

Introduction

The human body houses literally hundreds of different types of what we call “good bacteria.” These bacteria actually help to keep us healthy by aiding digestion and supporting our immune system. The majority of these good bacteria exist in the gut (gastrointestinal tract). The disruption/destruction of good bacteria (also called normal flora) can upset the balance of microorganisms in the body and thus result in opportunistic infections and subsequent poor

health. Much of what we eat and drink today is not friendly to the good bacteria. When good bacteria are destroyed, the balance of the body’s flora is upset. This often makes it relatively easy for certain other pathological microorganisms to grow in disproportionately high numbers, especially fungi. In this home study training we will look at one type of infection that many people have without realizing they have it—a fungal infection (also called “mycosis”).

Background

Fungal infections are becoming increasingly common today. It is estimated that over a billion people in the world are experiencing a fungal infection at any given time. Some sources estimate a much higher rate, stating that up to 70% (about 5 billion) of the people on earth are harboring fungal infections. Fungi most often cause infections on the skin and nails, but can also appear in the mouth, throat, sinuses, the eyes,

in the lungs, urogenital tract, intestinal tract, and can even become systemic, traveling through the bloodstream and infecting the bones and brain.

Fungi are microorganisms with tough, rigid cell walls that reproduce by means of spores. There are many different types of fungi that can infect humans, including *Aspergillus*, *Cryptococcus*, *Histoplasma*, *Blastomyces*, and *Zygomycetes*. Fungi exist all over the

world, and can be found in soil, air, water, wood debris, decaying vegetable matter, bird or animal excrement, and some are typically found on human skin. Probably the best-known fungus is *Candida* (yeast), which is normally present in the human body (skin and intestinal tract) and is usually harmless, although under the right circumstances it can become problematic.





How Fungal Infections Develop

Fungi can be transmitted through direct contact, or, if they already exist in the body, altering the body's internal environment can provide an opportunity for the fungus to multiply and become infectious.

Candida is an opportunistic organism. It is kept in check by the immune system and the normal flora of the skin, mouth, and gastrointestinal tract, but disruptions in the skin or mucosa (which serve as protective barriers), and/or in the normal flora of these organs, provide a chance for Candida to become invasive. It will seize any opportunity to grow and "take over."

There are certain people who may be more susceptible to fungal infections than others. Although antibiotics get rid of infections, they also kill the

"healthy" microorganisms (good bacteria) which are necessary for the normal everyday functions of the intestinal tract and the skin. This paves the way for a fungal infection, so anyone who has been taking antibiotics (especially repeatedly or for a long time) would be at greater risk for Candidiasis. People who have weakened or compromised immune systems (young children and elderly people in particular) or who take immunosuppressive drugs like steroids (Prednisone) or chemotherapeutic drugs are also at risk.

Candida (and any other microorganism) can also be transmitted by direct contact with the hands of healthcare workers or with contaminated medical equipment.

Symptoms of Common, Localized Fungal Infections

The kinds of symptoms people experience with fungal infections depend on where on or in the body the infection is located. On the skin, especially in the cases of Tinea Pedis (Athlete's Foot) and Tinea Cruris (Jock Itch), itching, burning, cracking and peeling of the skin occur, particularly between the toes or in the groin folds. The itching can be quite intense, which leads to scratching, which creates more inflammation.

Vaginal yeast infections also cause itching and burning, painful urination, painful intercourse, and foul-smelling discharge.

Fungal infections under fingernails or toenails cause the nails to become thickened, brittle, and discolored, often with white or yellow streaks.

Thrush is a common fungal infection in the mouth. The most prominent symptom is a white, raised film over the tongue, inner cheeks, or roof of mouth (palate). It can spread into the esophagus and cause difficulty swallowing and a feeling that food is getting "stuck" in the chest area on its way to the stomach.

Treatment for these is usually with topical medications like Nystatin

or Lamisil. Mycostatin swish-and-swallow or swish-and-spit is often prescribed for thrush. If these fail, Nizoral or Diflucan tablets can be taken orally.

Diagnosing the aforementioned fungal infections is pretty straightforward, and can be verified by clinical examination and patient description of symptoms. Often a sample is taken for culture and sensitivity in the lab, and then a treatment is prescribed. If these "surface" infections start to return some time after treatment, it may be suggestive of a deeper problem.



