

- Injury may be due to local or systemic release of microbial products including endotoxin (LPS), exotoxins or superantigens.
- Pathogens can induce immune responses that cause tissue damage. Absence of an immune response may reduce damage induced by some infections; conversely, immune compromise can allow uncontrolled expansion of opportunistic agents or of microorganisms that can directly cause injury.

Sexually Transmitted Infections

A variety of organisms can be transmitted through sexual contact (Table 8-3). Groups at greater risk for sexually transmitted infections (STIs) include adolescents, men who have sex with men, and people who use illegal drugs parenterally. While the increased risk among these groups is partially due to unsafe sexual practices, limited access to health care is often a contributing factor. The presence of an STI in children, unless acquired during birth, strongly suggests sexual abuse.

Some pathogens, such as *C. trachomatis* and *N. gonorrhoeae*, are almost always spread by sexual intercourse, whereas others, such as *Shigella* species and *E. histolytica*, are typically spread by other means, but are also occasionally spread by oral-anal sex. To reduce the spread of STIs, it is expected that these infections be reported to public health authorities so that people who have had intimate contact with the person may be tested and treated.

Although the various pathogens that cause STIs differ in many ways, some general features should be noted.

- STIs may become established and spread from the urethra, vagina, cervix, rectum, or oral pharynx. Organisms that

cause STIs depend on direct contact for person-to-person spread because these pathogens do not survive in the environment. Transmission of STIs often occurs from asymptomatic people who do not realize that they have an infection.

- Infection with one STI-associated organism increases the risk for additional STIs. This is mainly because the risk factors are the same for all STIs. In addition, the epithelial injury caused by *N. gonorrhoeae* or *C. trachomatis* can increase the chance of co-infection with the other, as well as the risk of HIV infection if there is concomitant exposure.
- The microbes that cause STIs can be spread from a pregnant woman to the fetus and cause severe damage to the fetus or child. Perinatally acquired *C. trachomatis* causes conjunctivitis, and neonatal HSV infection is much more likely to cause visceral and CNS disease than is infection acquired later in life. Syphilis frequently causes miscarriage. HIV infection may be fatal to children infected with the virus prenatally or perinatally. Diagnosis of STIs in pregnant women is critical, because intrauterine or neonatal transmission of STIs can often be prevented by treatment of the mother or newborn. Antiretroviral treatment of pregnant women with HIV infection and their newborn infants can reduce the transmission of HIV to offspring from 25% to less than 2%.

Syphilis is discussed later in this chapter, and other STIs are described in Chapters 21 and 22.

Spectrum of Inflammatory Responses to Infection

In contrast to the vast molecular diversity of microbes, the morphologic patterns of tissue responses to microbes are limited, as are the mechanisms directing these responses.

Table 8-3 Classification of Important Sexually Transmitted Diseases

Pathogens	Disease or Syndrome and Population Principally Affected		
	Males	Females	Both
Viruses			
Herpes simplex virus			Primary and recurrent herpes, neonatal herpes
Hepatitis B virus			Hepatitis
Human papillomavirus	Cancer of penis (some cases)	Cervical dysplasia and cancer, vulvar cancer	Condyloma acuminatum
Human immunodeficiency virus			Acquired immunodeficiency syndrome
Chlamydiae			
<i>Chlamydia trachomatis</i>	Urethritis, epididymitis, proctitis	Urethral syndrome, cervicitis, Bartholinitis, salpingitis and sequelae	Lymphogranuloma venereum
Mycoplasmas			
<i>Ureaplasma urealyticum</i>	Urethritis		
Bacteria			
<i>Neisseria gonorrhoeae</i>	Epididymitis, prostatitis, urethral stricture	Cervicitis, endometritis, Bartholinitis, salpingitis, and sequelae (infertility, ectopic pregnancy, recurrent salpingitis)	Urethritis, proctitis, pharyngitis, disseminated gonococcal infection
<i>Treponema pallidum</i>			Syphilis
<i>Haemophilus ducreyi</i>			Chancroid
<i>Klebsiella granulomatis</i>			Granuloma inguinale (donovanosis)
Protozoa			
<i>Trichomonas vaginalis</i>	Urethritis, balanitis	Vaginitis	