

➤ Sexually Transmitted Infections (Diseases - STIs)

- Sexually transmitted diseases (STDs) are those that are transmitted from one person to another during coitus or other genital contact.
- They sometimes are called *venereal diseases*, after Venus, the Roman goddess of love. The incidence of these diseases is disturbingly high.
- It is estimated that one in four Americans between the ages of 15 and 55 will acquire some form of STD; i.e., about 8 to 10 million Americans will contract an STD each year.
- Organisms causing STDs usually do not live and reproduce on dry skin surfaces.
- Require the moist environments of membranes in the so-called “transitional zones” of the body—those that occur at openings between the external and internal body surfaces.
- These transitional zones include the vulva, vagina, and urethra of the female; the penis and urethra of the male; and the mouth, oral cavity, eyes, and anus of both sexes.
- Although the body forms antibodies to many of the STD organisms, immunities are slow to develop or may never occur.
- **BACTERIA**
- Bacteria are single-celled, microscopic organisms.
- Most have a cell membrane and all lack membrane-bound organelles, including a nucleus.
- The bacterial genetic material is a single, circular molecule of DNA not arranged into a chromosome.
- Bacteria can have several shapes (e.g., rod-shaped; filamentous; spiral-shaped).
- Many bacteria cause disease by producing toxins. Bacteria that cause human illness can be prevented by vaccines or can be killed by antibiotics.
- **VIRUSES**
- A virus is a tiny, noncellular particle composed of a nucleic acid core (DNA or RNA) and a protein coat.
- Viruses are parasitic and reproduce only within a host cell.
- Some viral-caused human illnesses can be prevented by vaccination, but viruses are not harmed by antibiotics.
- Other kinds of organisms can cause STDs, such as fungi, protozoa, and invertebrates.

➤ Gonorrhea

- *Gonorrhea* (“clap,” “drip,” “strain”) is an STD that has been afflicting humans for centuries. References are made to this infirmity in ancient Chinese and Hebrew writings. In the early 1950s, the frequency of gonorrhea in the United States exhibited an epidemic increase but then began to decrease slowly in the late 1970s.
- At present, about 418,000 new gonorrhea cases are reported each year in the United States. Most new cases occur in the 15- to 29-year-old age group, although this disease can occur in people of any age. The incidence of gonorrhea is especially high in teenagers and male homosexuals.

- What caused the gonorrhea epidemic that occurred in the 1960s and 1970s in the United States?
- One factor was the increase in sexual activity and in the number of sexual partners of young people.
- Many sexually active teenagers were ignorant of precautions against, and symptoms of, gonorrhea. The condom, diaphragm, and spermicidal foams, creams, and jellies offer some protection against transmission of this disease, but the increasing preference for the combination pill over these methods in recent years has decreased the use of these measures.
- Another factor causing the past increase in the incidence of gonorrhea in the United States was the Vietnam War. After every war, there is an increase in STDs because people carry new strains of the organisms to other geographic regions.
- New strains of gonorrhea appeared that were resistant to traditional treatment with penicillin.
- **Cause of Gonorrhea**
- Gonorrhea is caused by the bacterium *Neisseria gonorrhoeae*, named after the scientist Albert Neisser, who identified it in 1879.
- The term *gonorrhoeae* is derived from a Greek word that means “flow of seed.” *Neisseria gonorrhoeae* is a Gram-negative, diplococcus bacterium.
- In 1883, Christian Gram of Denmark invented a stain that differentiated gram-positive from gram-negative bacteria. Gram-positive bacteria stain more darkly because of differences in their cell wall structure. “Diplococcus” means that these bacteria occur in pairs, with their adjacent sides flattened. A common name for the bacterium *N. gonorrhoeae* is *gonococcus*, and gonorrhea is often referred to as a “gonococcal infection.”
- **Transmission of Gonorrhea**
- 16 different strains of *N. gonorrhoeae*, some more damaging than others.
- All strains die quickly when exposed to dry air and sunlight, so it is virtually impossible to catch this disease by touching toilet seats and only very rarely can it be transmitted by moist towels, clothes, or hands.
- The main way this bacterium is transmitted is during heterosexual or homosexual coitus. The bacteria also can be transmitted to the mouth or anus during oral or anal coitus.
- Nonoxynol-9, an ingredient in spermicides, can reduce gonorrhea transmission by 60%.
- The gonorrhea bacteria thrive in the moist membranes of the urogenital tract, as well as in the mouth and oral cavity, anus, and eyes.
- *Incubation period* (the time it takes before symptoms appear) is usually 2 to 5 days, but it can be as soon as 1 day or as long as 8 days.

