Opportunistic Infections

Candidiasis (thrush, yeast infection)

Thrush, also called candidiasis, is a disease caused by the fungus, Candida albicans. Everyone has this fungus: It can be found on the skin, in the stomach, colon, rectum, vagina, and in the mouth and throat. Most of the time, it is harmless and actually helps keeps bacteria under control. Sometimes, however, the fungus overgrows which can lead to various problems.

People living with and without HIV can develop candidiasis, including women who develop vaginal yeast infections—a type of candidiasis. A person could also experience an overgrowth of fungus in their mouth or the back of their throat. Stress, poor diet, or not getting enough rest can contribute to these problems.

Also, using antibiotics—especially over long periods of time—can cause the infection to develop in the mouth or vagina. Oral thrush can also occur in people who use inhaled steroids, such as those for treating asthma and other lung problems.

Poor oral hygiene and smoking can also play a role in thrush. Excessive alcohol and sugar consumption have also been linked to it.

In people living with HIV, oral thrush and vaginal yeast infections can occur at any time, regardless of CD4 counts. The more the immune system weakens, the more likely these infections will occur and recur more often. People living with HIV who have a CD4 count below 200 are also more likely to develop candidiasis deeper in their bodies, such as in the esophagus or lungs. As with many opportunistic infections, candidiasis will usually improve or recur less often if HIV treatment significantly increases CD4 counts.

What are the symptoms?

Symptoms depend on the part of the body that’s affected. If you have any of these symptoms, you should contact your doctor:

- Oral candidiasis: Symptoms include burning pain in the mouth or throat, altered taste (especially when eating spicy or sweet foods), and difficulty swallowing. It appears as white or pinkish-red blotches on the tongue, gums, the sides or roof of the mouth, and the back of the throat. Sometimes, thrush can cause the corners of the mouth to become chapped, cracked,
and sore.

- **Vaginal candidiasis**: The most obvious symptom is a thick white discharge resembling cottage cheese. It can also cause itching and burning in or around the vagina, as well as a rash and tenderness of the outer lips of the vagina (labia). Women living with HIV are more likely to experience recurrent vaginal candidiasis than women who are HIV negative.

- **Esophageal candidiasis**: This type of candidiasis occurs deep down in the throat and can’t always be seen by looking into the mouth. It can cause chest pain, as well as pain and difficulty when swallowing. This is much more common in people with HIV with lower CD4 counts.

How is candidiasis diagnosed?

Most of the time, a doctor can diagnose candidiasis simply by looking in the mouth, at the back of the throat, or in the vagina. Sometimes it is necessary to scrape the overgrowth so that a sample can be sent to a lab. Assessing symptoms, X-rays and a special flexible microscope called an endoscope are used to look for candidiasis in the throat. People with thrush should be checked for possible esophageal disease as well.

How is candidiasis treated?

Just as there are three different types of candidiasis, there are three somewhat different ways to treat the disease.

**Treatment for Oral Candidiasis**

The most common treatment is to use a medicated liquid that is swished around the mouth and swallowed or to suck on a lozenge until it dissolves and then swallow. However, oral pills (not to be used during pregnancy) are just as or more effective than these other forms and offer more convenient dosing. The CDC recommends:

- **Fluconazole (Diflucan tablets)**: Diflucan is a tablet that must be swallowed. Studies show that it is just as effective as clotrimazole and nystatin, but is more convenient and better tolerated. The dose is typically 100 mg a day for 7-14 days.

Other treatments include:

- **Miconazole (Oravig)**: This 50 mg oral tablet is applied to the upper gum once a day for 1-2 weeks. Tablets should not be chewed or swallowed.
- **Clotrimazole (Mycelex t OHbrushes)**: These lozenges are used five times a day for 1-2 weeks.
Lozenges should dissolve in the mouth slowly and should not be chewed or swallowed whole. Clotrimazole can upset the stomach.

