



HIV-Related Infections and Cancers: Entire Lesson

Common types of illnesses

Opportunistic infections (or OIs) can be caused by viruses, bacteria, fungus, even parasites. Common opportunistic infections that are covered in this tutorial are:

- Candidiasis (thrush)
- Coccidioidomycosis
- Cryptococcosis
- Cryptosporidiosis
- Cytomegalovirus
- Herpes simplex
- Herpes zoster (shingles)
- Histoplasmosis
- HIV dementia
- HIV wasting syndrome
- Isosporiasis
- MAC
- PCP
- Pneumonia
- PML
- Salmonella
- Toxoplasmosis
- Tuberculosis

AIDS-related cancers include:

- Cervical cancer
- Kaposi sarcoma
- Lymphomas

What follows are descriptions of some of these illnesses.

Candidiasis (thrush)

Candidiasis (or 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 show no symptoms, but for those who have them, symptoms can include:

- white patches on the tongue
- smooth red areas on the back of the tongue
- painful areas in the mouth

- changes in taste
- sensitivity to spicy foods
- decreased appetite

Treatments for thrush include oral drugs (suspensions) that you swish around in your mouth and swallow. If you are taking drugs for thrush, be sure to:

- brush your teeth after each meal;
- rinse your mouth of all food before using either lozenges or suspension;
- avoid hurting your mouth: use a soft toothbrush, avoid foods and drinks that are too hot or too spicy.

Cervical cancer (for women)

Cervical cancer often is caused by the same virus that causes anal and genital warts. The virus is called human papilloma virus (or HPV). Safer sex may help reduce the risk of this infection, but many women who are infected with HPV never had genital warts.

In the early stage, there are often no symptoms. Some women, however, may notice bleeding between their periods or spots of blood after sex. Women should get regular exams with their gynecologist to check for cervical cancer.

Coccidioidomycosis

This is a caused by a fungus present in soil in desert areas of Mexico and South America and in the southwestern United States, but risk of infection is highest in Kern and Tulare counties and the San Joaquin Valley in California.

The fungus is inhaled from dust and dirt carried in the air or wind, rather than passed from person to person. Most people don't have symptoms. Others will feel like they have the flu, sometimes with chest pain and a cough. Infection can lead to meningitis, including headache, fever, and altered mental states.

Treatment with antifungal drugs usually is given for life to prevent the infection from returning. Sometimes surgery is required to remove infected tissue. The seriousness of the disease depends on what part or parts of the body the fungus has infected.

Cryptococcosis

This fungus is present in soil, usually where there are bird droppings, particularly those of pigeons. It can be passed through the air or wind. It's important to avoid handling birds, even as pets, and to avoid areas with lots of bird droppings.

The fungus can infect different organs, such as the lung, heart, and central nervous system. Symptoms vary, depending on where the infection occurs. In the lung, for example, symptoms can include:

- cough
- fever
- malaise
- shortness of breath

This infection is very serious. It can lead to meningitis (swelling in the brain) and pneumonia. Drugs are available for this infection, but they do not cure it.

Cryptosporidiosis

This parasite is found in the feces of many animals, including humans. It can contaminate drinking water.

To avoid infection from people, avoid contact with feces (diapers, sex involving direct oral-anal contact). Try to avoid accidentally swallowing water when swimming in pools, rivers, or lakes. Do not drink from streams. Drink bottled water or use filters on tap water (look for "submicron" filters, which will filter out this parasite).

Symptoms of this infection include:

- persistent watery diarrhea
- nausea
- vomiting
- abdominal pain
- cramping
- loss of appetite
- weight loss

There are not effective drugs against this parasite, but if you are taking anti-HIV drugs, they may help decrease your symptoms or even help rid your body of the parasite. If you are infected, it's best not to work as a food handler or share a room with

someone whose immune system is also weakened.

Cytomegalovirus (CMV)

Cytomegalovirus (or CMV) is passed by close contact through sex and through saliva, urine, and other body fluids. It can be passed from mother to child during pregnancy and by breast-feeding. If you are not infected, safer sex may help prevent it.