- **Female Gonorrhea Symptoms**

- About 75% of females who acquire gonorrhea are asymptomatic (show no symptoms).
- There are, at present, about 800,000 females in the United States with undiagnosed gonorrhea. This presents a problem because they are carriers of the disease without knowing it, and the disease can reach an advanced stage before a female knows that she has the affliction.

- **Female Gonorrhea Symptoms**

- In the remaining 25% of women who exhibit symptoms, the first sign usually is the appearance of a clear or whitish fluid discharge from the vagina (infection or inflammation of the vagina, called *vaginitis*). This discharge soon changes to a yellowish or greenish color; i.e., it becomes a pus-filled discharge. The vaginal wall can become quite irritated at this time. Eventually, the infection can reach the cervix; infection and inflammation of this organ (*cervicitis*) contribute to the purulent discharge. A discharge also can come from the urethra (*urethritis*). Urination can become difficult and painful when urethritis is present. Also, the bacteria can reach the urinary bladder, causing infection (*cystitis*).

- **Female Gonorrhea Complications**

- If left untreated, the bacteria can infect the uterus (*endometritis*) and can reach the oviducts 2 to 10 weeks after the initial infection. Inflammation and infection of the oviducts (*salpingitis*) can lead to infertility. If left untreated, the bacteria can spread to other pelvic and abdominal organs, resulting in a dangerous condition called *pelvic inflammatory disease (PID)*.

- **Gonorrhea Complications**

- The bacteria also can cause inflammation of the heart, brain, spinal cord membranes, eyes, skin, and joints.
- Oral coitus with a person carrying the bacteria in his or her genital region can lead to infection of the oral cavity.
- Anal coitus can transmit the disease into the anus and cause inflammation of the rectum (*proctitis*).

- **Gonorrhea and Pregnancy**

- Can pass the disease to the fetus
- The bacteria can enter the fetal blood across the placenta. If this happens in the first trimester, there is an increased risk of miscarriage.
- *N. gonorrhoeae* in the birth canal can infect the eyes of the newborn. Untreated, the newborn's eyes develop a purulent discharge within 21 days of birth, and the eyes can eventually be destroyed. Treatment of the newborn's eyes with silver nitrate or an antibiotic prevents this from occurring.

- **Male Gonorrhea Symptoms**

- Most men (70 to 90%) develop recognizable symptoms of gonorrhea.
- The first signs usually are a purulent discharge from the urethra and redness of the glans of the penis.
- Urination can become painful and difficult, and scar tissue can form in the urethra.

- Men also can have painful erections, pain in the groin region, and a low fever. If not treated, the infection can spread in about 3 weeks to the urinary bladder and prostate gland and can infect these organs. The epididymides also can become infected, and in some cases the testes themselves become infected and inflamed (*orchiditis*), sometimes leading to infertility.
- **Gonorrhea Diagnosis**
- The symptoms of gonorrhea are not especially useful in diagnosing the disease. This is because they are similar to symptoms of some other kinds of STD and because many females and some males are asymptomatic.
- Unfortunately, there is as yet no reliable blood test for gonorrhea, and direct microscopic observation only reveals the organisms in about half the infected individuals.
- **Gonorrhea Diagnosis**
- Swabs of the urethra, cervix, and/or rectum are made and are cultured in a special (Thayer—Martin) medium.
- The colonies of bacteria growing in this medium are then examined with a microscope for the presence of *N. gonorrhoeae*, and several biochemical tests are used to confirm the presence of this organism.
- This culture test takes about 24 to 48 hr. Unfortunately, in about 15 to 20% of people who have the disease, the gonorrhea bacteria are not visible in a culture. Therefore, it is a good idea to have repeat cultures done.
- **Treatment of Gonorrhea**
- Treatment with an injection of penicillin has been the standard treatment for gonorrhea since the 1940s.
- Some strains of *N. gonorrhoeae* have appeared that produce an enzyme (penicillinase) that destroys penicillin. These penicillin-resistant strains, called “supergonorrhea,” are becoming more common in the United States and produce fewer and milder early symptoms.
- The treatment of choice for gonorrhea has been probenecid (oral) plus procaine penicillin G (injection), or probenecid plus ampicillin (both given orally).
- The drug probenecid reduces excretion of the antibiotics by the kidneys. With the alarming increase in penicillin-resistant strains, however, the U.S. Centers for Disease Control in 1989 stopped recommending penicillin as the treatment of choice.
- Instead, other antibiotics (spectinomycin; tetracycline) can be used. A follow-up culture should be done 1 week after antibiotic treatment. Preliminary trials with a gonorrhea vaccine and antibody treatment have been encouraging.
- **Syphilis**
- *Syphilis* is a serious sexually transmitted disease caused by a bacterium, *Treponema pallidum*.
- About 50 million people in the world now have syphilis, and its incidence has been slowly increasing.

