Early Symptomatic HIV Infection

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Overview

Early symptomatic HIV infection includes persistent generalized lymphadenopathy, often the earliest symptom of primary HIV infection; oral lesions such as thrush and oral hairy leukoplakia; hematologic disturbances such as hypoproliferative anemia and thrombocytopenia; neurologic disorders such as aseptic meningitis; and dermatologic disorders such as varicella-zoster virus (shingles).

The clinical effects of human immunodeficiency virus (HIV) infection are diverse, ranging from an acute retroviral syndrome associated with primary HIV infection to a prolonged asymptomatic state to advanced HIV disease. Experts regard HIV disease as beginning at the time of primary (acute) HIV infection and progressing through numerous stages of chronic infection.

Acute HIV infection is defined as the period between exposure to the virus and completion of the initial immune responses. This period varies but generally lasts 2-3 months. During this time, antibody tests may be negative for HIV, but the serum viral load (the amount of HIV virus in the blood) is detectable and can be quite high (millions of copies per milliliter).

In most infected individuals, active virus replication and progressive immunologic impairment occur throughout the course of HIV infection, even during the clinically latent stage. Chronic HIV disease can be divided empirically based on the degree of immunodeficiency into the following stages:

1. Early stage - $CD4^+$ T-cell count >500/µL
2. Intermediate stage - $CD4^+$ T-cell count 200-500/µL
3. Advanced stage - $CD4^+$ T-cell count < 200/µL

Approximately 70% of patients with HIV infection develop symptoms during the acute infection period,[1] although some reports of symptomatic acute HIV infection are likely associated with a reporting bias, and the actual frequency may be lower. Symptoms associated with HIV seroconversion are nonspecific and may be attributed to a viral syndrome such as influenza virus infection.

Complex changes occur in the immune system during the acute infection period, including rapid depletion of CD4 cells. Anti-HIV antibodies are produced, and cytotoxic $CD8^+$ lymphocytes destroy HIV-infected cells. Unfortunately, the response is imperfect, and latent reservoirs of HIV infection become established throughout the body.

Chronic HIV infection begins after antibodies to the virus have fully developed and the initial immune response is complete. HIV disease with active virus replication usually progresses during this asymptomatic period, and the rate of disease progression correlates directly with HIV RNA levels. Individuals with high levels of HIV RNA progress to symptomatic HIV disease faster than patients with low levels of HIV RNA.

Some individuals develop symptoms or organ dysfunction during chronic infection due to direct effects of the virus rather than a defect in cell-mediated immunity. Some infected persons who are otherwise asymptomatic develop persistent generalized lymphadenopathy (PGL) during this time. With few exceptions, CD4 cell counts decline progressively during this asymptomatic period, at an average rate of approximately 50 cells/µL/y.

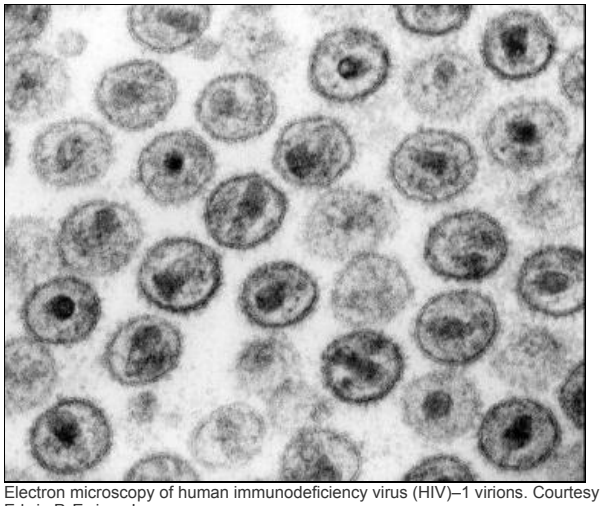
Acquired immunodeficiency syndrome (AIDS) is the condition that results from long-term (chronic) HIV infection and is defined by an absolute CD4 cell count of less than 200 cells/µL and specific opportunistic infections or malignancies. The interval between acute HIV infection and AIDS is highly variable, with a median time of approximately 10 years. In many infected individuals, an opportunistic disease is the first manifestation of HIV infection. When the CD4 cell count falls to below approximately 200 cells/µL, the resulting state of immunodeficiency places the individual at high risk for opportunistic infections and neoplasms (clinically apparent HIV disease).

For other discussions of HIV infection, see HIV Disease, Pediatric HIV Infection, and Antiretroviral Therapy for HIV Infection.

