Chapter 2: Overview of HIV/AIDS

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Learning objectives

- Define HIV, AIDS, their relationship and the differences between them.
- Identify how HIV is transmitted from one person to another – and how it is NOT spread.
- List risk factors for infection with HIV.
- Describe HIV tests and what they measure.
- Define CD4 counts and “viral loads.” List ways a person who is HIV-positive can avoid transmitting the virus to others.
- Name the common “opportunistic infections.”
- Explain HIV “drug cocktails” and their role in treating people with HIV.
- List common side effects of HIV/AIDS drugs.

Introduction

Three decades ago, when doctors first noticed a strange illness that became known as acquired immune deficiency syndrome, or AIDS, the diagnosis was nearly always a death sentence. While there still is no cure for AIDS or a way to eradicate the virus that causes it – the human immunodeficiency virus (HIV) – the number of people who are surviving with the infection has consistently risen in the past 20 years.

In 2006, more than a million Americans were living with HIV/AIDS, according to the Centers for Disease Control (CDC) in a 2008 report. Thanks to new drug therapies, many people who are HIV-positive are living symptom-free, and have yet to develop the illness AIDS.

Researchers and health officials agree that new drug therapies have helped to slow down the number of deaths attributed to HIV/AIDS in the past 20 years. But they fear complacency may have developed among people at high risk for the disease. While many more people are living with HIV/AIDS, the reality is that people continue to be diagnosed with HIV every day – in fact, one person every 9½ minutes, according to the CDC.

In August 2009, the CDC issued a report entitled “HIV prevention in the United States at a Critical Crossroads,” and it noted that its latest estimates suggest that more than 56,000 Americans are becoming infected every year, a slight increase over recent years of stable rates of infection. The report shows that infection rates grew among heterosexual men and women – particularly African American and Hispanic people – as well as men who have sex with men.

Also in 2009, the Henry J. Kaiser Family Foundation released a report on its survey of American attitudes and knowledge of AIDS, noting, “A sense of urgency about HIV/AIDS has fallen considerably from recent years, and personal concern about becoming infected has declined steadily, including among young adults.”

So, in addition to research efforts (in June 2010, the government listed more than 800 ongoing HIV/AIDS research projects on various websites), health officials are trying to put more emphasis on prevention and early detection.

For those already infected with HIV, the future is brighter for the many who continue to live, and live well, with HIV/AIDS. But with that comes the challenges of adapting to lifestyle and behavioral changes and a new commitment to good health. This course, adapted from information from the U.S. Department of Veterans Affairs and other government agencies, presents those challenges and the reality of living with HIV/AIDS.

THE BASICS OF HIV/AIDS

What is HIV?

HIV stands for the human immunodeficiency virus:

I – Immunodeficiency. This virus attacks a person’s immune system. The immune system is the body’s defense against infections, such
as bacteria and viruses. Once attacked by HIV, the immune system becomes deficient and doesn’t work properly.

**V – Virus.** A virus is a type of germ too small to be seen even with a microscope.

What does the virus do?

All viruses must infect living cells to reproduce. HIV takes over certain immune system cells that are supposed to defend the body. These cells are called CD4 cells, or T cells.

When HIV takes over a CD4 cell, it turns the cell into a virus factory. It forces the cell to produce thousands of copies of the virus. These copies infect other CD4 cells. Infected cells don’t work well and die early. Over time, the loss of CD4 cells weakens the immune system, making it harder for the body to stay healthy.

What is AIDS?

AIDS stands for acquired immunodeficiency syndrome:

- **A – Acquired.** This condition is acquired, meaning that a person becomes infected with it.
- **I – Immuno.** This condition affects a person’s immune system, the part of the body that fights off germs such as bacteria or viruses.
- **D – Deficiency.** The immune system becomes deficient and does not work properly.
- **S – Syndrome.** A person with AIDS may experience other diseases and infections because of a weakened immune system.

AIDS is the most advanced stage of infection caused by HIV. Most people who are HIV-positive do not have AIDS. An HIV-positive person is said to have AIDS when his or her immune system becomes so weak it can’t fight off infections and cancers.