- **Nystatin (Mycostatin liquid or pastilles):** Nystatin is available as a liquid or lozenge. The liquid dose is 5 milliliters taken four times a day for 1–2 weeks. It should be swished around the mouth slowly for a few minutes and then swallowed. One or two lozenges are taken four times a day for 7–14 days. They should dissolve in the mouth slowly and should not be chewed or swallowed whole.

- **Itraconazole (Sporanox liquid suspension):** This liquid must be swallowed. While it is as effective as the four medications listed above, it is not as well tolerated as fluconazole tablets.

- **Posaconazole oral suspension (Noxafile):** This is as effective as fluconazole, but has more interactions with other drugs similar to itraconazole. The liquid should be taken with food and is used once a day, swished around the mouth slowly for several minutes and then swallowed.

- **Another possible treatment for thrush is gentian violet (Genapax).** This is a dye made from coal tar and can be purchased from some pharmacies, health food stores, and other places where supplemental therapies are sold. Gentian violet is very messy and can stain clothing. It can also stain the inside of the mouth, which fades over time. It should be handled with care. For oral thrush, apply the dye by using a cotton swab. Dip the swab in the dye and coat the spots of Candida in the mouth. Avoid swallowing the drug as it can upset the stomach.

Treatment for Vaginal Candidiasis

The most common treatments are medicated creams or inserts (suppository) placed into the vagina. Most are available over-the-counter in many drug stores. However, these products can weaken condoms and diaphragms, which can increase the risk of pregnancy and HIV transmission.

- **Fluconazole (Diflucan):** One 150 mg dose of this tablet is taken for uncomplicated candidiasis. It should not be used during pregnancy.

- **Topical drugs:** These include a range of creams, ointments or suppositories. Some are used for as little as three days to up to 14 days. Many are found over the counter while others are by available by prescription. Discuss with your health provider which are best for you to use. They include the following:
- Butoconazole (Femstat cream)
- Clotrimazole (Gyne-Lotrimin cream)
- Clotrimazole (Mycelex vaginal suppositories)
- Miconazole (Monistat vaginal cream)
- Miconazole (Monistat vaginal suppositories)
- Terconazole (Terazol 3 and Terazol 7 creams)
- Terconazole (Terazol 3 suppositories)
- Tioconazole (Vagistat ointment)

- Itraconazole (Sporanox oral solution): The 200 mg dose is taken once a daily for 3–7 days as an alternative to fluconazole.

As with thrush, if vaginal yeast infections do not go away while using these creams or suppositories, or if the infection returns soon after treatment is stopped, more potent drugs such as nystatin (Mycostatin) liquid, itraconazole (Sporanox) liquid, or fluconazole (Diflucan) tablets can be prescribed by a doctor. Women who are pregnant should not use these oral drugs as they may harm the developing fetus.

Another possible treatment for vaginal yeast infections is gentian violet (Genapax). (See above for more information.) Genapax can be purchased as a tampon, and each contains 5 mg of gentian violet. The tampons can be messy and can stain clothing and undergarments. Handle and insert with care. Gentian violet tampons are inserted once or twice a day for 1–2 weeks.

Treatment for Esophageal Candidiasis

Because esophageal candidiasis is considered to be more severe, deeper in the body, and harder to treat, higher doses of drugs than those used to treat oral or vaginal candidiasis are usually needed to treat it. These drugs can cause liver enzymes to increase. They can also interact with other medications, including protease inhibitors, non-nucleoside reverse transcriptase inhibitors, as well as certain antihistamines and sedatives. Be sure to check with your doctor about other drugs you are taking before taking these antifungal treatments.

- Fluconazole (Diflucan): An intravenous solution or 200 mg tablet of fluconazole is taken once a day for 2–3 weeks. Fluconazole is considered the first choice for treatment.
- Itraconazole (Sporanox oral solution): This liquid should be taken on an empty stomach and vigorously swished around the mouth for several seconds and then swallowed. It is taken once a
day for 2–3 weeks.