Systemic Mycosis: When a Fungus Migrates

Usually when a fungus is confined to the skin, it is annoying and uncomfortable, but there is no threat of serious damage. This is not the case when the infection migrates elsewhere.

When a fungus spreads systemically in the body, it can travel in the bloodstream to the eyes, lungs, bones, or the brain. People most susceptible to systemic mycoses are those with poor immune system function (people with HIV, cancer, poorly controlled Diabetes Mellitus, elderly people and very young children, those who have had recent surgery, and people who are taking immunosuppressive drugs).

Malaise and fever are generally present when a fungus is causing a systemic infection. If it occurs in the eye, there may be redness, pain, blurred vision, or dark “floaters” present. If in the lungs, the person could experience shortness of breath, painful breathing, or he/she may cough up blood. Bone pain and a fever are the cardinal signs of a fungal infection in the bones. Headaches, cognitive problems, and seizures may indicate a fungal infection in the brain; if fungal meningitis (affecting the protective layers surrounding the brain and spinal cord), usually headaches, a stiff neck, and irritability are present. If you experience any of the aforementioned symptoms, please seek medical attention immediately.

Subclinical, Chronic Fungal Infections

Earlier in this training it was stated that estimates regarding how many people have fungal infections vary. Many people who harbor fungal infections don’t have any idea that’s what is wrong with them. The symptoms mimic other illnesses, and can be so vague or mild that the person does not realize that there is something wrong. This is why Dr. Mark Hyman calls fungal infections “a common but unrecognized problem.”

The list of potential signs and symptoms presented by a systemic fungal infection is a long one:

Chronic fatigue	Rectal itching	Difficulty concentrating
Loss of energy	Diarrhea or constipation	Insomnia
General malaise	Irritable Bowel Syndrome	Poor immune function
Muscle aches or weakness	Vaginal yeast infections	Allergies
Joint pain or swelling	Recurrent bladder infections	Food sensitivities
Decreased interest in sex	Thyroid dysfunction	Carbohydrate cravings
Impotence	Premenstrual syndrome	Eczema
Bad breath	Menstrual irregularities	Psoriasis
Thrush	Depression	Recurrent skin infections
Bloating and gas	Irritability	Toenail fungus
Intestinal cramps/abdominal pain	Poor memory	

It is important to be observant for any of the above, especially if the person experiencing them has experienced one or more of the following triggers:

High-sugar/high-carbohydrate, high-fat, low-fiber diet	Estrogen
Impaired immunity	Corticosteroid use
Antibiotic use	Psychological stress
Birth control pills	Received cancer treatment

Since these are quite commonly found in society today, the odds are fairly high that many people are walking around with Candidiasis in their systems.

Subclinical, Chronic Fungal Infections (continued from Page 3)

Someone with a systemic fungal infection can go years, even decades, without ever suspecting the cause of the symptoms. That same individual may even have (what are ultimately unnecessary) prescriptions for several of the above listed symptoms because the problem is misdiagnosed and the real issue has not been addressed. Persons with intellectual or developmental disabilities (IDD) are usually not capable of monitoring their own health needs, so it is critical that anyone who cares for them is especially vigilant and able to recognize that the individual should be evaluated for a systemic fungal infection.

Getting Well—and Staying Well

If you suspect that you or a person you care for may have a systemic fungal infection, please see the Primary Care Physician. He or she will most likely order a stool and/or blood culture to identify the microorganism. If the tests are positive, then treatment is usually with an antifungal medication such as Diflucan, however, to permanently eradicate the fungus it will be necessary to make some lifestyle changes.

First of all, diet must be addressed. Candida loves sugar and thrives when we feed it what it wants. That's why people with fungal infections often crave sweets or starchy, yeasty foods. It's the infection talking. So cutting back on carbohydrates is a must, especially the processed and unrefined foods (bread, pasta, doughnuts, crackers, etc.). We all need some carbohydrates, so it is best to go with natural sources: fruits and vegetables.