Pathophysiology

Acute HIV infection (also known as seroconversion) is defined as the period between exposure to the virus and completion of the initial immune responses (when an antibody test becomes positive for HIV). After infection, HIV is able to

replicate at an exponential rate using CD4 cells. See the image below.



Electron microscopy of human immunodeficiency virus (HIV)–1 virions. Courtesy of CDC/Dr. Edwin P. Ewing, Jr.

The following is a simplified outline of events that occur during acute HIV infection. [2]

Day 0

On day 0, the individual is exposed to HIV, and infection begins.

Day 8

On about day 8, the virus is detectable in blood using antigen tests such as polymerase chain reaction (PCR); however, antibody test findings are negative. The amount of virus in the blood more than doubles every day. The CD4 cell count (and total white blood cell count) begins to drop as the viral load increases.

Weeks 2-4

During weeks 2-4, early antibodies to HIV may be detected; however, they have a low affinity for viral antigens and have little effect on the virus itself. Newer antibody assays may detect these antibodies. The viral load peaks and begins to decline as the immune system begins to battle the virus with antibodies and CD8 cytotoxic cells.

Although persons infected with HIV may transmit the infection to another person at any time, they are highly infectious during the period of acute infection when genital shedding of HIV virus peaks, which occurs at approximately week 3-4 of acute infection. The individual may be asymptomatic during this period and thus may have no knowledge that he or she is infected and so may not use appropriate safer-sex precautions. This represents an epidemiologic challenge in controlling the HIV pandemic.

Weeks 10-24

During weeks 10-24, the HIV viral load drops to its lowest point, also known as the set point, which is different in each person. Antibodies now have higher affinity for viral antigen; therefore, antibody tests become positive for HIV. Seroconversion is now complete, and chronic HIV infection begins.

Clinical manifestations

Persistent generalized lymphadenopathy

This is often the earliest symptom of primary HIV infection. Because of marked follicular hyperplasia in response to HIV infection, the lymph nodes have very high viral concentrations. Persistent generalized lymphadenopathy may be observed at any point in the spectrum of immune dysfunction and is not associated with an increased likelihood of developing AIDS.

Oral lesions

Thrush can result from *Candida* infection; oral hairy leukoplakia is presumably due to Epstein-Barr virus (EBV) infection. Thrush is usually a sign of fairly advanced immunologic decline, generally occurring in individuals with CD4 cell counts of 200-500/µL.

HSV lesions can also reflect deteriorating immune function in patients infected with HIV. Aphthous ulcers of the posterior oropharynx affect 10-20% of patients infected with HIV. Their etiology is unknown. These ulcers can be very painful and can cause dysphagia if left untreated.

Hematologic disturbances

Upon disease progression, individuals with HIV infection develop a moderate to severe hypoproliferative anemia. The most common form of anemia observed in patients infected with HIV has the characteristics of anemia of chronic disease. In addition, anemia may be a complication of opportunistic infections or may be due to marrow damage from the virus or from antiretroviral drug toxicity (eg, zidovudine).

Thrombocytopenia may be an early manifestation of HIV infection. Approximately 3% of patients infected with HIV with CD4 cell counts greater than 400/µL have platelet counts of less than 150,000/µL. Of patients who have CD4 cell counts less than 400 cells/µL, 10% also have platelet counts of less than 150,000 cells/µL.

HIV-associated thrombocytopenia is rarely a serious clinical problem. In most cases, platelet counts remain greater than 50,000 cells/µL and the condition can be treated conservatively.

Idiopathic thrombocytopenia in persons with HIV infection is very similar to the thrombocytopenia observed in individuals with idiopathic thrombocytopenic purpura (ITP). Antibodies against HIV (anti-GP160/120) have been shown to also bind to platelets (anti-GPIIb/IIIa).[3] Because these data point to an immunologic basis for thrombocytopenia in persons infected with HIV, most of the treatments used are immune-based.

Another mechanism for HIV-induced thrombocytopenia is a direct effect of HIV on megakaryocytes. This is evidenced by a defect and subsequent decrease in platelet production.

In addition, thrombocytopenia has been reported as a consequence of classic thrombotic thrombocytopenic purpura (TTP) in patients infected with HIV. This clinical syndrome, consisting of fever, thrombocytopenia, hemolytic anemia, and neurologic and renal dysfunction, is a rare complication of early HIV infection.