- Other antifungals: Several other drugs can be used for 2–3 weeks, including voriconazole, isavuconazole, caspofungin, micafungin, anidulafungin, and amphotericin B.

Treatment for Severe or Drug-Resistant Candidiasis

Sometimes, candidiasis can become resistant to the “azole” drugs (all of those listed above) or is so severe that it cannot be adequately treated using any of these treatments. As a result, a drug called amphotericin B is often used. It is usually given by IV in a hospital. The two types are standard amphotericin B (Fungizone) and liposomal amphotericin B (Abelcet, AmBisome, Amphotec).

Amphotericin B can cause serious side effects, including kidney damage, allergic reactions (fever, chills, altered blood pressure, etc.), bone marrow damage, nausea, vomiting and headache. The risk of kidney damage is increased if amphotericin B is taken with cidofovir (Vistide) or ganciclovir (Cytovene), two drugs used to treat CMV, and pentamidine (NebuPent), a drug used to treat PCP. The risk of bone marrow damage is increased if amphotericin B is taken at the same time as AZT (Retrovir), flucytosine (Ancobon) or ganciclovir.

Generally speaking, liposomal amphotericin B is less toxic than standard amphotericin B. However, standard amphotericin B is faster acting and is usually the drug of choice when infections are severe and an immediate threat to life.

How should pregnant women be treated for candidiasis?

Because many antifungal drugs can be toxic to a developing fetus, the CDC recommends that topical treatments—such as creams or suppositories for vaginal candidiasis—be used whenever possible.

Can candidiasis be prevented?

There is no guaranteed way to prevent infection with the fungus or to prevent developing oral thrush, vaginal yeast infections, or more serious forms of candidiasis. These infections are more likely to occur in people with CD4 counts below 200. Thus, one way to help prevent it from occurring is to keep the immune system healthy—by taking HIV medications, reducing stress, eating right and getting plenty of rest.

There is still some debate regarding the use of antifungal drugs to prevent candidiasis. A few studies show that fluconazole can reduce the number of infections. However, it may be possible that prolonged use of fluconazole—or any “azole” drug—may lead to the fungus becoming resistant. This can prevent the drugs from working correctly when they are most needed. Because of this, many doctors do not recommend using these drugs continuously to prevent candidiasis. However, this may be the best option for people with a history of frequent outbreaks of oral thrush.
There are some tips to help prevent candidiasis:

- **Watch your diet**: It may be helpful to avoid foods high in sugar, dairy, yeast, wheat and caffeine. These are believed to promote fungal overgrowth.
- **Eat yogurt**: Many experts also recommend eating lots of yogurt that contains Lactobacillus acidophilus, a “good” bacteria believed to keep Candida albicans under control. Be sure the yogurt packaging reads “contains Lactobacillus acidophilus.”
- **Practice good oral hygiene**: This includes brushing regularly, flossing, using an antiseptic mouthwash (Listerine, etc.), and reducing/eliminating the use of tobacco products such as chewing tobacco and cigarettes.
- **For vaginal yeast infections**: To help reduce the risk of vaginal infections, wear loose, natural-fiber clothing and undergarments with a cotton crotch. Also, stay away from deodorant tampons and feminine deodorant sprays.

Are there any experimental treatments?

Candidiasis is a problem for many people, regardless of whether or not they have HIV. This is especially true for people who have strains of Candida that are resistant to currently available drugs. Thus, new drugs are always being developed for candidiasis and other fungal infections.

If you would like to find out if you are eligible for any clinical trials involving new treatments for candidiasis, visit [ClinicalTrials.gov](https://clinicaltrials.gov), a site run by the U.S. National Institutes of Health. The site has information about all HIV-related clinical studies in the United States. For more info, you can call their toll-free number at 1-800-HIV-0440 (1-800-448-0440) or email contactus@aidsinfo.nih.gov.

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