Even without an infection, an HIV-positive person is diagnosed with AIDS if his or her immune system becomes severely weakened. This is measured by a lab test that determines the number of CD4 cells a person has. A CD4 cell count less than 200 in an HIV-infected person counts as a diagnosis of AIDS. It can take between two to 10 years or longer for an HIV-positive person to develop AIDS, even without treatment.

How is HIV spread?

HIV is spread through four body fluids:

- Semen.
- Vaginal fluid.
- Blood.
- Breast milk.

HIV is **NOT** spread through:

- Tears.
- Sweat.
- Feces.
- Urine.

How is HIV spread through sex?

A person can get infected from sexual contact with someone who is infected with HIV. Sexual contact that can transmit HIV includes:

- Vaginal sex.
- Anal sex.
- Oral sex.

Unprotected sex with someone who is infected doesn’t mean a person will automatically be infected, too. But there is always a chance. Using a condom reduces the risk.

HIV is **NOT** spread by:

- Hugging or massage.
- Fantasizing.
- Dry kissing.
- Daily living with someone who has HIV.

How is HIV spread through blood?

People can become infected if their blood comes in contact with the blood of someone who is infected with HIV. Blood-borne infection with HIV can occur through:

- Sharing needles when shooting drugs.
- Tattoos or body piercings with unsterilized needles.

HIV is **NOT** spread by blood passed through insect bites.

Can mothers give HIV to their babies?

Pregnant women who are HIV positive can give the virus to their babies in the womb and during birth. Taking anti-HIV drugs during pregnancy and childbirth can help lower the risk, but there is no sure way to prevent infection. With proper care, however, most babies of HIV-infected women now are born free of the virus.

What are the symptoms of HIV?

You can’t tell if a person is HIV-positive by looking at them. Most people with HIV infection don’t look sick. Even so, when a person first becomes infected, he or she may experience certain symptoms. This period of early infection is called acute HIV infection. Symptoms can be different for each person, and sometimes there are no symptoms at all. It might feel like a cold or the flu. A person might experience fever, headache, a sore throat, swollen lymph nodes (usually on the neck), fatigue, a rash or sores in the mouth.
If symptoms appear, they usually do so within days or weeks after infection, and end after one to two weeks. The only way to tell whether the symptoms are from a cold, the flu or HIV is to have an HIV test.

Who is at risk?

As of 2006, guidelines from the U.S. Centers for Disease Control and Prevention have recommended that any sexually active person aged 13-64 be tested for HIV during routine health screenings every year, even if that person is at low risk of contracting the virus. However, health officials say people are at above-average risk of getting HIV if they:

- Have had unprotected sex with someone who is infected with HIV.
- Have shared needles and syringes for injecting medications.
- Have had a sexually transmitted disease, like chlamydia or gonorrhea.
- Received a blood transfusion/blood clotting factor between 1978 and 1985.
- Have had unprotected sex with anyone who falls into an above category.

How is HIV treated?

Many treatments now can help people with HIV. As a result, many people with HIV are living much longer and healthier lives than before.

Currently, medications can slow the growth of the virus or stop it from making copies of itself. Although these drugs don’t kill the virus, they keep the amount of virus in the blood low. The amount of virus in the blood is called the “viral load,” and it can be measured by a test. The lower the viral load, the longer a person can stay healthy and fight off infections.

There are several types of anti-HIV drugs. Each type attacks the virus in its own way.

How are the drugs taken?

Most people being treated for HIV take three or more drugs. This is called combination therapy, or a “drug cocktail.” (It also has a longer name: highly active antiretroviral therapy, or HAART.) Combination therapy is the most effective treatment for HIV.

Is it hard to take these drugs?

HIV medications have become much easier to take in recent years. Some newer drug combinations package three separate medications into only one or two pills, taken once a day, with minimal side effects for most individuals. Still, taking medication for HIV can be complicated and depends on the particular patient. On one hand, some of the drugs may be difficult to take, can cause serious side effects, and don’t work for everyone. Even when a drug does help a particular person, it may become less effective over time or stop working altogether. On the other hand, the drugs help keep HIV under control and let people infected with HIV live longer and healthier lives.

