Sexually Transmitted Diseases (STDs)

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COURSE OBJECTIVE: The purpose of this course is to prepare healthcare professionals to care for patients with sexually transmitted diseases.

LEARNING OBJECTIVES
Upon completion of this course, you will be able to:

• Summarize the epidemiology of the most common genital sexually transmitted diseases (STDs) in the United States.
• Describe the modes of transmission of genital STDs.
• Explain the principles and strategies for prevention of STDs.
• Discuss diagnostic methods for sexually transmitted diseases.
• List the treatment options for each of the most common STDs in the United States.
• Describe protection against STDs for victims of sexual assault.
• Discuss the education of patients and their partners at risk for contracting STDs.

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, 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.

OVERVIEW

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. Illnesses that develop from organisms acquired through sexual contact are called STDs (sexually transmitted diseases).

Sexual activity, both consensual and nonconsensual, is common, and sexually transmitted diseases are widespread. STDs are common reasons for patients to visit healthcare practitioners’ offices, clinics, urgent care centers, and emergency departments.

According to the Centers for Disease Control and Prevention (CDC), there are about 20 million new STD cases each year in the United States, resulting in healthcare costs of almost $16 billion. These figures partially represent the actual occurrence and financial burden of STDs, as many cases go unreported. These diseases are not limited by race, geography, or economic status. Age, however, is an important predictor of STDs: almost half of all STDs occur in people ages 15 to 24 years (CDC, 2015k).

STDs tend to coexist. Behavior that puts a person at risk for one STD may predispose them to having more than one infection (CDC, 2014k). People simultaneously have two or more STDs 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. As a rule, bacterial infections can be cured by a visit to the doctor’s office or clinic. With the cooperation of public and private healthcare workers, the rate of acquisition of bacterial STDs has been decreasing in the United States.

More is needed than the treatment of individual patients and their partners to slow the spread of STDs. Therefore, the control of STDs 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 ability to have future 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 (Golden et al., 2015)
- 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 include, for example, chlamydial infections and gonorrhea.
In contrast, other STDs 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: STD, VD, AND STI**

Sexually transmitted diseases (STDs) are illnesses that are spread by sexual contact. These diseases were formerly called venereal diseases (VDs).

Some healthcare workers talk about sexually transmitted infections (STIs) that may or may not become symptomatic diseases. These workers point out, for example, that less than half of the STIs caused by the bacterium *Chlamydia trachomatis* will end up causing the symptomatic disease chlamydial cervicitis in women and urethritis in men or may be asymptomatic in both (Malhotra, 2013).

This course groups both sexually transmitted infections and their diseases into one category called STDs.

**EPIDEMIOLOGY: THE DISTRIBUTION OF STDs**

STDs are widespread and among the most common infectious diseases in the world. Countries in the developing world are especially hard-hit by STDs. In some developing countries, HIV/AIDS has become the leading cause of death (WHO, 2015b).

STDs are also especially common in places where people live in less than ideal conditions. In these places, STDs are underdiagnosed and undertreated, and the victims of STDs are thus more likely to suffer serious long-term health consequences. People in the developing world have less access to education in general and health information in particular, as well as fewer socioeconomic resources. These shortages confound prevention and treatment of STDs.

According to the World Health Organization (WHO, 2015a), 498 million people ages 15 to 49 are infected every year with chlamydia, gonorrhea, syphilis, or trichomoniasis. It has also been estimated that 106 million people worldwide are infected specifically with gonorrhea each year. Gonorrhea infections can be cured by antibiotics, but untreated infections can lead to pelvic inflammatory disease (PID), ectopic pregnancies, premature deliveries, and infertility, all of which are more common in the developing world. Studies show that gonorrhea’s ability to develop resistance to treatment, such as extended-range cephalosporins, raises concern that the infection could become untreatable (Blomquist et al., 2014).

The rate of acquisition of viral STDs is increasing, and most viral infections cannot be cured by medicines. Data from the World Health Organization (WHO, 2015b) estimate a global figure of approximately 35 million people who are living with the human immunodeficiency virus (HIV). The same data show approximately 1,370,000 deaths by acquired immune deficiency syndrome (AIDS) worldwide in the countries reporting data (notably, the United States and China are not
Some STDs last a long time, and some STDs are incurable; therefore, the prevalence of STDs is much higher than their incidence. With over 19.7 million newly occurring STDs annually in the United States, rates of new STD infections are among the highest in the developed world. This is compared to 498 million newly occurring, curable STDs every year (Blomquist et al., 2014).

The cost is $15.6 billion/year for the eight most common newly diagnosed STDs in the United States. Part of this cost includes infection prevention efforts that address abstention, reducing the number of sexual partners, using condoms, and effective vaccines. Testing and prompt treatment are also part of the cost and can reduce expenses by preventing long-term effects. The greatest cost involves life-long treatment for certain STDs such as HIV and HPV-related cancers (CDC, 2013a).

**COMMON GENITAL STDs**

**Bacterial**
- Chancroid (*Haemophilus ducreyi*)
- Chlamydia (*Chlamydia trachomatis*)
- Gonorrhea (*Neisseria gonorrhoeae*)
- Syphilis (*Treponema pallidum*)

**Viral**
- Genital herpes (HSV)
- Genital warts (*Condyloma acuminata*) (Human papillomavirus, or HPV)
- Human immunodeficiency virus (HIV)
- Molluscum contagiosum (MCV)

**Protozoal**
- Trichomoniasis (*Trichomonas vaginalis*)

**Parasitic**
- Pubic lice (*Pediculus pubis*)
- Scabies (*Sarcoptes scabiei*)

Within the United States, some STDs, such as chlamydia, genital HPV, and genital herpes, are distributed widely and homogeneously. In contrast, gonorrhea, chancroid, HIV, and hepatitis B are typically concentrated in closely interacting networks of people who have more than one sexual partner.
In all areas and groups, adolescents and young adults acquire STDs at disproportionately high rates. Approximately 50% of sexually active adolescents (49% of young men and 51% of young women) will have at least one STD by age 25. Certain activities prevalent in the adolescent population put them at higher risk for exposure to STDs: new or multiple or anonymous sexual partners, concurrent illicit drug use (especially methamphetamines), men who have sex with men, and HIV-positive status (CDC, 2013a). All 50 states and the District of Columbia allow minors to consent to treatment for STDs without informing or obtaining consent from parents (CDC, 2014k).

Viral STDs do not always produce overt symptoms (CDC, 2012e). Estimates suggest that tens of millions of Americans (perhaps one fifth of the American population) have viral sexually transmitted infections, mainly HPV and HSV; genital HPV is the most common sexually transmitted microbe in the country. Fewer Americans have bacterial and protozoal STDs, which, in contrast to viral infections, are curable.

The actual numbers of STD infections can only be estimated. Although the frequency of new cases of certain STDs is monitored by the CDC, figures for the prevalence and incidence of even the monitored STDs are inexact because of asymptomatic or unreported 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 that are nationally monitored are:

- Chancroid
- Chlamydia
- Gonorrhea
- Hepatitis A
- HIV infections
- Syphilis

*Source: CDC, 2014k.*

**Age**

People of all ages can have STDs. At one end of the age spectrum, children can get STDs through sexual abuse. At the other end, the elderly can get STDs by not using barrier protections (male or female condoms) or unwittingly from unfaithful spouses. However, most new STDs are acquired by teens and young adults. For example, half of all new HIV infections occur in people between the ages of 15 and 24 years. In this same age group, 56% of all gonorrhea and 67% of all chlamydia infections occur (CDC, 2015k).
Young people continue to get STDs at a high rate. The age of first sexual activity is somewhat delayed compared to previous years (Finer & Philbin, 2013). Thirty percent of 15- to 16-year-olds have experienced sex compared to 16% of those younger, 48% at 17, 61% at 18, and 71% at 19. These statistics show age 17 as the average age of first sexual encounter. However, rates of oral and anal sex are rising among adolescents wishing to avoid pregnancy and the loss of virginity, and these practices may lead to oral, throat, and anorectal STDs.

Stereotypes about aging and sexuality also may cause health professionals to overlook the possibility of HIV/AIDS among older patients and may put such individuals at risk for transmission of the disease. The prevalence of HIV disease among older adults is increasing because more people are now living into their sixties with HIV managed as a chronic condition. In high-income countries, approximately 30% of all adults living with HIV are aged 50 and over (Rueda et al., 2014).

Sexually active older couples may not use condoms because they are unconcerned about pregnancy. But unless a couple is monogamous, unprotected sex increases the risk of infection with HIV or other sexually transmitted diseases from multiple sexual partners.

Gender

CDC statistics (2014a) show a higher incidence of gonorrhea in men than women and a higher incidence of chlamydia in women than men in newly reported cases. Women are three times as likely to be diagnosed with chlamydia as are men. This is partly because chlamydial infections are more likely to be symptomatic in women than in men (AVERT, 2012a). In women, chlamydia symptoms are milder and occur several weeks after infection, if at all. When symptoms occur, they may be mistaken as being caused by other reasons such as dysmenorrhea, dysuria, and vaginal discharge (CDC, 2014j).

Racial and Ethnic Subpopulations

Currently, STDs occur more frequently in certain identifiable subpopulations. Specifically, there are higher rates of both viral and bacterial STDs (especially gonorrhea, chlamydia, syphilis, and HIV) among African American and Hispanic males (Mojola & Everett, 2012). Black women show 5.8 times the rate of chlamydia than white women.

Among the regularly tallied STDs, new cases of chlamydia, gonorrhea, and syphilis are most frequent in African Americans, less frequent in American Indians/Alaskan Natives, even less frequent in Pacific Islanders, less frequent in Hispanics, and the least frequent in Asians. These statistics show the prevalence of chlamydia, gonorrhea, and syphilis is more frequent in ethnic minorities than in whites, with the exception of Asians regarding chlamydia and gonorrhea (CDC, 2014b). Comparative statistics are not available for all STDs.
ORGANISMS THAT CAUSE GENITAL STDs

In the United States, more than 30 different infectious agents are commonly transmitted sexually. Of these, 11 are responsible for the most common STDs of the genitals and the genital area (WHO, 2012b).

Bacteria

Four bacteria are frequent causes of genital STDs in the United States: *Haemophilus ducreyi*, *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, and *Treponema pallidum*.

- **Haemophilus ducreyi**. *H. ducreyi* is the bacterial cause of chancroid, an STD characterized by multiple, painful, ragged genital ulcers that are variable in size and tender, enlarged lymph nodes. In the United States, chancroid is not common. It is easily treatable by cephalosporin, macrolide, or fluoroquinolone antibiotics (Lewis, 2014).

- **Chlamydia trachomatis**. *C. trachomatis* is an intracellular parasitic bacterium that infects the lining of the urethra, cervix, epididymis, and Fallopian tubes. In the lining of the urethra, it causes the most common form of nongonococcal urethritis.

