are as follows:

- **Primary syphilis.** Primary syphilis is a local infection. Its hallmark is the appearance of an ulcer called a *chancre*. Typically, there is only one chancre, located at the site of infection: the penis, vulva, cervix, perianal region, or oral mucosa. The chancre appears a few weeks after *T. pallidum* bacteria have invaded the skin. The incubation period is approximately three weeks. A syphilis chancre has firm, raised edges and a smooth internal base, and it is painless. Local lymph nodes may be enlarged. If untreated, chancres heal spontaneously in three to six weeks, leaving faint scars. Even if the chancre has disappeared, the infected person is very contagious during this phase of the disease.
• **Secondary syphilis.** When primary syphilis is not treated, the chancre disappears for a few weeks. The disease then reappears as secondary syphilis. Secondary syphilis is a systemic infection with flu-like symptoms (low-grade fever, headache, malaise, generalized lymphadenopathy) and a widespread, symmetrical, nonitchy maculopapular rash, first on the trunk and arms and later on the palms and soles. The genital area may also have wart-like papules. During secondary syphilis, a person can develop syphilitic hepatitis or syphilitic glomerulonephritis.

• **Latent syphilis.** When secondary syphilis is untreated, the symptoms usually fade and the disease becomes quiescent, sometimes for years. This asymptomatic interim stage is called *latent syphilis.*

• **Tertiary (late-stage) syphilis.** In approximately one third of patients with latent syphilis, the disease reemerges if not treated and causes symptomatic damage to a variety of organs. This can occur 10 to 20 years after the initial infection. This is the final form of the disease. Tertiary syphilis can take many years, even decades, to become symptomatic. It produces granulomatous or necrotic lesions that can involve the skin, eyes, central nervous system, heart, aorta, or bones. Today, tertiary syphilis is rare except in patients with a concurrent HIV infection. (McCuistion et al., 2018)

*Primary syphilis.* A primary syphilitic lesion, also known as a chancre, can be seen on the penile corona on the right side of the glans penis. The lesion is accompanied by enlargement of the bilateral inguinal lymph nodes. (Source: CDC/Susan Lindsley, Public Health Image Library.)
TREATMENT OF SYphilIS

Intramuscular slow-release penicillin G is the treatment of choice for syphilis. In the first days after syphilis treatments, some people get a Jarisch-Herxheimer reaction (i.e., fever, myalgia, tachycardia, headaches, and hypotension), informally called Herx. Reacting patients are treated with bed rest and nonsteroidal anti-inflammatory agents.

SYphilIS TREATMENT REGIMES

For primary, secondary, or early latent syphilis, typical single-dose treatment:

- Penicillin G benzathine 50,000 units/kg up to 2.4 million U intramuscularly

For later stages of syphilis, the same drug is in three doses, each one week apart. Infants and children are given the same adult dosages.

Typical alternative, multi-dose treatment:

- Doxycycline 100 mg orally 2x/day for 14 days, or
- Azithromycin as a single 2-g oral dose in the case of penicillin allergy

For patients allergic to penicillin, either oral doxycycline or oral tetracycline is given. During pregnancy, however, only penicillin can be given to treat syphilis. Therefore, pregnant women who are allergic to penicillin should first be desensitized to and then treated with penicillin.
For pregnant patients, FDA Pregnancy Risk Categories (A=lowest risk, D=highest risk) of these drugs are:

- Penicillin G: B
- Doxycycline: D
- Tetracycline: C

Benthazine Penicillin G is the only medication given for syphilis during pregnancy.

(McCuistion et al., 2018)

After treatment, patients should be retested at 6, 12, and 24 months for the presence of nontreponemal antibodies. Within a year, the patient’s nontreponemal antibody titers should have decreased at least fourfold; otherwise, the patient should probably be retreated. On the other hand, tests for treponemal antibodies will remain positive even after adequate therapy.

After treatment, pregnant women should be retested monthly until delivery.

People at higher risk for syphilis should be rescreened regularly. High-risk groups include men who have sex with men without condoms or with multiple partners, male and female sex workers, adults in correctional facilities, and people who trade sex for drugs.

**TREATING SEXUAL PARTNERS**

Patients with early syphilis—i.e., primary, secondary, or early latent syphilis—are contagious. People who in the preceding three months have had sexual contact with a patient with early syphilis should be notified and treated. Treatment is recommended even for those contacts with no clinical or serologic evidence of the disease (CDC, 2017i). In rape crimes this is standard for postsexual assault prophylaxis.

**Genital Herpes**

Herpes simplex virus causes genital herpes, a disease characterized by recurring clusters of small painful ulcers that last for two to four weeks then crust over and scab. HSV is a DNA virus that occurs in two forms, designated HSV-1 and HSV-2. Both types of HSV can infect the genital region and cause ulcers, although most genital infections are caused by the HSV-2 form. However, an increasing number are being caused by HSV-1 (McCuistion et al., 2018).

Infections of HSV are very common and have no cure. CDC’s 2017 figures reveal an estimated 776,000 new cases of genital herpes every year. Genital herpes occurs in more than 17% of 14- to 49-year-olds in the United States (US-DHHS, 2018a). The infection is often symptom-free for months after contact with an infected partner, and not all HSV infections cause symptoms. Thus, only 1 in 4 people who have genital herpes are aware of their infection (CDC, 2017j).
Herpes is usually a localized disease. HSV-1 commonly causes oral or facial herpes, while HSV-2 commonly causes genital herpes. HSV-2 infection is more common among women than men. This may be because it is more easily transmitted from men to women than from women to men during penile-vaginal sex. A person can only get HSV-2 infection during genital contact with someone who has a genital HSV-2 infection. Receiving oral sex from a person with an oral HSV-1 infection can result in getting a genital HSV-1 infection.

SCREENING AND DIAGNOSIS OF GENITAL HERPES

The CDC does not recommend screening for HSV-1 or HSV-2 for everyone. Some exceptions where type-specific serologic HSV tests may be ordered include:

- Patients with repeated or atypical genital symptoms and negative HSV PCR or culture
- Patients with a clinical diagnosis of genital herpes but no laboratory confirmation
- Patients who have a partner with genital herpes
- Patients seen for an STD/STI evaluation (especially those with multiple sex partners)
- Persons positive for HIV
- MSM at increased risk for HIV acquisition

(CDC, 2017j)

Typical Course and Clinical Signs

Genital herpes is acquired by contact with skin, mucous membranes, or fluid droplets that contain the HSV virus. HSV-1 herpes is typically acquired from the saliva of an infected person. The increased rate in the younger population may be related to oral sex. HSV-2 herpes is typically acquired from direct skin-to-skin or mucous membrane-to-skin contact. The two types of herpes infections are clinically indistinguishable.

Genital herpes is very contagious. Most people who have genital herpes are asymptomatic and unaware of their infection, and these asymptomatic infected people can shed HSV and infect others. Asymptomatic people with HSV-2 infections are more likely to shed the virus than asymptomatic people with HSV-1 infections (CDC, 2017j).

When activated, a genital herpes infection produces skin lesions. On its own, the initial stage will spontaneously resolve and the infection will become quiescent. The HSV virus can then be reactivated by stresses that temporarily affect the immune system. Reactivation leads to a bout of symptoms that will again resolve spontaneously.

Symptoms of the initial stage of infection begin 2 to 12 days after contact with the virus, 4 days on the average. There can be systemic symptoms (low-grade fever, headaches, and muscle aches) along with the typical local symptoms of genital herpes (pain, burning, itching, and tingling followed by skin or mucous membrane vesicles). Herpetic vesicles or blisters are of similar sizes and surrounded by a ring of erythema. These painful
vesicles rupture into tender ulcers in about 48 hours, and later, the ulcers become crusted as they heal. Herpes lesions heal fully in two to four weeks and usually leave no scars.

During a symptomatic episode of genital herpes, patients present with one or more clusters of vesicles. Common sites include the shaft and the glans of the penis in men and the labia and the buttocks in women. These skin lesions sometimes spread along the perineum, buttocks, and thighs; women tend to have more widespread lesions than men. People with genital herpes can also develop lesions outside the genital region. Along with the surface vesicles, there are usually enlarged, tender inguinal lymph nodes bilaterally.

After the initial stage of infection subsides, the HSV virus remains quiescent in the sensory nerve ganglia of the region. For genital herpes, these nerve ganglia are the dorsal root ganglia of spinal nerves S2, S3, and S4. When the latent virus is reactivated, it travels down the nerve to infect the same skin patches as before. HSV-2 is more likely to cause recurrent episodes of genital herpes than is HSV-1, but recurrent episodes of both HSV strains occur much less frequently as time passes.

The recurrent episodes of genital herpes typically begin with a 12- to 24-hour prodrome of local burning and tingling, followed by the appearance of clusters of lesions. The recurrence is usually less severe than the initial outbreak. Occasionally, there are also systemic symptoms (fever, headache, malaise, and lymphadenopathy). As in the primary infection, complete healing of the skin ulcers takes two to four weeks. Recurrent outbreaks of the virus may be less severe and shorter in duration than the initial outbreak (CDC, 2017j).

Research shows that the disease cycle also includes frequent, brief, undetectable viral shedding, leaving the host unaware of contagion and resulting in a higher than previously believed transmission rate (CDC, 2015f).

Clinical diagnosis of genital herpes is not always clear-cut. Genital herpes can present atypically, and, especially in women, there can be itching, abrasions, or fissures without the classic ulcers being visible. It is not possible to distinguish HSV-1 infections from HSV-2 infections clinically.

The effect of herpes lesions goes beyond physical discomfort. People who know that they are infected with genital herpes also suffer psychological symptoms. Infected people feel socially isolated, and because recurrent episodes of the disease are not predictable, people with HSV infections may be hesitant to have sexual relationships.
Genital herpes. A maculopapular herpetic rash can be seen on the penile shaft and corona of the glans penis. (Source: CDC/Dr. N. J. Flumara, Dr. Gavin Hart, Public Health Image Library.)

**Lab Tests**

Lab tests can confirm a clinical diagnosis of genital herpes. Swab specimens from vesicles or ulcers can be cultured, and diagnostic results are available in two to seven days using standard techniques and in one to two days using direct immunofluorescent antibody (DFA) stains. Polymerase chain reaction (PCR) testing and serology can also be employed. PAP smears can also be used to look for HSV-infected cells.

The fastest and most reliable tests for HSV infections are blood tests that search for HSV antibodies; blood tests are also available to distinguish between HSV-1 and HSV-2. Because HSV-1 infections are so widespread, only blood tests for the less common HSV-2 antibodies are diagnostically helpful in most cases.

When genital herpes is suspected, the patient should also be tested for other STDs.

**TREATMENT FOR GENITAL HERPES**

Currently, no treatments cure genital herpes infections. The treatment goals are to moderate symptoms, reduce the number of recurrences (outbreaks), and shorten the times of heavy viral shedding.

Antiviral drugs can reduce the effects of genital herpes but do not cure the infection. The recommended therapies are the same for HSV-1 and HSV-2. Treatment for recurrences is most effective when it is begun as soon as the prodromal symptoms appear and before the herpes vesicles develop. Therefore, patients with genital herpes are often given an antiviral drug prescription that can be filled immediately when the disease begins.
The frequency of recurrent episodes of genital herpes decreases significantly over time. Clinicians with patients on daily antiviral treatments should reevaluate periodically (e.g., yearly) the need for daily medication.

**GENITAL HERPES TREATMENT**

For the **first (primary) episode** of genital herpes, typical treatments:

- Acyclovir 400 mg orally 3x/day for 7–10 days, or
- Acyclovir 200 mg orally 5x/day for 7–10 days, or
- Famcyclovir (Famvir) 250 mg orally 3x/day for 7–10 days, or
- Valacyclovir (Valtrex) 1 g orally 2x/day for 7–10 days

Treatment can be extended if symptoms persist after 10 days of treatment.