Once they start taking medications, patients must work with their doctors to monitor how well the drugs are working, deal with side effects, if any, and decide what to do if the drugs stop working. The good news is that experts are learning more about the virus and creating new treatments for HIV that are easier to take.

Do people with HIV have to be treated for the rest of their lives?

Right now, there is no cure for HIV infection or AIDS. Once a patient starts treatment, he or she must continue it to be sure that the virus doesn’t multiply out of control.

Are there long-term effects?

Over time, people who are HIV-positive may experience symptoms from the infection and side effects from their anti-HIV drugs. Sometimes it is not clear whether the virus or the medications are causing the problems.

One long-term effect that some people experience is a change in the way their bodies process fats and sugars. For example, they may gain or lose a lot of fat in unusual areas of the body, or they may develop heart disease or diabetes.

Eventually, people may get sick with other infections or cancers because their weakened immune system can’t protect the body anymore. They may reach the advanced stage of infection, AIDS.

Is HIV always fatal?

Most people with HIV probably will have the virus in their body when they die because there is currently no way to get rid of it. Whether HIV will be what causes someone’s death, however, is not always clear.

What many people want to know is whether it is possible to get HIV and have a normal, relatively healthy life. HIV is often thought of as an incurable, fatal illness, and it certainly can be – especially after a person’s immune system is weakened to the point that he or she develops AIDS. Without treatment, most people with HIV will eventually develop AIDS and die. When someone dies of AIDS, it is usually because of an opportunistic infection or other long-term effect of having HIV.

Since 1996, improved treatments have given renewed hope to many people who are HIV-positive. While the treatments are not a cure and are far from perfect, they may help to keep people with HIV healthy for a long time.

How long? No one knows, really. Some people may do very well for many, many years. Others may eventually get sick and die despite being treated. Recent studies suggest that people who take the treatments can gain, on average, 24 extra years of life. There is a great need for research to find new and better treatments for HIV.
HIV and hepatitis C

HIV and hepatitis C are caused by different viruses and are very different illnesses that are increasingly found together in people with HIV.

HIV is spread mainly through the blood and through sexual contact. It can wear down the body’s immune system, making it hard for the body to fight off dangerous infections. Hepatitis C is a disease that affects the liver. It is caused by a virus called the hepatitis C virus, and it is spread mainly by blood, but rarely by sex. In many cases, hepatitis C never goes away. Over time, it can cause other health problems, such as cirrhosis (scarring of the liver) and liver cancer. Because of the similar methods of transmission of both viruses, it is becoming increasingly more common for a patient to be infected with both viruses.

HIV affects the whole immune system, including the body’s ability to fight off hepatitis C. As a result, a person with HIV might develop a case of hepatitis C that is worse than it would be if he or she didn’t have HIV.

THE HIV TEST

What does the test measure?

The HIV test is designed to determine whether a person has been infected with HIV, the virus that causes AIDS. When a person is infected with HIV, the body produces cells and particles to fight the virus, called antibodies. The HIV test can detect these antibodies to HIV in a person’s body; they are different from antibodies for the flu, colds or other infections. So a person who has HIV antibodies has been infected with HIV. The test does not tell whether people have AIDS, how long they have been infected or how sick they might be.

What does the test involve?

The HIV test requires a sample of blood or fluid from inside the mouth.

For the blood test, blood is drawn either from the arm or from the finger with a needlestick. Results from oral-fluid or blood tests usually take one to two weeks.

For the oral-fluid test (called OraSure), a probe sits in the mouth between the cheek and gums for two to five minutes.

However, there are now rapid tests for both oral fluid and blood that give results in less than 30 minutes. Rapid tests require special handling, and not every medical center or clinic offers them. What’s more, positive results from rapid tests must be confirmed by another, more sensitive test – and getting those results can take one to two weeks. A negative result from the rapid test does not need to be confirmed.

In most people, the body will produce antibodies to the virus between 2 and 12 weeks after exposure to HIV. But in some people, it may take three months after exposure for the test results to be 97 percent accurate, and six months to be absolutely certain, meaning people whose initial tests are negative should retest.