  Chlamydial infections are more prevalent among young women, with 623.1 cases per 100,000, but the infections are not always symptomatic, resulting in underreporting. The prevalence among males is lower, at 262.6 cases per 100,000. The reported rate for both genders may be influenced by an increase in screening for the infection and testing urine with the highly sensitive nucleic acid amplification test (NAAT). Both genders show a decrease in the occurrence of chlamydia as age increases (CDC, 2014c).

  In women, untreated chlamydial infections can cause pelvic inflammatory disease (PID), potentially leading to infertility or ectopic pregnancies. 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.

- **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.

  Gonorrhea is about one tenth as common as chlamydial infections, although the two infections are frequently found to coexist in an infected person (CDC, 2012f; WHO, 2012b). In the United States approximately 820,000 new cases of gonorrhea occur every year, and it is the second most commonly reported STD. Women under 25 years of age are at the highest risk for infection (CDC, 2014k).

- **Treponema pallidum**. *T. pallidum* is the bacterium causing syphilis. It 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. 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, 2015c).

Viruses

Four viruses—herpes simplex virus (HSV), HIV, human papillomavirus (HPV), and molluscum contagiosum virus (MCV)—cause most of the viral genital STDs in the United States.

• **Herpes simplex virus (HSV).** HSV comprises two types, HSV-1 and HSV-2. People who have 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. It occurs in more than 17% of 14- to 49-year-olds in the United States (CDC, 2014h).

• **Human immunodeficiency virus (HIV).** HIV infections deplete the immune system of cells, including 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, 2012b). HIV can be transmitted through sexual contact, and if AIDS develops, 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 more likely (CDC, 2014k; WHO, 2012b).

• **Human papillomavirus (HPV).** More than 40 types of HPV infect humans, and HPV infections are the most common STDs in the United States, infecting 79 million Americans. About 14 million people become newly infected each year, although these infections are usually not symptomatic. HPV is so common that almost all sexually active people will contract the infection at some point in their lives. HPV infections can be sexually transmitted even when an infected person has no visible symptoms. 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, 2015).

• **Molluscum contagiosum virus (MCV).** MCV causes a common, mild, and self-limiting skin disease (molluscum contagiosum) of children, characterized by small, dimpled papules or vesicles. In adults, MCV also causes genital skin lesions that can be spread through sexual contact. Genital molluscum contagiosum is usually treated by destroying the skin lesions.
People with HIV infections are more likely to acquire molluscum contagiosum. With HIV, the molluscum contagiosum lesions cover larger areas, they spread beyond the genital and inguinal region, and they are difficult to eradicate unless the person maintains or has regained sufficient numbers of immune cells (Chen, Antsey, & Bugert, 2013).

CASE: HPV

Regina is a nurse who works in an urgent care clinic that holds classes in the evenings for young women in the local community. At the beginning of a class on STDs, 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, including genital warts caused by HPV, can be transmitted to a sexual partner even if the infected partner is asymptomatic. Other STDs that are transmitted skin-to-skin can also be transmitted even if a condom is used (CDC, 2012d; CDC, 2013f).

Protozoa

One protozoan, *Trichomonas vaginalis*, commonly causes genital STDs. Globally, this is the most common non-viral STD. *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, where vaginitis is the typical clinical manifestation. It is usually asymptomatic in men (Munzy & Schwebke, 2013). Trichomoniasis can be cured with oral antiprotozoal drugs.

Exoparasites

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

- *Phthirus pubis*. 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 (Fantasia et al., 2011; CDC, 2014k).

- *Sarcoptes scabiei*. 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 (CDC, 2014k).

**Characteristics of the Organisms Causing STDs**

STDs are infections that can be acquired through genital, anal, and oral sexual contact. Such STDs have at least two special characteristics. First, the microbes causing these STDs are not normal residents of the human urogenital tract. Second, STD microbes are especially dependent on sexual contact for transmission (CDC, 2014k).

Non-STD 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. 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 tend to be finicky, and they thrive in only 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**

Besides STDs, genital infections can be caused by a range of non-STD organisms that should also be considered when determining a diagnosis. These other organisms include actinomycetes, *Haemophilus* ssp., *Staphylococcus aureus*, *Enterobacteriaceae*, group A and group B streptococci, *Candida* ssp., *Gardnerella*, *Ureaplasma urealyticum*, and a variety of anaerobes. Patients can, of course, concurrently have a genital STD and a non-STD infection.

The presence of one STD makes the coexistence of another STD 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 (CDC, 2012a).

STD clinics and other medical facilities that specialize in treating STDs know that typical STD symptoms can be caused by non-STD organisms and that the identification of one STD does not rule out the concurrent existence of other STDs or non-STD infections.
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. Another common source of the advice to see a clinician is when a person’s sexual partner is diagnosed with an STD.

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

- **History.** The medical care of a person with a possible STD 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, their anogenital region is examined thoroughly, and when appropriate, their mouth and pharynx is also examined.
- **Laboratory Tests.** With STDs, 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 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 also cause swollen and tender inguinal lymph nodes. Most genital STDs do not produce a fever or other systemic symptoms. In addition, genital STDs can cause discomfort during intercourse, urination, or defecation.

**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? (Lentz, 2007)

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:

1. 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?

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

3. Prevention of Pregnancy
• What are you doing to prevent pregnancy?

4. Protection from STDs
• What do you do to protect yourself from STDs and HIV?
  • For condom answers:
    o If never, why don’t you use condoms?
    o If sometimes, in what situations (or with whom) do you use condoms?

5. Past History of STDs
• Have you ever had an STD?
• Have any of your partners had an STD?

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?

Source: CDC, 2014k.

THE 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 adolescents who might not feel comfortable acknowledging their engagement in behaviors that place them at risk for STDs (CDC, 2014k). Adolescent subjects responded they felt more like talking if they were not rushed, if the provider was of the same gender, if the provider introduced the subject, and if they were told that screening was routine.

A study by Buhi and colleagues (2013) examined adolescents’ preferences for answering questions about sensitive topics such as sexual health via short message services like texting and social media networking sites. These methods can also be used for sexual health promotion and prevention.
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

**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, and organizations treating them are not required to report this (CDC, 2014k). 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.

One study (Gilbert et al., 2014) found that 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 parents surveyed believed a more forthcoming discussion would ensue if confidentiality was supported, but 61% preferred to be present in the examination room.

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 (Bravender et al., 2014).

**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.

Georgia would like to warn Dwayne about the possibility of contracting an STD 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) (U.S. DHHS, 2012) 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 for use in the course, as allowed by the school district. She asks Dwayne to deliver them to the classroom, offering him a copy.

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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.

GENITAL EXAMINATION OF A FEMALE

For genital exams, the examiner (female or male) should always explain in detail what will be happening, beginning by explaining the steps of the exam and allowing the patient 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 woman is sitting on the exam table, even when she is at a 45° angle, so it is usually best for the patient to be lying on her back. The lithotomy position with the patient’s legs in stirrups gives the best view of the entire perineum.

The genital exam is also an opportunity to educate the patient about her anatomy and physiology. She can better see what is happening by raising the head of the exam table and providing the patient a hand mirror.

The examiner first studies the pubic hair, looking for evidence of lice or mites. Then, he or she 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 she agrees. She also can observe how it is gently opened. To help educate the patient and allay any fears, it may be useful for her to be told 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 (Lentz, 2007).
GENITAL EXAMINATION OF A MALE

The clinician should begin 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 anogenital region of a male. 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 buttocks are best examined with the patient bending forward (supported by the exam table) and the clinician seated on a low stool behind the patient.

The examiner 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 (Gerber & Brendler, 2007). If it is the patient’s first digital prostate gland exam, it is important to describe the procedure to him beforehand.

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 (Matteucci et al., 2012). When sending a sample to the lab, the physician or nurse will indicate the most likely diagnoses. In some clinics, clinicians or a lab person will do visual identification by the use of slides to confirm a diagnosis (e.g., for candida or trichomoniasis).

THE ADVANTAGE OF RAPID TESTS

To prevent the spread of STDs, 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.

Efforts are being made to devise faster lab tests. Rapid tests that can be done in a clinic in less than 30 minutes are available for syphilis, gonorrhea, chlamydia, HIV, and genital herpes. 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. A noted disadvantage of over-the-counter tests, such as for HIV, is not linking results to information about necessary treatment and available resources (Myerson et al., 2013).

**COLLECTING TEST SAMPLES**

The laboratory needs to be asked in advance for written instructions on specimen collection, storage, and transport. These requirements need to be reviewed and understood by the primary care providers. Sufficient swabs, blood drawing equipment, and containers need to be available in the examining rooms.

In testing for genital STDs, 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 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.

**PREGNANCY TESTING**

Beyond tests for a range of STDs and non-STD infections, specific situations call for additional lab tests. For instance, when treating a woman for an STD, 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 tests for women in their reproductive years.

**Common Presenting Syndromes of Genital STDs**

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:

1. Genital itching
2. Genital ulcers
3. Genital warts
4. Urethritis
5. Vaginal and cervical infections
6. Epididymitis
7. Pelvic inflammatory disease
8. Anorectal infections

Following is a brief overview of each of these presentations.

**GENITAL ITCHING**

One manifestation of genital STDs is the new appearance of genital itching. When patients describe itching, they sometimes include the sensations of irritation, prickling, 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 (Verstraelen et al., 2013).

The common STDs that cause genital itching include genital herpes, genital warts, molluscum contagiosum, pubic lice, scabies, and other STDs that cause urethritis or vaginitis. Of these, pubic lice and scabies tend to cause the most intense itching (CDC, 2014k).

Anogenital infections that are not STDs also cause itching. Common examples are bacterial vaginosis, group B streptococci, pinworms, Staphylococcus aureus, and yeast infections (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 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, the ulcers are usually shallow. In women, ulcers from STDs 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 (Roett et al., 2012).
In the United States, most genital ulcers are caused by one of three infectious agents: HSV, *Haemophilus ducreyi*, and *Treponema pallidum*. Each microbe is associated with a different typical presentation (Roett et al., 2012). 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, 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 (Roett et al., 2012).

**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.

**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 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 clinics, gonorrhea can be the most common cause of urethritis.

*Chlamydia trachomatis* is the STD that 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 (Chrisment et al., 2013; Shimada et al., 2014).

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 that most commonly cause vaginitis or cervicitis are chlamydia, gonorrhea, trichomoniasis, and HSV. Common non-STD 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 (40%–45%), vulvovaginal candidiasis (20%–25%), and trichomoniasis (15%–20%). Risk factors include being African American, having multiple or new sex partners, douching, not using barrier protection, and absence of lactobacilli (CDC, 2013b).

**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). The specimens can be tested for NaCl (wet mount), KOH (wet mount), Whiff test, cultures, and the vaginal pH (CDC, 2013b).

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 (PID).