For **recurrent outbreaks**, typical treatments:

- Acyclovir 800 mg orally 3x/day for 2 days, or
- Acyclovir 800 mg orally 2x/day for 5 days, or
- Acyclovir 400 mg orally 3x/day for 5 days, or
- Famcyclovir 125 mg orally 2x/d for 5 days, or
- Famcyclovir 1,000 mg orally 2x/d for 1 day, or
- Famcyclovir 500mg oral loading dose, then 250 mg 2x/d for 2 days, or
- Valacyclovir 500 mg orally 2x/d for 3 days, or
- Valacyclovir 1,000 mg orally daily for 5 days

For **frequent outbreaks** (i.e., six or more per year), patients can be put on a prophylactic course of daily antiviral drugs. Typical daily treatments:

- Acyclovir 400 mg orally 2x/day, or
- Famcyclovir 250 mg orally 2x/day, or
- Valacyclovir 1 g orally 1x/day, or
- Valacyclovir 500mg 1x/day if fewer than 10 outbreaks a year

Daily suppressive therapy can also be used for patients who are psychologically distressed by the disease and is successful in 70% to 80% of patients who have frequent recurrences.
In a pregnant woman infected with HSV, prophylactic

- Acyclovir 400 mg 3x/d until delivery, or
- Valacyclovir 500 mg orally 2x/d therapy at 36 weeks’ gestation reduces the risk that she will transmit HSV to her newborn baby during delivery.

For pregnant patients, FDA Pregnancy Risk Categories (A=lowest risk, D=highest risk) of these drugs are:

- Acyclovir: B
- Famcyclovir: B
- Valacyclovir: B

Intravenous (IV) therapy is for severe HSV disease or complications that necessitate hospitalization (e.g., disseminated infection, pneumonitis, or hepatitis) or CNS complications (e.g., meningoencephalitis). Recommended treatment:

- Acyclovir 5–10 mg/kg IV every 8 hours for 2–7 days followed by oral antiviral therapy to complete at least 10 days of total therapy.

HSV encephalitis requires 21 days of intravenous therapy.

(McCuistion et al., 2018)

PREVENTING THE SPREAD OF GENITAL HERPES

Physicians, nurses, and other clinicians should talk to these patients and give them specific information about how to avoid spreading genital herpes. Oral and written information should include these points:

- A person with genital herpes should tell all recent and future sexual partners about their infection. The sexual partners should understand that they are at risk for acquiring genital herpes even when the patient is asymptomatic.
- All forms of genital contact—vaginal, anal, or oral-genital—can transmit herpes.
- Using condoms and taking daily antiviral medications will reduce the risk of transmitting genital herpes.
- Sexual contact should be avoided entirely from the time an infected person has the prodromal symptoms of a herpes outbreak until after the sores have healed and new skin has formed.
- During a herpes outbreak, an infected person should avoid touching their sores and should wash their hands after each time they have contact with the lesions.
Once a person’s body has had time to make antibodies, blood tests can determine whether the person has an HSV-2 infection. A person who is unsure whether they have acquired an HSV-2 infection can be tested two weeks or longer after sexual contact with an infected partner.

During their third trimester, pregnant women who do not have HSV should avoid sexual contact with partners who have an HSV infection. Pregnant women who have or who may have genital herpes should inform their healthcare providers.

There is increased risk for HIV conversion among HSV-2 seropositive persons who are exposed to HIV (CDC, 2015f).

**HIV/AIDS**

(HIV infections and the subsequent development of AIDS are discussed in other Wild Iris Medical Education courses. HIV infections will only be summarized here, with a focus on the genital aspects of the infection.)

Human immunodeficiency virus (HIV) causes acquired immunodeficiency syndrome (AIDS), an STD/STI that, after about 10 to 15 years of infection, makes the body excessively susceptible to opportunistic infections and cancers. HIV, which is a retrovirus and which uses immune cells as its hosts, is fragile and cannot survive for long outside the body (WHO, 2015b).

In the United States:

- More than 1.1 million people were living with HIV in 2015, about 15% of whom were unaware.

- In 2016 there were 39,782 new cases confirmed in the United States. Men who have sex with men (MSM) continue to be the largest group infected, with 68% of new cases.

- Approximately 50% of all new documented cases of HIV are in people under 25 years of age.

- HIV infections are three to four times more common among men than women, although the percentage of women with this STD/STI is rising.

- The occurrence of HIV is highest in African American MSM (26%), then white MSM (19%) and Hispanic MSM (19%).

- The death rate from HIV infections has been declining in the United States. In 2015, 6,465 people with an AIDS diagnosis died, representing the ninth leading cause of death among 25- to 44-year-olds that year. The total deaths recorded due to AIDS since 1987, when such deaths were first recorded, is 507,351. (CDC, 2017c, 2018e)
DIAGNOSIS OF HIV/AIDS

Varying levels and concentrations of HIV have been found in most bodily fluids of infected persons, including blood, semen, saliva, tears, breast milk, and vaginal and cervical secretions. However, only blood, semen, breast milk, and vaginal and cervical secretions have been proven to transmit HIV infection.

Although the mechanisms of HIV and how it affects the immune system are not fully understood, the primary event is the HIV invasion of the body’s CD4+ cells (T-helper lymphocytes, also called T4 cells), white blood cells essential to the function of the immune system in fighting infection. HIV infects and destroys the T4 cells and damages their ability to initiate antibody production. Thus, it steadily deactivates the immune system, leading to dysfunction of various organ systems, including the endocrine, gastrointestinal, and nervous systems.

AIDS is an advanced state of the HIV infection. A person is said to have AIDS when an HIV infection has depleted their body of immune cells to such an extent that life-threatening OIs can thrive and rare cancers can develop. Some AIDS-permitted infections and cancers involve the genitourinary tract. These urogenital diseases include:

- In men, opportunistic infections of the prostate, epididymis, and testes; atrophy of the testes; and testicular tumors
- In women, opportunistic vulvovaginal infections and cervical cancer
- In all genders, opportunistic urethritis, inguinal and perineal skin infections and cellulitis, severe outbreaks of genital herpes, extensive and treatment-resistant genital warts, HPV-induced anal cancer, and quickly progressing and treatment-resistant syphilis (Lewis et al., 2017)

Clinical Signs

Clinically, HIV infections can be asymptomatic. Over time, however, the depletion of immune cells takes its toll, and when AIDS develops, the person will often have fever, weight loss, and anorexia, and OIs or malignancies can arise. These infections and malignancies are called indicator diseases, the most common of which are:

- Respiratory infections (e.g., Pneumocystis jiroveci pneumonia [formerly called Pneumocystis carinii pneumonia, or PCP], tuberculosis, bacterial pneumonia, fungal infections)
- CNS infections (e.g., toxoplasmosis, cryptococcal meningitis, tuberculosis)
- GI infections (e.g., cryptosporidiosis, isosporiasis, cytomegalovirus)
- Eye infections (e.g., cytomegalovirus, toxoplasmosis)
- Kaposi’s sarcoma (a cancer that causes lesions in soft tissue)
• Various lymphomas
  (CDC, 2015h)

For 10 years, 50% of those infected with the HIV virus have no symptoms, which can lead to further transmissions due to continuing unsafe practices (CDC, 2017c).

Women may also have no symptoms for up to 10 years. When symptoms appear, they may be experienced as extreme fatigue, rapid weight loss, frequent low-grade fevers and night sweats, frequent oral yeast infections, vaginal yeast infections, STDs/STIs, PID, abnormal menstrual cycles, and dark blotches on or under the skin or inside the mouth, nose, or eyelids.

**Lab Tests**

An HIV infection is diagnosed using blood antibody tests. Enzyme linked immunosorbent assay (ELISA) shows the presence of HIV antibodies in the blood. Rapid diagnostic tests (RDTs) are replacing the ELISA as the most commonly used HIV diagnostic test since the cost is less and the results are obtained more rapidly, although they are slightly less accurate (Mehra et al., 2015). The AIDS stage of an HIV infection is identified by the patient’s degree of immune cell depletion; specifically, a patient with an HIV infection has AIDS when their count of T4 cells is less than 200/mm³ or less than 14% of the total lymphocyte count.

The presence of other STDs/STIs makes both the transmission and the acquisition of an HIV infection more likely. Therefore, when patients are diagnosed with any STD/STI, they should be tested for HIV. Similarly, patients with other STDs/STIs should be advised to be especially careful because they can get (and give) the AIDS virus more easily than people without an STD/STI (CDC, 2017k).

With the advent of performance enhancers for erectile dysfunction (such as Viagra, Cialis, and Levitra), men over 50 are having sex more frequently and into more advanced age. They are less likely to use condoms than their younger counterparts. This places them at greater risk for STDs/STIs, including HIV/AIDS. However, clinicians may fail to ask patients about unprotected sex or to offer voluntary HIV testing. The result can be delayed diagnosis of HIV/AIDS in older adults because symptoms can mimic those of normal aging, such as fatigue, weight loss, forgetfulness, and/or confusion.

**TREATMENT OF HIV/AIDS**

Management of HIV infections is an evolving specialty. The standard for HIV treatment is combination antiretroviral therapy (cART), also referred to as highly active antiretroviral therapy (HAART), or sometimes an “AIDS cocktail.” HAART is initiated when there is a low T-cell count. There are currently 30 cART regimens being prescribed, depending on the phase of the HIV virus life cycle.
The earliest six drug treatment classes were named after the six phases of replication of the virus:

- Nucleoside and nucleotide reverse transcriptase inhibitors (NRTIs)
- Non-nucleoside reverse transcriptase inhibitors (NNRTIs)
- Protease inhibitors (PIs)
- Entry inhibitors
- Fusion inhibitors
- Integrase inhibitors

(Orsega, 2015)

There are now newer classifications of antiretroviral drugs:

- CCR5 antagonists
- Post-attachment inhibitors
- Pharmacokinetic enhancers

New AIDS drugs are in clinical trials all the time, and the most recent were approved by the FDA as recently as September 2018 (USDHHS, 2018b).

The treatment of AIDs also includes prophylaxis against opportunistic infections and aggressive treatment of those infections.

**CASE: HIV and Opportunistic Infections**

A pale young man, accompanied by his partner, walks up to the medical screening examination desk in the emergency department after being told by the admission clerk to “go to the head of the line.” He has a persistent cough that he tells the RN has been going on “for about two months.”

The nurse applies a surgical mask over the patient’s mouth and nose and proceeds to complete a focused history and physical. When the patient tells the RN that he has a five-year history of genital warts, the RN asks him how recently he has been tested for any other STDs/STIs, including HIV/AIDS. The patient states that he and his partner were tested for “everything” when they first started dating two years ago but that they do not have a monogamous relationship.

The patient’s oxygen saturation is 89% on room air. The nurse proceeds to send the patient to radiology for a stat chest X-ray (CXR) per ED standard orders. The CXR shows bilateral masses that are later biopsied as Kaposi’s sarcoma, an indicator disease for HIV/AIDS.
PREVENTING THE SPREAD OF HIV

A large public effort has been made to slow the spread of HIV infections. Nonetheless, HIV prevention efforts in the United States have had mixed results. Routine HIV testing for pregnant women in many states, and good preventive interventions, mean that diagnoses of HIV in babies have dropped dramatically. There is a 15% to 30% chance of HIV passing from mother to child without treatment. Antiretroviral treatment (ART) can reduce the transmission to <5% (Leopoldino et al., 2017). Infection rates have also declined among injecting drug users, however there has been an alarming increase among men who have sex with men.

Prevention and Routes of Transmission

Most HIV prevention methods address the three main routes of transmission.

