

HIV/AIDS

Human immunodeficiency virus (HIV) is a retrovirus that is transmitted through blood and body fluids (semen, vaginal secretions).

HIV targets CD4+ lymphocytes, also known as T-cells or T-lymphocytes. T-cells work in concert with B-lymphocytes. Both are part of specific acquired (adaptive) immunity. HIV integrates its RNA into host cell DNA through reverse transcriptase, reshaping the host's immune system.

HIV is found in feces, urine, tears, saliva, cerebrospinal fluid, cervical cells, lymph nodes, corneal tissue, and brain tissue, but epidemiologic studies indicate that these are unlikely sources of infection.

All women who are pregnant should be screened for HIV. 

DISEASE PROCESS STAGES

HIV infection is one continuous disease process with three stages.

Progression of HIV infection

- Manifestations occur within 2 to 4 weeks of infection.
- Manifestations are similar to those of influenza and can include a rash and a sore throat.
- This stage is marked by a rapid rise in the HIV viral load, decreased CD4+ cells, and increased CD8 cells.
- The resolution of manifestations coincides with the decline in viral HIV copies.
- Lymphadenopathy persists throughout the disease process.

Chronic asymptomatic infection

- This stage can be prolonged and clinically silent (asymptomatic).
- The client can remain asymptomatic for 10 years or more.
- Anti-HIV antibodies are produced (HIV positive).
- Over time, the virus begins active replication using the host's genetic machinery.
 - CD4+ cells are destroyed.
 - The viral load increases.
 - Dramatic loss of immunity begins.

AIDS

- This stage is characterized by life-threatening opportunistic infections.
- This is the end stage of HIV infection. Without treatment, death occurs within 5 years.
- All people with AIDS have HIV, but not all people who have HIV have AIDS.

86.1 HIV infection stages

A confirmed case classification meets the laboratory criteria for a diagnosis of HIV infection and one of the four HIV infection stages.

To read more about HIV, go to www.cdc.gov.

Stage 1

DEFINING CONDITIONS: None

CD4+ T-LYMPHOCYTE COUNT:
500 cells/mm³ or more

CD4+ T-LYMPHOCYTE PERCENTAGE
OF TOTAL LYMPHOCYTES: 29% or more

Stage 2

DEFINING CONDITIONS: None

CD4+ T-LYMPHOCYTE COUNT:
200 to 499 cells/mm³

CD4+ T-LYMPHOCYTE PERCENTAGE
OF TOTAL LYMPHOCYTES: 14% to 28%

Stage 3 (AIDS)

Documentation of an AIDS-defining condition supersedes a CD4+ T-lymphocyte count of 200 cells/mm³ or more and a CD4+ T-lymphocyte percentage of total lymphocytes of more than 14%.

DEFINING CONDITIONS: One or more of the following

- Candidiasis of the esophagus, bronchi, trachea, or lungs
- Herpes simplex: Chronic ulcers (more than 1 month duration)
- HIV-related encephalopathy
- Disseminated or extrapulmonary histoplasmosis
- Kaposi's sarcoma
- Burkitt's lymphoma
- Mycobacterium tuberculosis of any site
- *Pneumocystis jirovecii* pneumonia
- Recurrent pneumonia
- Progressive multifocal leukoencephalopathy
- Recurrent salmonella septicemia
- Wasting syndrome attributed to HIV

CD4+ T-LYMPHOCYTE COUNT: Less than 200 cells/mm³

CD4+ T-LYMPHOCYTE PERCENTAGE OF TOTAL LYMPHOCYTES: Less than 14%

Stage 4

No information available

HEALTH PROMOTION AND DISEASE PREVENTION

- Teach the client how the virus is transmitted and ways to prevent infection, such as the use of condoms, abstinence, and avoiding sharing needles.
- Encourage the client to maintain up-to-date immunizations, including yearly seasonal influenza and pneumococcal polysaccharide vaccine.
- Providers should use standard precautions when caring for the client.

ASSESSMENT

RISK FACTORS

- Unprotected sex (vaginal, anal, oral)
- Multiple sex partners
- Occupational exposure (health care workers)
- Perinatal exposure
- Blood transfusions (not a significant source of infection in the U.S.)
- IV drug use with a contaminated needle
- Older adult clients
 - HIV infection can go undiagnosed in older adult clients due to the similarity of its manifestations to other illnesses that are common in this age group. 
 - Older adults are more susceptible to fluid and electrolyte imbalances, malnutrition, skin alterations, and wasting syndrome than younger adults.
 - Older adult women experience vaginal dryness and thinning of the vaginal wall, increasing their susceptibility to HIV infection.