Neurologic disorders

Aseptic meningitis can be observed in all but the very late stages of HIV infection. This suggests that aseptic meningitis in the setting of HIV infection is an immune-mediated disease. Aseptic meningitis due to HIV infection usually resolves spontaneously within 2-4 weeks. Signs and symptoms may persist long-term in some patients.

Through unknown mechanisms, HIV infection can mimic Guillain-Barré syndrome (acute inflammatory demyelinating polyradiculoneuropathy).

Mononeuritis multiplex, a necrotizing arteritis of peripheral nerves, is another autoimmune peripheral neuropathy observed in patients infected with HIV.

Zidovudine can cause myopathy; this is often reversible once the drug is discontinued. HIV infection can also cause myopathy by direct damage to the muscle cells. The exact mechanism has not yet been elucidated.

Dermatologic conditions

Reactivation of varicella-zoster virus (shingles) occurs in 10-20% of patients infected with HIV. Onset of shingles indicates a modest decline in immune function and is often the first clinical indication of immunodeficiency.

Epidemiology

United States statistics

In 2006, a study of people requesting HIV testing at a sexually-transmitted diseases (STD) clinic in San Francisco found 136 new HIV infections in 3,789 people tested; 8% of those with HIV infection were acutely infected (antibody findings negative, antigen findings positive). This study found that acute HIV infections were associated with having a known HIV-positive partner within the past 12 months and a history of hepatitis B, syphilis, or *Chlamydia* infection in the past 2 years.[4]

A larger, prospective study of 109,250 people seeking HIV testing in North Carolina found 606 new HIV infections, 4% of which were acute infections (antibody findings negative, antigen findings positive). Seventy percent of the acute HIV infections were in people who were tested at STD clinics.[5]

As of 2013, the Centers for Disease Control and Prevention reported a roughly stable incidence of HIV infection among all ethnicities, with black/African American bearing much of the burden of disease; there are an estimated 50,000 new HIV infections per year in the United States.

Clearly, the prevalence of acute HIV infection varies and depends on geography, as well as demographics of the population tested. Early symptomatic HIV infection has no reported racial predilection, affects both sexes, and can occur in individuals of any age.

Clinical Presentation

Acute human immunodeficiency virus (HIV) infection manifests as numerous signs and symptoms and can affect multiple systems. The most common presentations

include asymptomatic infection, fever, chills, malaise, fatigue, swollen lymph nodes, sore throat, and myalgias.[2] Approximately 30% of individuals with acute HIV infection are asymptomatic but are highly infectious; this represents an epidemiologic challenge in controlling the HIV pandemic.

Manifestations of acute HIV infection are as follows:

- Constitutional - Fever, chills, malaise or fatigue, night sweats, anorexia, and weight loss
- Lymphatics - Swollen lymph nodes are common, especially in the groin, head, and neck
- Nose and throat - Sore throat, with or without ulcers or thrush
- Gastrointestinal - Nausea, emesis, and diarrhea
- Musculoskeletal – Asymmetric joint swelling and tenderness; myalgias are also common
- Neurologic - Personality changes, headache, and painful or stiff neck

Physical examination findings of acute HIV infection are nonspecific and may mimic those of other viral infections, such as influenza. In addition, many of these findings resolve without medical intervention. The most common findings include fever and chills, lymphadenopathy, pharyngitis, anemic pallor, and rash. Involved lymph nodes are generally discrete and freely mobile and may be tender. Rash is usually maculopapular and primarily on the trunk and/or proximal extremities.

A variety of oral lesions may be found. Thrush manifests as a white exudate, often with an erythematous mucosa. Thrush develops most commonly on the soft palate. Early lesions can also be found along the gingival border. The diagnosis is made based on clinical appearance or direct examination of a scraping for pseudohyphal elements, which are characteristic of candidiasis (typically with *Candida albicans*). Severe cases of thrush can involve the esophagus, with resultant dysphagia or odynophagia.

Oral hairy leukoplakia manifests as filamentous white lesions, generally along the lateral borders of the tongue. Aphthous ulcers are shallow and painful and usually affect the posterior oropharynx.

Lesions from herpes simplex virus (HSV) may be present; oral and genital lesions are most common, but perianal and periungual lesions are also observed. Herpetic lesions resemble a cluster of vesicles on an erythematous base.

Reactivation of herpes zoster (shingles) is characterized by lesions due to varicella-zoster virus (VZV) that may extend over several dermatomes. Widespread cutaneous dissemination may occur, but visceral involvement has not been reported.