- In the US, about 82,000 new cases of syphilis are reported per year, the highest rate in 40 years. The actual incidence is even higher because many cases are not reported.
- **Origin of Syphilis**
- **Columbian Theory** There are at least two theories about the origin of syphilis. The “Columbian theory” proposes that Christopher Columbus and his crew contracted the disease from natives on their first voyage to the West Indies in 1493.
- They then introduced the disease to Europe. The first documented epidemic of syphilis occurred in western Europe at the end of the 15th century. People in one country usually blamed foreigners for introducing the disease. Thus, it was called the “Neopolitan disease” in France, the “French pox” by Italians, and the “French or Spanish disease” by the English.
- In 1520, after the epidemic was over, an Italian physician and philosopher, Hieronymus Fracastorius, wrote a poem in which the people of the earth were given a horrible disease by the sun god, Apollo, because a shepherd encouraged his people to worship the king instead of Apollo.
- The shepherd’s name was Syphilis.
- **Evolutionary Theory** The “evolutionary theory” of the origin of syphilis proposes that this disease is related to other nonvenereal diseases such as yaws and nonvenereal syphilis.
- *Yaws*, a nonvenereal tropical disease of the skin, is the most primitive of all the diseases. It is caused by a bacterium closely related to *Treponema pallidum*, called *Treponema pertenue*.
- When people migrated to cooler, drier northern climates, their skin became drier, and *Treponema pertenue*, favoring moist regions, migrated to the axilla, mouth, nostrils, crotch, and anus and caused *nonvenereal syphilis*.
- This disease (also called *endemic syphilis*) is a childhood infection in arid regions of the world. It is transmitted by direct (nonsexual) body contact, in drinking water, or by eating utensils.
- The bacterium that causes this disease is not distinguishable from *T. pallidum* and probably evolved from *T. pertenue*. Later, *T. pallidum* began to favor the even moister areas of the genitals and became the sexually transmitted affliction we now know as syphilis.
- Since it was recently proven that both yaws and syphilis were present in the Americas before Columbus, both theories may be true.
- **Syphilis vs. Gonorrhea**
- For years, it was thought that syphilis and gonorrhea were caused by the same organism.
- An English physician, John Hunter (1728—1793), once attempted to prove that these diseases were caused by different organisms by injecting pus from a gonorrhea patient into himself.
- Unfortunately, and unbeknownst to him, the patient also had syphilis. Hunter contracted both diseases, perpetuating the misconception that they were caused by the same organism, and he died of his self-inflicted syphilis.
- In 1838, Phillippe Ricord of France determined that gonorrhea and syphilis were caused by different bacteria.
- **Syphilis Transmission**
- *Treponema pallidum* is a corkscrew-shaped (spirochete) bacterium.
- Thrives in moist regions of the body and will survive and reproduce only where there is little oxygen present.
- It is killed by heat, drying, and sunlight. Therefore, one cannot catch syphilis from contacting toilet seats, bath towels, or bedding.

