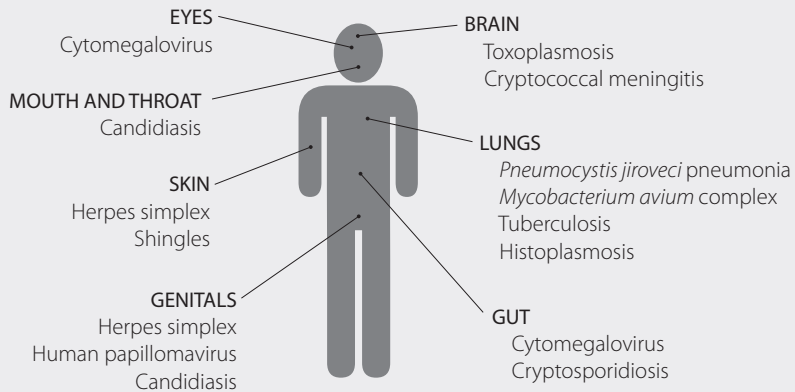


# OPPORTUNISTIC INFECTIONS

## ORGAN-SPECIFIC OPPORTUNISTIC INFECTIONS IN HIV-INFECTED INDIVIDUALS



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### General Notes

- **Opportunistic Infections (OI)** are diseases that rarely occur in healthy people but cause infections in individuals whose immune systems are compromised, including by HIV infection. Organisms that cause OIs are frequently present in the body but are generally kept under control by a healthy immune system. HIV gradually weakens a person's immune system and leads to the development of one or more opportunistic infections, which signals the progression to AIDS. These illnesses are generally the eventual cause of death due to HIV infection.
- **Prophylaxis** refers to the prevention or protective treatment of disease. Primary prophylaxis refers to the medical treatment that is given to prevent onset of an infection. Secondary prophylaxis refers to medications given to prevent recurrent symptoms in an existing infection.
- **Antiretroviral therapy** refers to any of a range of treatments that include antiretroviral medications. These drugs are designed to destroy retroviruses such as HIV, or interfere with their ability to replicate. HAART (Highly Active Antiretroviral Treatment) refers to a course of treatment that involves the use of three or more antiretroviral drugs. HAART strengthens the immune system and therefore helps protect against opportunistic infections.

### BRAIN

**Cryptococcal Meningitis** [krip-toe-KOK-kull men-in-JY-tiss] is caused by *Cryptococcus*, a fungus commonly found in soil contaminated by bird droppings. People become infected with *Cryptococcus* by breathing in dust that is contaminated with the fungus. Although most people have been exposed to this fungus, it does not usually cause disease in healthy individuals. Among people with HIV, infection most often results in meningitis. Symptoms may include fever, headache, nausea, vomiting, stiff neck, mental confusion, vision problems and coma. *Cryptococcal* meningitis does not spread from one person to another. Primary

prophylaxis (treatment to prevent disease) and secondary prophylaxis (treatment to prevent disease recurrence) are available. The disease can be treated with anti-fungal medications. Without treatment, death can occur quite rapidly.

**Toxoplasmosis** [tock-so-plaz-MO-sis] (also referred to as Toxo) is an infection caused by a parasite found in cat feces, raw meat, raw vegetables, and soil. Infection can result from eating contaminated food or contact with cat droppings. Toxo can infect many parts of the body but most commonly causes encephalitis, an infection of the brain. It cannot be spread from one person to another and does not cause infection among people with healthy immune systems. Symptoms may include fever, confusion, headache, personality changes, tremors and seizures and can result in coma and death. Primary and secondary prophylaxes are available. Toxo can be treated with a combination of anti-toxo drugs.

## EYES

**Cytomegalovirus** [sigh-TOE-meg-a-low-VY-rus] (also referred to as **CMV**) is a virus that typically causes an eye disease called **retinitis** [ret-tin-EYE-tis]. Retinitis is the most common type of CMV infection among people with HIV. CMV can be passed from person to person through saliva, semen, vaginal secretions, urine, breast milk and transfusions of infected blood. While anyone can be infected with CMV, illness occurs only among people with weakened immune systems. Symptoms may include blind spots and blurred, distorted or decreased vision that can progress to complete blindness. Primary prophylaxis may be recommended in certain cases. Forms of treatment for retinitis include intravenous medications, pills and injection of drugs directly into the eye. Secondary prophylaxis is also available. If left untreated the disease will cause blindness.