Prevention efforts aimed at slowing sexual transmission of HIV include:

- Condom use (including female condoms)
- Safer sex education
- Treating sexually transmitted infections
- Male circumcision

Prevention efforts aimed at slowing HIV transmission through blood include:

- Screening blood products
- Reducing needle sharing
- Stopping needlestick accidents

Preventing mother-to-child transmission includes:

- Testing the mother for HIV during her third trimester, after the delivery, and at her first antenatal appointment
- Offering treatment if the mother tests positive
- Testing the newborn and offering treatment if positive (CDC, 2018f)

Antiretroviral Treatment and Prevention

Increasingly, antiretroviral treatment is being used to prevent HIV transmission. Good adherence to antiretroviral treatment can lower a person’s viral load and reduce the risk of onwards HIV transmission to others.
Pre- and Postexposure Prophylaxis

Emergency treatment to prevent HIV infection, known as postexposure prophylaxis (PEP), is a series of antiretroviral drugs taken after potential exposure to HIV. Likewise, preexposure prophylaxis (PrEP) can be taken before potential exposure to HIV. For example, if one partner in a relationship is HIV positive and the other is HIV negative (known as a serodifferent couple), the negative partner can take PrEP to protect himself from HIV transmission. Federal guidelines also recommend that PrEP be considered for those who are HIV negative and at substantial risk for HIV infection.

PrEP

The FDA has approved the combination medication tenofovir disoproxil fumarate plus emtricitabine (TDF/FTC) (Truvada) for use as PrEP to prevent new infections. HIV infection has been greatly reduced among those at high risk when PrEP is taken consistently (USDHHS, 2018c). PrEP is a powerful prevention tool and can be combined with condoms and other prevention methods to provide greater protection than when used alone.

Genital HPV Infections

Human papillomavirus is a family of viruses that cause genital (anogenital) warts and, much less frequently, cervical cancer. Human papillomaviruses are small DNA viruses. Hundreds of HPV types have been characterized, and approximately 40 of these can infect humans. Many HPV infections are asymptomatic, but some types of HPV infections cause common skin warts and plantar warts, while other types of HPV infections occasionally cause malignant skin and mucous membrane lesions (CDC, 2017l).

Benign HPV lesions such as genital warts are caused by low-risk types of HPVs (e.g., HPV types 6 and 11). Rarer, malignant HPV lesions such as cervical cancer and cancers of the anus, penis, vagina, or vulva can be caused or facilitated by high-risk types of HPV (e.g., HPV types 16 and 18).

HPV is quite contagious, and HPV infection is the most common STD/STI in the United States. (Chlamydia is the most commonly reported STD/STI.) HPV is so common that one half to four fifths of all sexually active adults will have had at least one genital HPV infection during their lives, and it is estimated that 1 in 100 of every sexually active person has genital warts at any given time. About 14 million people become newly infected each year, although these infections are usually not symptomatic. About half of the new cases occur in people who are between the ages of 15 and 24. Women are more susceptible to acquiring genital HPV infections than are men. As with other sexually transmitted infections, HPV infections are most common in people with more than one sexual partner (CDC, 2017l).
SCREENING FOR GENITAL HPV INFECTIONS

Since HPV infections are so common, using blood tests to screen asymptomatic people does not usually help to control the spread of HPV infections. In contrast, routine Pap testing is very effective at reducing cervical cancers in those who are infected. A variety of policy groups suggest that all women should have a Pap test to screen for cervical cancer within three years of beginning sexual activity or by no earlier than the age of 21 years (whichever occurs first) and at least every three years thereafter. There is no evidence that HPV immunizations should change the schedule of HPV testing, which is often performed with Pap smears as co-testing (CDC, 2016a).

DIAGNOSIS OF GENITAL HPV INFECTIONS

Typical Course

Greater than half the sexual partners of a person with HPV lesions will become infected. Most genital HPV infections are acquired through sexual intercourse. Other forms of genital contact can transmit HPVs, but infection by nongenital contact is less common.

Genital warts can develop beyond the genitals. Perianal genital warts can be acquired by skin-to-skin contact, but intra-anal genital warts are transmitted through anal intercourse. Very rarely, newborns can be infected by HPV during the birth process.

Most HPV infections are short-lived; they spontaneously disappear in less than a year and they cause no clinical problems. The serious health problems, such as cervical cancers, appear to be caused by uncommonly persistent infections when the persistent HPV is a high-risk type (e.g., HPV type 16). In these cases, the HPV infection may persist for decades before a cancer develops (CDC, 2017l).

The aberrant cell growth caused by high-risk HPVs leads to squamous cell dysplasias (e.g., cervical dysplasia) and eventually to neoplasms, such as cervical intraepithelial neoplasias (CIN), squamous cell cancers, anal squamous cell cancers, or adenocarcinomas. HPV dysplasias in the cervix can usually be detected by Pap tests.

Clinical Signs

The majority of cases (greater than 70%) of genital HPV infections are subclinical and produce no symptoms. Those genital HPV infections that do produce symptoms give rise to genital warts or to cervical dysplasia.

Genital warts, like cutaneous warts, can usually be diagnosed by their appearance, symptoms, and history. Genital warts caused by low-risk HPVs are soft, raised, skin-colored, and nontender. Most genital warts are asymptomatic, although sometimes they cause itching or burning. Clinicians generally diagnose genital warts by checking the genital area (CDC, 2017l).
Genital warts vary widely in size. They can be as tiny as a pinhead or as large as a small cauliflower (1 cm to 2 cm in diameter), and they can occur singly or in clusters. The small warts tend to be on stalks. Genital warts are typically found on moist surfaces such as the labia, vagina, cervix, urethra, bladder, perianal skin, or anus. In women, the walls of the vagina and the surface of the cervix can also have genital warts (which are often flat patches), and when external warts are present, women should have a speculum exam to search for internal warts.

In all genders, genital warts can grow along the internal walls of the urethra or bladder. Large or extensive warts around the urethral meatus indicate that the internal urinary tract should also be examined for warts.

When diagnosing genital warts, clinicians must rule out secondary syphilis, which may also cause wart-like papules.

Genital warts. Soft, wart-like growths caused by HPV can be seen on the penile shaft. The most commonly affected areas are the penis, vulva, vagina, cervix, perineum, and perianal area. (Source: CDC/Dr. M. F. Rein, Public Health Image Library.)

Genital warts. A close view of the anal region of a male patient shows the presence of condylomata acuminata. (Source: Public Health Image Library.)
Lab Tests

HPV cannot be cultured. On the other hand, DNA from HPV viruses can be tested to determine whether the virus is one of the high-risk types. DNA testing and type classing are used to make judgments about dysplasias with unclear cytologic test results, and DNA tests are also a common adjunct to Pap testing of women older than 30 years of age. Tissue testing after biopsy provides a definitive diagnosis, as do PCR assays (Lewis et al., 2017).

TREATMENT OF GENITAL HPV INFECTIONS

HPV infection itself cannot be treated, but lesions caused by the virus are treated by removal, which reduces infectivity but does not remove the presence of the virus.

About a quarter of all genital warts will disappear on their own; nonetheless, most clinicians and patients elect to treat the lesions. Treatment consists of removal of the wart. After treatment, the virus is still left in the surrounding epithelium, and approximately one third of patients will have a recurrence of the warts. In addition, HPV infections are commonly reacquired from the patient’s sexual partner(s).

For squamous cell dysplasias, treatment is usually excision. Dysplasias should be referred to a specialist for medical management (CDC, 2017; McCuistion et al, 2018).

GENITAL WARTS TREATMENT REGIMES

For small areas (less than 10 cm²) of genital warts, patients can often treat themselves with topical chemicals. It may be necessary to apply these topical drugs for many weeks. It should be noted that for several hours these chemicals can affect the efficacy of condoms.

Typical treatments are either:

- Imiquimod 5% cream applied to warts 1x/day at bedtime 3 days per week, or
- Podofilox 0.5% solution or gel applied to warts 2x/day in cycles of 3 days of treatment alternating with 4 days of no treatment, or
- Sinecatechin 15% ointment

For larger areas of genital warts, physician-applied treatments are recommended. These treatments include:

- Chemicals (podophyllin, diphencyprone, trichloracetic acid, bichloroacetic acid, salicylic acid, or interferon injected into the lesion)
- Loop electrosurgical excision procedure (LEEP)
- Cold (cryotherapy), liquid nitrogen
• Heat (electrocautery or laser therapy), ablation
• Laser treatments

For pregnant patients, the FDA Pregnancy Risk Categories (A=lowest risk, D=highest risk) of the above drugs are:

• Imiquimod: C
• Podofilox: C

(Lewis et al., 2017; Mayo Clinic, 2018c)

PREVENTING THE SPREAD OF GENITAL HPV INFECTIONS

The consistent use of condoms will reduce the risk of contracting and spreading HPV infections. The HPV2 and HPV4 vaccines (e.g., Gardasil, Cervarix) are recommended for the immunization of both males and females.

The Advisory Committee on Immunization Practices (ACIP) recommends either vaccine for routine use in females ages 11 or 12 years. Ideally, the vaccination should be given before a girl or woman has become sexually active because it does not protect against existing HPV infections. The current HPV vaccine does not protect against all potentially cancer-causing types of HPV. Therefore, all women—even those who have been vaccinated against HPV—should have regular Pap tests.

The CDC recommends the HPV vaccine for all males ages 11 to 12 and those to age 21 who have not had all three doses of the vaccine. It is also recommended for gay, bisexual, and men who have sex with men. Men through age 26 who are immunocompromised, including HIV positive, who have not had all three doses may also benefit. The vaccine is most effective when given to younger males. The vaccine has been proven to prevent genital warts and anal cancers in males and may help to prevent cancers of the oropharynx and penis (ACIP, 2018).

Additionally, HPV vaccination can be paid for by the U.S. Vaccines for Children Program. This federal program covers the cost of recommended vaccinations for children through the age of 18 years if they are Medicaid-eligible, uninsured, underinsured for vaccinations, Native American, or Alaskan Native.

Many parents object to administering the HPV vaccine to 11- or 12-year-olds, as recommended, since they are typically not yet sexually active at this age. However, vaccinating this early provides the best prophylaxis, and most immunizations are given before exposure to an infection.
HPV VACCINATION

The HPV4 (quadrivalent) vaccination was first licensed by the FDA for use in females in 2006 and in males in 2009 for prevention of genital warts. In 2010, the FDA added prevention of anal cancer in males and females as an indication for use.

A newer 9-valent vaccination shows nearly 97% efficacy against cervical, vulvar, and vaginal diseases related to HPV types 31, 33, 45, 52, and 58 in clinical trials. The 9-valent vaccination is expected to prevent an additional 15% to 20% of cervical cancers and 15% to 20% of other HPV-related cancers. Thus, the quadrivalent vaccine for HPV is no longer recommended by the FDA.

In 2018 the FDA approved a modification of the biologics license for 9-valent human papillomavirus vaccine (9vHPV; Gardasil 9, Merck) to extend the age range for the use of the vaccine to include women and men 27 through 45 years of age. This means that administration of 9vHPV to people 27 through 45 years of age is no longer off-label (ACIP, 2018).

(The ACIP was scheduled to discuss this change in licensure and consider modification of their HPV vaccine recommendations at their October 2018 meeting.)

CASE: HPV Vaccination

A mother brings her 13-year-old daughter, Rosa, to the pediatrician’s office for her annual well-child check-up. They are seen by Luanne, a pediatric NP. Much to Rosa’s embarrassment and concern, her mother starts asking the nurse about “this vaccine for genital warts I’m hearing about on TV. Does Rosa need that if she’s not having sex yet?”

Luanne explains to both Rosa and her mother that the vaccine is a series of injections that protect Rosa from HPV, the virus that causes genital warts. She explains that these warts may cause cervical cancer later in life. The recommendation is that girls receive the immunizations before they are sexually active and can get the warts. Luanne also points out to the mother that immunizations are only effective if they are given before exposure to the infection.

The mother thanks Luanne and asks if there is anything like that for her 11-year-old son. Luanne explains that genital warts in men and boys can become cancerous as well and that the vaccine is also recommended for boys. The mother says she will “think about it and look up some more about it on the Internet.” Luanne offers to answer any questions that may occur later and gives a pamphlet to both Rosa and her mother.

Trichomoniasis

*Trichomonas vaginalis* is the protozoan that causes trichomoniasis, a sexually transmitted form of vaginitis or urethritis. Trichomoniasis is a common infection. It is estimated that there are about 7.5 million newly occurring each year. Only 15% to 30% show overt symptoms. The infection is more prevalent in women than men, with older women more likely to develop the
infection. Those women with more than one sexual partner or with another STD/STI are the most likely to get trichomoniasis (McCuistion et al., 2018).