- It can, however, live in collected blood for up to 24 hr at 4°C, and thus, in rare cases, is transmitted during blood transfusion.
- Nine out of 10 cases of syphilis transmission occur during sexual intercourse, although it also can be introduced into an open wound in the skin.
- Fortunately, only about 1 in 10 people exposed to the bacteria develops syphilis.
- **Primary Stage of Syphilis**
- *Primary Stage* The symptoms of untreated syphilis occur in four stages.
- The *primary stage of syphilis* usually appears as a single sore called a *chancre* (pronounced shang'ker) at the place where the bacteria first entered the body.
- Round, ulcer-like sore with a hard raised edge and a soft center. It looks like a crater, about 1/2 to 1 in. in diameter. This chancre, which for all its awful appearance is painless, appears 10 to 90 days after entry of the bacteria.
- Because the chancre is painless and may be in a location not readily noticed, a person may not realize that he or she is infected.
- In males, the chancre usually occurs on the glans or corona of the penis, but it can occur anywhere on the penis or on the scrotum.
- In females, it usually appears on the vulva, but sometimes can appear on the cervix or vaginal wall.
- After oral coitus with an infected person, it can appear on the lips, tongue, or tonsils, and it can appear in the anus after anal coitus with an infected person.
- Inguinal lymph nodes enlarge a few days after the sore appears.
- The chancre heals in 1 to 5 weeks, and the primary stage is then over.
- Meanwhile, the bacteria travel in the blood or lymphatic system to other parts of the body and eventually cause the secondary stage of syphilis if the person is not treated.
- **Secondary Stage of Syphilis**
- *Secondary Stage* The *secondary stage of syphilis* occurs 2 weeks to 6 months after the primary stage.
- This stage is characterized by a rash that appears on the upper body, arms, and hands, which then spreads to other skin regions.
- In white-skinned people, the rash appears as cherry-colored blemishes or bumps that change to a coppery-brown color.
- In dark-skinned people, the blemishes are grayish blue.
- Larger bumps can develop and burst, especially in the inguinal region.
- The rash does not itch and is painless, but the syphilis bacteria are present in great numbers in these sores, and contact with the sores is very infectious to other people.

- Other symptoms of the secondary stage include hair loss, sore throat, headache, loss of appetite, nausea, constipation, pain in the joints and abdominal muscles, a low fever, and swollen lymph glands.
- The symptoms are minor and cause little inconvenience in about 60% of untreated individuals in the secondary stage and thus can be completely overlooked.
- The secondary stage goes away in 2 to 6 weeks, and the untreated individual then enters the latent stage of syphilis.
- **Latent Stage of Syphilis**
- *Latent Stage* During the *latent stage of syphilis*, which can last for years, a person exhibits few or no symptoms.
- After about a year of the latent stage, the individual can no longer transmit the bacteria to another person (except to a fetus, as discussed later). About half of the people who enter the latent stage never leave it, even if not treated.
- The other half eventually enter the tertiary stage of syphilis if not previously treated with antibiotics.
- **Tertiary Stage of Syphilis**
- *Tertiary Stage* Entrance into the *tertiary stage of syphilis* occurs because the bacteria have invaded tissues throughout the body.
- The tertiary stage is characterized by large, tumor-like sores (*gummas*) that form on tissues of skin, muscle, the digestive tract, liver, lungs, eyes, nervous system, heart, or endocrine glands.
- Infection of the heart (cardiovascular syphilis) can cause severe damage to the heart and its valves.
- Invasion of the bacteria into the central nervous system causes “neurosyphilis,” and the brain and spinal cord can be severely damaged.
- People with neurosyphilis can develop partial or total paralysis, blindness, or psychotic and unpredictable behavior.
- People in the tertiary stage are not infectious, but about 4000 die annually of tertiary syphilis in the United States.
- **Congenital Syphilis**
- A person is not infectious in most of the latent stage or in the tertiary stage of syphilis.
- This is true except in the case of an infected pregnant woman, who can pass the bacteria to her fetus at any stage of syphilis.
- The placenta protects the fetus against invasion of the syphilis bacteria up to the 6th month of pregnancy, after which time the *T. pallidum* organism passes through the placental membranes into the fetal bloodstream. Then, the fetus can contract the disease from the mother.
- If this happens, about 30% of the fetuses miscarry and 70% are born with *congenital syphilis*.