Most people probably are infected with this virus, though they have no symptoms. In HIV-positive people, the infection can be extremely serious. Symptoms can include:

- blind spots in vision, loss of peripheral vision
- headache, difficulty concentrating, sleepiness
- mouth ulcers
- pain in the abdomen, bloody diarrhea
- fever, fatigue, weight loss
- shortness of breath
- lower back pain
- confusion, apathy, withdrawal, personality changes

Drugs are available to keep symptoms of the infection under control. Anti-HIV drugs can improve the condition, too. If you haven't started taking drugs for HIV, it may be best to wait until you have been on treatment for CMV for a few weeks.

Many people whose vision is affected by the virus will have to remain on therapy for life to prevent blindness. Some will be able to stop their CMV therapy if their immune system has recovered sufficiently with antiretroviral therapy, but will need to have regular eye checkups to make sure the CMV does not return. Treatment can prevent further loss of vision but cannot reverse existing damage. If you experience any vision problems, tell your provider immediately.

Herpes simplex virus

Herpes simplex is caused by a virus. Symptoms include red, painful sores on the mouth ("fever blisters"), genitals, or anal area. Genital herpes is passed through sexual contact. Herpes on the mouth is easily spread through kissing. It can be spread to the genitals through oral sex. The virus can be spread even if you don't have blisters. Safer sex can decrease the risk of infection.

Drugs are available to help herpes blisters heal, but there's no cure. Outbreaks may occur periodically for the rest of your life.

For more information on herpes, call the HELP line in Atlanta at 404-294-6364 or the National Herpes Hotline at 919-361-8488.

Herpes zoster (shingles)

Shingles is caused by a virus, the same one that causes chickenpox. People with shingles usually had chickenpox as a child, and the virus is getting active again.

Symptoms can include:

- painful skin blisters on one side of the face or body
- some vision loss

The skin blisters can be extremely painful. Treatment is available to help the blisters heal, but there is no cure. Bathing them in mild soap and water can help. Antibiotic ointments can help keep the infection from spreading.

Histoplasmosis

This infection is caused by a fungus present in the soil contaminated with bat or bird droppings, particularly in eastern and central United States. It gets in the air when the soil is disturbed, such as when people explore caves. It is not passed from person to person.

Symptoms can include:

- fever
- weight loss
- cough
- shortness of breath
- abdominal pain

This is an extremely serious disease, and often leads to death. Treatment must be lifelong to prevent the disease from coming back. Even with treatment, the disease may recur

HIV dementia

Sometimes called "HIV encephalopathy" or "AIDS dementia," this disease is caused by HIV invading the brain.

Symptoms can include:

- memory loss
- depressed mood
- unsteadiness when walking
- irritability
- apathy
- clumsiness
- shaky hands (poor handwriting)
- personality changes

This condition is less common now that there are drugs available to treat HIV. It may even be prevented by using HIV drugs that cross into the brain.

People who are affected need to have a strong support system. Friends, roommates, or family members can help make sure that HIV medications are taken on time, in the right combination, and at the right dose. If memory is poor, a person can use notes, calendars, and alarms to remember medicines, appointments, and other important events.

HIV wasting syndrome

Wasting syndrome refers to unwanted weight loss that is equal to more than 10 percent of their 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.

The condition 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, you may need to take in more calories and protein to keep from losing muscle mass. To do this, you can add to your meals:

- peanut butter
- legumes (dried beans and peas)
- cheeses
- eggs
- instant breakfast drinks
- milkshakes
- sauces

You can also maintain or increase muscle mass through exercise, especially with progressive strength-building exercises. These include resistance and weight-lifting exercise. (For more diet and exercise tips, see the [Daily Living](#) section.)

Isosporiasis

This condition is caused by a parasite found in feces. It may contaminate food or drinking water. It is most common in tropical and subtropical regions of the United States. To avoid infection, do not drink water from rivers and streams. When appropriate, drink bottled water or use filters on tap water. Cook food thoroughly.

Symptoms can include:

- stomach cramps
- watery diarrhea
- weight loss (which may be significant)
- weakness
- loss of appetite
- fever

Antifungal drugs can treat the infection, but they may need to be taken for a long time to keep the parasite in check.

Kaposi sarcoma

Kaposi sarcoma (KS) is the most common cancer seen in HIV. This cancer is caused by the human herpes virus 8 (HHV-8). The virus can be spread by deep kissing, unprotected sex, and sharing needles. It also can be spread from mother to child.