## MOUTH

**Candidiasis** [can-did-EYE-a-sis] is the most common fungal infection in people with HIV. It usually affects the mouth, throat, lungs and vagina (see *Genitals*). The fungi that cause Candidiasis are naturally present in the human body and are responsible for most cases of the disease, but rare cases of person-to-person transmission have been recorded. Although anyone can develop the disease, it is more common among people with HIV. Infection in the mouth is called *thrush* and can cause pain when swallowing, nausea and loss of appetite. Symptoms of throat infection may include chest pain and difficulty swallowing. Primary prophylaxis is not recommended and use of secondary prophylaxis may be recommended in certain cases. There are a variety of treatments available to control infection.

## SKIN

**Herpes simplex** [HER-peeZ SIM-plex] is a disease caused by the Herpes simplex virus. There are two types of Herpes simplex virus (HSV): HSV1, which causes cold sores or blisters around the mouth and the eyes; and HSV2, which causes genital or anal herpes. The viruses are spread from one person to another by contact with an infected area such as the mouth and genitals. Symptoms appear in outbreaks of rash, which may involve itching, tingling and the appearance of painful blisters or sores. HSV can affect anyone but outbreaks are more frequent and more serious in people with HIV. Although there is no prevention or cure for HSV, there are treatments that shorten the length and severity of the outbreaks.

**Herpes zoster** [HER-peeZ ZOS-tur], also known as **shingles**, is caused by the virus responsible for the chickenpox, Herpes Varicella-zoster virus. Although it can also affect HIV-negative individuals it is most common among people with HIV because of their weakened immune systems. It results in very painful rashes and blisters on the chest, back and face. The rash typically affects one side of the body and lasts for a few weeks. There are no primary or secondary prophylaxes available for shingles. Treatments include anti-herpes drugs and pain medications.

**INTESTINES / GUT**

**Cryptosporidiosis** [krip-toe-spor-rid-ee-O-sis] (also referred to as Crypto) is an intestinal infection that is easily spread through contact with water, feces or food that have been contaminated with a common parasite called *Cryptosporidium*. Symptoms may include diarrhea, nausea, vomiting, weight loss and stomach cramps. Infection usually lasts one to two weeks in HIV-negative individuals, but can last much longer and be life-threatening in people with HIV. While there are no medications that prevent or treat crypto, there are a variety of treatments to control the diarrhea caused by infection.

**Cytomegalovirus** [sigh-TOE-meg-a-low-VY-rus] (also referred to as CMV) is a virus that most commonly affects the eyes (see *Eyes*), but among people with HIV it can also cause colitis [ko-LY-tis], which is an infection of the colon. CMV can be passed from person to person through saliva, semen, vaginal secretions, urine, breast milk and transfusions of infected blood. While anyone can be infected with CMV, illness occurs only among people with weakened immune systems. Symptoms of CMV colitis may include abdominal pain, diarrhea, cramps, weight loss and blood loss. Primary and secondary prophylaxes, and treatments are available.

**GENITALS**

**Candidiasis** [can-did-EYE-a-sis] is the most common fungal infection in people with HIV. It usually affects the vagina, mouth (see *Mouth*), throat and lungs. The fungi that cause Candidiasis are naturally present in the human body and are responsible for most cases of the disease, but rare cases of person-to-person transmission have been recorded. Although anyone can develop the disease it is more common among people with HIV. Symptoms of vaginal infection may include white discharge, itching, and pain during urination or sexual activity. Primary prophylaxis is not recommended and secondary prophylaxis may be recommended in certain cases. Anti-fungal treatments help control the fungus but recurrence of the infection is common.