- The latter children are contagious in their 1st and 2nd year, and go through all the stages of syphilis if left untreated.
- About 23 in 100 such cases develop tertiary syphilis in 10 to 20 years.
- Symptoms of tertiary congenital syphilis include damage to the eyes, deafness, flattening of the bridge of the nose (“saddle nose”), and central incisor teeth that are spread apart and notched (“Hutchinson’s teeth”). Many of these individuals die from this affliction.
- **Diagnosis of Syphilis**
- Several of the symptoms of syphilis can be confused with those of other sexually transmitted diseases.
- It is difficult to grow cultures of *T. pallidum* in the laboratory. Therefore, other tests are necessary to see if a person has contracted the disease. Diagnosis of syphilis can be accomplished in several ways.
- Several such tests are available, including the Venereal Disease Research Laboratory (VDRL) test, the Rapid Plasma Reagin (RPR) test, and the Syphla-Chek Test.
- All are equally sensitive, but Syphla Chek seems to be the best for primary syphilis.
- The older “Wasserman Test” for syphilis has been displaced by these newer methods.
- A blood test for the presence of antibodies to the disease can be done a week or so after the primary chancre appears.
- False positive results occur in 1 out of 3000 of these blood tests, and more importantly, false negatives occur about 25% of the time.
- Because of this error factor, an individual’s tissues also should be checked for the presence of live *T. pallidum*, based on their characteristic shape and movement, using a dark-field microscope to confirm the diagnosis.
- **Treatment of Syphilis**
- Once it has been determined that a person has syphilis, treatment with one several antibiotics is effective.
- Most commonly, benzathine penicillin G is used as a single injection each day for 8 days if the person is in the primary stage and for 3 to 4 weeks at higher dosage if the person is in a more advanced stage of the disease.
- Tetracycline or erythromycin can be used if a person is hypersensitive to penicillin.
- Like gonorrhea, syphilis is a curable disease
- Individuals with tertiary syphilis, though treated, still may have suffered permanent tissue damage.

➤ **Chlamydia**

- *Nonspecific urethritis* has, in the past, referred to any sexually transmitted *urethritis* (urethral infection) not caused by *Neisseria gonorrhoeae*.
- We know now that the leading cause of this affliction is the Gram-negative, bacterium-like microorganism *Chlamydia trachomatis*.
- This is a member of a group of very small bacteria that, unlike other bacteria, live inside cells and were once thought to be virus.
- About half the cases of nonspecific urethritis in men and women are caused chlamydia.
- Chlamydia can also passed to the eyes by touching infected regions.
- At present, there are about million reported new cases of chlamydia each year, making it the leading sexually transmitted disease in the United States in this regard.
- **Chlamydia and the Female**
- In females, the cervix is the main site of chlamydia infection, leading spotting between periods, a yellowish vaginal discharge, and frequent urination
- The cervix, vagina, urethra, and vulva become reddened and irritated.
- There is an association between chlamydia infection and cervical cancer.
- About 50 to 70% of infected women have no symptoms, which makes early detection difficult.
- The result of an untreated infection could be pelvic infection and sterility.
- It is estimated that about 11,000 women in the United States become sterile annually as a result of chlamydia infection.
- A chlamydia infection in a pregnant woman can be passed to her child during delivery, and the result can be lung and eye infections in the newborn.
- **Chlamydia and the Male**
- Male partners of chlamydia-infected women usually have chlamydia their bodies.
- Although 30% of men are asymptomatic, the remainder develop frequent and painful urination.
- For men, the incubation period is 7 to days.
- Chlamydia infection can lead to abnormal and nonmotile sperm men.
- **Chlamydia Diagnosis and Treatment**
- Chlamydia is detected by tissue culture as well as an enzyme test.
- For both sexes, chlamydia can be cured by treatment with tetracycline or erythromycin but not penicillin.
- Both partners should be treated, even if only one has symptoms.

- **Other STI Bacteria**

- Other causes of nonspecific urethritis include *Ureaplasma urealyticum*, which is related to chlamydia.
- *Hemophilus vaginalis*, a bacterium, also produces some cases of nonspecific urethritis.
- In women, these can also cause pelvic infection and even infertility, and they can cause infertility in men (through scarring sex accessory tubes or damaging sperm).

- **Lymphogranuloma venereum**

- *Lymphogranuloma venereum* is a tropical sexually transmitted disease rare in the United States, but its incidence is on the rise. It is caused by *Chlamydia trachomatis*, the same organism (but a different strain of it) that is one cause of nonspecific urethritis. Although most people catch this disease after close contact, it also can be transmitted on clothing. A newborn's eyes also infected with this organism if it is present in the vulva of a delivering mother. After an incubation period of 7 to 21 days, a small, painless blister for males, this blister occurs on the penis or scrotum, and in females occurs vagina, vulva, cervix, or urethra. The anus, tongue, or lips can also be involved. Other symptoms can include swelling of inguinal lymph nodes, fever, backache, abdominal and joint pain, and loss of appetite. In a few cases spreading organisms can cause a serious complication. *Reiter's syndrome* is characterized by rheumatism, arthritis, conjunctivitis, and heart valve. Diagnosis of this disease is by a skin test (Frei test) or by a test for antibodies. Both tests, however, only become positive 3 to 4 weeks after the onset disease. Treatment is with tetracycline or the sulfonamides.