**DIAGNOSIS OF TRICHOMONIASIS**

**Typical Course**

*T. vaginalis* infects the vagina and the Skene’s ducts of women and the lower urinary tract of both men and women. The organism is spread by sexual contact. During birth, infected mothers can also pass the protozoa to their newborn daughters, and the presence of *T. vaginalis* in pregnant women can contribute to preterm labor. *T. vaginalis* can survive for up to 24 hours outside the body in a moist environment.

**Clinical Signs**

When symptoms are present, the most common symptom is a copious, watery vaginal discharge that is sometimes bubbly or frothy and that makes the underwear wet. The discharge can be white, gray, yellow, or green and typically has an unpleasant odor.

On speculum examination, the vaginal vestibule and vaginal walls can appear inflamed and edematous. The cervix may also be edematous and red, and sometimes the cervix has tiny pinpoint hemorrhages, giving it the appearance of the skin of a strawberry.

Most men with trichomoniasis are asymptomatic. When symptoms do occur, the infection produces urethritis, epididymitis, or prostatitis (McCuistion et al., 2018).
**Lab Tests**

Traditionally, trichomoniasis has been diagnosed by putting a sample of vaginal or urethral discharge on a warm microscope slide with physiologic saline and then examining the slide at high power. The discharge will contain many white cells and epithelial cells, and *T. vaginalis* protozoa can be seen as ovoid organisms that wiggle when their flagella twitch. Culture is the gold standard of diagnosis, but it is time-consuming, costly, and necessitates a repeat visit for follow-up treatment.

The nucleic acid amplification test (NAAT) for *T. vaginalis* infection also has high sensitivity and specificity and can use genital secretions or urine specimens. Recently, rapid testing has been developed to provide results in 30 minutes.

Patients with trichomoniasis are likely to have other STDs, and trichomoniasis increases the likelihood of the transmission and the acquisition of HIV by 1.5 to 2.7 times. Therefore, patients with trichomoniasis should be offered screening tests for a range of STDs/STIs (Gaydos et al., 2017).

**TREATMENT OF TRICHOMONIASIS**

Oral, not topical, antimicrobials are recommended for treating trichomoniasis.

<table>
<thead>
<tr>
<th><strong>TRICHOMONIASIS TREATMENT REGIMES</strong></th>
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<tr>
<td><strong>Typical single-dose treatments</strong> are:</td>
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<tr>
<td>• Tinidazole 2 g orally in a single dose, or</td>
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<tr>
<td>• Metronidazole 2 g orally in a single dose</td>
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Single-dose therapy of either drug can produce nausea.

**A typical multiple dose treatment** is:

• Metronidazole 500 mg orally 2x/d for 7 days

Both tinidazole and metronidazole inhibit the body’s metabolism of alcohol. Patients given tinidazole should not drink alcohol for the next three days; patients given metronidazole should not drink alcohol for the next 24 hours.

**For pregnant patients**, the FDA Pregnancy Risk Categories (A=lowest risk, D=highest risk) of these drugs are:

• Metronidazole: B
• Tinidazole: C
The recommendation for pregnant women is metronidazole 2 gm orally in a single dose.

(McCuistion et al., 2018)

**TREATING SEXUAL PARTNERS**

Trichomoniasis is easily transmitted sexually, and sexual partners of patients with trichomoniasis should always be treated, even when they are asymptomatic. It is recommended that all asymptomatic individuals who test positive for trichomoniasis in STD/STI screenings should be treated.

**Pubic Lice**

*Phthirus pubis* is the species of louse that prefers living among coarse human hair, such as pubic hair. An infestation of pubic lice produces the STD/STI called *pediculosis pubis*, a local skin condition marked by intense itching. Pubic lice are also called *crab lice*, and a case of pediculosis pubis has been informally called *the crabs*. They are exoparasites (creatures living on the surface of the human body).

Pubic lice are gray, oval, six-legged arthropods. Each is 1.1 mm to 1.8 mm long, making pubic lice smaller than head lice, which are a different species. Pubic lice lay their eggs (nits) on coarse body hair—i.e., pubic hair, perianal hair, thigh hair, abdominal hair, axillary hair, beards, and eyelashes. The eggs take six to ten days to hatch. The adult lice live by sucking blood and do not move far from their eggs (CDC, 2013; Lewis et al., 2017). Lice that are not in contact with a person will usually die in one to two days.

Pubic lice can be acquired by close physical contact with a person who has lice or by contact with recently-infested towels or bedding. Pediculosis pubis is quite contagious, and a person who has sex with an infected partner is likely to become infected. Condoms will not prevent transmission of pubic lice.

Figures on the prevalence and incidence of pediculosis pubis are mostly estimates, as pubic lice is not a reportable infection. As with other STDs/STIs, pediculosis pubis is most common in young adults who are sexually active.

**DIAGNOSIS OF PUBIC LICE INFESTATIONS**

*Typical Course*

Louse eggs are shiny and translucent and are secreted onto human hair shafts. Adult lice live and feed at the base of the hairs. When lice feed on blood, they inject saliva, and the saliva causes a continuous itching that is especially troublesome at night. The itching of pediculosis pubis is produced by an allergic sensitization to louse antigens, and this allergic reaction takes time to develop.
Clinical Signs

Pubic lice tend to remain in place and not travel far. An infestation from sexual contact is usually limited to the pubic hair. On hairy people, the lice sometimes spread through contiguous patches of hair to the thighs, abdomen, chest, axillae, and even to the beard. When pubic lice are found on children, especially on the head or the eyelids, it can be an indication of sexual abuse (CDC, 2013c).

Patients with pediculosis pubis present with unrelenting itching. A close examination of the infected area will find the eggs on the lower portions of shafts of hair; the eggs can be best seen using a magnifying lens. Under magnification, the lice can be seen to have small heads and three pairs of clawed, jointed legs.

The patient’s scratching further inflames the infested area. Skin in the infected area may have a red macular or maculopapular rash. There will be pale blue hemorrhagic spots left at points where the lice have been feeding, and excretions from the lice typically dot the area like tiny pepper grains. The patient’s scratching can cause secondary marks and infections. Serious infestations can lead to scaly skin.

Lab Tests

Pediculosis pubis is diagnosed using clinical criteria. However, when pubic lice are found on a patient, the person should be tested for other sexually transmitted diseases because patients with pubic lice have been found to have additional STDs/STIs, including HIV (CDC, 2013c).

TREATMENT OF PUBIC LICE INFESTATIONS

Topical creams or solutions are used to treat lice infestations. For symptomatic relief from itching, the patient can be given antihistamines or, in some cases, topical corticosteroids. Besides treating the person, the patient’s bedding and clothes should be decontaminated. Dry cleaning or machine washing in hot water and drying in a hot cycle are usually sufficient. Afterward, these items should not be allowed in contact with the patient or partner for at least three days.
PUBIC LICE TREATMENT REGIMES

Typical first-line treatment is:

- Permethrin (Nix) cream rinse 1% applied to the infected area for 10 minutes then thoroughly washed off (Note: this is a different concentration from the 5% permethrin cream used for scabies.)

Typical alternative treatments include:

- Pyrethrins with piperonyl butoxide shampoo or mousse applied to the infected area for 10 minutes then thoroughly washed off
- Malathion 0.5% lotion applied for 8 to 12 hours and washed off, or
- Ivermectin 250 ug/kg repeated in 2 weeks
- Lindane shampoo no longer recommended

Treatment should be repeated in a week if lice or symptoms persist. Treatment failures may result from reinfections from lice in parts of the body that have not been treated.

For pregnant patients, the FDA Pregnancy Risk Categories (A=lowest risk, D=highest risk) of these drugs are:

- Permethrin (Nix) cream rinse: B (the only recommended treatment for pubic lice in pregnancy)
- Pyrethrins with piperonyl butoxide: not available

(McCuistion et al., 2018)

TREATING INTIMATE CONTACTS

People who have had intimate contact (sexual or otherwise) with the patient in the past month should also be treated. Treated people should avoid intimate contact with anyone until they have been reexamined, usually five to seven days after treatment.

Scabies

*Sarcoptes scabiei* is the species of mite that causes the itchy skin infestation known as scabies. *S. scabiei* are short, stubby-clawed arthropods. Each itch mite is tiny, about one tenth the size of a pubic louse. Itch mites live their entire lives on humans. The females make wavy burrows in the human epidermis, where they lay their eggs. The maturing larvae live on the surface of the skin.
Scabies is a common disease throughout the world, and it is endemic in tropical countries. In the United States, scabies outbreaks occur more often in the winter and in locales where living conditions are crowded, such as in dense urban areas and in prisons, nursing homes, refugee camps, and childcare centers. For unknown reasons, black people are less likely than white people to get scabies.

**DIAGNOSIS OF SCABIES**

**Typical Course**

Scabies is acquired through close skin-to-skin contact. Between adults, scabies is often transmitted through intimate contact such as via sexual interactions, but scabies is not only transmitted sexually. Scabies will spread in a household or among any group of people who share close, direct physical contact (Tarbox et al., 2018).

After moving to a new person, the female itch mite chews a wavy burrow just beneath the surface of the skin. The burrowing leads to intense itching produced by the person’s allergic reaction to mite antigens. During a person’s first infestation, it may take weeks to develop the itchy allergic response, but in subsequent infestations, the response will occur within a day.

Itch mites move around more than pubic lice, and they wander throughout the body, especially at night. Moreover, unlike lice, itch mites do not limit themselves to hairy patches of skin, and they prefer thin skin. They can be found along the penis and scrotum in men, the vulva and the nipples in women, and the finger webs and the flexor surfaces of wrists, axillae, waist, feet, ankles, and under jewelry in all genders.

Typical scabies infestations include only a few mites, usually five to ten. Occasionally, however, people get crusted or Norwegian scabies, which is an infestation of millions of mites. Crusted scabies is most often found in immunocompromised patients. This form of scabies can involve extensive areas of skin, and the infested person is extremely contagious (Tarbox et al., 2018).

**Clinical Signs**

The hallmark of scabies is severe itching that gets worse at night or after bathing. In sexually transmitted scabies, the genital areas become itchy, but even when scabies has been acquired sexually, skin elsewhere on the body can become infected and itchy. People with sexually transmitted scabies commonly have itchy hands, wrists, breasts, and buttocks. Skin in the infected area is marked by thin, wavy, raised tunnels (burrows). The signs of infestation may also resemble a rash, insect bites, pimples, or eczema (Tarbox et al., 2018).
Scabies. A close view of the pubic region shows the presence of papules caused by an infestation of scabies (*Sarcoptes scabiei*). (Source: CDC/Dr. M. F. Rein, Susan Lindsley, Public Health Image Library.)

A scabies infestation can look like many other pruritic dermatologic conditions, and the diagnosis of scabies is made by finding the itch mites. The larvae and the eggs cannot be seen without magnification, but the female mites are sometimes just large enough to be seen with the naked eye.

The clearest identification can be made from scrapings of the skin papules. Using the edge of a sharp blade, the papule is scraped and the collected material is put on a microscope slide in a drop of mineral oil. At 1,000x magnification, mites, eggs, and bits of excrement should be visible when the dermatologic condition is scabies (Fuller, 2013).

**TREATMENT OF SCABIES**

Scabies is treated with a scabicide that kills adults, larvae, and eggs. Itching can persist for weeks after a successful treatment. For symptomatic relief from itching, the patient can be given antihistamines or, in some cases, topical corticosteroids. The patient’s bedding and clothes should also be decontaminated. Dry cleaning or machine washing in hot water and drying in a hot cycle are usually sufficient. Afterward, these items should not be allowed in contact with the patient for at least three days.