**Herpes simplex** [HER-peeZ SIM-plex] is a disease caused by the Herpes simplex virus. There are two types of Herpes simplex virus (HSV): HSV1, which causes cold sores or blisters around the mouth and the eyes; and HSV2, which causes genital or anal herpes. The viruses are spread from one person to another by contact with an infected area such as the mouth and genitals. Symptoms appear in outbreaks of rash, which may involve itching, tingling and the appearance of painful blisters or sores. HSV can affect anyone but outbreaks are more frequent and more serious in people with HIV. Although there is no prevention or cure for HSV, there are treatments that shorten the length and severity of the outbreaks.

**Human papillomavirus** [pa-pill-LOW-muh-VY-rus] (also referred to as HPV) is a commonly occurring genital infection that is caused by a group of viruses called human papillomavirus. HPV is easily passed from person to person through direct contact with infected areas, for example during sexual activity. It can cause genital warts, which look like bumps on the penis, vagina and anus. Certain types of HPV are also linked to cervical cancer. The virus can be passed from one person to another even when a person is asymptomatic. Anyone can be infected with HPV but infection is usually short in healthy people. Among people with HIV, HPV infection is more serious, can recur frequently and last for long periods of time. These persistent infections are associated with higher risks of cervical cancer. In June 2006, the first HPV vaccine, Gardasil, produced by Merck, was approved by the U.S. Food and Drug Administration (FDA) for use in females between the ages of 9 and 26. The vaccine is nearly 100% effective against four types of HPV. There are numerous ways to remove warts and dysplasias.

**LUNGS**

**Histoplasmosis** [hiss-toe-plaz-MO-sis] is caused by a fungus found in soil contaminated with bird droppings or other organic matter. People get infected by breathing in dust that is contaminated with the fungus. Anyone can be infected with the fungus but people with HIV are more likely to develop the disease. Symptoms may include fever, weight loss, fatigue, difficulty breathing and swollen lymph nodes. Histoplasmosis typically affects the lungs, but among people with weakened immune systems, the disease can spread to the rest of the body. That is a serious complication that can be fatal if left untreated. Histoplasmosis is not transmitted through person-to-person contact. Primary prophylaxis is not currently recommended. Anti-fungal medications are available for treatment of histoplasmosis and secondary prophylaxis is available to prevent disease recurrence.

**Mycobacterium avium Complex** [MY-ko-back-TEER-ree-um A-vee-um] (also referred to as MAC) is an illness caused by *Mycobacterium avium* and *Mycobacterium intracellulare*. These two similar types of bacteria are commonly found in water, soil, dust and food. Anyone can be infected with the bacteria but HIV-infected individuals are at higher risk of developing serious disease. Disease symptoms may include fever, weight loss, night sweats and weakness. Infection can occur at one site in the body or can spread throughout the body. A variety of drugs are available to treat and prevent MAC.

**Pneumocystis jiroveci pneumonia** [NEW-mo-SIS-tis yee-row-vet-zee new-MO-knee-yuh], formerly known as *pneumocystis carinii* pneumonia, is caused by a fungus and usually appears as a lung infection. The fungus is believed to be spread through the air. Although it can be present in the lungs of any individual, it causes serious disease only when an infected individual's immune system becomes weakened. It is the most common opportunistic infection among people with HIV. Symptoms may include dry cough, chest tightness, fever and difficulty breathing. Although PJP is entirely preventable and treatable, it is a serious disease that can be fatal if untreated. There are a variety of drugs available for primary and secondary prophylaxis and treatment of PJP.

**Tuberculosis** [too-burr-kyu-LOW-sis] (also referred to as TB) is a common bacterial infection among people with HIV. An individual can become infected with TB when another person who has active TB coughs, sneezes or talks. Although TB also affects HIV-negative individuals, people with HIV are at higher risk of infection. While not all infected people become ill, TB infection speeds up HIV progression and is the leading cause of death among people with HIV worldwide. Symptoms may include fever, cough, night sweats, weight loss, fatigue, swollen lymph nodes and coughing up blood. Primary prophylaxis is available but secondary prophylaxis is not considered to be necessary. A variety of antibiotics are used in treatment of TB. Depending on the severity of infection, treatment can last for many months or even years.