EXPECTED FINDINGS

- Chills
- Rash
- Anorexia, nausea, weight loss
- Weakness and fatigue
- Headache and sore throat
- Night sweats

LABORATORY TESTS

CBC and differential: Abnormal (anemia, thrombocytopenia, leukopenia)

Platelet count: Decreased less than 150,000/mm³

DIAGNOSTIC PROCEDURES

- Positive result from an HIV antibody screening test (enzyme-linked immunosorbent assay [ELISA]) confirmed by a positive result from a supplemental HIV antibody test (Western blot or indirect immunofluorescence assay [IFA])
- Home test kits are also available using a drop of blood. These provide anonymous registration and counseling before the test via a telephone call.
- Two non-invasive tests are available using either mucosal fluid or urine.
- Client who has a positive result from a confirmatory test (e.g., Western blot) should then be tested for viral load.

HIV RNA quantification (HIV viral load test)

- Determines viral load before beginning treatment
- Can be repeated at intervals to monitor disease progression, identify compliance with treatment and determine HIV medication resistance.

HIV drug resistance testing (HIV genotype or HIV tropism)

- Guides changes in medication therapy when resistance occurs
- Useful with CD4 counts fall despite therapy

Liver profile, biopsies, and testing of stool for parasites

NURSING ACTIONS: Prepare the client for the test.

CLIENT EDUCATION

- Inform the client about the details of the test, such as length and what to expect.
- Explain that a positive Western blot or IFA test means the client has been exposed to and has the AIDS virus in her body but does not mean the client has clinical AIDS.
- Allow the client time to ask questions or express emotions.
- Provide education regarding safe sexual practices.

Brain or lung MRI or CT scan

Detailed image of the brain or lung to detect abnormalities

NURSING ACTIONS: Prepare the client for the procedure.

CLIENT EDUCATION: Inform the client about the length of time the test takes (up to 1 hr).

PATIENT-CENTERED CARE

NURSING CARE

- Assess risk factors (sexual practices, IV drug use).
- Monitor fluid intake/urinary output.
- Obtain daily weights to monitor weight loss.
- Monitor nutritional intake.
- Monitor electrolytes.
- Assess skin integrity (rashes, open areas, bruising).
- Assess pain status.
- Monitor vital signs (especially temperature).
- Assess lung sounds/respiratory status (diminished lung sounds).
- Assess neurological status (confusion, dementia, visual changes).
- Encourage activity alternated with rest periods.
- Administer supplemental oxygen as needed.
- Provide analgesia as needed.
- Provide skin care as needed.

MEDICATIONS

Highly active antiretroviral therapy involves using three to four HIV medications in combination with other antiretroviral medications to reduce medication resistance, adverse effects, and dosages.

Fusion inhibitors: Enfuvirtide blocks the fusion of HIV with the host cell

Entry inhibitors: Maraviroc

Nucleoside reverse transcriptase inhibitors: Zidovudine interferes with the virus's ability to convert RNA into DNA.

Non-nucleoside reverse transcriptase inhibitors: Delavirdine and efavirenz inhibit viral replication in cells.

Protease inhibitors: Atazanavir, nelfinavir, saquinavir, and indinavir inhibit an enzyme needed for the virus to replicate.

Integrase inhibitors: Raltegravir

Antineoplastic medication: Interleukin is an immunostimulant that enhances the immune response and reduces the production of cancer cells (used commonly with Kaposi's sarcoma).

NURSING CONSIDERATIONS

- Monitor laboratory results (CBC, WBC, liver function tests). Antiretroviral medications can increase alanine aminotransferase, aspartate aminotransferase, bilirubin, mean corpuscular volume, high-density lipoproteins, total cholesterol, and triglycerides. **QEBP**
- Monitor total CD4+ T lymphocyte count as well as CD4 percentage and ratio of CD4 to CD8 cells.
 - Normal CD4-to-CD8 ratio is 2:1. A ratio of less than 1 indicates more severe disease manifestations
 - Low CD4 T lymphocyte counts and steadily decreasing counts indicate poor prognosis or medication resistance.

CLIENT EDUCATION **Qecc**

- Educate the client about the adverse effects of the medications and ways to decrease the severity of adverse effects.
- Educate the client about the need to take medications on a regular schedule and to not miss doses. Missed medication doses can cause drug resistance.

