

# Human Immunodeficiency Virus Infection and Acquired Immunodeficiency Syndrome



Brian T. Montague, Aadia I. Rana, Edward J. Wing, and Timothy P. Flanigan

## DEFINITION AND EPIDEMIOLOGY

The human immunodeficiency virus (HIV) is a retrovirus from the lentivirus family. The first descriptions of the disease came in 1982, when HIV-associated wasting occurring in large numbers of young adults in a Ugandan fishing community was described as “slim disease.” In the United States in the same year, the designation acquired immunodeficiency syndrome, or AIDS, was applied to a syndrome identified in previously healthy men who had sex with men (MSM). It was characterized by serious infections with unusual opportunistic pathogens, such as pneumonia from *Pneumocystis carinii* (now called *Pneumocystis jirovecii*) or development of the formerly rare tumor, Kaposi’s sarcoma. Such infections had previously been found only among patients with severe cellular immunodeficiency, and studies confirmed profound immunodeficiency in these individuals. When similar opportunistic infections (OIs) were subsequently observed in injection drug users and in men with hemophilia along with their female sexual partners, it became clear that this syndrome was caused by an agent transmitted either through sexual contact or through infusion of blood or blood products.

The HIV virus was identified in 1983, and its role as the causative agent of AIDS was confirmed in 1984. By 1993, AIDS had become the leading cause of death among American adults aged 25 to 44 years, a trend that was dramatically reversed by the introduction of effective combination antiretroviral therapy (ART) at the end of 1995. By the end of 2006, approximately 1.1 million persons in the United States were living with HIV and AIDS, and an estimated 56,300 persons are estimated to have become infected that year. More than 20% of people living with HIV remain unaware of their status; they are at risk for serious health complications and for transmitting the virus to others.

## TRANSMISSION


Although it was initially observed most frequently among homosexual men and intravenous drug users in the United States, heterosexual intercourse has been the dominant mode of HIV transmission throughout most of the world. The virus is present in semen and cervicovaginal secretions of infected individuals and can be transmitted by either partner during vaginal or anal

intercourse. The concurrent presence of other sexually transmitted diseases, especially those associated with genital ulcerations, strongly facilitates sexual transmission of HIV.

Vertical transmission of HIV from an infected mother to her child may occur in utero, during labor, or through breastfeeding. In the absence of antiretroviral treatment (ART), HIV infects 25% to 30% of infants born to HIV-infected mothers. The rate of vertical transmission can be reduced to less than 2% by prenatal and perinatal treatment of the mother and postnatal treatment of the infant with effective antiretroviral drugs.

Before the nationwide implementation of a blood screening test in late 1985, infection by means of transfused blood or blood products accounted for almost 3% of AIDS cases in the United States. Since 1985, all blood products in North America have been screened for HIV antigens and antibodies to HIV. The risk of transfusion-acquired HIV infection in North America and western Europe is now exceedingly small, but not absent.

HIV infection may occur after accidental parenteral exposures among health care workers. After injury by an HIV-contaminated hollow needle, the risk of infection is approximately 0.3%. Observational data suggest that this risk can be reduced at least 10-fold by prompt postexposure prophylaxis.

 For a deeper discussion of these topics, please see Chapter 387, “Prevention of Human Immunodeficiency Virus Infection,” in Goldman-Cecil Medicine, 25th Edition.

## EPIDEMIOLOGY

HIV is a reportable condition in the United States. Individual states and the Centers for Disease Control and Prevention (CDC) together monitor incident cases of HIV, the number of persons known to be living with HIV, and the incidence of AIDS diagnosis. The CDC has established clear surveillance criteria for the diagnosis of AIDS, which include having a CD4<sup>+</sup> T-helper lymphocyte count (CD4 count) lower than 200 cells/mm<sup>3</sup>, having been diagnosed with any of a large number of OIs indicative of defects in cellular or humoral immunity, and having certain neoplasms or other conditions associated with severe immunodeficiency. With ART, the clinical significance of an AIDS diagnosis is more limited, although tracking the number of AIDS