**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, it is recommended that certain patients be treated for bacterial cervicitis solely on clinical criteria. The CDC (2012h) 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 causing epididymitis in young sexually active men is chlamydia; gonorrheal epididymitis infections are less common. Bacterial epididymitis is treated empirically with antibiotics before the causative microorganism is identified. For a specific diagnosis, the exudate must be sampled for best treatment results (Durglishvili & Galdava, 2013). Male counseling may be needed, as epididymitis is painful and looks very unusual.
UPPER FEMALE GENITAL TRACT INFECTIONS: PID

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 (CDC, 2012k). Both male and female teens should be counseled that some STDs can cause the inability to become pregnant (Godinjak & Hukic, 2012).

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 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 adds the symptoms of diarrhea and abdominal cramps (de Vries, 2013).

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 causing anorectal infections are **Chlamydia trachomatis**, **Neisseria gonorrhoeae**, HSV, and **T. pallidum**.

Besides proctitis, anorectal STDs include HPV infections, which cause anogenital warts (condyloma acuminata) or rarely, anorectal cancers.

**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. She 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.

**DIAGNOSTIC, TREATMENT, AND PREVENTION RECOMMENDATIONS**

Most STDs are a threat to both the health of the patient and the health of the community, and treatment is always recommended.

STDs present with a variety of syndromes, but their treatment depends on the specific agent causing the problems. STDs can be caused by organisms across the full spectrum of infectious agents, including bacteria, viruses, protozoa, and external parasites (exoparasites). Following are the current recommended treatments for common genital STDs. For some, early treatment may be essential.

The drugs and administration regimens offered below are examples of common recommendations based on CDC guidelines, but actual treatments must be tailored to the specific patient. Updated treatment recommendations are available at cdc.gov/std/treatment.

**TWO TREATMENT PRINCIPLES**

1. **Treat As Soon As Possible**

Medical care for STDs 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 is frequently given early. These early treatments are based on three types of information: the patient’s symptoms, the STD 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 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 (Balkus et al., 2013). Treatment of STDs 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, however, is driven by public health concerns. When patients come to a clinic, an urgent care center, or an 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, and the partners should be encouraged to have STD testing. These instructions should be given to the patient with the understanding that the confidentiality of all parties’ medical records will be strictly preserved (Ward & Bell, 2014).

Chancroid

Chancroid is caused by the bacterium *Haemophilus ducreyi* and is an STD that produces ragged genital ulcers. *H. ducreyi* are small, Gram-negative, rod-shaped bacteria that grow in chains or strands (Roett et al., 2012).

**EPIDEMIOLOGY OF CHANCROID**

Chancroid is one of the most common STDs in the developing world, and it is found widely throughout Africa, Asia, South America, and the Caribbean. Chancroid tends to be most common in areas with a high prevalence of HIV infections and to occur in situations associated with prostitution and illicit drug use. In the United States, 28 cases a year were reported in the latest CDC statistics. Because *H. ducreyi* is difficult to culture and diagnose, it is estimated that the actual yearly number of cases of chancroid is a few thousand (Roett et al., 2012).

**DIAGNOSIS OF CHANCROID**

**Typical Course and Clinical Signs**

*H. ducreyi* cannot invade normal intact skin. Therefore, people become infected when the bacteria are rubbed into skin cuts or abrasions. These small skin injuries can themselves be the result of sexual contact, and the susceptible injured skin is usually on the penis or the vulvovaginal surfaces.

Three to six days after the bacteria penetrate the injured skin, a surface papule develops. The papule becomes a pustule that then ruptures to form a painful, friable, soft ulcer. Chancroid ulcers have a bad odor; a necrotic, grayish, or yellowish (“dirty”) purulent base; and irregular edges. Chancroid ulcers can be quite painful (CDC, 2012f).
A patient can have more than one chancroid ulcer, and these ulcers can be small or can merge into a single large sore. Ulcers inside the vagina or on the cervix can be painless and go unnoticed by patients. Half of the chancroid patients develop large, tender inguinal lymph nodes that can become fluid-filled and that sometimes rupture (CDC, 2012f).

The combination of painful genital ulcers and tender, fluctuant inguinal lymph nodes should put chancroid on the list of a patient’s possible diagnoses. However, the specific presentation of chancroid varies from patient to patient, and it cannot always be distinguished by clinical appearance from syphilis or genital herpes.

**Lab Tests**

Clinical appearance is not a reliable way to diagnose chancroid. Sometimes, a light microscopic examination can be diagnostic. In chancroid, a stained smear of lesion exudate will show many short strands of *H. ducreyi*, a small Gram-negative coccobacilli. Most times, however, definitive diagnosis depends on culturing the bacteria, which requires specialized culture media (Roett et al., 2012).

Patients with chancroid lesions may have concurrent genital herpes. Chancroid patients should also be tested for syphilis and HIV.

**TREATMENT OF CHANCROID**

Chancroid responds to antibiotics, specifically cephalosporin, macrolide, or fluoroquinolone-based regimens. As with all STDs, compliance is best assured by giving the full treatment in a single dose, as it is easier to take and more likely to be taken (Lewis, 2014).

After taking antibiotics, chancroid patients should notice subjective improvement within three days, and patients should be clinically re-examined five to six days after the antibiotic regimen.
Chancroid ulcers will usually heal completely. Most ulcers heal within a week, although large ulcers can take a month to heal. The glans on uncircumcised males tends to heal more slowly. Patients with HIV also heal slowly and may require a longer course of antibiotic.

The antibiotic susceptibility of \textit{H. ducreyi} has been found to vary geographically. When chancroid ulcers do not heal, bacterial cultures and sensitivities should be done to identify the most effective antibiotic. Nonhealing ulcers may also be due to the presence of other infectious agents.

Occasionally, chancroid patients develop large, fluctuant, inguinal lymph nodes, called buboes. These swell and become painful, and they can be drained by incision.

### CHANCROID TREATMENT REGIMES

Typical single-dose treatments:
- Azithromycin 1 g orally, or
- Ceftriaxone 250 mg intramuscularly

Typical multiple-dose treatments:
- Ciprofloxacin 500 mg orally 2x/day for 3 days, or
- Erythromycin base 500 mg orally 4x/day for 7 days (some specialists prefer this regimen for treating patients who are simultaneously infected with HIV)

For pregnant patients, the FDA Pregnancy Risk Categories (A=lowest risk, D=highest risk) of these drugs are:
- Azithromycin: B
- Ceftriaxone: B
- Ciprofloxacin: C
- Erythromycin: B

Sources: CDC, 2014k.

### Treating Sexual Partners

Men with chancroid have usually been infected by heterosexual contact with prostitutes. All people who have had sex with chancroid patients during the two weeks preceding the appearance of genital lesions should be identified and treated, even when those sexual partners are asymptomatic (Lewis, 2014). Vigorously treating \textit{H. ducreyi} infections is one factor in the battle against AIDS, because chancroid lesions make a person more susceptible to acquiring HIV infections.
Chlamydial Infections

Chlamydial urethritis, cervicitis, and PID are caused by the bacterium *Chlamydia trachomatis*. Chlamydia are parasitic bacteria that can only survive inside cells. Diagnostic tests include urine sample, nucleic acid amplification, culture, and serology (Caple et al., 2012).

EPIDEMIOLOGY OF CHLAMYDIAL INFECTIONS

Of the reportable diseases, chlamydial infections are the most common STDs in the United States (Brunham & Rappuoli, 2013). In young men, chlamydial infections are the most common cause of epididymitis.

Asymptomatic infection is common among both men and women, with the greatest prevalence among people less than 24 years of age (CDC, 2014k). In 2013, 1,401,906 cases of chlamydia were reported to CDC from 50 states and the District of Columbia. Most cases are 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, 2014e).

CHLAMYDIA SCREENING

Chlamydial infections are frequently asymptomatic; approximately 70% of women (Matteucci et al., 2012) and 50% of men (Caple et al., 2012) with chlamydia exhibit no symptoms. For women, screening for asymptomatic cases is important because 40% of untreated chlamydial infections develop into PID (CDC, 2014e). 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 (CDC, 2014e). In some regions of the United States, selective screening of young women for cervical chlamydial infections has reduced the prevalence of the disease by 60%.

A yearly clinical screening is recommended for:

- All sexually active females less than 24 years of age
- Sexually active women 24 years of age or older when they:
  - Have two or more sexual partners
  - Begin a new sexual relationship
  - Acquire some other STD
  - Practice inconsistent condom use
  - Engage in sex work
Nucleic acid amplification tests (NAATs) can identify chlamydial infection in asymptomatic women.

**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 a 1- to 3-week incubation period before the organism produces symptoms, but about half of infected men and more than three quarters 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 chlamydia 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 (Malhotra et al., 2013). During vaginal births, pregnant women can pass chlamydial infections to their newborns. The resulting infection can cause pneumonia or conjunctivitis in the infant. Women who have chlamydial infections are 6-1/2 times more likely to develop cervical cancer than women without the infection.

**LYMPHOGRANULOMA VENEREUM: AN UNCOMMON PRESENTATION OF CHLAMYDIAL INFECTIONS**

Certain variants of *Chlamydia trachomatis* cause lymphogranuloma venereum, a sexually transmitted disease that invades the lymphatic system. It produces enlarged, tender inguinal and femoral lymph nodes that eventually form large abscesses. The disease is treated with oral antibiotics (CDC, 2012l).

Cases of lymphogranuloma venereum are rare in the United States. Usually, the disease appears in people who have had sexual contacts in other parts of the world—notably, the Caribbean, South America, Southeast Asia, and Africa—where the disease is more common.

**Clinical Signs**

**Chlamydial urethritis** produces a gray, white, or yellow discharge; pain on urination; and urethral itching. Men sometimes also get epididymitis, with pain and swelling around a testicle.

**Chlamydial cervicitis** produces a gray, white, or yellow vaginal discharge; 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.

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.

Chlamydia is most accurately diagnosed using nucleic acid amplification tests (NAATs). NAAT assays that will detect and distinguish both *N. gonorrhea* and *C. trachomatis* are commonly available. Testing is also done by culture, serology, and urine sample (Caple et al., 2012; CDC, 2012e). 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 *Chlamydia 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 (CDC, 2012f).

**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 treatments:

- Erythromycin base 500 mg orally 4x/day for 7 days, or
- Erythromycin ethylsuccinate 800 mg orally 4x/day for 7 days, or
- Ofloxacin 300 mg orally 2x/day for 7 days, or
- Levofloxacin 500 mg orally 1x/day for 7 days

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

- Azithromycin: B
- Doxycycline: D (contraindicated in the second and third trimesters of pregnancy)
- Erythromycin ethylsuccinate: B
- Levofloxacin: C
- Ofloxacin: C

Sources: CDC, 2015c.

**Treating Sexual Partners**

For chlamydial infections, the patient’s sexual partners should be tested and, if appropriate, treated for any STDs (LACDPH, 2012). 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 (CDC, 2012).