Symptoms include brown, purple, or pink lesions (or blotches) on the skin, usually on the arms and legs, neck or head, and sometimes in the mouth. Sometimes there is tooth pain or tooth loss, weight loss, night sweats, or fever for longer than 2 weeks. KS can also affect internal organs, most seriously the lungs. A person can have KS of their internal organs even if they don't have lesions on their skin.

HIV drugs can slow the growth of lesions, even reverse the condition itself. KS has become less common and much more treatable since the development of effective combination HIV therapy. Other treatments for KS, such as laser therapy, are meant to relieve symptoms and improve the appearance of the lesions. There is also chemotherapy that helps control KS. It's important that people with KS keep lesions clean. They should call their provider if the lesions are spreading, if swelling gets worse, or if they develop a cough, shortness of breath, or problems in the gut.

Lymphomas

Lymphomas associated with HIV include a large group of cancers that begin in the cells of the immune system. The cancers can go on to invade different parts of the body, such as the central nervous system, liver, bone marrow, and gastrointestinal tract. Symptoms depend on where the cancer resides.

Treatment varies depending on the specific cancer, but can include radiation and chemotherapy. HIV drugs, by boosting the immune system, can help the body fight the cancer, too. In fact, the development of effective combination HIV therapy has greatly improved the outlook for persons with HIV-associated lymphoma.

Mycobacterium avium complex (MAC) or M kansasii disease

This condition is caused by bacteria present everywhere in the environment-- in soil, food and animals. It is difficult to avoid exposure because MAC is in so many places. In general, avoid handling soil, and carefully handle and prepare food. (See [food safety tips](#) in Diet and Nutrition in the "Daily Living" section.)

Symptoms of MAC can include:

- fever
- night sweats
- weight loss
- loss of appetite
- chronic diarrhea
- weakness
- fatigue
- abdominal pain

Medicines will not get rid of the infection, but can lessen symptoms and improve how you feel. HIV drugs, by helping your immune system stay strong, can help your body fight the infection. Call your doctor if you have vision changes or abdominal discomfort while being treated for MAC.

Pneumocystis pneumonia (PCP)

An unusual fungus found in many places in the environment causes this condition. 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 lung.

Symptoms can include:

- fever
- shortness of breath
- dry cough
- night sweats or fatigue

The usual treatment is with antibiotics called sulfa drugs. Do not take dairy products within 2 hours before, or 1 hour after, a dose of sulfa. (Dairy products can interfere with your body's ability to absorb the medicine.)

After completing treatment, if you experience shortness of breath (especially with exercise), fever, chills and sweats, or a new cough, see your doctor.

PCP is much more common in persons with a CD4 count less than 200 cells per cubic millimeter of blood. Starting combination antiretroviral therapy before your CD4 count gets this low, or, if you already have a CD4 count less than 200, taking daily doses of protective antibiotics, greatly reduces the risk of developing PCP.

Pneumonia, recurrent

Bacterial pneumonia (often caused by *Streptococcus pneumoniae* or *Haemophilus influenzae*) can affect people whose immune systems are not weakened by HIV. Persons infected with HIV, however, are much more likely than people who are HIV negative to develop bacterial pneumonia. Fortunately, these pneumonias can be treated with available antibiotics. HIV-infected persons should receive a vaccine called the Pneumovax, to help prevent pneumonia caused by *Streptococcus pneumoniae*.

Progressive multifocal leukoencephalopathy (PML)

This disease is caused by a virus called the JC virus. Most people probably already are infected, but in HIV-positive people the virus can cause disease. The virus is possibly spread through sexual contact, or from mother to child.

Symptoms can include:

- difficulty in speaking
- difficulty in walking
- weakness in arms or legs
- personality changes
- seizures
- changes in vision
- headache
- shaky hands

There is no specific treatment for PML, but some HIV drug combinations can reverse the symptoms and keep the JC virus under control. People with PML should have a good support system. Friends, roommates, or family members can help make sure that HIV medications are taken on time, in the right combination, and at the right dose. The disease is extremely serious and can lead to death.

Salmonella septicemia, recurrent

Salmonella is a bacteria often found in food such as undercooked poultry, eggs, and unpasteurized milk. It is also present in water, soil, kitchen surfaces, animal feces, and raw meat and on certain animals, such as reptiles.

Symptoms can include:

- diarrhea
- fever

Salmonella septicemia usually is treated with antibiotics. Drug therapy may be required for life to prevent relapses.