Talk to your doctor about any antibiotics, steroids, or hormones that you have been taking. It is best not to take them unless it is absolutely necessary, because they create an internal environment that will predispose you to more fungal infections. Overuse of antibiotics not only sets up a favorable environment for fungi, it causes the "bad" bacteria to get stronger and more resistant to treatment.

References:

<http://medical-dictionary.thefreedictionary.com/fungus>
<http://www.cdc.gov/fungal/diseases/candidiasis/invasive/health-professionals.html>
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It is also necessary to replace/restore the good bacteria in the gut that were destroyed. Ask your physician about taking a probiotic. These can be obtained over the counter, but some are better than others; the probiotic should contain at least 10-20 billion live organisms of lactobacillus and bifidobacter species. Consuming cultured foods like yogurt, Kefir, and Kombucha can help, too.

There are foods that are known to have antimicrobial and immune-boosting properties. Garlic and oregano are two of them. Coconut oil contains lauric acid and caprylic acid, which are natural antifungals.

Finally, it is wise to make sure your house is free of mold and spores. Fungi thrive in dark, damp places, so checking basements and garages for mold and eliminate it. Keep your home clean and dry. Also, if you must shower in public places like the YMCA or a hotel, wear flip-flops or some other protective foot gear. Fungal infections can easily be transmitted this way.

In closing, if you suspect that you or someone you care for may have a chronic, systemic fungal infection, please see the doctor and discuss your concerns. Proper diagnosis and treatment can spare a person years of misery.

Fungal Infections Test

Name: _____

Role/Title: _____

Agency: _____

Date: _____

Please provide contact information (email address, fax number, or mailing address) where you would like your certificate to be sent:

You must submit your completed test, with at least a score of 80%, to receive $\frac{1}{2}$ **hour** of training credit for this course.

- * To submit via fax, please fax the test and evaluation to 814-728-8887.
- * Via email, please send an email to HCQUNW@MilestonePA.org. Please put “Fungal Infections Test” in the subject line, and the numbers 1— 5, along with your answers, in the body of the email, OR scan the test and evaluations pages and email as attachments.
- * Via mail, send the test and evaluation to Milestone HCQU NW, 247 Hospital Drive, Warren PA 16365.

Knowledge Assessment: (true or false)

1. Symptoms of systemic fungal infections
 - a. Include craving carbohydrates, experiencing sexual problems, having difficulty with concentration and memory, and insomnia
 - b. Are often mistaken for symptoms of another illness and escape an accurate diagnosis
 - c. Can be vague and mild enough that the person may go years without being treated
 - d. All of the above
 - e. None of the above
2. Triggers for the development of a systemic fungal infection include all of the following *except*:
 - a. Antibiotic use
 - b. Cocaine addiction
 - c. Birth control medication
 - d. High-carbohydrate diet
3. Fungal infections can be present on the skin and nails, in the eyes, bones, lungs, brain, and bloodstream
True False
4. Someone with recurrent bouts of Athlete’s Foot
 - a. Should be checked for a systemic fungal infection
 - b. Should stop staying at Motel 6
 - c. Should eat more sweets
 - d. All of the above
 - e. None of the above
5. Estimates claim that up to 7% of the population has a systemic fungal infection. True False

Home Study Evaluation

Training Title: Fungal Infections

Date: _____

Please circle your PRIMARY reason for completing this home-study training:

It's mandatory interested in subject matter need training hours convenience

Please circle the best response to each question.

5 = Strongly Agree 4 = Agree 3 = Undecided 2 = Disagree **1 = Strongly Disagree**

- | | | | | | |
|---|---|---|---|---|---|
| 1. As a result of this training, I have increased my knowledge. | 5 | 4 | 3 | 2 | 1 |
| 2. I learned something I can use in my own situation. | 5 | 4 | 3 | 2 | 1 |
| 3. This training provided needed information. | 5 | 4 | 3 | 2 | 1 |
| 4. The training material was helpful and effective. | 5 | 4 | 3 | 2 | 1 |
| 5. Overall, I am satisfied with this training. | 5 | 4 | 3 | 2 | 1 |

Suggestions for improvement: _____

Additional information I feel should have been included in this training: _____

I would like to see these topics/conditions developed into home-study trainings: _____