**PREVENTING THE RECURRENCE AND SPREAD OF CHLAMYDIAL INFECTIONS**

The clinician’s best opportunity to prevent the recurrence of a chlamydial infection is at the time of the patient’s diagnosis. Healthcare workers should explain to the patient that barriers (e.g., condoms) are needed to protect against this and other STDs and that other birth control methods will not prevent STD infections. Patients should also be reminded that if their partners are not monogamous, then STDs can enter the relationship between two previously uninfected people (CDC, 2014c).

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 need to return to the clinic or office to be retested in three to four months.
Gonorrhea

*Neisseria gonorrhoeae* is the bacterium that causes gonorrhea, an STD producing urethritis or cervicitis. *N. gonorrhoeae*, sometimes called gonococci, are Gram-negative, aerobic, paired cocci (i.e., diplococci) (WHO, 2012b; CDC, 2012f).

**EPIDEMIOLOGY OF GONORRHEA**

In 2013 in the United States, the total reported cases of gonorrhea was 169,130 for men and 163,208 for women of known age and gender. This was an increase of 4.1% over the previous year (CDC, 2014f). This means that the prevalence of gonorrhea is about one tenth the prevalence of chlamydial infections, which are the STDs that most commonly cause urethritis and cervicitis. Gonorrhea and chlamydia often coexist, and as many as 45% of patients with gonorrhea have a concurrent chlamydial infection.

In the United States, gonorrhea is most prevalent in the South, in women ages 15 to 24, men ages 20 to 24, African American men ages 20 to 24, and Native Americans/Alaskan native men ages 20 to 24 (CDC 2014f). Under-reporting and lack of symptoms may account for estimates to be below actual occurrence.

Rates of occurrence of new cases of gonorrhea are approximately the same in men and women. Men, however, are less easily infected from a single sexual encounter. A man has a 20% chance of acquiring gonorrhea from an infected woman, whereas a woman has a 50% chance of acquiring gonorrhea from an infected man due to the increased occurrence of pharyngeal and anorectal gonorrhea in women. The rate of infection of African American women in the United States is 17 times higher than that of white women (Matteucci et al., 2012).

**GONORRHEA SCREENING**

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

- Sexually active women younger than 24 who have had STDs, who have new or multiple partners, who are prostitutes, who are drug users, or who 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) (WHO, 2012b)

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 clinics for any reason
- Patients with newly diagnosed chlamydial infections
People younger than age 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, nucleic acid amplification test, and hybridization tests are used for screening. Tests that combine screening for gonorrhea and chlamydia are commonly available (AHQS, 2014).

**DIAGNOSIS OF GONORRHEA**

**Typical Course and Clinical Signs**

Gonorrhea is an infection of mucous membranes that can be transmitted vaginally, orally, and anally (AMA, 2013). In men, *N. gonorrhoeae* causes gonorrheal urethritis. Most men with gonorrheal urethritis have symptoms, which include pain or discomfort on urination and a purulent urethral discharge. In men, untreated gonorrheal urethritis can develop into epididymitis.

In women, *N. gonorrhoeae* that have invaded the urethral opening produce gonorrheal urethritis, and *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 (Matteucci et al., 2012). When symptoms do occur, they can include purulent and sometimes odorous vaginal discharge, vaginal bleeding after intercourse, and pain or discomfort on urination.

Gonorrhea can also infect the Bartholin’s glands. Untreated gonorrheal 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 (AMA, 2013). 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.

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.
Discharge from the penis caused by gonorrheal urethritis. (Source: CDC.)

Gonorrheal infection of cervix (speculum view). Exudate, erythema, and swelling of the cervical os caused by gonorrheal cervicitis. (Source: CDC.)

**Lab Tests**

Light microscopic examination of a sample of urethral discharge can be used to diagnose gonorrhea in men. Nucleic acid amplification tests (NAATs) may also be used. In male gonorrheal urethritis, stained microscope slides will show Gram-negative diplococci (Caple et al., 2012). 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 (Matteucci et al., 2012).

Urine samples can be used to test for urethritis in both 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, 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 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 (CDC, 2015d). 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 (CDC, 2014f). (Up-to-date recommendations are available at cdc.gov/std/gonorrhea/gisp.)

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 (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.

Source: CDC, 2015d.

Patients with gonorrhea often have other STDs 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.
Treating Sexual Partners

The sexual partners of gonorrhea patients should be tested for a range of STDs, 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.

PREVENTING THE RECURRENCE AND SPREAD OF GONORRHEA

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.

Syphilis

Treponema pallidum is the bacterium that causes syphilis, an STD that, 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. One 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 (CDC, 2012f).

EPIDEMIOLOGY OF SYPHILIS

CDC figures for the U.S. population reflect a total of 89 cases of syphilis per 100,000 in males and 10.3 in females. African Americans represent the largest infected ethnic group, with 34% of males and 44% of females testing positive for primary or secondary syphilis. Seventy-five percent of all reported cases are in the MSM (men who have sex with men) population. Regionally, the most cases were reported in the West in 2013. Syphilis tends to be most common in large cities (CDC, 2015e). By age group, the greatest percentage of infection is among 20- to 29-year-olds, representing 42% of infected males and 52% of infected females (CDC, 2014g).

SYPHILIS SCREENING

Routine screening is recommended for:

- Patients with any newly diagnosed STD
- Patients at high risk for STDs
- 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 Treponema pallidum particle agglutination (TPPA) (AHQS, 2014).
People who have syphilis are more likely to also have acquired other STDs. Therefore, patients with syphilis should also be tested for HIV, hepatitis B and C, chlamydia, and gonorrhea.

### DIAGNOSIS OF SYPHILIS

**Typical Course**

Syphilis is transmitted by sexual contact. It can also be passed at birth from mother to child as the newborn rubs along the birth canal.

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:

1. **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 between 10 and 90 days. 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.

2. **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—a low-grade fever, headache, malaise, generalized lymphadenopathy, and a widespread, symmetrical, non-itchy 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.

3. **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.

4. **Tertiary syphilis (late-stage syphilis).** In approximately one third of the patients who have 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.

(CDC, 2012m)
Pregnant women with syphilis can 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 (CDC, 2012m).

![A chancre of primary syphilis below the glans of the penis. (Source: CDC.)](image1)

![A chancre of primary syphilis below the vulva (beyond and to the left of the tip of the tongue blade). (Source: CDC.)](image2)

**Lab Tests**

The most common tests for syphilis are blood tests in which the patient’s serum is screened for antibodies likely to have been produced against *T. pallidum*. The two first-line screening techniques use either the rapid plasma reagin (RPR) test or the Venereal Disease Research Laboratory (VDRL) test. It usually takes at least a week after a patient acquires syphilis for these antibody tests to become positive (Caple et al., 2012).

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.

**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 should have bed rest and should be given 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

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 later stages of syphilis, the same drugs are used, but the treatment is extended over a longer period.

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

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

Source: CDC, 2014k.

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, 2012m). In rape crimes this is standard for post–sexual assault prophylaxis.

PREVENTING THE RECURRENCE AND SPREAD OF SYPHILIS

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 screened regularly. High-risk groups include men who have sex with men without condoms or with multiple partners, male and female prostitutes, adults in correctional facilities, and people who trade sex for drugs (Caple et al., 2012).

**Genital Herpes**

Herpes simplex virus (HSV) causes genital herpes, a disease characterized by recurring clusters of small painful ulcers. 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 (Hofstetter et al, 2014).

**EPIDEMIOLOGY OF GENITAL HERPES**

Infections of HSV are very common and have no cure. CDC’s 2013 figures reveal 24.1 million cases of reported genital herpes in the United States, with 45% of those among 15- to 24-year-olds. Initial symptoms of genital herpes is the reason for more than 250,000 physician visits per year, although the infection is often symptom-free for months after contact with an infected partner (CDC, 2014g).

Herpes is usually a localized disease. HSV-1 commonly causes oral or facial herpes, while HSV-2 commonly causes genital herpes. Not all HSV infections cause symptoms, so, for example, only 1 in 4 people who have genital herpes are aware of their infection. The rates for genital HSV are higher for women (20.3%) and the highest for non-Hispanic African Americans of both genders (41.8%) (CDC, 2014d).

**DIAGNOSIS OF GENITAL HERPES**

*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, 2014d).

When activated, a genital herpes infection produces skin lesions. The initial episode of activation, at the time of acquisition of the virus, is called the **primary stage** of infection. On its own, the primary 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 primary stage of infection begin three to seven days after contact with the virus. 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. They rupture into 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.

After the primary 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 (CDC, 2012f). 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.

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; Hofstetter et al., 2014).

Genital herpes causes painful vesicles that rupture in a few days, leaving tender ulcers. 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.

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.
Genital herpes (HSV) vesicles on the shaft of the penis. (Source: CDC.)

Genital herpes (HSV) vesicles on the labia. (Source: CDC.)

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 are hesitant to have sexual relationships.

**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 (Caple et al., 2012). 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, to reduce the number of recurrences (outbreaks), and to 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. Doctors with patients on daily antiviral treatments should reevaluate periodically (e.g., yearly) the need for daily medication.

### GENITAL HERPES TREATMENT REGIMES

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

For **recurrent outbreaks**, typical treatments:

- Acyclovir 800 mg orally 3x/day for 2 days, or
- Acyclovir 800 mg orally 2x/day for 3–5 days, or
- Acyclovir 200 mg orally 5x/day for 5 days, or
- Acyclovir 400 mg orally 3x/day for 5 days, or
- Famcyclovir 125 mg orally every 12 hours for 5 days, or
- Famcyclovir 250 mg orally every 12 hours for 2 days, or
- Famcyclovir 1,000 mg orally every 12 hours for 1 day, or
- Famcyclovir 500mg oral loading dose, then 250 mg every 12 hours for 2 days, or
- Valacyclovir 500 mg orally every 12 hours for 3 days, or
- Valacyclovir 1,000 mg orally every 12 hours 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.
In a **pregnant woman** infected with HSV, prophylactic acyclovir therapy at 36 weeks gestation reduces the risk that she will transmit HSV to her newborn baby during delivery.

For pregnant patients, the 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.

It is important that patients with genital herpes understand that when they are asymptomatic or on daily antiviral medications, they can still shed the HSV virus, and they should protect their sexual partners by using condoms.

**PREVENTING THE SPREAD OF GENITAL HERPES**

Not only should healthcare providers talk with their genital herpes patients about the disease, but physicians, nurses, and other clinicians should talk to these patients and give them written information detailing specific information about how to avoid spreading genital herpes. The 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 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 a fragile virus and cannot survive for long outside the body (Marsden & Zack, 2013; WHO, 2015d).

EPIDEMIOLOGY OF HIV / AIDS

Globally, 2.0 million people became infected by the virus in 2014 and 1.2 million people died from HIV-related causes. An estimated 36.9 million people were living with HIV at the end of 2014. Sub-Saharan Africa is the most affected region, with 25.8 million people living with HIV in 2014 and accounting for almost 70% of the global total of new HIV infections (WHO, 2015e).