**SCABIES TREATMENT REGIMES**

A typical first-line treatment is:

- Permethrin (Nix or Lyclear) cream 5% applied to the body from the neck down and left for 8 to 14 hours before being thoroughly washed off; reexamine the patient in one week and use an alternative drug if live mites are still present. This is the treatment of choice for infants and young children. (Note: this is a different concentration from the 1% permethrin cream used for pubic lice.)
A typical **second-line treatment** is:

- Ivermectin 0.2 mg/kg orally, repeated in 2 weeks if necessary (Note: this is not an FDA-approved indication.)

A typical **second-line treatment for pregnant women, lactating women, or young children** is:

- Sulfur 8%–10% applied thinly to the whole body at night and left for 24 hours before being washed off, then reapplied for 3 consecutive nights (Note: this is not an FDA-approved indication.)

Lindane shampoo is no longer considered a treatment for scabies, as it can cause toxicity of the brain and other parts of the nervous system.

For **pregnant patients**, the FDA Pregnancy Risk Categories (A=lowest risk, D=highest risk) of these drugs are:

- Ivermectin: C
- Permethrin (Nix) cream 5%: B

(McCuistion et al., 2018)

**TREATING INTIMATE CONTACTS**

Treat sexual partners and other close contacts of patients who have scabies. To avoid reinfection, it is best to treat all close contacts at the same time, even if they do not have symptoms.

**CASE: Scabies**

Toby is a 17-year-old girl with a 6-month-old infant. She is seen at home for monthly visits by Jennifer, a public health nurse, because that is the regulation for underage mothers in the county where Toby and the baby reside. Toby tells Jennifer that she has been itching “down there for about two weeks, I guess. I think I must have caught something from my girlfriend when I borrowed her clothes. I guess.”

Jennifer examines Toby and discovers scabies in the pubic region. She examines the infant, who is clear. She explains that scabies can only be transferred through close, physical contact, not clothing. Toby states she has resumed sexual intercourse with the baby’s father.

Jennifer suggests permethrin (Nix) cream for Toby, the baby’s father, and everyone in the household, and she explains that it can be bought over the counter and how to use it. She explains that all clothing and bedding, including the infant’s, need to be washed in hot water and run through a dryer immediately.
PREVENTING THE SPREAD OF STDs/STIs

Sexually transmitted infections affect all corners of society and place a high burden on public health systems. Thus, society attempts to guide and influence sexual relations and to require individuals to voluntarily modify their private behaviors.

Public health programs aim to control the spread of STDs/STIs by targeting people’s voluntary behavior in three realms: before, during, and after sexual relations. Similarly, based on the special characteristics of STDs/STIs, a few basic principles guide the public health programs that have been designed to reduce their spread.

The dependence of STDs/STIs on the particular features of sexual contact leads to a few practical principles, which are the basic guides used by healthcare workers when they plan ways to protect people from acquiring STDs:

- Uninfected sexual partners are at high risk of acquiring STDs/STIs from infected partners.
- The specific sites of sexual contact are likely to be the locations at which STDs/STIs begin.
- The use of condoms is an effective barrier method to limit contact. (Shafer, 2015)

These simple principles are valid for STD/STI transmission beyond heterosexual vaginal intercourse; they also apply to oral intercourse, anal intercourse, and all other sexual contacts between heterosexual or homosexual partners.

Before Sex: Preemptive Protections

PREEXPOSURE VACCINATIONS

In theory, it should be possible to eradicate a sexually transmitted agent by vigilantly finding and treating every case. Antibiotics can eliminate certain bacteria (e.g., *T. pallidum*, *N. gonorrhoeae*, and *C. trachomatis*) from a single person’s body. However, antibiotic resistance makes it unlikely that the bacteria can be eradicated in large human populations. Viruses are even more difficult to eradicate because the current antiviral drugs do not kill viruses in vivo but only limit viral replication (WHO, 2012).

At the moment, therefore, the major preemptive control on the spread of STDs/STIs cannot depend on vigorous treatment. Instead, preemptive control depends on the development and the use of vaccines that can immunize people against the acquisition of sexually transmitted infections.

Certain widespread infectious diseases—notably, diphtheria, measles, polio, smallpox, and whooping cough—have been dramatically reduced or eradicated through the use of preexposure
vaccinations, not by using antimicrobial drugs. Public health officials hope that preexposure vaccinations can similarly slow the spread of STDs/STIs, although only a few such vaccines are currently available, such as:

- **Hepatitis B.** Hepatitis B virus causes liver dysfunction. Vaccination against HBV is recommended for all people who are being evaluated for any STD/STI or who are at high risk for acquiring HBV (e.g., drug users, men who have sex with men, healthcare workers, and incarcerated people).

- **Hepatitis A.** A vaccine against hepatitis A is also available, and it is recommended for men who have sex with men and for users of illegal drugs (Shafer, 2015).

- **Human papilloma virus.** HPV can also be combatted through vaccination. (See the box “HPV Vaccination” earlier in this course for more details.) (Basak et al., 2016)

**CIRCUMCISION**

Population studies suggest that circumcision may reduce the risk of developing HIV infections and genital ulcers. (See the box “Circumcision and HIV” earlier in this course.)

**EDUCATING PEOPLE AT HIGHER RISK**

Many of the behavioral changes that individuals must make to protect society are voluntary. Giving people clear and complete information about STDs/STIs and their prevention has been shown to reduce those people’s risky sexual behaviors and to slow the spread of STDs/STIs.

A variety of structured programs that include interactive discussions, counseling, peer group discussions, and video presentations have been documented to slow the spread of STDs/STIs. These programs cost money and absorb the time of professionals. With limited time, money, and personnel, the strategy has been to focus resources on high-risk populations and to emphasize the first-line types of STD/STI protection, such as barrier methods (e.g., condoms). Likewise, expensive screening tests for STDs/STIs have been aimed at high-risk populations to get the best results with limited resources.

In the United States, certain subpopulations are disproportionately plagued by STDs, and it is especially to these groups that education campaigns are directed.

**Patients with Existing STDs/STIs**

People who currently have STDs/STIs are an at-risk population because they are more likely to be reinfected or to acquire additional STDs/STIs. Randomized trials have shown that risk-reduction counseling of such patients significantly lowers their subsequent chances of acquiring an STD/STI (Shafer, 2015). This kind of preventive counseling should now be considered a standard component of the treatment of all patients with an STD/STI.


Substance Abusers

Abuse of alcohol and other substances contributes to an increase in risky behavior and therefore the occurrence of STDs/STIs in this population (Shafer, 2015). Those with a history of substance abuse report other risky practices, such as younger sexual activity, higher numbers of sexual partners, and inconsistent use of condoms. Inebriation or the influence of drugs may cause individuals to be less inhibited or less cognizant of safety issues. It is essential that this population be educated as to the higher incidence of STDs/STIs contracted while under the influence of alcohol and other drugs. For younger people, this information needs to be introduced at the middle school ages, as sexual activity and substance abuse often begin then.

Adolescents

Among adolescents, rates of sexual intercourse and pregnancy have been decreasing during the last two decades. Nonetheless, 40% of all high school students report having already had sexual intercourse at least once, and in the United States, adolescents and young adults ages 15–24 have a higher rate of STDs/STIs than any other age group (CDC, 2018d).

The goal of prevention education among adolescents is to influence their voluntary and private behavior. Such education includes providing adolescents with facts such as:

- Which STDs/STIs are common
- How STDs/STIs are transmitted
- What symptoms signal an STD/STI
- Consequences of an STD/STI
- How transmission of STDs/STIs can be prevented

Education also includes firm advice about what to do and what not to do, including practical examples of how to carry out this advice. Inviting questions as well as structuring peer education groups is also helpful. For example, one important aspect of adolescent sex education is to draw a correlation between the use of alcohol and drugs and risky sexual behavior. Mind-altering substances may reduce inhibitions or affect judgment, resulting in risky sexual practices. The incidence of high school students consuming alcohol or other drugs is 22.4%. This increases the risk of teen pregnancy, HIV infection, and other STDs/STIs. Helping adolescents make healthy choices requires specific advice that they do not use alcohol or other drugs and that this will reduce the risk of contracting STDs/STIs (CDC Foundation, 2016).

It has also been found that comprehensive sex education programs that discuss practicing abstinence, choosing low-risk partners, discussing partners’ sexual history, using condoms consistently, and not having multiple partners do the best job of preventing STDs/STIs (Bleakley et al., 2018). However, the inclusion or exclusion of specific
content in middle school and high school sex education programs is based on individual state laws.

**DISCUSSING STDs/STIs WITH ADOLESCENTS**

Specifically, discussions with teens should emphasize these points:

- The use of condoms is essential. Nonetheless, condoms do not completely protect a person from acquiring or transmitting STDs/STIs.
- Some STDs/STIs (e.g., genital herpes and genital warts) can be transmitted through any form of sexual contact; sexual intercourse is not necessary.
- Oral and anal sex can transmit STDs/STIs that can infect the mouth, throat, anus, or rectum.
- Abstinence from vaginal, oral, and anal intercourse is the only 100% effective way to prevent STDs/STIs and pregnancy. (CDC, 2015m)

**Sex Workers**

Sex workers are at higher risk for contracting STDs/STIs because of a greater-than-average frequency of sexual activity (possibly several times per day), multiple sexual partners, inconsistent use of condoms, frequent episodes of anal or oral sex, and clients who are more likely to engage in risky sexual behaviors and more likely to transmit STDs/STIs. This group may practice riskier behaviors than the general population because of the opportunity for a higher payment for having sex without a condom or with an individual known to be HIV positive. Laws in most countries prohibit sex work, creating a hidden population who may not have normal access to healthcare to prevent and treat STDs/STIs.

Transgender sex workers have a higher incidence of STDs/STIs than cisgender (gender identity matches sex assigned at birth) sex workers, but both have a higher rate of infection than those who do not have sex for pay, with the exception of men who have sex with men and African American men (Wickersham et al., 2017).

Globally, the per capita occurrence of STDs/STIs in sex workers compared to the general population is 13 times as high. The highest incidence of infected sex workers is in sub-Saharan Africa, where 50% of female sex workers were HIV-positive. Globally, sex workers comprise 9% of newly diagnosed HIV-positive cases. Inconsistent use of condoms among sex workers is directly tied to an increasing occurrence in STDs/STIs, particularly HIV/AIDS, even when that occurrence is initially very small.

Sex workers are also at greater risk as potential victims of violence, and this risk puts them at greater risk for contracting STDs/STIs since a violent climate is linked to a decreased use of condoms during sex (Reza-Paul et al., 2012). The threat of violence will
cause sex workers to participate in practices even when they know that such activity may cause them to contract STDs/STIs.

Education about the correlation between substance abuse and STDs/STIs, the benefits of condom use, and the increased risk from multiple partners reduces the incidence of STDs/STIs among sex workers (CDC, 2018i). Readily available condoms, decriminalization of sex work, and empowerment of sex workers to negotiate safer sex can also reduce the occurrence of STDs/STIs in this population as well as in their clients. Information about the effects of the various STDs/STIs may also improve the consistency of condom use (AVERT, 2018c).

**During Sex: Safer Sex**

**BARRIERS AS PROTECTION**

Abstinence, the restriction of sexual relations to long-term monogamous relationships, and partners telling the truth are the best protections against sexually transmitted diseases. The second-best protection is putting a physical barrier between the contacting couple (CDC, 2017n).

Barriers (i.e., male and female condoms and dental dams) are the best protections against the transmission and acquisition of STDs/STIs during sexual contact. In theory, female condoms cover more areas of contact during sexual activity than do male condoms, but neither type of condom prevents all skin-to-skin contact.

In general, condoms are more effective in preventing those STDs/STIs that are transmitted via fluids (e.g., chlamydia, gonorrhea, HIV, trichomoniasis) than those STDs/STIs that are transmitted via direct skin contact (e.g., chancroid, genital herpes, genital warts, syphilis) (CDC, 2017n).

To be most protective, condoms must be used correctly and all the time. Healthcare workers should not assume that patients know how to use condoms, and it is always appropriate to demonstrate how to put a condom on a penis or in a vagina using an anatomically correct model. If lubrication is used in conjunction with condoms, patients should be instructed to use only water-based lubrication, as oil-based may cause erosion of the condom.