A positive HIV test

A positive HIV test does not equal death: It means people need to take better care of themselves to stay healthy. Many people who have been infected since the 1980s are alive today, living healthy and productive lives. The most important things people who get a positive result can do immediately are:

- Start seeing a doctor or other health care provider.
- Follow the doctor’s instructions about lifestyle, diet, nutrition, and treatment.
- Learn about HIV disease and how to take care of themselves.
- Ask for help or support.

Living with AIDS

Soon after a diagnosis, a doctor will run other tests to determine patients’ overall health and the condition of their immune systems. This is key because HIV affects the immune system, and can make common illnesses much worse than they would be for people who don’t have HIV.

Learn about HIV and AIDS

The more people know about HIV and how to treat it, the less confused and anxious they and others will be about the diagnosis. And the more they learn, the better they will be at making decisions about their health.

There are many ways to learn about HIV and AIDS:

- The U.S. government has many informative, reputable websites that provide accurate information about living with HIV for patients and caregivers, friends and partners. An excellent place to start is at an online centralized site called AIDS.gov (http://aids.gov/), which links to dozens of federal agencies and outside resources for people wanting to learn about HIV/AIDS. Many of them provide phone numbers, hotlines and ways to obtain informative brochures in the mail.
- Use the local library. The most current information will be in the library’s collection of newspapers and magazines (books about HIV and AIDS may be out of date by the time they are published).
- A newly diagnosed person should talk with others who have been diagnosed with HIV and AIDS. Doctors may know where to find support groups. Patients can also search online, where there are message boards and chat rooms. However, they should always discuss what they learn from these sources with the doctor. The information may not be accurate, and even if it is, it may not be right for this patient’s particular situation.

Telling others

People who find they are HIV-positive need support from family, friends, and colleagues, and they must be people who are willing to help them through the emotional and physical issues they are going to face.
Those who want to help loved ones and friends who are facing HIV should:

- Offer support and understanding.
- Provide assistance, such as running errands and helping with childcare, doctor visits, and work.
- Learn from the person with HIV how it is spread and spur the discussion on how to prevent the person from spreading it.

Deciding to tell others that he or she is HIV-positive is an important personal choice. It can make a big difference in how the patient copes with the disease, and can affect his or her relationships with people. People who decide to share information about their diagnosis should tell people they trust or those who are directly affected. These include family members, good friends, all health care providers, and personal services workers such as cosmetologists, nail technicians, and dental specialists.

However, patients don’t have to tell everyone about their HIV status right away. They might want to talk with a counselor or social worker first.

Support groups

Joining a group of people who are facing the same challenges can have important benefits. These include helping people feel better about themselves, finding a new life focus, making new friendships, improving their mood, and better understanding their own needs and those of their families. People in support groups often help each other deal with common experiences associated with being HIV-positive. Support groups are especially helpful for people who live alone or don’t have family and friends nearby. Working with the doctor

If ignored, HIV can lead to illness and death. This is why it is so important for people infected with HIV to get medical care. They should not be afraid to seek a doctor or nurse practitioner with experience in treating HIV-infected patients – he or she can help them to stay well. Many doctors who treat HIV are specialists in infectious disease. They work with a team of other health professionals who focus on HIV as a chronic, or lifelong, disease.

Before appointments

People with HIV – indeed any patient with any serious disease – should prepare for an appointment with a doctor by writing down:

- Any questions they have.
- Any symptoms or problems they want to tell the doctor about (include symptoms such as poor sleep, trouble concentrating, feeling tired).
- A list of the medications they are taking (including herbs and vitamins).
- Upcoming tests or new information they’ve heard about.
- Changes in their living situation, such as a job change.

Monitoring health

Once patients are diagnosed with HIV, they need to pay closer attention to their health than they did before. The most important is to track the condition of their immune system. First, regular lab tests can often show signs of illness before there are any noticeable symptoms. Second, they must listen to what their bodies are telling them and be on alert for signs that something isn’t right.

Regular lab tests

While many doctors use laboratory tests to check patients’ general health, they are especially important for people with HIV. For those people, the tests:

- Show how well their immune system is functioning.
- How rapidly HIV is progressing.
- Check certain basic body functions (tests look at the kidneys, liver, cholesterol and blood cells).
- Whether they have other diseases that are associated with HIV.