In the United States, statistics indicate that more than 1.2 million people were living with HIV in 2012, about 12.8% of whom were unaware. HIV infections are three to four times more common among men than among women, although the percentage of women with this STD is rising. HIV/AIDS hits African Americans more commonly than whites, with men who have sex with men (MSM) showing the highest occurrences in both races (CDC, 2015g). The occurrence of HIV is highest in African American MSM (46%), then white MSM (21%) and Hispanic MSM (17%) (Caple et al., 2012).

The death rate from HIV infections has been declining in the United States. In 2012, 13,712 people with an AIDS diagnosis died (CDC, 2015g).

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 (CDC, 2012n; Marsden & Zack, 2013).

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 both 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, quickly progressing and treatment-resistant syphilis, treatment-resistant chancroid, and extensive molluscum contagiosum (CDC, 2012n)

**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 opportunistic infections (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
- Various lymphomas (CDC, 2015h)
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 CD4 cells is less than 200/mm³ or less than 14% of the total lymphocyte count.

The presence of other STDs makes both the transmission and the acquisition of an HIV infection more likely. Therefore, when patients are diagnosed with any STD, they should probably be tested for HIV. Similarly, patients with other STDs should be advised to be especially careful because they can get (and give) the AIDS virus more easily than people without an STD (London, 2014).

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, including HIV/AIDS (Jones et al., 2013).

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 seniors 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 six drug treatment classes are 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)
Additionally, the treatment of AIDs includes prophylaxis against opportunistic infections and aggressive treatment of those infections.

### CASE: HIV and OIs

A pale young man, accompanied by his partner, walks up to the medical screening examination desk in the emergency department (ED) 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 do a focused history and physical. When the patient tells the RN he has a five-year history of genital warts, the RN asks him how recently he has been tested for any other STDs, 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 and public effort has gone into slowing the spread of HIV infections. Nonetheless, HIV prevention efforts in the United States have had mixed results (AVERT, 2014b). 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 now a 15% to 45% chance of HIV passing from mother to child without treatment. Antiretroviral treatment (ART) can reduce the transmission to <5%. 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.

1. Prevention efforts aimed at slowing **sexual transmission** of HIV include:
   - Condom use (including female condoms)
   - Safer sex education
   - Treating sexually transmitted infections
   - Male circumcision

2. Preventing efforts aimed at slowing HIV **transmission through blood** include:
   - Screening blood products
   - Reducing needle sharing
• Stopping needlestick accidents

3. Preventing **mother-to-child transmission** includes:
   • Testing the mother for HIV at her first antenatal appointment, during her third trimester, and after the delivery
   • Offer treatment if the mother tests positive
   • Testing the newborn and offering treatment if positive

**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.

**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.

### PREEXPOSURE PROPHYLAXIS (PrEP)

In July 2012, the U.S. Food and Drug Administration approved the combination medication tenofovir disoproxil fumarate plus emtricitabine (TDF/FTC), a combination pill known as Truvada, for use as PrEP to prevent new infections. HIV infection has been shown to be reduced by up to 92% among those at high risk when PrEP is taken consistently (CDC, 2015).

PrEP is a powerful prevention tool and can be combined with condoms and other prevention methods to provide greater protection than when used alone. However, the drug must be taken every day and its use followed up every three months by a healthcare provider.

### CIRCUMCISION AND HIV

Among the lesser-known long-term preventive measures is male circumcision. Males who have been circumcised are less likely than uncircumcised males to become infected by the HIV-1 strain (Caple et al., 2012). (In contrast, circumcision does not appear to provide any protection against HSV-2, syphilis, or gonorrhea.)
Genital HPV Infections

**Human papillomavirus (HPV)** 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, 2012f).

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) (Notara et al., 2012; CDC, 2012f).

**EPIDEMIOLOGY OF GENITAL HPV INFECTIONS**

Approximately 79 million people in the United States are infected with HPV, and it is estimated that 14 million people get a new infection of genital HPV each year. Most new genital HPV infections occur in young, sexually active people: about half of the new cases occur in people who are between the ages of 15 and 24. Genital HPV infections are usually not noticed, and they are gone within less than a year. Ten percent of genital HPV infections last longer than two years, and it is from these persistent infections that cancers can occasionally develop (CDC, 2015a).

HPV is quite contagious; it is the most common sexually transmitted infection in the United States. Between one half and four fifths of all sexually active adults will have had at least one genital HPV infection during their lives. Women are more susceptible to acquiring genital HPV infections than are men, and greater than four fifths of all sexually active women will have had a genital HPV infection during their lives. As with other sexually transmitted infections, HPV infections are most common in people with more than one sexual partner (CDC, 2013a).

**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, 2012f).

HPVs invade surface cells, where they cause aberrant cell growth. The most common lesions caused by HPVs are thickened epithelial overgrowths called warts. Genital warts (condylomata acuminata) can occur on the external genitalia, vagina, anus, rectum, and cervix. Approximately 90% of genital warts are caused by HPV type 6 or HPV type 11, although not all people infected with these low-risk types of HPV develop warts. When they do occur, genital warts appear two to three months after a person has been infected (Collins & Peate, 2012).

The aberrant cell growth caused by other types of HPVs—the 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 such as types 6 and 11 are soft, raised, skin-colored, and nontender. Most genital warts are asymptomatic, although sometimes they cause itching or burning. Healthcare providers generally diagnose genital warts by checking the genital area (CDC, 2015i).

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 both men and women, 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 on and surrounding the glans of the penis. (Source: CDC.)

Genital warts on the vulvae. (Source: CDC.)

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 (Matteucci et al., 2012).

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 physicians 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 a 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, 2012f).

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 (Collins & Peate, 2012).
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)
- Surgical excision
- Cold (cryotherapy), liquid nitrogen
- Heat (electrocautery or laser therapy), ablation

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

- Imiquimod: C
- Podofilox: C

**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, 2014).
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.

**HPV VACCINATION**

The HPV4 (quadrivalent) vaccination is directed against HPV types 6, 11, 16, and 18 and was licensed by the U.S. Food and Drug Administration for use in females in June 2006. Bivalent HPV vaccine (HPV2) is directed against HPV16 and 18 and was licensed for use in females in October 2009. In 2009, HPV4 was also licensed for use in males for prevention of genital warts, and in December 2010, the FDA added prevention of anal cancer in males and females as an indication for use.

A newer nine-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 nine-valent vaccination is expected to prevent an additional 15% to 20% of cervical cancers and 15% to 20% of other HPV-related cancers.

Source: Schuchat, 2015.

**CASE: HPV Vaccination**

A mother brings her 13-year-old daughter to the pediatrician’s office for her annual well-child check-up. They are seen by Luanne, a pediatric NP. Much to Rosa, the child’s, embarrassment and concern, the 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 three injections spread over six months and will 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 and women ages 9 to 26 receive the immunizations before they are sexually active and can get the warts.

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. 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.

**Routine Screening for Genital HPV Infections**

HPV infections are quite common, and 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. A variety of policy groups suggest that all women should have a Pap test to screen for cervical cancer no earlier than the age of 21 years and at least every three years thereafter. There is no evidence that HPV
immunizations should change the schedule of HPV testing, often performed with Pap smears as co-testing (CDC, 2016).

Molluscum Contagiosum

Molluscum contagiosum virus (MCV) causes molluscum contagiosum, which is usually a benign, superficial skin disease. MCV is a poxvirus and the cause of 1% of all skin infections. Four types of MCV have been identified; MCV-1 is the most common. MCV has very specific requirements and can live only in keratinocyte cells of human skin (Leung, 2015).

EPIDEMIOLOGY OF GENITAL MOLLUSCUM CONTAGIOSUM

Adults with immunodeficiencies are much more likely to suffer from molluscum contagiosum. Approximately 90% of patients who are HIV-positive have skin lesions of some sort, including molluscum contagiosum. In one study, 18% of patients who were HIV positive were found to have molluscum contagiosum (Rane et al., 2014). In immunodeficient people, molluscum contagiosum can spread to all body surfaces. Immunocompetent adults do not get molluscum contagiosum lesions far from the genital area. The appearance of molluscum contagiosum on the face of an adult is a good indicator that they have an HIV infection or some other immunosuppressive condition.

DIAGNOSIS OF MOLLUSCUM CONTAGIOSUM

Typical Course

Genital molluscum contagiosum infections are transmitted through direct contact with skin lesions. Occasionally, the disease has been acquired by contact with the virus on damp surfaces, towels, or washcloths (Nguyen et al., 2014). The incubation period of molluscum contagiosum skin lesions is between two and seven weeks.

In adults, molluscum contagiosum is most often an asymptomatic infection of the genital skin. When symptoms do appear, they take the form of a small cluster (11 to 20) of skin-colored papules that are 3 mm to 5 mm in diameter and have a waxy, central core. These skin lesions are usually painless, although they may itch. When undisturbed, the skin lesions disappear on their own within six to nine months and leave no scars (Nguyen et al., 2014).

Inside the skin papules, there is a waxy substance that contains MCV particles. If the papules are scraped and broken open, the virus particles can be spread to other body surfaces in a process called autoinoculation. In such cases, people can reinfect themselves, and the disease and the lesions can persist for as long as a few years.

Immunodeficient patients, such as those infected with HIV, do not combat MCV effectively, and the molluscum contagiosum lesions can spread widely over the body and
face (Rane et al., 2014). Unlike in adults, molluscum contagiosum lesions in children can appear over the entire body, usually on the face, trunk, or limbs (Nguyen et al., 2014).

**Clinical Signs**

Molluscum contagiosum can usually be accurately diagnosed by the appearance of the skin lesions. These papules or nodules are smooth and round, usually with a small central indentation (umbilification) in each papule, although a magnifying lens may be needed to see this dimple.

![A molluscum contagiosum skin papule with a central dimple. (Source: CDC.)](image)

Molluscum contagiosum lesions (papules) occur with three general distributions:

- In children, the lesions are found on the face, neck, trunk, or limbs. (Genital lesions may be the result of sexual abuse.)
- In immunocompetent teenagers and adults, the virus has usually been transmitted sexually, and the lesions are found in the genital and inguinal regions.
- In immunodeficient people, the lesions tend to cover larger areas, typically on the face, neck, scalp, or upper body.

**Lab Tests**

Punch biopsies of the skin can be taken for clinical diagnosis of the molluscum contagiosum (Rane et al., 2014). Sometimes, a simple light microscopic examination of the white material expressed from a papule will confirm the diagnosis, when the skin cells are seen to contain intracellular inclusions (molluscum bodies) characteristic of invading MCV.

Patients with molluscum contagiosum should be tested for other STDs and should be examined for coexisting genital warts or pubic lice.

**TREATMENT OF MOLLUSCUM CONTAGIOSUM**

In immunocompetent individuals, molluscum contagiosum lesions will usually disappear without treatment. The spontaneous resolution of molluscum contagiosum typically takes six to nine
months, although in some cases it can take years. Treatment is recommended for genital lesions in sexually active patients to reduce the chance of transmission.