People should not use male and female condoms simultaneously. As a rule, male condoms are preferred because they have proven to be effective, are easily available, and are inexpensive.

**CONTRACEPTION AND STD/STI PROTECTION ARE DIFFERENT**

In many people’s minds, unwanted pregnancy is the foremost fear associated with sexual intercourse. Sterilization, taking birth control pills, use of spermicidal gels or foams, avoiding intercourse during the mid-menstrual cycle, withdrawal before ejaculation, and other contraceptive techniques reduce the risk of pregnancy and make sexual intercourse feel safer. However, it should be pointed out to people that this safe feeling is only about protection from pregnancy; it is not about protection from infection.
CORRECT USE OF MALE CONDOMS

Male latex condoms are a good form of both contraception and disease prevention when used correctly. The steps in proper usage are:

- Use a new condom for every act of vaginal, anal, and oral sex throughout the entire sexual encounter (from start to finish).
- Before any genital contact, put the condom on the tip of the erect penis with the rolled side out.
- If the condom does not have a reservoir tip, pinch the tip enough to leave a half-inch space for semen to collect. Holding the tip, unroll the condom all the way to the base of the erect penis.
- After ejaculation and before the penis gets soft, grip the rim of the condom and carefully withdraw. Then gently pull the condom off the penis, making sure that semen does not spill out.
- Wrap the condom in a tissue and throw it in the trash, where others will not handle it.
- If you feel the condom break at any point during sexual activity, stop immediately, withdraw, remove the broken condom, and put on a new condom.
- Ensure that adequate lubrication is used during vaginal and anal sex, which might require water-based lubricants. Oil-based lubricants (e.g., petroleum jelly, shortening, mineral oil, massage oils, body lotions, and cooking oil) should not be used because they can weaken latex, causing breakage.

(CDC, 2016b)

Condoms do not provide protection if they are used incorrectly or inconsistently. Incorrect use is a major cause of a condom’s failure to prevent contraception or disease. Common problems are, for example, that men delay putting on a condom or that they remove it too early. Even with the best of intentions, the failure rate is significant during the first year when a couple is consistently using male condoms.

A larger problem is the inconsistent use of condoms. Women who have frequent intercourse, who use hormonal contraceptives, or who have uncooperative male partners are the most likely to have sexual intercourse without using the protection of a condom.

CORRECT USE OF FEMALE CONDOMS

Female condoms are less well-known than male condoms, however they are available over the counter and allow women a measure of control over their protection against conception and disease. Female condoms are more expensive than male condoms, costing 2 to 10 times as much. Some women find them awkward to use or romantically unappealing.
The steps in proper usage are:

- Find the inner ring of the condom and hold it between the thumb and middle finger. Squeeze the ring together and insert it as far as possible into the vagina, making sure that the inner ring is past the pubic bone. Leave the outer ring outside of the vagina. Make sure that the condom has not become twisted.

- After intercourse and before standing up, squeeze and twist the outer ring to make sure the semen stays inside; remove the condom by pulling gently.

- Use the condom only once. Throw used condoms in the trash. Do not flush a female condom down the toilet; it is likely to clog the plumbing.

- Be careful not to tear condoms with sharp fingernails or jewelry.

- Do not use a female condom and a male condom at the same time. Friction between them can cause them to bunch up or tear.

- Do not use a petroleum-based substance (e.g., Vaseline) as a lubricant. These substances break down latex.

- If a condom tears or breaks, the outer ring becomes pushed up inside the vagina, or the condom bunches up inside the vagina during intercourse, remove it and insert another condom right away.

(CDC, 2016c)

CORRECT USE OF DENTAL DAMS

Oral sex is a widespread form of sexual activity. It has been found that 85% of 18- to 45-year-olds and 33% of 15- to 17-year-olds profess to having had oral sex at least once. Chlamydia, gonorrhea, syphilis, HIV, HPV, and trichomoniasis can all be spread by oral sex. Oral sex has a much lower risk for transmission of HIV, but it can be spread orally in the absence of protection (CDC, 2017n).

A dental dam is a latex or polyurethane sheet used between a person’s mouth and vagina or anus during oral sex. Ready-to-use dental dams can be purchased online or can be constructed by cutting the ends off of a condom and then cutting through the remaining tube to form a square or rectangle.

The steps in proper usage are:

- Place a dental dam flat to cover the vaginal opening or anus.

- Throw away used dental dam in the trash; do not attempt to flush, as this may clog the toilet.

- Use a new latex or polyurethane dental dam every time you have oral sex.
• Read the package and check the expiration date.
• Make sure there are no tears or defects.
• Place the dental dam before starting oral sex and keep it in place until finished.
• Use water-based or silicone-based lubricant to prevent breakage.
• Store dental dams in a cool, dry place.

(CDC, 2016d)

CONDOM USE IN THE UNITED STATES

Among adolescents, condom use has decreased. In a longitudinal study of heterosexually active, unmarried adolescents, 63.6% of females reported consistently using condoms in 2003 compared to 46.7% in 2015, and 69% of males reported consistently using condoms in 2003 compared to 58.1% in 2015 (Harper et al., 2018). At the other end of the age spectrum, it has been shown that elderly adults are less likely to use condoms than younger people.

After Sex

SCREENING AT-RISK POPULATIONS

Reducing public health threats such as STDs/STIs takes the cooperation of physicians, clinics, and hospitals. For STDs/STIs, extra efforts at screening for asymptomatic or unrecognized infections are important ways to contain the infections’ spread.

One simple screening opportunity is to routinely include STD/STI screening and risk-assessment questions when taking all patients’ medical histories.

Beyond incorporating STD/STI questions into routine medical histories, special efforts should be made to check certain subpopulations. Many infected individuals are missed by routine STD/STI screening because they do not develop or are not aware of symptoms, and thus they do not present themselves to the healthcare system. Other individuals avoid the healthcare system because they are hesitant about acknowledging or reporting symptoms. For these reasons, additional plans should be made to routinely screen certain high-risk people, such as:

• Young adults between the ages of 15 and 24 (the age group with the highest rates of STD/STI infections)
• Returning international travelers (STDs/STIs being one of the top five health risks for international travelers)
• Women who are sexually active, including women who have sex with women
• Those who abuse substances
• Sex workers
• Those who have had sex with multiple or new partners
• Those with a history of prior STDs

STATISTICAL MONITORING: REPORTABLE DISEASES

To recognize diseases that are spreading, each state requires its physicians and medical lab facilities to report cases of certain diseases to local health boards. The CDC then compiles and publishes these statistics for the entire country through the National Notifiable Diseases Surveillance System.

The STDs/STIs that are nationally monitored are:

• Chancroid
• Chlamydia
• Gonorrhea
• Hepatitis B
• Hepatitis C
• HIV infection
• Syphilis
  (Boskey, 2018)

EPIDEMIOLOGICAL TREATMENT: EXPEDITED PARTNER THERAPY (EPT)

There is no simple way for public health officials to identify all people who have sexually transmitted infections, and infected individuals do not always identify themselves because:

• Sexually transmitted infections are not always symptomatic and infected people are not always aware of an infection.

• Symptomatic people can be too embarrassed, too poor, or too afraid of lack of confidentiality to see a healthcare provider.

As a counterbalance, patients who are diagnosed with an STD/STI provide a means of identifying some of the still undiagnosed cases of the disease. Specifically, the recent partners of STD/STI patients are a pool of potentially infected individuals. Examining and treating these “hidden” cases is one way to limit the spread of STDs/STIs.

With the cooperation of their patients, clinicians should try to find and treat sexual contacts who may have an STD/STI. This effort is a form of epidemiologic treatment. Epidemiologic treatment uses population studies and statistical risk assessments to make educated guesses as to which sexual partners of patients are likely to also be infected (Shafer, 2015).
Patients should be asked to notify their sexual partners and to encourage the partners to see a physician. Some local health departments have programs to help patients notify their partners and to arrange confidential treatment and counseling.

Unfortunately, these programs do not always work, in part due to their multistep process of identifying, notifying, examining, and treating such individuals. Each step in the process poses an opportunity for an infected person to fail to get treated. Obstacles include:

- Patients are embarrassed about having to tell sexual partners that they may have a sexually transmitted infection.
- When partners are notified, they may be asymptomatic and not seek medical evaluation.
- The partners may be too embarrassed to see a physician.

Some of these difficulties can be overcome by having the patients deliver the therapy—either a prescription or a medication—directly to their sexual partners. This has been called patients’ delivery of partners’ therapy (PDPT) or expedited partner therapy (EPT).

In controlled studies, EPT was found to be more effective than the conventional multistep notification and treatment approach (Shafer, 2015). Currently, however, EPT cannot always be used because not all states allow physicians to prescribe medications without directly examining the patient. According to CDC figures as of June 2015, EPT is allowable in 42 states and the District of Columbia; potentially allowable in an additional six states and Puerto Rico; and not allowed in Kentucky and South Carolina (CDC, 2018h).

**STD/STI PROTECTION FOR VICTIMS OF SEXUAL ASSAULT**

It is estimated that 1 in 5 women and 1 in 14 men in the United States have been sexually assaulted (CDC, 2018j). Along with physical injury and psychological trauma, sexual assault brings fears of pregnancy and STDs/STIs.

Overall, the chances of a victim getting an STD/STI from a sexual assault are not high. For example, from a sexual assault, the general risk of contracting HIV infection is less than 1%. Trichomoniasis, bacterial vaginosis, gonorrhea, and chlamydia are the most frequently diagnosed STDs/STIs following a sexual assault. The actual risk, however, varies by region and by the type of attack (CDC, 2015o).

The best treatment for sexual assault victims is given by a Sexual Assault Response Team (SART) or a Sexual Assault Nurse Examiner (SANE), which include nurses with special training in forensics and psychological therapy. Emotional support and continuity of care is essential for the well-being of a sexual assault patient (CDC, 2015o). All treatments and examinations should be done with the victim’s consent, and SART clinicians should have the appropriate consent forms on hand.
Initial Evaluation

The initial examination of a person who has been sexually assaulted combines patient care with the collection of criminal evidence. The examination should be thorough and should recognize that from 40% to 80% of sexual assault victims sustain injuries outside the anogenital area. The person’s mouth, anus, and rectum should be examined when appropriate.

Testing for and Treating STDs/STIs

Decisions about testing for and treating STDs/STIs should be made in discussions with the patient. Together, the victim and the health team can usually formulate a plan that combines testing and preventive treatment and that includes scheduled follow-up visits to monitor the victim’s health. The treatment plan is sometimes broadened to include HPV vaccinations if the victim is a young woman who has not yet been immunized.

The medical and psychological plans should be written, and copies should be given to the patient along with written information about STDs/STIs, pregnancy, and the psychological effects of sexual assault.

Testing poses complications for the protection of sexual assault victims. In some situations, defense lawyers have used positive test results as an opportunity to explore the victim’s sexual history. For this and other reasons, many providers of acute care prefer to give victims of sexual assaults preventive or prophylactic treatment rather than to wait for (and make records of) definitive diagnoses before treating the patient (CDC, 2015o).

Preventive treatment usually includes antibiotics against the two highest-risk sexually transmitted infections: gonorrhea and chlamydia. Preventive treatment also includes vaccination against hepatitis B when the victim either has not already been immunized or is not certain about their immunization history. With preventive therapy, prophylaxis against trichomoniasis, syphilis, or HIV is typically decided on a case-by-case basis. The result of a urine pregnancy test is used to guide the choice of preventive drugs.