Possible complications

Certain changes can happen to people who are HIV-positive and living longer because of HIV medications. Some people have experienced visible changes in body shape and appearance. Sometimes these changes can raise the risk of heart disease and diabetes.

Also, by weakening the immune system, HIV can leave people vulnerable to certain cancers and infections. These infections are called “opportunistic” because they take the opportunity to attack patients when their immune systems are weak.

Protecting others

A patient with HIV can give the virus to others by having unprotected sex or by sharing needles (or if she is pregnant or has an infant, during pregnancy, childbirth or by breast-feeding). This is true even if the patient feels perfectly fine. Using condoms and clean needles can prevent a patient from infecting others. It can also protect a patient with HIV from getting other sexually transmitted diseases.

Sometimes it can be difficult for a person with HIV to explain that they have the virus to people with whom they have had sex or shared needles in the past. However, it is important those people be told so that they can decide whether to be tested. Most city or county health departments will test a patient without using the patient’s name. A doctor can help arrange this service.
Moving forward with life

Life does not end with a diagnosis of HIV. In fact, with proper treatment, people with HIV can live very healthy lives. Taking care of their overall health can help them deal with HIV. They should:

- Get regular medical and dental checkups.
- Eat a healthy diet. There are many sources of information on healthy diets for those with HIV. Exercise regularly.
- Avoid smoking and recreational drug use.
- Limit alcohol intake.
- Practice safe sex (it can protect others from getting HIV, and can protect the person from other sexually transmitted diseases).

Understanding lab tests

Laboratory tests can help keep tabs on patients’ health; a doctor will set up a schedule for patients with HIV. The lab tests look at:

- How well their immune systems are functioning (CD4 count).
- How rapidly HIV is progressing (the viral load).
- How well their bodies are functioning (tests look at kidneys, liver, cholesterol and blood cells).
- Whether they have other diseases that are associated with HIV (tests for certain infections).

The most important tests include:

- CD4 count (or T-cell test)
  The CD4 count is like a snapshot of how well the immune system is functioning. CD4 cells (also known as CD4+ T cells) are white blood cells that fight infection. The more a person has, the better. These are the cells that HIV kills. As HIV infection progresses, the number of these cells declines. When the CD4 count drops below 200 because of advanced HIV disease, a person is diagnosed with AIDS. A normal range for CD4 cells is between 600 and 1,500.
- Viral load (or HIV RNA)
  Viral load tests measure the amount of HIV in the blood. Lower levels are better than higher levels. The main goal of HIV drugs is to reduce viral load as much as possible for as long as possible. Some viral load tests measure down to 400 or 500 copies of HIV per unit of blood; others go as low as 50 or even 25 copies. High levels – from 30,000 (in women) to 60,000 (in men) and above – are linked to faster disease progression. Levels below 50 offer the best outcome for a patient’s health. The lower the viral load, the better.

CD4 counts and viral load tests are usually done every three months. Results can help a patient and doctor decide when it’s time to start taking anti-HIV drugs.

Other tests look at whether the person with HIV may be resistant to certain medications, meaning the drugs don’t work well for this person, usually because a disease has mutated or changed. Other lab tests look at a person’s blood counts, which measure things like whether a person has anemia or a high white blood cell count, which indicates the body is fighting off an infection; blood chemistries, which measure things like cholesterol levels; other ailments, such as sexually transmitted diseases; and screenings for tuberculosis and hepatitis A, B and C.

Body changes

People who are taking HIV medications and living longer sometimes experience visible changes in body shape and appearance. A buildup of fat is called lipoaccumulation (“lipo” means fat). A loss of fat is called lipoatrophy.

Possible changes in body appearance:

- Increased fat in the abdomen.
- Increased fat in neck, shoulders, breasts or face.
- Fatty bumps on the body.
- Loss of fat in the face, legs or arms.

Blood sugar levels

The body may become less sensitive to insulin because blood sugar levels increase. This can lead to diabetes.

Exercise may be able to lessen the fat deposits around the gut. Maintaining a healthy diet can help lower the blood fats (cholesterol and triglycerides) that increase the risk of heart disease.