The treatment of genital molluscum contagiosum is similar to the treatment of genital warts. Immediate or rapid removal of the lesions can be done by physicians using cryotherapy, curettage, or laser therapy. Slower removal of the lesions can be done by the patients themselves by applying topical ointments or creams (Nguyen et al., 2014).

In patients with immunosuppressive conditions, such as AIDS, molluscum contagiosum does not always resolve with the standard treatments, and the recurrence of lesions is common. Molluscum contagiosum lesions are most likely to resolve if the patient’s immune status can be improved; this might happen, for example in AIDS patients, as a response to HAART.

**MOLLUSCUM CONTAGIOSUM TREATMENT REGIMES**

There is no FDA-approved therapy for molluscum contagiosum, and the infection is often allowed to self-resolve in immunocompetent individuals. However, to prevent embarrassment or contagion the following may be used:

For small areas, patients can gradually remove the skin lesions using topical chemicals. Typical treatments are either:

- Imiquimod cream 5%, 3.75%, or 2.5% concentration (3 times/week for up to 16 weeks) or
- Podofilox 0.5% solution or gel

For larger areas or for more rapid removal, physician-applied treatments are recommended. These treatments include:

- Chemicals (0.7% canthardin, imiquimod, podophyllin, cimetidine, potassium hydroxide (KOH), IV or topical cidofovir, salicylic acid, or intralesional Candida antigen injection
- Direct destructive measures, such as surgical excision (scraping with a curette)
- Cold (liquid nitrogen cryotherapy)

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

- Imiquimod: C
- Podofilox: C

Source: Nguyen et al., 2014.
PREVENTING THE SPREAD OF MCV

It is important to explain to patients how molluscum contagiosum is transmitted. The virus is acquired only by direct contact with infected areas of the body or by contact with damp items, such as towels or washcloths that have directly contacted infected areas of the body and have not yet been cleaned (Nguyen et al., 2014).

Patients should keep skin lesions covered with clothing or with a bandage when other people might brush against those areas of skin. They should wash their hands after touching the lesions. Male condoms will not protect against the acquisition of molluscum contagiosum because sexual interactions include skin-to-skin contact outside the region enclosed by the condom.

**CASE: MCV**

Anita is a 9-year-old girl who has been HIV-positive since birth. She is well known to the surgical staff at the local community hospital for recurrent surgeries to remove severe molluscum contagiosum lesions that cover her body. Dr. McCoy is her pediatrician and suspects Anita may be autoinfecting from the lesions as they break open in surgery, as they do not seem to clear up for very long.

Anita is quiet in Dr. McCoy’s office as her mother listens to a new plan to treat the lesions medically over the long term with a 5% imiquimod cream. Anita is reassured that the cream will not hurt, and Dr. McCoy shows her pictures of other children who have greatly improved-looking skin. Dr. McCoy then asks the clinic nurse to teach Anita and her mother the importance of frequent handwashing after touching the lesions and covering open lesions to prevent the spread of the infection from one area to another.

Trichomoniasis

*Trichomonas vaginalis* is the protozoan that causes trichomoniasis, a sexually transmitted form of vaginitis or urethritis.

**EPIDEMIOLOGY OF TRICHOMONIASIS**

Trichomoniasis is a common infection. It is estimated that there are about 3.7 million cases in the United States, with an estimated 1.1 million newly occurring each year. Only 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 are the most likely to get trichomoniasis (CDC, 2015j).
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 (Secor et al., 2014).

Most men with trichomoniasis are asymptomatic. When symptoms do occur, the infection produces urethritis.

Trichomoniasis of the cervix (speculum view). Typically, trichomoniasis produces a copious discharge. Here, the discharge fills the cervical os. (Source: Public Health Image Library.)

Trichomoniasis occasionally produces a distinctive hemorrhagic spotting on the cervix, resembling the surface of a strawberry (speculum view). (Source: Public Health Image Library.)
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. In trichomoniasis, the discharge will contain many white cells and epithelial cells, and \textit{T. vaginalis} protozoa can be seen, appearing as ovoid organisms that wiggle when their flagella twitch. Culture is the gold standard of diagnosis, but is time-consuming, costly, and necessitates a repeat visit for follow-up treatment.

The nucleic acid amplification test (NAAT) for \textit{T. vaginalis} infection also has high sensitivity and specificity and can use genital secretions or urine specimens. Recently, rapid testing has been developed with results in 30 minutes (Myerson et al., 2013).

Patients with trichomoniasis are likely to also 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 (Secor et al., 2014).

TREATMENT OF TRICHOMONIASIS

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

TRICHOMONIASIS TREATMENT REGIMES

Typical single-dose treatments are:

- Tinidazole 2 g orally, or
- Metronidazole 2 g orally

Single-dose therapy of either drug can produce nausea.

A typical multiple dose treatment is:

- Metronidazole 500 mg orally 2x/day 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

Source: CDC, 2015j; CDC, 2014k.
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 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 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, or creatures living on the surface of the human body; they can be transmitted from person to person through sexual contact.

Pubic lice are grey, 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 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, 2013c).

Epidemiology of Pubic Lice Infestations

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

Diagnosis of Pubic Lice Infestations

*Typical Course*

Pubic lice can be acquired by close physical contact with a person who has lice or by contact with recently lice-infested towels or bedding. Lice that are not in contact with a person will usually die in one to two days.

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.

Louse eggs (nits) 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 patient’s scratching further inflames the infested area. Skin in an infested area will have pale blue spots from tiny underlying hemorrhages.
The itching of pediculosis pubis is produced by an allergic sensitization to louse antigens, and this allergic reaction takes time to develop.

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).

**Clinical Signs**

Patients with pediculosis pubis present with unrelenting itching. A close examination of the infected area will find translucent 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.

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.

*A case of pediculosis pubis. Lice live at the bases of pubic hairs, and translucent eggs (nits) stick to the hair shafts, looking like tiny water droplets. (Source: CDC.)*

**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, 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.

**PUBLIC LICE TREATMENT REGIMES**

Typical first-line treatment is:

- Permethrin cream rinse (Nix cream) 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

- Lindane shampoo, only when pubic lice or scabies is resistant to other treatment or in patients intolerant to other treatments (Lindane is no longer considered first-line treatment, as it can cause toxicity of the brain and other parts of the nervous system; it is not given to infants, children, the elderly, pregnant or breastfeeding women, or people weighing less than 110 pounds.)

- Malathion 0.5% lotion applied for 8 to 12 hours and washed off, or

- Ivermectin 250 ug/kg repeated in 2 weeks

Treatment should be repeated in a week if lice or symptoms persist. Treatment failures may result from reinfestations 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:

- Lindane shampoo: C
- Permethrin cream rinse: B
- Pyrethrins with piperonyl butoxide: not available

Source: CDC, 2013c; CDC, 2014k.

**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 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 (Fuller, 2013).

**EPIDEMIOLOGY OF SCABIES**

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, long-term care facilities, and childcare centers. Severe or crusted scabies is most often a disease of immunocompromised people. For unknown reasons, blacks are less likely than whites 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 (Fuller, 2013).

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. Itch mites prefer thin skin, and they can be found along the penis and scrotum in men, along the vulva and the nipples in women, and along the finger webs and the flexor surfaces of wrists, axillae, waist, feet, and ankles in both genders.

Typical scabies infestations include only a few mites, usually five to ten. Occasionally, however, people get crusted 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 (Fuller, 2013).
**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 tunnels look like curvy gray, white, or erythematous skin papules, and they can be from one to ten millimeters long.

![A case of genital scabies, showing pimple-like irritations and sores on the body caused by scratching. (Source: Public Health Image Library/Susan Lindsley.)](image-url)

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.

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 for at least three days.
SCABIES TREATMENT REGIMES

A typical first-line treatment is:

- Permethrin 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 (Note: this is a different concentration from the 1% permethrin cream used for pubic lice.)
- Sulfur 8%–10%
- 10%–25% benzyl benzoate
- 10% crotamiton
- 0.5% malathion

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. It may be used only when pubic lice or scabies is resistant to other treatment or in patients intolerant to other treatments. Lindane is not given to infants, children, the elderly, pregnant or breastfeeding women, or people weighing less than 110 pounds.

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

- Ivermectin: C
- Lindane lotion or cream: C
- Permethrin cream 5%: B
- 6% sulfur: not available

**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 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.

PUBLIC HEALTH: PREVENTING THE SPREAD OF GENITAL STDs

Sexually transmitted infections affect all corners of society and burden public health systems throughout the world. In the United States, estimates of the yearly incidence of sexually transmitted infections include:

- 17,375 new cases of syphilis (a 10% increase from the previous year)
- 47,500 new HIV diagnoses (a 5.5% increase from the previous year)
- 333,004 new cases of gonorrhea (a 0.6% decrease from the previous year)
- 1,401,906 new cases of chlamydia (a decrease of 1.5% from the previous year)
- About 1.2 million Americans living with HIV/AIDS (CDC, 2015k; CDC, 2015l)

Sexual relations are a continual, essential, and private part of human populations, and society’s attempts to guide and influence sexual relations require individuals to voluntarily modify their private behaviors. In this regard, public health programs to control the spread of STDs target people’s voluntary behavior in three realms: before, during, and after sexual relations. Similarly, based on the special characteristics of STDs, a few basic principles guide the public health programs that have been designed to reduce the spread of STDs.
Practical Principles Guiding STD Prevention Programs

The dependence of STDs 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 from infected partners.
- The specific sites of sexual contact are likely to be the locations at which STDs begin.
- The use of condoms is an effective barrier method to limit contact.

(Shafer, 2015)

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

Before: Preemptive Protections

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., Treponema pallidum, Neisseria gonorrhoeae, and Chlamydia 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, 2012b).

PREEXPOSURE VACCINATIONS

At the moment, therefore, the major preemptive control on the spread of STDs 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, although only a few such vaccines are currently available, such as HBV, hepatitis A virus, and HPV (WHO, 2012b).

Hepatitis B virus causes liver dysfunction. Vaccination against HBV is recommended for all people who are being evaluated for any STD or who are at high risk for acquiring HBV (e.g., drug users, men who have sex with men, healthcare workers, and incarcerated people). 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).
HPV can also be combatted through vaccination. (See the box on “HPV Vaccination” earlier in this course for more details.)

CIRCUMCISION

In the United States, 58.3% of neonatal males are circumcised, a 10% decrease over the last 30 years (CDC, 2013d). Circumcision may reduce the person’s later risk of developing penile cancer and urinary tract infections. Population studies suggest that circumcision may also reduce the risk of developing HIV infections and genital ulcers.

EDUCATING PEOPLE AT RISK

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

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 (CDC, 2012h). 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 protection, such as barrier methods (e.g., condoms). Likewise, expensive screening tests for STDs 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.