INTERPROFESSIONAL CARE

- Infectious disease services may be consulted to manage HIV.
- Respiratory services may be consulted to improve respiratory status and provide portable oxygen.
- Nutritional services may be consulted for dietary supplementation. Food services can be indicated for clients who are homebound and need meals prepared.
- Rehabilitation services may be consulted for strengthening and improving the client's level of energy.
- Refer the client to local AIDS support groups as appropriate. **Qtc**
- Home health service can be indicated for clients who need help with strengthening and assistance regarding ADLs. Home health services may also provide assistance with IVs, dressing changes, and total parenteral nutrition (TPN).
- Long-term care facilities can be indicated for clients who have chronic HIV.
- Hospice services can be indicated for clients who have a late stage of HIV.

Alternative therapy

Vitamins, herbal products, and shark cartilage can help alleviate manifestations of HIV. Ask the client if she is taking herbal products. These can alter the effects of prescribed medications.

CLIENT EDUCATION

- Instruct the client to practice good hygiene and frequent hand hygiene to reduce the risk of infection.
- Instruct the client to avoid crowded areas or traveling to countries with poor sanitation.
- Encourage the client to avoid raw foods, such as fruits or vegetables, and undercooked foods such as meats, fish, or eggs.
- Instruct the client to avoid cleaning pet litter boxes to reduce the risk of toxoplasmosis.
- Encourage the client to keep the home environment clean and to avoid being exposed to family and friends who have colds or flu viruses.
- Instruct the client to wash dishes in hot water using a dishwasher if available.
- Encourage the client to bathe daily using antimicrobial soap.
- Provide client teaching. **Q_{cc}**
 - Transmission, infection control measures, and safe sex practices
 - Importance of maintaining a well-balanced diet
 - Self-administration of prescribed medications and potential adverse effects
 - Findings that need to be reported immediately (infection)
- Instruct the client to adhere to the antiretroviral dosing schedules.
- Instruct the client about the need for frequent follow-up monitoring of CD4⁺ and viral load counts.
- Encourage the use of constructive coping mechanisms.
- Assist the client with identifying primary support systems.
- Teach the client to report manifestations of infection immediately to the provider.

COMPLICATIONS

Opportunistic infections

- **Bacterial diseases**, such as tuberculosis, bacterial pneumonia, and septicemia (blood poisoning)
- **HIV-associated malignancies**, such as Kaposi's sarcoma, lymphoma, and squamous cell carcinoma
- **Viral diseases**, such as those caused by cytomegalovirus, herpes simplex, and herpes zoster virus
- **Fungal diseases**, such as pneumocystis jirovecii pneumonia (PCP), candidiasis, cryptococcosis, and penicilliosis
- **Protozoal diseases**, such as PCP, toxoplasmosis, microsporidiosis, cryptosporidiosis, isosporiasis, and leishmaniasis

NURSING ACTIONS

- Implement and maintain antiretroviral medication therapy as prescribed.
- Administer antineoplastics, antibiotics, analgesics, antifungals, and antidiarrheals as prescribed.
- Administer appetite stimulants (to enhance nutrition).
- Monitor for skin breakdown.
- Maintain fluid intake.
- Maintain nutrition.

CLIENT EDUCATION: Teach the client to report indications of infection immediately to the provider. **Q_{cc}**

Wasting syndrome

NURSING ACTIONS

- Maintain nutrition orally or by TPN if indicated.
- Monitor weight, calorie counts, and I&O.
- Provide between-meal supplements/snacks.
- Decrease fat content of foods to prevent complications of fat intolerance.
- Rinse the client's mouth several times daily with saline or sodium bicarbonate and sterile water to reduce mouth pain and increase appetite.
- Serve at least six small feedings with high protein value. **Q_{EBP}**

Fluid/electrolyte imbalance

NURSING ACTIONS

- Monitor fluid/electrolyte status.
- Report abnormal laboratory data promptly.
- Encourage the client to drink 2,000 to 3,000 mL of fluid daily.
- Make dietary adjustments to reduce diarrhea.

Seizures (HIV encephalopathy)