Toxoplasmosis

The parasite that causes toxoplasmosis is found in almost all animals. Cats and birds are major sources of infection. Indoor cats pose less risk, but cats that are free of toxoplasmosis can go outside can carry it back in. Avoid cat feces (use gloves to change litter). Avoid handling birds. Never eat undercooked meats, particularly pork or lamb.

Symptoms can include:

- dull, constant headache
- changes in vision
- disorientation
- seizures

Treatment for toxoplasmosis is sometimes lifelong to prevent symptoms from recurring.

If you are being treated for toxoplasmosis, see your doctor promptly if you develop a rash or if your symptoms worsen. Help your memory by posting reminder notes. Keep keys, glasses, phone numbers, and other important items in the same place, so you can always find them. Keep a calendar of your appointments posted in a place you look at a lot, such as across from your favorite chair.

Tuberculosis (TB)

Mycobacterium tuberculosis disease is caused by a bacteria passed through the air when someone coughs, sneezes, or talks. It is spread easily in closed-in places, such as low-income housing, shelters, and jails.

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 usually is curable. If left untreated, it can kill. It's important that you take your TB medication exactly as prescribed (missed doses can result in the TB germ developing resistance to the drug). Some TB medications can damage your liver, but your liver usually recovers if the medications are stopped. If your skin or eyes turn yellow, or if your urine darkens to the color of Coca-Cola while you are taking tuberculosis medications, see your doctor immediately. It could be a sign of liver damage.

CD4 counts and infections

The weaker your immune system, the more likely you are to get an opportunistic infection.

In general, here's how a CD4 count relates to your risk of OIs:

Above 500 CD4 cells

No unusual infections likely to appear.

200-500 CD4 cells

There is an increased risk for certain infections, such as shingles, thrush, skin infections, bacterial sinus and lung infections, and TB.

50-200 CD4 cells

There is an increased risk for PCP (pneumonia), and you should begin treatment to prevent it. If counts are below 100, other preventive treatment should begin for MAC.

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.

The Centers for Disease Control and Prevention (CDC) has developed a list of these illnesses (see below). No single patient is likely to have all of these problems. Some of the conditions, in fact, are rare.

- Candidiasis of the esophagus, bronchi, trachea, or lungs (but NOT the mouth, which is also known as thrush)
- Cervical cancer, invasive
- Coccidioidomycosis, disseminated or extrapulmonary
- Cryptococcosis, extrapulmonary
- Cryptosporidiosis, chronic intestinal (greater than one month's duration)
- Cytomegalovirus disease (other than liver, spleen, or nodes)
- Cytomegalovirus retinitis (with loss of vision)
- Encephalopathy, HIV related
- Herpes simplex: chronic ulcer(s) (more than 1 month in duration); or bronchitis, pneumonitis, or esophagitis
- Histoplasmosis, disseminated or extrapulmonary
- Isosporiasis, chronic intestinal (more than 1 month in duration)
- Kaposi sarcoma
- Lymphoma, Burkitt's (or equivalent term)
- Lymphoma, immunoblastic (or equivalent term)
- Lymphoma, primary, of brain
- Mycobacterium avium complex or M kansasii, disseminated or extrapulmonary
- Mycobacterium tuberculosis, any site (pulmonary or extrapulmonary)
- Mycobacterium, other species or unidentified species, disseminated or extrapulmonary
- Pneumocystis jiroveci pneumonia
- Pneumonia, recurrent
- Progressive multifocal leukoencephalopathy
- Salmonella septicemia, recurrent
- Toxoplasmosis of brain
- Wasting syndrome due to HIV

(Source: Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. Morbidity and Mortality Weekly Report, December 18, 1992/41 (RR-17), 1993).

Preventing Opportunistic Infections (OIs)

Opportunistic infections can be caused by viruses, bacteria, and fungus, even parasites. One way to avoid these infections is to reduce your risk of exposure to these germs. Here are some practical suggestions.

Sexual exposures

- Use condoms every time you have sex. (See [Tips for Using Condoms](#))
- Avoid oral-anal sex.

- Use waterproof gloves if you're going to insert your finger into your partner's anus.
- Frequently wash hands and genitals with warm soapy water after any sex play that brings them in contact with feces.