Adolescents

Among adolescents, rates of sexual intercourse and pregnancy have been decreasing during the last two decades. Nonetheless, 47% of all 15- to 21-year-olds report having already had sexual intercourse at least once, and in the United States, adolescents and young adults have a higher rate of STDs than any other age group (CDC, 2015m).

According to the CDC (2015m) statistics on adolescents:

- Nearly 10,000 young people (ages 13 to 24) were diagnosed with HIV infection in the United States in 2013.
- Young gay and bisexual men (ages 13 to 24) accounted for an estimated 19% (8,800) of all new HIV infections in the United States and 72% of new HIV infections among youth in 2010.
- Nearly half of the 20 million new STDs each year were among young people between the ages of 15 and 24.
- Approximately 273,000 babies were born to teen girls ages 15 to 19 years in 2013.
The goal of prevention education is to influence adolescents’ voluntary and private behavior. Such education includes providing adolescents with the facts on which STDs are common, how STDs are transmitted, what symptoms signal an STD, the consequences of an STD, and how transmission of STDs 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.

Programs that focus on abstinence from sexual intercourse have not significantly reduced teen pregnancies or decreased the acquisition of STDs by adolescents. Instead, it has been found that comprehensive sex education programs of practicing abstinence, choosing low-risk partners, discussing partners’ sexual history, using condoms consistently, and not having multiple partners do a better job of preventing STDs (Akers et al., 2012).

**DISCUSSING STDs 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.
- Some STDs (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 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 and pregnancy.

Source: CDC, 2015m.

**African Americans**

In the United States, only 15.2% of the population is African American, but 64% of women with AIDS are African American. African American women are more likely to die from AIDS-related diseases than are white women (65%) (Baumgartner, 2014). Well-thought-out and pretested programs are available to disseminate information about the effects, prevention, and treatment of STDs to inner-city African American women and other sectors of this hard-hit population.

**Patients with Existing STDs**

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

**Sex Workers**

The per capita occurrence of STDs in sex workers compared to the general population is significantly higher. According to the World Health Organization (2012d), the highest incidence of infected sex workers is in sub-Saharan Africa, where more than a third (36.9%) of female sex workers were HIV-positive compared to 1.7% in North America. Inconsistent use of condoms among sex workers is directly tied to an increasing occurrence in STDs, particularly HIV/AIDS, even when that occurrence is initially very small.

Information about the effectiveness of barrier methods (condoms) in preventing the transmission of STDs, readily available condoms, decriminalization of sex work, and empowerment of sex workers to negotiate safe sex would reduce the occurrence of STDs in this population as well as their clients. Information about the effects of the various STDs may also improve the consistency of condom use (WHO, 2012d).

Globally, sex workers are also at greater risk as potential victims of violence, and this risk puts them at greater risk for contracting STDs, as the 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.

**Substance Abusers**

Abuse of alcohol and other substances contributes to an increase in risky behavior and therefore the occurrence of STDs 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 (Oshri et al., 2012). 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 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.

**Sexual Minorities**

Lesbian, gay, bisexual, and transgender individuals are at significantly higher risk for STDs than their heterosexual counterparts when compared by similar gender and ethnicity. The disparity in occurrence of STDs is evident starting in adolescence and young adulthood, when risky practices or lack of information about prevention are more prevalent (CDC, 2014).
During: Condoms Can Protect against STDs

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, 2012i).

Barriers (i.e., male and female condoms) are the best protections against the transmission and acquisition of STDs 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 that are transmitted via fluids (e.g., chlamydia, gonorrhea, HIV, trichomoniasis) than those STDs that are transmitted via direct skin contact (e.g., chancroid, genital herpes, genital warts, syphilis) (CDC, 2012h).

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.

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

CLEARING UP CONFUSION: CONTRACEPTION VS. PROTECTION FROM STDs

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.

USE OF CONDOMS IN THE UNITED STATES

Among adolescents, condoms are used more frequently today than before. In a study of 2,328 heterosexually active, unmarried 15- to 24-year-olds, 56% reported consistently using condoms. At the other end of the age spectrum, there are no exact statistics, but it has been shown that elderly adults are less likely to use condoms than younger people (Higgins & Wang, 2015).

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, 2013e)

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 3% during the first year when a couple is consistently using male condoms (CDC, 2013e).

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 they allow women a measure of control over their protection against conception and disease (Caliskan et al., 2012). 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.

- Before intercourse, and during it if needed, put a couple of drops of water-based lubricant on the penis.

- 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 such as 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.
  
  (NIH, 2012a)

**After: Screening At-Risk Populations**

Reducing public health threats such as STDs takes the cooperation of physicians, clinics, and hospitals. For STDs, 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 screening and risk-assessment questions when taking all patients’ medical histories.

Beyond incorporating STD questions into routine medical histories, special efforts should be made to check certain subpopulations. Many infected individuals are missed by routine STD 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 18 and 28 (the age group with the highest rates of STD infections)

- Returning international travelers (STDs 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

**WOMEN SHOULDER THE BURDEN OF STDs**

Why is there an emphasis on STDs in women? In general, women suffer more from STDs than men. Women are more likely to be infected when exposed to many of the STDs. At the same time, women are more likely to be asymptomatic. Untreated, STDs in women tend to lead to more serious diseases, such as PID and cervical cancer (AMA, 2013; Malhotra et al., 2013). Therefore, more thorough and widespread clinical screening is recommended for women than for men.

**Epidemiological Treatments: 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 provide a means of identifying some of the still undiagnosed cases of the disease. Specifically, the recent partners of STD patients are a pool of potentially infected individuals. Examining and treating these “hidden” cases is one way to limit the spread of STDs.

With the cooperation of their patients, healthcare workers should try to find and treat sexual contacts who may have an STD. 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; Ward & Bell, 2014).

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 to notify their partners and to arrange confidential treatment and counseling.

**TIME WINDOWS FOR TREATING ASYMPTOMATIC PARTNERS OF STD PATIENTS**

Epidemiologic treatment presumes that, as a general rule of thumb, asymptomatic partners should be treated if they have had sexual contact with a newly diagnosed patient during the following time windows preceding the diagnosis:
• Chlamydial infection: 2 months
• Chancroid: 10 days
• Epididymitis: 2 months
• Gonorrhea: 2 months
• Pelvic inflammatory disease: 2 months
• Pubic lice: 1 month
• Scabies: 1 month
• Syphilis: 3 months (even if this contact has negative syphilis blood tests)

The sooner partners are treated, the better, since some STDs may affect fertility (e.g., chlamydia) or cause great pain (e.g., epididymitis) if allowed to progress.


Unfortunately, this form of multistep notification and treatment does not always work. “Multistep” refers to the process of identifying persons at risk for exposure to STDs (partners), and the number of steps taken to identify, notify, examine, and treat 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; Ward & Bell, 2014). 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 38 states and the District of Columbia; potentially allowable in an additional eight states and Puerto Rico; and not allowed in Florida, Kentucky, Ohio, and West Virginia (CDC, 2015).
STD PROTECTION FOR VICTIMS OF SEXUAL ASSAULT

It is estimated that 1 in 5 women and 1 in 71 men in the United States have been sexually assaulted (Symonds & Oldham, 2014). Along with physical injury and psychological trauma, sexual assault brings fears of pregnancy and STDs.

Overall, the chances of a victim getting an STD 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, bacteria vaginosis, gonorrhea, and chlamydia are the most frequently diagnosed STDs following a sexual assault. The actual risk, however, varies by region and by the type of attack (CDC, 2015o; Symonds & Oldham, 2014).

The best treatment for sexual assault victims is given by a sexual assault response (SAR) team 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 SAR teams 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

Decisions about testing for and treating STDs 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, pregnancy, and the psychological effects of sexual assault.

Testing for STDs 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 STDs: 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 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, 2015).

**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

Source: CDC, 2015.

**CASE: Sexual Assault**

Geeta is a sexual assault nurse examiner. She is called in to the ED by the county sheriff to examine a 32-year-old woman who complains of being 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 STDs. She reassures the patient and stays with her.

**EMOTIONAL / PSYCHOLOGICAL ASPECTS OF STDs**

STDs 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, those who transmit a disease to unborn or newly born offspring, those who discover they have an STD as a result of a partner’s infidelity, and those suffering from side effects due to treatments (AHRQ, 2014).

STDs and Sexual Assault

One frightening outcome of sexual assault is the possibility of contracting an STD from the assailant. Although the possibility of contracting HIV from a sexual assault is less than 1% (CDC, 2015o; Symonds & Oldham, 2014), contracting trichomoniasis, gonorrhea, chlamydia, and bacterial vaginosis is more common. The victim will require education about the STD symptoms to look for and the necessary follow-up. (See also “STD Protection for Victims of Sexual Assault” above.)

STDs and Fertility

Some STDs, if untreated for a significant amount of time, can cost a woman the ability to become pregnant. Untreated gonorrhea, for example, can cause PID (pelvic inflammatory disease) that 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 and Offspring

Certain STDs can be transmitted to offspring. Trichomoniasis can be transmitted to a newborn daughter 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 to their newborns, possible effects on the fetus, the need for treatment during pregnancy, and methods of prevention (AMA, 2013; Malhotra et al., 2013). Counseling will be needed if the mother’s STD results in preterm labor and birth, neonatal sepsis, premature rupture of membranes (PROM), or any harm to the unborn infant occurs.

STDs and Infidelity

At times the diagnosis of an STD 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 and the value of starting treatment quickly.
STDs and Treatment Side Effects

Another possible outcome of contracting an STD are side effects of the medications used for treatment. As one example, side effects of Lindane, a medication commonly used for both scabies and pubic lice, may include skin rash and itching and may be as serious as seizures or toxicity of the brain and nervous system (CDC, 2013c; NIH, 2012b). Patients with STDs need to be educated about possible side effects or adverse reactions from the medications they are taking to treat their STDs.

SUMMARY

Sexually transmitted diseases are infections that are efficiently transmitted through sexual contact. The range of the infectious agents of STDs is broad and includes bacteria, viruses, protozoa, and tiny arthropods (lice and mites). A common characteristic of most agents causing STDs 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 way that they are transmitted from person to person. This is the case, for example, with chlamydial infections and gonorrhea. For other organisms, sexual contact is a minor component of their mode of acquisition; candida (yeast) infections are examples of these organisms. The latter diseases—i.e., diseases in which sexual contact is not a major mode of transmission—are usually not classified as STDs.

For systemic STDs, such as HIV infections, the genital regions are mainly points of entry into the circulation. For other more local STDs, such as HPV infections, the genital region becomes the primary site of lesions. This course has focused on local STDs.

The Epidemiology of STDs

STDs are quite common. It is estimated that 20 million new cases of STDs occur each year in the United States, mostly among young people between the ages of 15 and 24 years (CDC, 2015k).

Although they are major public health concerns, some widespread STDs 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 50% to 80% of people expected to be infected in their lifetimes (CDC, 2013a). Nonetheless, the numbers of HPV infections remains only an estimate.