Experts aren’t sure whether these changes are due to HIV itself or to the anti-HIV drugs. There are no proven cures at this time, but there are steps a person can take to reduce the effects, including treatment by plastic surgeons with liposuction to remove fat and injections to fill out sunken areas, particularly in the face.

Opportunistic infections and AIDS-related cancers

HIV weakens the immune system, leaving a person vulnerable to certain infections and cancers. The infections are called “opportunistic” because they take the opportunity to attack when the immune system is weak. The cancers are called “AIDS-related” because they appear mostly in people who have advanced, late-stage HIV infection, AIDS.

Most people who die of AIDS do not die from the virus itself. They die from opportunistic infections. Often, people are infected with the opportunistic infection long before they become infected with HIV. Their functioning immune system keeps it under control, so they don’t have any symptoms of the infection. Once HIV damages their immune system enough, the infectious disease becomes uncontrolled and makes them sick. In fact, many HIV-negative people have opportunistic infections but don’t know about it because their immune system keeps the infections in check.

Common types of illnesses

Opportunistic infections can be caused by viruses, bacteria, fungus, even parasites. Common opportunistic infections for people with HIV are:

- Tuberculosis (TB)
  Tuberculosis is caused by a bacteria passed through the air when someone coughs, sneezes, or talks. It is spread easily in confined spaces. Tuberculosis (TB) can occur early in the course of HIV infection, often when CD4 counts are slightly below normal.
Symptoms can include fever, night sweats, weight loss, fatigue, loss of appetite and coughing. TB can be prevented and is generally curable. If left untreated, it can cause death.

- **Pneumocystis pneumonia (PCP)**
  An unusual fungus found in many locations in the environment causes this kind of pneumonia. Nearly two out of three children have been exposed to it by age 4. The fungus can affect many organs, the most common being the lungs. Symptoms can include fever, shortness of breath, a dry cough, night sweats and fatigue.

- **HIV wasting syndrome**
  Wasting syndrome refers to unwanted weight loss that is equal to more than 10 percent of a person’s body weight. For a 150-pound man, this means a loss of 15 pounds or more. Weight loss can result in loss of both fat and muscle. Once lost, the weight is difficult to regain. The condition can be caused by many things: HIV, inflammation, or opportunistic infections.

The weight loss may be accompanied by low-grade fever and sometimes diarrhea. The person may get full easily or have no appetite at all.

HIV wasting syndrome may be preventable, to some degree, by eating a good diet. A “good diet” for an HIV-positive person may not be the low-fat, low-calorie diet recommended for healthy people. Compared with other people, someone with HIV may need to take in more calories and protein to keep from losing muscle mass. Foods to add to meals in this type of diet include peanut butter, legumes (dried beans and peas), cheese, eggs, instant breakfast drinks, milkshakes and sauces.

People living with HIV can also maintain or increase muscle mass through exercise, especially with progressive strength-building exercises. These include resistance and weight-lifting exercise.

- **Candidiasis (thrush)**
  Candidiasis (also called thrush) is a fungal infection of the mouth or lungs. Most people already have the Candida fungus in their body, but the body keeps it in check. Someone whose immune system is weakened is more likely to develop problems. Some people have no symptoms, but others may experience white patches or smooth red areas on the back of the tongue, painful areas in the mouth, changes in taste and sensitivity to spicy foods, and decreased appetite.

**AIDS-defining illnesses**

Certain serious and life-threatening diseases that occur in HIV-positive people are called “AIDS-defining” illnesses. When a person gets one of these illnesses, he or she is diagnosed with the advanced stage of HIV infection known as AIDS, regardless of CD4 and viral load counts.

The Centers for Disease Control and Prevention (CDC) has developed a list of these illnesses. No single patient is likely to have all of these problems. Some of the conditions, in fact, are rare. The list includes 24 different diseases or illnesses. Detailed information on these opportunistic diseases can be found online at the U.S. National Library of Medicine, part of the National Institutes of Health, at [http://sis.nlm.nih.gov/hiv/opportunisticinfections.html#1a1](http://sis.nlm.nih.gov/hiv/opportunisticinfections.html#1a1).