Follow-Up Care

In all cases, the medical team should arrange a follow-up visit in one week so that the physical and psychological healing of the victim can be monitored. At this time, some testing or retesting for STDs/STIs may be appropriate. A visit at one to two weeks can include another pregnancy test, rescreening for bacterial infections, and blood tests for viral infections (HSV, hepatitis B, HIV, and cytomegalovirus). Another visit at one to two months is recommended to reevaluate for development of anogenital warts. It is recommended that victims who are concerned about syphilis or HIV infection should be retested at six weeks, three months, and six months after the assault (CDC, 2015o).
POST–SEXUAL ASSAULT PROPHYLACTIC TREATMENT REGIMENS

- Ceftriaxone 250 mg IM in a single dose, plus
- Azithromycin 1 g orally in a single dose, plus
- Metronidazole 2 g orally in a single dose or
- Trinidazole 2 gm orally in a single dose

(CDC, 2015o)

CASE: Sexual Assault

Geeta is a sexual assault nurse examiner. She is called in to the emergency department by the county sheriff to examine a 32-year-old woman who states she was sexually assaulted by her boyfriend. The patient is crying continuously and presents with a black eye and bruising on her arms and legs.

Geeta helps the woman into a patient gown in the sexual assault examination room in the ED. She wears gloves and a surgical gown at all times and places the woman’s clothing into evidence bags, sealing and initialing them. She explains each step of the procedure for collecting forensic evidence to the patient. She photographs the patient’s injuries. She takes blood, urine, and swab samples of the vagina.

Geeta calls a patient advocate to come and talk to the patient. She discusses the possibility of prophylactic treatment to prevent any sexually transmitted infections. She reassures the patient and stays with her.

EMOTIONAL/PSYCHOLOGICAL ASPECTS OF STDs/STIs

STDs/STIs can take an emotional toll on those involved in the transmission and contraction of the diseases. The ramifications of some of the diseases can have life-altering and even fatal effects. Thus, emotional/psychological counseling and education are essential, particularly for victims of sexual assault, those who may become sterile as a result of an STD/STI, those who transmit a disease to unborn or newly born offspring, those who discover they have an STD/STI as a result of a partner’s infidelity, and those suffering from side effects due to treatments (AHRQ, 2014).

STDs/STIs and Sexual Assault

One frightening outcome of sexual assault is the possibility of contracting an STD/STI from the assailant. Although the possibility of contracting HIV from a sexual assault is less than 1% (CDC, 2015o), contracting trichomoniasis, gonorrhea, chlamydia, and bacterial vaginosis is more common. The victim will require education about the STD/STI symptoms to look for and the necessary follow-up. (See also “STD/STI Protection for Victims of Sexual Assault” above.)
STDs/STIs and Fertility

Some STDs/STIs, if untreated for a significant amount of time, can cost a woman the ability to become pregnant. Untreated gonorrhea, for example, can cause pelvic inflammatory disease, which can lead to ectopic pregnancy or infertility. Both men and women need to be educated and counseled about the extreme consequences of unprotected sexual intercourse.

STDs/STIs and Offspring

Certain STDs/STIs can be transmitted to offspring. Trichomoniasis can be transmitted to a newborn during a vaginal birth. Congenital syphilis, herpes, HPV, chlamydia, and gonorrhea can all be transmitted from the mother, often during a vaginal delivery. It is imperative that pregnant women be educated as to the possibility of transmitting STDs/STIs to their newborns, possible effects on the fetus, the need for treatment during pregnancy, and methods of prevention (CDC, 2018b). Counseling will be needed if the mother’s STD/STI results in preterm labor and birth, neonatal sepsis, premature rupture of membranes (PROM), or any harm to the unborn infant.

STDs/STIs and Infidelity

At times, the diagnosis of an STD/STI is the first evidence that a partner has been sexually active with another person. The realization about what has occurred may trigger a need for psychological counseling to address unresolved issues that arise from the infidelity and the possible outcomes. Couples counseling may be required if the parties want to stay together. The recipient of the transmission of disease(s) needs to learn about the importance of getting tested for other STDs/STIs and the value of starting treatment quickly.

SEXUAL EXPRESSION IN RELATIONSHIPS

A healthy sexual relationship includes similar characteristics to any healthy relationship in the areas of communication, respect, and caring. A healthy sexual relationship includes partners who:

- Have one another’s consent
- Are able to talk honestly to each other
- Treat each other with respect
- Care about their partner’s pleasure
- Protect each other against physical and emotional harm, unwanted pregnancy, and sexually transmitted infections
- Accept responsibility for their actions

(WCH, 2018)
An unhealthy sexual relationship may occur when one partner exerts more power over the other. Issues of consent, abuse, and unwanted touching may be symptoms of a relationship that is unhealthy. The following are characteristics of an unhealthy sexual relationship:

- Lack of consent for any sexual acts
- Uncomfortable touching
- Forced sex
- Continued advances after being told “no”
- Treating a partner like a sexual object
- Humiliation
- Persistent pressuring for sex
- Coercion
- Causing pain
- Violent behavior

(Campbell College, 2018)

CONCLUSION

Sexually transmitted infections are those that are transmitted through sexual contact. The range of infectious agents that cause STDs/STIs is broad and includes bacteria, viruses, protozoa, and tiny arthropods (lice and mites). A common characteristic of most agents causing STDs/STIs is that they do not tolerate dry, cool environments but instead thrive in warm, moist mucous membranes.

For certain organisms, sexual contact is the main means of transmission from person to person. This is the case, for example, with chlamydial infections and gonorrhea. For systemic STDs/STIs, such as HIV and hepatitis infections, the genital regions are mainly points of entry into the circulation. For other more local STDs/STIs, such as HPV infections, the genital region becomes the primary site of lesions. (This course has focused on local STDs/STIs.)

The Epidemiology of STDs/STIs

STDs/STIs are quite common. It is estimated that 20 million new cases of STDs/STIs occur each year in the United States, the majority among young people between the ages of 15 and 24 years (CDC, 2018b).

Although they are major public health concerns, some widespread STDs/STIs have not been quantified by exact statistics. For example, HPV infection, the cause of genital warts, is thought
to be the most widespread sexually transmitted disease in the United States, with up to 80% of people expected to be infected in their lifetimes (CDC, 2018b). Nonetheless, the numbers of HPV infections remain only an estimate. It may be that HPV and some other STDs/STIs are underreported because the symptoms are subclinical, the patient may be embarrassed, or, as in the case of syphilis and HPV, the original symptoms go away while the STD/STI remains. This may cause the patient to assume they are no longer infected.

**Common Presenting Syndromes**

Symptomatic STDs/STIs of the genitals present as a variety of syndromes. These include:

- Urethritis (urethral discharge and dysuria), caused most often by *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, or *Trichomonas vaginalis*; common non-STD/STI causes include *Ureaplasma urealyticum* and *Mycoplasma genitalium*

- Genital ulcers (skin or mucous membrane sores), caused most often by HSV, *Haemophilus ducreyi* (chancroid), or *Treponema pallidum* (syphilis)

- Genital warts (protuberant growths on the skin or mucous membranes), caused most often by HPV

- Lower genital tract infections in women (vaginal discharge, irritation of the vulvae, and dysuria), caused most often by *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Trichomonas vaginalis*, or HSV; common non-STD/STI causes include *Candida albicans* and bacterial vaginosis

- Upper genital tract infections in women (lower abdominal pain, adnexal and cervical tenderness), caused most often by *Chlamydia trachomatis* or *Neisseria gonorrhoeae*; common non-STD/STI causes include *Gardnerella vaginalis*, *Haemophilus influenzae*, and enteric gram-negative organisms, such as *E. coli*

Sexual contact includes contact between genitals, mouth, and anus. Therefore, STDs/STIs can also present with oral/pharyngeal or anal/rectal symptoms.

**Principles of Treatment**

When an STD/STI is diagnosed, it is important that it be treated quickly to reduce the risk of the patient spreading the disease or developing worsening symptoms. Specific symptoms suggest particular infections or a syndrome of related symptoms and organisms. Clinical manifestations can often provide enough information to start treatment immediately, while other infections may require testing to provide a specific causative factor. Rapid testing can provide results within as little as 30 minutes, allowing treatment to be given in the same, initial visit (Gaydos et al., 2017). When possible, it is ideal to use medicines for which the entire treatment regimen can be administered in one dose that can be given during the patient’s first visit.
Patients with an STD/STI should also be tested for other STDs/STIs because the presence of one infection makes the existence of a second more likely. Anyone who comes into the health system to be tested for an STD/STI should be screened for an HIV infection.

STDs/STIs are treated according to the type of infectious organism, not the type of presenting syndrome. Often, clinical diagnoses cannot definitively identify the causative organisms, and lab tests are needed to verify or to pinpoint the diagnosis.

The current recommended treatments are given by the CDC in updates to its STD/STI treatment guidelines (see “Resources” at the end of this course).

Protecting the Public

From a public health standpoint, it is best to treat the sexual partners of a patient with an STD/STI at the same time as the primary patient. Therefore, STD/STI patients should be encouraged to notify their sexual partners of the possibility that they may also be infected. Both patient and partner should be told that infected people can often be asymptomatic and that screening with lab tests should be done even when an at-risk person seems to be perfectly healthy. For certain STDs/STIs, the chances of transmission are so high that sexual partners should be treated prophylactically, even without testing.

Besides treating infected patients and their sexual partners, public health programs work to reduce the overall transmission and acquisition of STDs/STIs. These programs educate people, especially those people who are at high risk (such as teens and young adults), by explaining what STDs/STIs are, how they are acquired, how they can be prevented, and how they are treated. One principle that should be stressed is that, for sexually active people, barrier methods (i.e., condoms) are the best safeguard against transmitting or acquiring many of the STDs/STIs and that other forms of contraception may protect against pregnancy but do not protect against disease.

Another key public health effort is large-scale vaccination against STDs/STIs. Currently, it is recommended that young males and females be vaccinated against HPV (Schuchat, 2015) and that people at risk for STDs/STIs be vaccinated against hepatitis B.

Examples of public healthcare that can be done at the level of individual patients include:

- Reaching out to sexual partners and expedited partner therapy
- Making extra efforts at patient education
- Vaccinating young men and women
- Providing counseling
- Rapid testing

Nurses and other healthcare professionals must take on these responsibilities, which go beyond the acute treatment of their patients, to protect the community from STDs/STIs.
RESOURCES

Teacher’s guide: STDs (KidsHealth)
https://classroom.kidshealth.org/classroom/9to12/problems/conditions/stds.pdf?ref=search

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
http://www.cdc.gov/nchhstp/

Recommended vaccines (CDC)
http://www.cdc.gov/vaccines/vpd-vac/default.htm

Sexual and reproductive health (WHO)
https://www.who.int/reproductivehealth/topics/rtis/en/

Sexually transmitted diseases (NIH, MedlinePlus)

Sexually transmitted diseases treatment guidelines (CDC)
https://www.cdc.gov/std/tg2015/default.htm

STDs (Teensource)
https://www.teensource.org/std

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ACCREDITATION INFORMATION FOR WILD IRIS MEDICAL EDUCATION
1. The most commonly reported sexually transmitted infection in the United States in recent years is:
   a. Chlamydia.
   b. Gonorrhea.
   c. Syphilis.
   d. HIV.

2. Half of new sexually transmitted infections in recent years have been documented in people ages:
   a. 15–24 years.
   b. 25–34 years.
   c. 35–44 years.
   d. 45–54 years.

3. Healthcare professionals may overlook symptoms of STDs/STIs in older adults because:
   a. Older adults are less susceptible to sexually transmitted infections.
   b. Older adults do not engage in risky sexual behaviors.
   c. STD/STI rates have been steadily decreasing among this population.
   d. Of the stereotype that older adults are no longer sexually active.

4. Which is a true statement about the occurrence of STDs/STIs among U.S. subpopulations?
   a. Among men who have sex with men, STD/STI incidence is disproportionately higher among whites.
   b. Among age groups, STDs/STIs occur more frequently among older adults.
   c. The incidence of gonorrhea is higher among women than men.
   d. Rates of STDs/STIs by race/ethnicity are highest among African Americans.

5. Which is a true statement regarding STDs/STIs in pregnant women?
   a. Testing for STDs/STIs in pregnant women is not recommended due to risk to the fetus.
   b. STDs/STIs may increase the risk for fetal demise.
   c. The herpes virus cannot be transmitted during a vaginal birth.
   d. Breastfeeding is not a significant mode of HIV transmission.
6. A problem associated with treating STDs/STIs in an urgent/emergent care setting is:
   a. Greater embarrassment for the patient when being seen by an unfamiliar clinician.
   b. A longer wait time when compared with making an appointment with a physician.
   c. Insufficient follow-up care.
   d. A lack of access to such locations.