Injection drug use

- Do not inject drugs.
- If you cannot stop using, avoid sharing needles and other equipment.
- Get vaccinated against hepatitis A and hepatitis B.

Job exposure

Certain type of jobs or facilities can put an HIV-positive person at risk of OIs. These include work in:

- health care facilities
- homeless shelters
- day-care centers
- prisons
- places that involved work with animals (such as farms, veterinary clinics, pet stores)

Pet exposure

Pets can carry diseases that don't affect a healthy person but can pose a serious risk to someone with HIV. For that reason, if you have a pet, follow these suggestions.

General

- Wash your hands after handling your pet (especially before eating).
- Avoid contact with your pet's feces. If your pet has diarrhea, ask a friend or family member to take care of it.
- If you are getting a new pet, try not to get one that is younger than a year old, especially if it has diarrhea. (Young animals are more likely to carry certain germs like Salmonella.) Avoid stray animals.

Cats

- Keep your cat indoors. It should not be allowed to hunt, and should not be fed raw or undercooked meat.
- Have a friend or family member clean the litter box daily. If you have to do it yourself, wash your hands thoroughly afterward.
- Control fleas (ask your vet how to do this).
- Avoid playing with your cat in ways that may result in scratches or bites. If you do get scratched or bitten, wash the area right away. Don't let your cat lick your cuts or wounds.

Birds

- Avoid areas where there are bird droppings. Do not disturb soil underneath bird-roosting sites.

Others

- Avoid touching reptiles, such as snakes, lizards, iguanas, and turtles.
- Wear gloves if you are cleaning an aquarium.

Cautions about food and water

- Avoid raw or undercooked eggs (including hollandaise sauce, Caesar salad dressing, some mayonnaises, eggnog, cake and cookie batter).
- Avoid raw or undercooked poultry, meat, and seafood (especially raw seafood). Use a meat thermometer. Cook poultry to 180° F, and other meats to 165° F. If you don't have a meat thermometer, cook meat until no traces of pink remain.
- Avoid unpasteurized dairy products and fruit juice.
- Avoid raw seed sprouts (such as alfalfa, mung beans).
- Wash fruits and vegetables thoroughly before eating.
- Don't let uncooked meats come into contact with other uncooked foods. (Wash thoroughly hands, cutting boards, counters, knives, and other utensils after contact with uncooked meats.)
- Do not drink water directly from lakes or rivers.

HIV-positive people whose immune systems are severely weakened may want to:

- Avoid soft cheeses (feta, brie, camembert, blue-veined, and Mexican-style cheeses, such as queso fresco).
- Cook leftover foods or ready-to-eat foods, such as hot dogs, until they are steaming hot.
- Avoid food from delicatessens, such as prepared meats, salads, and cheeses--or heat these foods until steaming before eating.

Cautions about travel





Before you travel to other countries, particularly developing countries, talk to your doctor about ways you can avoid getting sick on your trip.

When traveling in developing countries, people who are HIV positive have to be especially cautious of food and water that may be contaminated. It is best to avoid:

- raw fruits and vegetables (unless you peel them first)
- raw or undercooked seafood or meat
- tap water (or ice made with tap water)
- unpasteurized milk or dairy products
- swallowing water when swimming

Talk to your health care provider about whether you need to get vaccinated before your trip and whether you need to take drugs to prevent diseases that are common in the country you are going to visit.

Just Diagnosed Resources

- [Questions to Ask Your Doctor about Your Diagnosis](#)
A list of questions to print out and bring to your medical appointment.
- [Just Diagnosed with HIV?](#) 
The Body's starting place for people newly diagnosed with HIV. Articles on understanding HIV, choosing and working with a physician, first steps to treatment, telling others.
- [HIV/AIDS Program](#) 
Resources for HIV-positive persons developed by the Seattle & King County County Department of Public Health which includes [Now That You Know](#)  [PDF], a workbook for people with HIV covering medical, practical, and emotional issues.
- [AIDS.org: Telling Others You Are HIV Positive](#) 
Issues and guidelines about telling family members, friends, and others that you are HIV positive.
- **Hotlines:**
 - The CDC National AIDS Hotline, including its Spanish Service and TTY Service, is operated under contract with Centers for Disease Control and Prevention. Group calls can also be arranged by calling the hotline.
- **More Information:**
 - Find [Web sites](#) on more specific topics, such as opportunistic infections, travel health, and more.

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