- **Chancroid**

- *Chancroid* (or "soft chancre") is a sexually transmitted disease caused by small, Gram-negative bacterium, *Hemophilus ducreyi*. It is rare in the States, being most common in the tropical Far East. However, it has appearing more frequently in the United States. Once the bacteria enter in the skin or invade the mucous membranes of the genital region, a small (small elevation on the skin) appears in 12 to 24 hr. This papule, con found on the penis or vulva, then bursts, and an ulcer forms in 1 to 2 days) ulcer looks like the chancre of primary syphilis except that it has soft edges. It also is painful, whereas the hard chancre of primary syphilis is painless. Multiple soft chancres can develop as the organism spreads, even to the thighs. A common symptom is swollen lymph glands in the groin region. Many females do not show symptoms but are carriers of the bacteria. Anal coitus can soft chancre in the anus. Chancroid can be diagnosed by examining a skin culture under a microscope and looking for *Hemophilus ducreyi*. Also, evidence of *H. ducreyi* can be detected by a skin test (Ducrey's skin test) becomes positive 1 to 2 weeks after a person is infected. Standard treats with a sulfa drug such as sulfonamide.

- **Granuloma Inguinale**

- *Granuloma inguinale* is caused by a Gram-negative bacterium by the of *Caiymmatobacterium granulomatis* (formerly called *Donovania granulomatis*). This is an extremely rare sexually transmitted disease, with 100 cases occurring annually in the United States. It is more common in India and New Guinea. From one to several weeks after the bacteria enter the body, a tiny blister occurs on the penis or vulva, which then develops into an open, bleeding sore. The skin around the sore becomes swollen and red. One can diagnose this disease by looking for the bacteria in a small piece of skin taken from the edge of the sore, using a microscope. Treatment is with tetracycline.

➤ Genital Herpes

- *Herpes genitalis* is a very common viral STI.
- Each year, about 5 million people in the world and more than 500,000 in the United States will contract this disease.
- As herpes is, at present, incurable, it is estimated that there are about 2 million sufferers in the United States today.
- It is most prevalent in teenagers and young adults, especially in poorer regions, but it can infect anyone.
- There may be an inherited resistance to herpes viruses, since a gene for herpes virus sensitivity is present on chromosome 3 in humans.
- **Cause of Genital Herpes**
- This disease is caused by *herpes simplex type 2 virus*.
- There are 25 herpes viruses which cause such diseases as;
 - fever blisters and cold sores (*herpes simplex type 1 virus*)
 - chicken pox in children or shingles in adults (*varicella—zoster virus*)
 - infectious mononucleosis (*Epstein—Barr virus*)
 - cytomegalic inclusion disease, which affects the fetus and newborn and results in enlargement of the liver and spleen (*cytomegalovirus*).
- The herpes simplex type 2 virus usually affect the body below the waist (e.g., the genitals, thighs, and buttocks), whereas type 1 usually invades areas above the waist.
- About 20% of herpes infections of the genital region, are caused by herpes simplex type 1, usually as a consequence of oral coitus with an infected person.
- Similarly, type 2 occasional is isolated from mouth sores.
- Condoms are not 100% effective in preventing transmission of the herpes virus.
- It should be emphasized that herpes genital can be transmitted by nonsexual contact with an infected person.
- Herpes viruses can survive a few hours on moist toilet seats, gloves, in tap water, an on plastic surfaces in spas, a person could at least *theoretically* could acquire the virus from these surfaces, although actual transmission via this route is rare.
- **Genital Herpes Symptoms**
- Once a person contracts the herpes genitalis virus, usually through genital contact, clusters of tiny blisters develop that change to painful round sores in 4 to 7 days.
- Two or 3 days later, these take the form of multiple, small, round, itchy ulcers.
- Severe ulcers occur only in about 10% of infected people; in the remaining 90% the sores are minor and often go unnoticed.
- In males, the sores occur mainly on the penis (shaft, foreskin, glans, urethral meatus), especially the uncircumcised.