NURSING ACTIONS

- Maintain client safety.
- Implement seizure precautions. **Q_s**

Application Exercises

1. A nurse in an outpatient clinic is assessing a client who reports night sweats and fatigue. He states he has had a cough along with nausea and diarrhea. His temperature is 38.1° C (100.6° F) orally. The client is afraid he has HIV. Which of the following actions should the nurse take? (Select all that apply.)
 - A. Perform a physical assessment.
 - B. Determine when manifestations began.
 - C. Teach the client about HIV transmission.
 - D. Draw blood for HIV testing.
 - E. Obtain a sexual history.
2. A nurse is caring for a client who is suspected of having HIV. The nurse should identify that which of the following diagnostic tests and laboratory values are used to confirm HIV infection? (Select all that apply.)
 - A. Western blot
 - B. Indirect immunofluorescence assay
 - C. CD4+ T-lymphocyte count
 - D. HIV RNA quantification test
 - E. Cerebrospinal fluid (CSF) analysis
3. A nurse is providing teaching for a client who has stage 3 HIV disease. Which of the following statements by the client should indicate to the nurse an understanding of the teaching?
 - A. "I will wear gloves while changing the pet litter box."
 - B. "I will rinse raw fruits with water before eating them."
 - C. "I will wear a mask when around family members who are ill."
 - D. "I will cook vegetables before eating them."
4. A nurse is assessing a client for HIV. The nurse should identify that which of the following are risk factors associated with this virus? (Select all that apply.)
 - A. Perinatal exposure
 - B. Pregnancy
 - C. Monogamous sex partner
 - D. Older adult woman
 - E. Occupational exposure
5. A nurse is providing teaching for a client who has stage 2 HIV disease and is having difficulty maintaining a normal weight. Which of the following statements by the client should indicate to the nurse an understanding of the teaching.
 - A. "I will choose a diet high in fat to help gain weight."
 - B. "I will be sure to eat three large meals daily."
 - C. "I will drink up to 1 liter of liquid each day."
 - D. "I will add high-protein foods to my diet."

PRACTICE Active Learning Scenario

A nurse is planning care for a client who has AIDS. Use the ATI Active Learning Template: System Disorder to complete this item.

NURSING CARE: Describe at least three nursing actions.

Application Exercises Key

1. A. **CORRECT:** The nurse should perform a physical assessment to gather data about the client's condition.
B. **CORRECT:** The nurse should gather more data to determine whether the manifestations are acute or chronic.
C. Teaching the client about HIV transmission is not an appropriate action by the nurse at this time.
D. Drawing blood for HIV testing is not an appropriate action by nurse at this time.
E. **CORRECT:** The nurse should obtain a sexual history to determine how the virus was transmitted.
NCLEX® Connection: Physiological Adaptation, Illness Management
2. A. **CORRECT:** Positive results of a Western blot test confirm the presence of HIV infection.
B. **CORRECT:** Positive results of an indirect immunofluorescence assay confirm the presence of HIV infection.
C. CD4+ T-lymphocyte count assists with classifying the stage of HIV infection.
D. HIV RNA quantification tests are used to determine viral level and to monitor treatment.
E. CSF analysis can be used to confirm meningitis.
NCLEX® Connection: Reduction of Risk Potential, Diagnostic Tests
3. A. A client who has AIDS should avoid changing the litter box to prevent acquiring toxoplasmosis.
B. A client who has AIDS should avoid consuming raw fruits due to the presence of bacteria that can cause opportunistic infections.
C. Due to compromised immune response, a client who has AIDS should avoid contact with family members who are ill.
D. **CORRECT:** A client who has AIDS should cook vegetables before eating to kill bacteria that cause opportunistic infections.
NCLEX® Connection: Physiological Adaptation, Illness Management
4. A. **CORRECT:** Perinatal exposure is a risk factor associated with HIV. Women who are pregnant should take precautionary measures to prevent HIV exposure.
B. Women who are pregnant should be tested for HIV, but pregnancy is not a risk factor associated with this virus.
C. Having a monogamous sex partner is not a risk factor associated with the HIV virus.
D. **CORRECT:** Being an older adult woman is a risk factor associated with the HIV virus due to vaginal dryness and the thinning of the vaginal wall.
E. **CORRECT:** Occupational exposure, such as being a health care worker, is a risk factor associated with the HIV virus.
NCLEX® Connection: Health Promotion and Maintenance, Health Promotion/Disease Prevention
5. A. The client should be taught to avoid high-fat foods to gain weight because fat intolerance—causing flatus, bloating, and diarrhea—is common in clients who have HIV/AIDS.
B. The client should be taught that small frequent meals (such as six meals daily) are better tolerated than three large meals.
C. The client should be taught to drink 2 to 3 L of liquids daily to maintain nutrition status.
D. **CORRECT:** The client should be taught to add high-protein, high-calorie foods to the diet daily as the best way to gain weight and maintain health.
NCLEX® Connection: Physiological Adaptation, Illness Management

PRACTICE Answer

Using ATI Active Learning Template: System Disorder

NURSING CARE

- Assess risk factors (sexual practices, IV drug use).
- Monitor fluid intake/urinary output.
- Obtain daily weights to monitor weight loss.
- Monitor nutritional intake.
- Monitor electrolytes.
- Assess skin integrity (rashes, open areas, bruising).
- Assess pain status.
- Monitor vital signs (especially temperature).
- Assess lung sounds/respiratory status (diminished lung sounds).
- Assess neurological status (confusion, dementia, visual changes).

NCLEX® Connection: Physiological Adaptation, Alterations in Body Systems