Thrombocytopenia may occur acute HIV infection. As in other forms of thrombocytopenia, bleeding is rare unless the platelet count falls to below 10,000 cells/µL. In those cases, bleeding gums, extremity petechiae, and easy bruising are common presentations.

Neurologic manifestations

Aseptic meningitis may manifest as headache, photophobia, and frank encephalitis. Cranial nerve involvement may be observed. Cranial nerve VII is affected predominantly; sometimes, nerves V and/or VIII are also affected.

Acute inflammatory demyelinating polyneuropathy causes weakness, areflexia, and minimal sensory changes.

Patients with mononeuritis multiplex develop multifocal asymmetric cranial or peripheral nerve lesions, including facial or laryngeal palsy, wristdrop or footdrop, and other neuropathic symptoms. Early in the course of HIV infection, mononeuritis multiplex is usually limited to a single nerve or a few nerves and resolves spontaneously without treatment.

Myopathy is characterized by proximal muscle weakness as the primary clinical finding.

Encephalopathy or encephalitis can also be seen in acute HIV infection.

Differential Diagnosis

Differential diagnosis includes the following:

- Acute viral hepatitis
- Gonococcal infection
- Infectious mononucleosis
- Influenza
- Rubella
- Syphilis
- Toxoplasmosis

Persistent generalized lymphadenopathy

The adenopathic form of Kaposi sarcoma (KS) should be part of the differential diagnosis of persistent generalized lymphadenopathy regardless of whether the CD4 cell count is above or below 200/µL. In patients with a CD4 cell count below

200/µL, the differential diagnosis should also include lymphoma, mycobacterial infection, toxoplasmosis, systemic fungal infection, and bacillary angiomatosis.

Oral lesions

Oral lesions in HIV-infected patients, regardless of CD4 cell count, include the following:

- Thrush
- Hairy leukoplakia
- Aphthous ulcers
- Herpes simplex
- Herpes zoster

In patients with CD4 cell counts less than 200/µL, cytomegalovirus (CMV) infection and KS should also be considered.

Acute inflammatory demyelinating polyneuropathy

Differential diagnostic considerations include the following:

- Guillain-Barré syndrome
- Lambert-Eaton syndrome
- Botulism
- Myasthenia gravis

Mononeuritis multiplex

Other disorders to consider in HIV-positive patients with mononeuritis multiplex include the following:

- Diabetes mellitus
- Vitamin B-12 deficiency
- Adverse effects of metronidazole (Flagyl) or dapsone

Testing for Suspected and Diagnosed HIV

Serum testing for antigen and antibody

Patients with suspected acute human immunodeficiency virus (HIV) infection should undergo serum testing for HIV antibody and HIV antigen using HIV nucleic acid amplification, HIV p24 antigen, or polymerase chain reaction (PCR) testing for viral load. Beware of false-positive HIV viral load test results (< 15,000 RNA copies/mL blood).[6, 5] For more information, see Rapid Testing for HIV and Laboratory Assays in HIV Infection.

Genotypic testing

If HIV infection is diagnosed, genotypic testing of the infecting strains for antiretroviral drug resistance is recommended.[7] Resistance testing at baseline will be helpful in guiding the selection of an antiretroviral drug regimen that can provide the optimal virologic response. See Antiretroviral Therapy for HIV Infection. Genotypic testing is recommended whether antiretroviral therapy will be given for acute infection or will be deferred until the CD4 count declines below threshold levels.

Persistent generalized lymphadenopathy

Persistent generalized lymphadenopathy is diagnosed clinically. Lymph node biopsy is not indicated in patients with early-stage HIV disease unless the patient has signs and symptoms of systemic illness (eg, fever, weight loss) or enlarged, fixed, or coalescent lymph nodes. A serologic diagnosis of acute Epstein-Barr virus (EBV) or cytomegalovirus (CMV) mononucleosis should be considered.

Thrush

Thrush is diagnosed on the basis of clinical appearance or examination of a scraping for pseudohyphal elements. Culturing is of no value because throat cultures are positive for *Candida* in most patients with HIV infection, even those without thrush. See Thrush for more details.

Oral hairy leukoplakia

Oral hairy leukoplakia is typically diagnosed based on clinical appearance. Biopsy tissue findings reveal epithelial hyperplasia with protruding hairs and minimal inflammation. EBV can be visualized with electron microscopy, immunofluorescence, or Southern blot analysis. See Hairy Leukoplakia for more details.