Common Presenting Syndromes

Symptomatic STDs 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 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 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 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 can also present with oral/pharyngeal or anal/rectal symptoms.

**Principles of Treatment**

When an STD is diagnosed, it is important that it be treated quickly to reduce the risk of the patient spreading the disease. 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 (Myerson et al., 2013). 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 should also be tested for other STDs because the presence of one STD makes the existence of a second STD more likely. Anyone who comes into the health system to be tested for an STD should be screened for an HIV infection.

STDs 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.
CAUSES AND SYNDROMES OF COMMON GENITAL STDs

<table>
<thead>
<tr>
<th>Type</th>
<th>Causative / Infectious Organism</th>
<th>Resulting Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacteria</strong></td>
<td><em>Chlamydia trachomatis</em></td>
<td>Nongonococcal urethritis, purulent hypertrophic cervicitis, epididymitis, salpingitis, conjunctivitis, trachoma, pneumonia, perihepatitis, lymphogranuloma venereum, Reiter’s syndrome</td>
</tr>
<tr>
<td></td>
<td><em>Haemophilus ducreyi</em></td>
<td>Chancroid</td>
</tr>
<tr>
<td></td>
<td><em>Neisseria gonorrhoeae</em></td>
<td>Urethritis, cervicitis, Bartholinitis, proctitis, pharyngitis, salpingitis, epididymitis, conjunctivitis, perihepatitis, arthritis, dermatitis, endocarditis, meningitis, amniotic infection syndrome</td>
</tr>
<tr>
<td></td>
<td><em>Treponema pallidum</em></td>
<td>Primary, secondary, latent, and tertiary syphilis</td>
</tr>
<tr>
<td><strong>Virus</strong></td>
<td>Herpes simplex virus (HSV)</td>
<td>Genital herpes, proctitis, meningitis, disseminated infection in neonates</td>
</tr>
<tr>
<td></td>
<td>HIV</td>
<td>AIDS and related illnesses</td>
</tr>
<tr>
<td></td>
<td>Human papillomavirus (HPV)</td>
<td>Condyloma acuminata; cervical and perianal warts; cervical, vulvar, and penile cancer</td>
</tr>
</tbody>
</table>

Source: CDC, 2012f; CDC, 2014k.

The current recommended treatments are given by the CDC in updates to its STD 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 at the same time as the primary patient. Therefore, STD 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, 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. These programs educate people, especially those people who are at high risk (such as teens and young adults), by explaining what STDs 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, condoms are the best safeguard against transmitting or acquiring many of the STDs and other forms of contraception do not protect against disease.
Another key public health effort is large-scale vaccination against STDs. Currently, it is recommended that young males and females be vaccinated against HPV (Schuchat, 2015) and that people at risk for STDs 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

Healthcare professionals must take on these responsibilities, which go beyond the acute treatment of their patients, to protect the community from STDs.

**RESOURCES**

About sexually transmitted diseases (TeensHealth)
http://kidshealth.org/teen/sexual_health/stds/std.html

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

National Prevention Information Network
https://npin.cdc.gov/disease/stds

Sexually transmitted diseases (CDC)
http://www.cdc.gov/std/

Sexually transmitted diseases (NIH, MedlinePlus)

Sexually transmitted infections (WHO)
http://www.who.int/topics/sexually_transmitted_infections/en/

STDs/STIs (American Sexual Health Association)
http://www.ashasexualhealth.org/stdsstis/

Vaccines and Preventable Diseases (CDC)
http://www.cdc.gov/vaccines/vpd-vac/default.htm
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London S. (2014). Adolescents who acquire bacterial STDs have elevated risk of later testing positive for HIV. Perspectives on Sexual and Reproductive Health, 46(1), 54–5. doi: 10.1363/46e5156_5


Muzny CA & Schwebke JR. (2013). The clinical spectrum of Trichomonas vaginalis infection and challenges to management. Sexually Transmitted Infections, 89(6), 423. doi: 10.1136/sextrans-2012-050893


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TEST

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1. A young adult male patient with low socioeconomic status describes rarely using condoms with sexual intercourse and using alcohol and/or drugs during sexual encounters. The patient is primarily at risk for more than one STD because of his:
   a. Age.
   b. Sexual behaviors.
   c. Socioeconomic status.
   d. Gender.

2. A young adult female patient is diagnosed with genital warts (HPV). The nurse practitioner informs the patient that this is a very common, incurable STD caused by which type of infectious agent?
   a. A protozoa
   b. A parasite
   c. A virus
   d. A bacterium

3. Statistical monitoring of sexual activity among U.S. adolescents and young adults shows:
   a. A decreasing age for first sexual activity.
   b. Higher rates of oral sex.
   c. A sexual abstinence rate ranging between 60% and 75%.
   d. Lower rates of anal sex.

4. Stereotyping older adult patients as sexually inactive may cause healthcare providers to overlook symptoms of:
   a. Hypothyroidism.
   b. Breast cancer.
   c. Prostate enlargement.
   d. HIV/AIDS.

5. Which is a true statement about the occurrence of STDs among U.S. subpopulations?
   a. STDs occur with equal frequency among all subpopulations.
   b. STDs occur more frequently among older adults.
   c. STDs occur more frequently among white Americans.
   d. STDs occur more frequently among African Americans.
6. 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. Use a written questionnaire instead of a face-to-face interview as the sole data-gathering instrument.
   d. Avoid questions about intimate relations with someone of the same sex.

7. A female patient describes genital itching. The most appropriate next action for the clinician treating her is to:
   a. Continue with the history taking, focusing on the nature and duration of this problem.
   b. Order a complete blood count (CBC), HIV test, and screening tests for syphilis and gonorrhea.
   c. Using appropriate personal protective equipment (PPE), examine the affected area.
   d. Prescribe nonspecific treatment to relieve the itching.

8. When a patient presents with genital ulcers, laboratory testing should include screening for which two infectious agents causing STDs?
   a. Scabies and pubic lice
   b. Treponema pallidum and herpes simplex virus (HSV)
   c. Chlamydia trachomatis and Neisseria gonorrhoeae
   d. Trichomonas vaginalis and human papillomavirus (HPV)

9. Patients with genital warts caused by human papillomavirus (HPV) need to know 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.

10. When a patient presents with nongonococcal urethritis (NGU), the clinician orders a screening test for:
    a. Chlamydia.
    b. Urinary tract infection.
    c. Genital molluscum contagiosum.
    d. Trichomoniasis infection.
11. What is the reason for initiating quick treatment for STDs?
   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

12. Treatment of a chancroid ulcer is usually with:
   a. A topical corticosteroid agent, such as hydrocortisone.
   b. An antibacterial agent, such as azithromycin.
   c. An antifungal agent, such as nystatin.
   d. An antiviral agent, such as acyclovir.

13. Chlamydial infections in the United States are most prevalent among:
   a. Postmenopausal women.
   b. The lesbian, gay, bisexual, and transgender community.
   c. Residents from southern states.
   d. People under the age of 24.

14. Patients of a rural health clinic have good rapport with and trust the family nurse practitioner who practices there. The practitioner determines that chlamydia screening is least likely to benefit which female patient who visits the clinic?
   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 19-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

15. 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.
16. 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. Female patients, except for those with symptoms.

17. 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.

18. 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 called a chancre
   d. A systemic disease characterized by granulomatous or necrotic lesions leading to organ damage

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

20. The two types of infections caused by the herpes simplex viruses, HSV-1 and HSV-2, are:
   a. Clinically indistinguishable.
   b. Equally prevalent among U.S. subpopulations.
   c. Equally contagious in asymptomatic persons.
   d. Symptomatic in most HSV-infected persons.
21. 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.

22. A female patient in the urgent care clinic responds to learning she is diagnosed with genital herpes by saying she has heard that the herpes virus cannot be treated. The clinician tells 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 her sexual partners from acquiring genital herpes.

23. 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.

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

25. 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.
26. The typical time course of most human papillomavirus (HPV) infections is:
   a. Short-lived, disappearing in less than one year.
   b. Long-lived, persisting for five to ten years.
   c. Permanent, persisting through a person’s entire life.
   d. Short-lived, disappearing in five to seven days.

27. Female patients with human papillomavirus (HPV) infections are most often found to have:
   a. Genital warts.
   b. Squamous cell dysplasia.
   c. Cervical cancer.
   d. No symptoms.

28. The appearance of genital warts in human papillomavirus (HPV) infections is:
   a. Usually uniform, dome-shaped papules.
   b. Most often widely varied in size and shape.
   c. Usually thin, flat skin tags on stalks.
   d. Most often the shape of small cauliflowers.

29. 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.

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

31. Clinical signs of molluscum contagiosum are:
   a. Skin or mucous membrane ulcers with necrotic bases and ragged edges.
   b. Vaginitis or urethritis with a 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.
32. In preparation for a weeklong pediatric hematology/oncology summer camp, the camp nurse develops a pamphlet about how to prevent transmission of molluscum contagiosum virus (MSV). The pamphlet clearly states that campers with molluscum contagiosum lesions:
   a. May not share eating utensils.
   b. May share sunblock lotion.
   c. Must share a common tent with campers who have similar diseases.
   d. Must prevent skin-to-skin contact by covering lesions.

33. 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.

34. Treatment for the sexual partners of a patient with trichomoniasis is provided:
   a. Only upon request.
   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.

35. Which is a true statement about pubic lice?
   a. Pubic lice live by sucking blood.
   b. Pubic lice belong to the same species as head lice but live in pubic hair.
   c. Pubic lice cause the disease called scabies.
   d. Pubic lice are treated with single-dose regimens of oral antibiotics.

36. New protocols on the treatment of pubic lice include:
   a. Using the same concentration of medication as is used to treat scabies.
   b. Applying Permethrin cream rinse (Nix cream) for no longer than three minutes.
   c. Administering a single-dose of an oral or topical antibiotic.
   d. Using Lindane shampoo only if another medication to treat pubic lice did not work.

37. Scabies is definitively diagnosed from:
   b. Dermatologic examination.
   c. Blood tests.
   d. Microscopic evaluation of skin scrapings.
38. After monogamy, the best protection against STDs 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.

39. Expedited partner therapy (EPT), by which patients with STDs deliver medications to their sexual partners:
   a. Requires that sexual partners be seen and tested before treatment.
   b. Promotes less sexual contact between partners.
   c. Is a good choice for all patients.
   d. Is not legal in all states.

40. 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.

41. Victims of sexual assault are usually treated for STDs:
   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.

42. What is the rationale for conducting follow-up testing after a sexual assault?
   a. Pregnancy or some STDs 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.

43. Which STDs can be transmitted to a newborn when passing through an infected birth canal?
   a. Human immunodeficiency virus (HIV) and molluscum contagiosum virus (MSV)
   b. Scabies and pubic lice
   c. Gonorrhea and chlamydia
   d. Hepatitis A and B