- **Genital Herpes Symptoms**

- The primary symptoms usually are more painful in females with sores appearing on the labia, clitoral hood, cervix, vaginal introitus, urethral meatus, or perineum.
- Urination and coitus can be painful.
- More severe but less common symptoms in both sexes include fever and enlargement of the inguinal lymph nodes.
- In general, the symptoms are more severe in people who have never been exposed to any herpes virus.
- If a person touches an open sore and then his or her eyes, he or she can develop a virus infection that can lead to blindness.
- The sores, if they develop, heal in 1 to 6 weeks.
- Individuals can infect other people most when sores are present but can also be infectious after the sores and scabs disappear.
- After the herpes sores have healed, the virus migrates up sensory nerves to clumps of nerve cells near the spinal cord. They lie dormant there for several days, weeks, or months.
- When they become active again, they migrate back to the skin, and cause recurrence of the symptoms.
- Such recurrence can be on different parts of the penis or scrotum in males or on the vulva, vagina, or cervix in females.
- The recurrent attack often is accompanied by enlargement of the lymph nodes in the groin, as well as fever and headaches. Then, the symptoms go away in 1 to 4 weeks.
- Recurrence of symptoms can occur frequently (e.g., once a month), or there may be several months between attacks.
- Some individuals have more than 10 attacks, and these often are associated with times of stress or, in females, with menstruation.
- Eventually, antibodies are formed that alleviate or stop recurrences, and a few people may never have a second attack. Nevertheless, herpes genitalis can stay with many people for their entire lives.
- There is a disturbing positive correlation of females developing cervical cancer after having had herpes genitalis; the incidence is two to four times higher than in those who have not had herpes genitalis.
- Herpes also is associated with an increased risk of atherosclerosis and blood clots.
- **Genital Herpes & Pregnancy**
- Herpes simplex type 2 virus in the blood of a pregnant female can cross the placenta and damage the fetus. This, however, is rare.

- More often, the fetus is exposed to the virus during birth, especially if the woman has open sores during delivery.
- However, about a third of cases of neonatal herpes occur during deliveries in which the woman had no open sores.
- About 25% of newborns exposed to herpes virus type 2 develop blindness or brain damage, and another 25% of exposed newborns develop skin lesions.
- For this reason, the fetuses of women with herpes infection often are delivered by cesarean section.
- **Genital Herpes Diagnosis**
- In addition to the previously described symptoms, herpes genitalis can be diagnosed by taking a smear from the cervix, culturing it with tissue cells, and examining the cells for the presence of the virus.
- Also, a blood test for antibodies is available, but it does not differentiate between antibodies to herpes simplex type 1 and type 2 viruses.
- **Genital Herpes Treatment**
- There is no reliable cure for herpes genitalis, which explains why the actual number of people having the virus is high.
- Some procedures, however, have the potential to reduce the severity and frequency of recurrence of the herpes symptoms. Proper hygiene has such an effect.
- Vitamin A seems to be helpful because it stimulates the immune system.
- Zinc sulfate administered in a special tampon prevented recurrence and spread of the disease in a preliminary trial.
- Topical application of a drug, 5-iodo-deoxyuridine, seems to relieve the symptoms.
- A drug called 2-deoxy-D-glucose can also combat herpes genitalis.
- The most commonly used drug is, acyclovir (Zovirax), which interferes with reproduction of the herpes virus.
- Evidence shows, however, that new strains of the herpes virus resistant to acyclovir can appear
- Exposure of the herpes sores to a certain dye and fluorescent light can increase the healing rate and decrease recurrence, but there is a possibility that such exposure increases the risk of cervical cancer.
- Wet compresses or hot sitz baths should not be used, since they can spread the sores.
- Clinical trials of a genital herpes vaccine are now underway in the United States. This vaccine does not prevent herpes but does decrease the frequency of sore recurrence.