Aphthous ulcers

Aphthous ulcers are diagnosed clinically. Examination of biopsy tissue reveals nonspecific inflammation and is not diagnostic. The primary role for biopsy is when aphthous ulcers are difficult to distinguish from herpes simplex virus (HSV) lesions.

See Aphthous Stomatitis for more details.

HSV infection

Viral culture is the criterion standard for diagnosis of HSV infection. Viral PCR of intralesional fluid is also highly sensitive. Direct fluorescent antigen (DFA) is also a useful and generally rapidly available test that yields good sensitivity and specificity. Tzanck preparation (ie, Giemsa stain of vesicle contents) may reveal multinucleated giant cells and intranuclear inclusions specific for HSV or varicella-zoster virus (VZV), but the sensitivity is low. See Herpes Simplex for more details.

VZV infection

Viral culture is also the criterion standard for diagnosis for VZV. In addition, DFA is a useful and generally rapidly available test with good sensitivity and specificity. Results from a Tzanck preparation (ie, Giemsa stain of vesicle contents) may reveal multinucleated giant cells and intranuclear inclusions specific for HSV or VZV, but the sensitivity is low. See Herpes Zoster for more details.

Anemia

In patients with anemia, a thorough evaluation is essential to exclude all other causes besides HIV, especially any correctable causes. In addition to the workup detailed in Anemia, measuring the serum erythropoietin (EPO) level can help distinguish between bone marrow damage (ie, normal EPO level) and inflammatory anemia (ie, low EPO level).

Thrombocytopenia

In patients with thrombocytopenia, a thorough evaluation is essential to exclude all other causes (eg, Thrombotic Thrombocytopenic Purpura), such as drug toxicity, lymphoma, fungal infection, and mycobacterial infection. In HIV-related thrombocytopenia, bone marrow examination generally reveals a normal or increased number of megakaryocytes.

Neurologic abnormalities

A lumbar puncture is an important element of the evaluation in patients with HIV infection who have neurologic abnormalities. A lumbar puncture is most helpful in the diagnosis of opportunistic infections. In aseptic meningitis or encephalitis, cerebrospinal fluid (CSF) examination reveals lymphocytic pleocytosis, an elevated protein level, and a normal glucose level.

In acute inflammatory demyelinating polyneuropathy, CSF examination reveals pleocytosis and increased protein levels. A peripheral nerve biopsy reveals a perivascular infiltrate, suggesting an autoimmune etiology. Electromyography (EMG) reveals demyelination.

Tests for other abnormalities

In patients with HIV myopathy, EMG is a sensitive diagnostic test. The most common finding on muscle biopsy is scattered myofiber degeneration with occasional inflammatory infiltrates. Other pathological findings include nemaline rod bodies, cytoplasmic bodies, and mitochondrial abnormalities. Serial creatine kinase levels are useful for monitoring the course of the disorder.

EMG is also useful for evaluating mononeuritis multiplex. Results generally reveal multifocal axonal neuropathy. Biopsy of nerve tissue reveals inflammation and vasculitis. In some cases, CMV inclusions have been found.

In patients with elevated transaminases, acute viral hepatitis A, B, and C should be excluded with appropriate serologic testing.

Treatment of Acute HIV Infection

Antiretroviral treatment of acute human immunodeficiency virus (HIV) infection is controversial. However, treating acute HIV infection has several theoretical advantages, as follows[1] :

- To relieve symptoms in some symptomatic patients
- To halt viral evolution at a time of minimal viral diversity, prior to viral adaptations to specific host immune responses
- To protect developing immune responses from the deleterious effects of sustained HIV viremia
- To reduce the viral set-point
- To limit the latent pool of infection

Several studies have shown no benefit for short-term combination antiretroviral therapy during acute infection.[8] However, a 2006 retrospective study found that an initiation of combination therapy within 2 weeks of HIV seroconversion was associated with sustained viral load and CD4 cell count benefits for up to 72 weeks after termination of therapy.[9]

In 2007, another group found that in patients who received 3 months of antiretroviral therapy, the subsequent CD4 cell count decline over 3 years was

slower than in patients who did not receive acute therapy.[10] When antiretroviral therapy was started later than 2 weeks after antibody seroconversion, however, patients had a persistent but decreasing CD4 T cell count benefit and a loss of the viral load benefit by week 72 after discontinuation of treatment.

CD4 cell counts appear to deplete very rapidly during acute HIV infection. Thus, treatment to prevent early loss of cells may be impractical in most circumstances.