**Treatment decisions**

HIV is a virus that can multiply quickly in the body. Even though no cure exists for HIV infection or the later stage of HIV disease known as AIDS, there are many different drugs that can slow down the virus, and we know that the slower the virus grows, the longer people live and the healthier they remain. Most people who take medication for their HIV infection can now expect to live healthy lives for many years.

Without treatment, however, HIV can make the immune system very weak. Because the immune system is what allows the body to fight off bacteria and viruses, the person will have a hard time staying well.

Deciding to start taking anti-HIV drugs is a very personal choice, and one that cannot be made alone. A patient must talk with his or her doctor, who can help the person make a wise, appropriate decision.

**Symptoms (the patient’s “clinical status”)**

“Clinical status” refers to how well the patient is doing in general, including how well he or she feels. Before starting treatment, a doctor normally will look at whether the person has symptoms of HIV disease, which can be signs that HIV is weakening the immune system, and includes things such as weight loss, chronic fevers and opportunistic infections.
AIDS means treatment is needed
Most experts agree that anyone diagnosed with AIDS should take anti-HIV drugs unless there is some reason why doing so would make that person sicker.

Once a person and his or her doctor have decided the patient should start taking drugs for HIV, the doctor will come up with a personal treatment plan.

What kinds of drugs are available?
Anti-HIV drugs are also called antiretroviral drugs or antiretrovirals. They work because they attack the HIV virus directly. The drugs cripple the ability of the virus to make copies of itself.

There are five main classes of anti-HIV drugs and at least 25 different drugs, with more still in development. Each group attacks HIV and helps the body fight the infection in its own way. Most of these drugs come as pills, capsules, or coated tablets. Several of them may be combined into one tablet to make it easier to take medications. These are known as fixed-dose combinations.

When the HIV virus enters a healthy cell, it attempts to make copies of itself. It does this by using an enzyme; some drugs work because they block that enzyme in various ways. Another drug group blocks an enzyme that otherwise allows the reproduced virus to leave its cell home and infect other cells. The next group of medications stops the HIV virus from getting into healthy cells in the first place. To infect a cell, HIV must bind to two types of molecules on the cell’s surface. The last group of drugs keeps the virus from binding to these molecules.

Anti-HIV drugs are used in combination with one another in order to get the best results. The goal is to get the viral load as low as possible for as long as possible. These medications do different things to the virus – they attack it in different ways – so using the different drugs in combination works better than using just one by itself.

Experts haven’t come up with one combination of HIV medications that works best for everyone. Each combination has its pros and cons for each patient.

Questions patients should ask doctors about all drugs
One of the most important things all patients can do to make sure they take medications correctly is to talk with their doctors about their lifestyle, such as their sleeping and eating schedules. When a doctor prescribes a drug for any illness, patients should be sure to ask the following questions (and make sure they understand the answers):

- What dose of the drug should be taken? How many pills does this mean?

- How often should the drug be taken?
- Does it matter if it is taken with food, or on an empty stomach?
- Does the drug have to be kept in a refrigerator?
- What are the side effects of the drug?
- What should be done to deal with the side effects?
- How severe do side effects have to be before a doctor is called?

Staying on a treatment plan
During every visit to the doctor, a patient with HIV taking combination therapy should talk about whether he or she is having trouble staying on the treatment plan. Studies show that patients who take their medication the right way get the best results: their viral loads stay down, their CD4 counts stay up, and they feel healthier.

What are drug interactions?
Anti-HIV medications can be affected by other medications, including drugs people buy over-the-counter at a drugstore. Even herbal therapies and some things found in common foods can affect HIV medications.

When one drug affects how another drug behaves, this is called a drug-drug interaction. For example, some drugs become less effective when taken together.

Side effects
Among the most common side effects of anti-HIV drugs are:

- Anemia, or a low red blood cell count. Symptoms include feeling tired, fatigued or shortness of breath.
- Diarrhea, which can be a minor hassle or a serious medical problem. A person’s doctor should be told if goes on for a long time, is bloody or accompanied by a fever, or just worries the person.
- Dry mouth, which can make it difficult to chew, swallow and talk. If it is severe or doesn’t go away, a doctor should be consulted.
- Fatigue, which can cause people to have a hard time getting out of bed, walking up stairs or even concentrating on something for very long. If the fatigue doesn’t go away after a person gives his or her body and mind time to rest, the doctor should be consulted.
- Hair loss can occur with certain medications. Stress can make it worse.