7. When educating a young adult female patient who has been diagnosed with genital warts due to HPV infection, the nurse informs the patient that this is a very common, incurable infection caused by a:
   a. Protozoa.
   b. Parasite.
   c. Virus.
   d. Bacterium.

8. Which is not usually categorized as an STD/STI-causing organism because it is normally found in the human urogenital tract?
   a. *Chlamydia trachomatis*
   b. *Treponema pallidum*
   c. *Candida albicans*
   d. Human papilloma virus

9. While taking a sexual history from an adolescent patient, the clinician’s action is to:
   a. Talk initially in a private setting while the patient is still clothed.
   b. Avoid embarrassment by refraining from asking about anal intercourse.
   c. Conduct a face-to-face interview instead of employing a written survey.
   d. Avoid questions about intimate relations with someone of the same sex.

10. When performing an examination of the female genitalia, the clinician:
    a. Asks the patient to remain quiet while the exam is being done.
    b. Has the patient sit on the exam table at a 45° angle.
    c. Also educates the patient about their anatomy and physiology.
    d. Limits the exam to areas the patient indicates as showing symptoms or discomfort.
11. The disadvantage of over-the-counter rapid tests for HIV or other STDs/STIs is that such tests:
   a. Are not linked to necessary treatment information.
   b. Take too long to produce results.
   c. Are available for purchase only to those over 21 years of age.
   d. Are sold only in certain states.

12. In a female patient who describes intense genital itching, the clinician suspects the patient’s symptoms are caused by:
   a. Pubic lice and/or scabies.
   b. A recently acquired HIV infection.
   c. A new laundry detergent.
   d. Wearing a wet bathing suit.

13. When a patient presents with genital ulcers, laboratory testing should include screening for:
   a. Scabies and pubic lice.
   b. Syphilis and HIV.
   c. *Chlamydia trachomatis* and *Neisseria gonorrhoeae*.
   d. *Trichomonas vaginalis* and human papillomavirus (HPV).

14. The clinician treating a patient with genital warts caused by human papillomavirus (HPV) educates the patient that their infection can be sexually transmitted when they:
   a. Have no visible signs of an infection.
   b. Have bad hygiene.
   c. Share food or eating utensils.
   d. Kiss, hug, or hold hands with another person.

15. When a patient presents with nongonococcal urethritis (NGU), the clinician orders a screening test for:
   a. Chlamydia.
   b. Scabies.
   c. Genital molluscum contagiosum.
   d. Trichomoniasis infection.
16. What concern underlies the principle of initiating quick treatment for STDs/STIs?
   a. Discouraging the development of antibiotic-resistant microbes
   b. Verifying definitive lab results
   c. Reducing the risk for spreading the infection to other people
   d. Implementing a cost-saving measure

17. Which is a true statement about chlamydial infections in the United States?
   a. Most people with chlamydia display symptoms of their infection.
   b. Infections are reported more commonly among males than among females.
   c. The occurrence of chlamydial infection increases as age increases.
   d. Chlamydia is the most common reportable STD.

18. Chlamydia screening is least likely to benefit which female patient?
   a. A 15-year-old patient who presents for her sports physical and denies sexual activity
   b. A 29-year-old patient who is in her first sexual relationship since her divorce 2 years ago
   c. A 21-year-old patient who presents for her college physical and a birth control pill renewal
   d. A 26-year-old patient who was just diagnosed with trichomoniasis

19. Treatment for chlamydial infections is generally:
   a. Antihistamines and topical corticosteroids.
   b. An antibacterial agent, such as azithromycin.
   c. An antiviral agent, such as acyclovir.
   d. Contraindicated in all patients who are pregnant.

20. Routine screening for gonorrhea is recommended for all:
   a. Patients who are newly diagnosed with chlamydia.
   b. Patients who are sexually active.
   c. Female patients who are pregnant.
   d. Male patients under the age of 25.
21. A patient with a history of urogenital gonorrhea is newly diagnosed with pharyngeal gonorrhea. When the patient questions the recommended 2-dose azithromycin regime, the clinician explains that:
   a. Because this is not a first-episode infection, more medication is needed.
   b. The regime will encourage the patient to come in for a follow-up visit.
   c. For pharyngeal gonorrhea, a second-dose treatment is indicated.
   d. A second dose will treat any other infections the patient may have.

22. Which description fits primary syphilis?
   a. A quiescent or inactive infection
   b. A systemic infection, with low-grade fever, malaise, lymphadenopathy, and rash
   c. A local infection characterized by a firm, painless genital ulcer
   d. A systemic disease characterized by granulomatous or necrotic lesions leading to organ damage

23. The preferred treatment for syphilis is the:
   a. Antibacterial drug penicillin.
   b. Antiviral drug acyclovir.
   c. Antiprotozoal drug metronidazole.
   d. Systemic insecticide ivermectin.

24. The two types of infections caused by the herpes simplex viruses, HSV-1 and HSV-2:
   a. Are clinically indistinguishable.
   b. Are not always contagious.
   c. Always show symptoms immediately.
   d. Are transmitted orally only.

25. Patients with genital herpes can sometimes tell when an outbreak is about to occur by experiencing prodromal symptoms, including:
   a. Nausea, vomiting, and diarrhea.
   b. Burning or tingling in the anogenital region, along with headache and malaise.
   c. Painless ulcers that appear suddenly.
   d. White or yellow copious, thick vaginal or urethral discharge.
26. When caring for a patient with genital herpes, the clinician explains to the patient that antiviral drugs such as acyclovir can:
   a. Cure genital herpes, according to some recent studies.
   b. Reduce the frequency of genital herpes outbreaks.
   c. Alleviate herpes symptoms but should not be taken when pregnant.
   d. Protect one’s sexual partners from acquiring genital herpes.

27. Body fluids that have been proven to transmit HIV infection include blood, semen, breast milk, vaginal secretions, and:
   a. Sweat.
   b. Tears.
   c. Cervical secretions.
   d. Urine.

28. Genital warts are caused by the:
   a. Herpes simplex virus (HSV).
   b. Molluscum contagiosum virus (MCV).
   c. Hepatitis B virus (HBV).
   d. Human papillomavirus (HPV).

29. The incidence of genital human papillomavirus (HPV) infections in the United States is:
   a. Less common in females.
   b. Most common in people with more than one sexual partner.
   c. Most common in sexually active, middle-aged males.

30. Human papillomavirus (HPV) infections are typically:
   a. Short-lived, disappearing in less than one year.
   b. Long-lived, persisting for five to ten years.
   c. Long-lived, persisting for two to four years.
   d. Short-lived, disappearing in five to seven days.

31. Female patients with human papillomavirus infections are most often found to have:
   a. Uterine cancer.
   b. Uterine prolapse.
   c. Leukorrhea.
   d. No symptoms.
32. In appearance, genital warts caused by human papillomavirus infection are:
   a. Usually uniform, dome-shaped papules.
   b. Most often widely varied in size and shape.
   c. Usually thin, flat skin tags.
   d. Most often the shape of carrots.

33. The treatment for genital warts includes:
   a. Destructive chemicals, ablation, or excision.
   b. Antibiotics and antifungal and antiviral medications.
   c. Antihistamines and systemic corticosteroids.
   d. Focal radiation or pelvic floor seeding.

34. Vaccination against human papillomavirus (HPV) is recommended:
   a. For female adolescents only.
   b. To protect against most of the 40 known types of HPV.
   c. Prior to female and male adolescents becoming sexually active.
   d. To protect against cervical cancer but not genital warts.

35. A characteristic of symptomatic trichomoniasis is:
   a. Skin or mucous membrane ulcers with necrotic bases and ragged edges.
   b. Vaginitis with a foul-smelling, copious white, yellow, or gray discharge.
   c. Dome-shaped skin papules with a tiny dimple (umbilification) in the center.
   d. Skin or mucous membrane ulcers with smooth bases and raised, firm (indurated) edges.

36. Treatment for the sexual partners of a patient with trichomoniasis is recommended:
   a. Only when requested by the patient.
   b. If they are symptomatic, as diagnostic confirmation is not considered necessary.
   c. If they are symptomatic and their diagnosis is confirmed by laboratory tests.
   d. In all cases, even if they are asymptomatic.

37. Which is a true statement about pubic lice?
   a. Pubic lice live by sucking blood.
   b. Pubic lice transmission can be prevented by using condoms.
   c. Pubic lice cause the disease called scabies.
   d. Pubic lice are treated with single-dose regimens of oral antibiotics.
38. New protocols on the treatment of pubic lice include:
   b. Applying permethrin (Nix) cream rinse for no longer than 60 minutes.
   c. Administering a single dose of an oral or topical antibiotic.
   d. Using only permethrin (Nix) cream during pregnancy.

39. Scabies is definitively diagnosed from:
   b. Dermatologic examination.
   c. Blood tests.
   d. Microscopic evaluation of skin scrapings.

40. Which is a true statement regarding STD/STI prevention education among adolescents?
   a. Because the rate of sexual intercourse is decreasing among teens, STD/STI education is not as effective.
   b. The best prevention programs discuss both abstinence from intercourse and condom use.
   c. Federal laws dictate what content must be included in school sex education programs.
   d. Educational efforts have not been shown to prevent STDs/STIs in young adults.

41. Which is not a true statement regarding STD/STI transmission risk among sex workers?
   a. Sex workers use condoms consistently, thereby reducing their risk.
   b. The threat of violence may cause sex workers to engage in riskier behaviors.
   c. More frequent sex and a higher number of partners increases the risk of STDs/STIs among sex workers.
   d. Decriminalizing sex work can lead to a reduction in STDs/STIs among sex workers and their clients.

42. After monogamy, the best protection against STDs/STIs for sexually active people is:
   a. Correct use of barrier methods.
   b. Engaging only in oral sex.
   c. Daily administration of an antiviral drug, such as acyclovir.
   d. Surgical sterilization procedures.
43. Which is a correct instruction in the use of a female condom?
   a. Use a female condom together with a male condom for greatest protection.
   b. Dispose of a used condom by flushing it down the toilet.
   c. Use a spermicidal lubricant with the condom to ensure effectiveness against STI transmission.
   d. Leave the outer ring of the condom outside the vagina.

44. Which STD/STI is not nationally monitored?
   a. Chancroid
   b. Chlamydia
   c. Trichomoniasis
   d. Syphilis

45. Expedited partner therapy (EPT), by which patients with STDs/STIs deliver medications to their sexual partners:
   a. Requires that sexual partners admit they had sex.
   b. Promotes less sexual contact between partners.
   c. Is only done once both parties are confirmed as having an STD/STI.
   d. Is not legal in all states.

46. Forensic evidence from a person who has been sexually assaulted is best collected by:
   a. A crime scene investigator from the police department.
   b. A Sexual Assault Nurse Examiner (SANE).
   c. The emergency department physician.
   d. The police on the scene of the assault.

47. Victims of sexual assault are usually treated for STDs/STIs:
   a. Only after definitive diagnosis of an infection.
   b. Prophylactically.
   c. With an antiviral drug, such as acyclovir.
   d. To prevent defense lawyers from exploring the victim’s sexual history in court proceedings.

48. What is the rationale for conducting follow-up testing after a sexual assault?
   a. Pregnancy or some STDs/STIs may not show up immediately.
   b. The initial tests are usually inaccurate.
   c. Secondary infections from treatment take weeks to develop.
   d. The patient may infect someone else.
49. When counseling a patient regarding impacts of a sexually transmitted infection, the clinician:
   a. Avoids mentioning possible transmission to a newborn so as not to upset a pregnant patient.
   b. Encourages the patient to continue sex with an infected partner who is respectful.
   c. Discusses extreme risks of not treating the infection, such as infertility.
   d. Lets the patient know that infection may indicate infidelity in their partner.