DHHS Guidelines for Antiretroviral Agents

Current Guidelines for the Use of Antiretroviral Agents in HIV-1–Infected Adults and Adolescents, published by US Department of Health and Human Services, recommend starting antiretroviral therapy for all individuals when infection is diagnosed, regardless of stage of infection, as long as barriers to therapy do not exist. Considerations are as follows:

- The goal of treatment should be the suppression of plasma HIV RNA to below detectable levels
- Testing for plasma HIV RNA levels and CD4 count and toxicity monitoring should be performed
- If therapy is initiated before drug-resistance test results are available, a ritonavir-boosted protease inhibitor–based regimen should be used, because clinically significant resistance to protease inhibitors is less common than resistance to non-nucleoside reverse transcriptase inhibitors in antiretroviral therapy–naive persons who harbor drug-resistant virus

For discussion of antiretroviral drugs and regimens, see Antiretroviral Therapy for HIV Infection.

Treatment Initiation According to CD4 Count

In 2008, a subset analysis of the Strategic Management of Antiretroviral Therapy (SMART) study found that although deferring treatment until the $CD4^+$ T-cell count dropped below 200 cells/µL had been the standard of care, initiation of combined antiretroviral therapy at higher CD4 counts (>350 cells/µL) was associated with decreased morbidity and mortality in HIV disease.[11]

Similarly, the National Institutes of Health Comprehensive International Program of Research on AIDS (CIPRA) HT 001 clinical study showed that starting antiretroviral therapy at CD4 T-cell counts between 200-350 cells/µL improves survival compared with deferring treatment until the CD4 T-cell count drops below 200 cells/µL, which was the standard of care at the time.[12]

Interim analysis of CIPRA HT 001 showed that of 816 HIV-infected adults with early HIV disease, 6 of those who began antiretroviral therapy within 2 weeks of enrollment (early treatment) died, while 23 participants in the standard-of-care group died.[12] Among participants who began the study without tuberculosis infection, 18 individuals in the early treatment group developed tuberculosis, while 36 people in the standard-of-care group developed tuberculosis.

These interim results were statistically significant and led to ending the trial early to offer antiretroviral therapy to all participants in the standard-of-care group with a $CD4^+$ T-cell count of less than 350 cells/µL.[12]

For these reasons, current Guidelines for the Use of Antiretroviral Agents in HIV-1–Infected Adults and Adolescents, published by US Department of Health and Human Services, recommend starting antiretroviral therapy for all individuals when infection is diagnosed, regardless of stage of infection, as long as barriers to therapy do not exist.

For discussion of antiretroviral drugs and regimens, see Antiretroviral Therapy for HIV Infection.

Follow-up Care

Most of the conditions involved in early symptomatic human immunodeficiency virus (HIV) infection can be treated in an outpatient setting. Decisions for inpatient care are made on a case-by-case basis. Patients infected with HIV should be cared for by providers with expertise in HIV infection because this has been shown to decrease patient morbidity and to extend patient lifespan.

In patients with idiopathic thrombocytopenic purpura, splenectomy is an option if the condition is refractory to medical treatment. Most patients with HIV-associated thrombocytopenia respond to splenectomy. Splenectomy is also an option in refractory cases of thrombotic thrombocytopenic purpura, but the response rate is highly variable.

Because of the risk of infections with encapsulated organisms, all patients infected with HIV, especially those who are about to undergo splenectomy, must be immunized with pneumococcal polysaccharide vaccine.

Pre-exposure Prophylaxis

A multinational study, called the Pre-exposure Prophylaxis Initiative (iPrEx) trial,

found that once-daily emtricitabine plus tenofovir disoproxil fumarate (FTC-TDF) reduced the risk of acquiring HIV by 44% in a study population of high-risk, HIV-negative men or transgender women who have sex with men.[13]

Additional studies have been completed or are ongoing in serodiscordant heterosexual couples and intravenous drug users.[14, 15] The CDC has updated interim guidance for pre-exposure prophylaxis (PrEP) in these groups.[16] For more information, see Preexposure HIV Prophylaxis.

Patient Education

Counsel patients extensively about the course of HIV illness, therapeutic options, health maintenance issues (eg, immunizations, abstinence, safer-sex practices, informing sexual partners about HIV diagnosis), and the range of conditions that can occur at each stage on the HIV continuum. Close follow-up care with providers who have expertise in treating patients infected with HIV is essential.

For patient education resources, see the Immune System Center, Sexually Transmitted Diseases Center, and Teeth and Mouth Center, as well as HIV/AIDS, Rapid Oral HIV Test, Oral Herpes, and Canker Sores.

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