- Headaches can be caused by these medications as well as by tension or stress. They usually can be treated by over-the-counter drugs, such as aspirin.
- Nausea and vomiting can occur with some medications. This usually goes away a few weeks after starting a new medication. Recurrent vomiting is cause to call a doctor.
- Pain and nerve damage can be caused by HIV itself as well as medications to fight HIV. Peripheral neuropathy, when these nerves are damaged, cause the feet, toes and hands to feel like they’re burning or stinging, or numb and stiff. A doctor should be consulted.
- Rash can be caused by medication. Often they come and go, but can signal a bad reaction to a medication. Skin changes, especially after starting new medication, should be reported to a doctor.
- Weight loss can be the result of many other side effects. People who are losing weight without trying should talk to their doctor.
How do doctors know when a drug is working?

Doctors will look at how much virus is in a patient’s bloodstream (the viral load) to see how well the drug therapy is working. If the medications are working, the viral load goes down and there is less of it in the bloodstream.

The CD4 count also should stay the same or go up if the drugs are working. Regular health checkups should show that the treatment is helping the patient fight off infections and diseases and remain healthy.

If a viral load becomes undetectable, can a person stop treatment?

Having an undetectable viral load, meaning that the virus isn’t showing up on tests, is a sign that the anti-HIV medications are working. But it doesn’t mean treatment can be stopped. If the treatment is stopped, the virus will start reproducing again, and the viral load will increase. Even though the virus is undetectable in the blood, it is still hidden in other parts of the body, such as the brain, reproductive organs and lymph nodes.

What if the treatment isn’t working?

Even when a person has tried different combinations of drugs, the treatment plan doesn’t always work. This often occurs because the drugs don’t completely stop the virus from reproducing. As the virus makes copies of itself, changes (or mutations) sometimes occur. These changes may result in a new strain of the virus that is resistant to the action of the drugs. A blood test can help identify other drugs that might still work for the person.

Even if a virus is resistant to most or all available drugs, some people can still stay healthy by continuing to take the same combination of drugs.

People who have a strain of HIV that is resistant to most or all available drugs could consider joining a clinical trial that is testing new drugs that have not yet been approved by the U.S. Food and Drug Administration (FDA). General information on participating in clinical trials can be found at [http://www.clinicaltrials.gov/](http://www.clinicaltrials.gov/).

**OVERVIEW OF HIV/AIDS**

Final Examination Questions

Choose the best answer for questions 1 through 5 and mark your answers on the Final Examination Sheet found on page 68 or take your test online at PharmacyTech.EliteCME.com.

1. Which immune cells does the HIV virus attack?
   a. CD4 cells.
   b. B-lymphocytes.
   c. T-lymphocytes.
   d. Helper B-cells.

2. Which of the following patients is not at an above-average risk of infection from HIV?
   a. A 24-year-old homosexual male who has been diagnosed with gonorrhea.
   b. A 32-year-old IV heroin user who often shares the drug and needles with friends.
   c. A married 34-year-old male in a monogamous relationship.
   d. A 19-year-old prostitute who does not insist that her clients use condoms.

3. Loved ones and friends of people who are HIV-positive can help by doing all of the following except:
   a. Insist the person confide in others about having the disease.
   b. Learn from the person with HIV how it is spread and spur the discussion on how to prevent the person from spreading it.
   c. Offer simple support and understanding.
   d. Provide assistance, such as running errands and helping with childcare, doctor visits and work.

4. Patients infected with HIV will not need to undergo which of the following lab tests regularly?
   a. CD4 count.
   b. H. pylori testing.
   c. HIV viral load.
   d. Tuberculosis and hepatitis screenings.

5. Which of the following types of medications are used to treat HIV?
   a. Antibiotics.
   b. Anticoagulants.
   c. Proton pump inhibitors.
   d. Antiretrovirals.