➤ **Genital Warts (HPV)**

- *Genital warts (Condyloma acuminata)* occurs in the genital region because of the presence of a *human papilloma virus (HPV)*.
- This virus often is transmitted sexually, which is why the condition may be called “venereal warts.” These warts also can appear spontaneously. (The kind of warts that occur on the skin in other body regions is caused by a different virus.)
- About 20% of sexually active 14- to 18-year-old females have the virus, and most of their sex partners do as well.
- This amounts to about two million new cases in the United States annually, which makes it one of the most prevalent STIs.
- **Genital Warts (HPV) Symptoms**
- After the genital wart virus is contracted, the warts appear in 3 weeks to 8 months.
- They are moist, soft, cauliflower-like bumps occurring singly or in groups. They can be pink, red, or dark gray.
- Females often get them on the cervix, labia, vulva, or perineum.
- In males they appear on the prepuce, glans, or coronal ridge of the penis, as well as in the urethra and on the scrotum.
- **Genital Warts (HPV) Treatments**
- Genital warts can be effectively treated with the medications that chemically or physically destroy the warts
- podophyllin or trichloroacetic acid = chemical
- dry ice, or liquid nitrogen = freeze warts
- The warts usually dry up and fall off a few days after being treated.
- If this does not work, the warts can be removed by laser surgery or heat cauterization.
- **Genital Warts (HPV) Diagnosis**
- Genital wart infection can be serious. In women, there is a strong association between the presence of the virus and abnormal growth (dysplasia; cancer) of the cervix.
- There are about 70 types of HPV, and 4 are commonly associated with cervical abnormalities.
- About 95% of women with cervical cancer have one or more types of HPV virus (compared with 20% of women without cervical cancer).
- It takes about 2 1/2 years after acquiring the virus for the resultant cervical abnormalities to appear.
- Although a Pap smear does not detect the virus, any cervical abnormalities detected by a Pap smear should be followed by an antibody test available for HPV.
- Women with a positive HPV test should get a Pap smear every 6 to 12 months.

- Men who are positive for HPV should be aware that some types of cancer of the penis appear to be associated with the virus.
- Women are 5—11 times more likely to have HPV and cervical cancer if their spouse frequents prostitutes or has many sexual partners.
- There also is an association of the virus with cancer of the anus in gay men.
- **Molluscum contagiosum**
- *Molluscum contagiosum* is a disease caused by a virus related to the chicken pox virus. This virus can be sexually transmitted, but it also can be transmitted by skin contact. The condition is most commonly seen in children. The symptoms are small, pink, wart-like growths on the face, arms, back, umbilical region, or buttocks. This disease is relatively harmless, and the growths can be removed by freezing or burning.
- **Viral Hepatitis B**
- Infection of the liver with hepatitis virus B (*viral hepatitis, type B*) often is transmitted by the use of an infected hypodermic needle.
- It can also be transmitted during sexual contact or during other close contact with infected people.
- The virus is present in saliva and semen and can be transmitted during kissing or anal or oral intercourse, and can cross the placenta.
- About 50 to 60% of these cases not attributed to injections using infected needles occur in homosexual men, although hepatitis type B also can be transmitted during heterosexual coitus.
- In fact, it is spreading rapidly on college campuses. There are about 300,000 new cases of hepatitis B in the United States each year, and 1 to 2% of these are fatal.
- Symptoms include an inflamed liver (*hepatitis*), liver cancer, fever, weakness, headache, and muscle pain. A new hepatitis B vaccine has met with 92% success, but many people are not aware of its availability.
- **Pediculosis Pubis, “Crabs” -- An STI caused by an Arthropod**
- *Pediculosis pubis*, or “crabs,” is caused by a tiny, parasitic, blood-sucking crab louse by the name of *Phthirus pubis*.
- This organism can be transmitted by direct body contact and also by contact with hair, clothing, or bedding.
- The organism can be seen at the base of hairs or as black spots visible on underwear. It lives in pubic, axillary, eyebrow, eyelash, and facial hair, but never in scalp hair.
- It needs the environment of human hair, as it dies in 24 hr if removed.
- Female parasites lay tiny white eggs at the base of hairs, and the eggs hatch into larvae in 7 to 9 days.
- Adults or larvae causing itching, and scratching can lead to secondary infection of the skin or hair follicles.

- In World War II, parasitized people were shaved and a 10% DDT powder was used for 24 hr.
- Now, an insecticide called gamma benzene hexachloride (Kwell) is applied as a cream, lotion, or shampoo.
- If one member of a household has crabs, all members should be treated.
- All underclothing and linens should be washed in hot water with bleach.