Candida and other Fungi

Dr. John Bergman

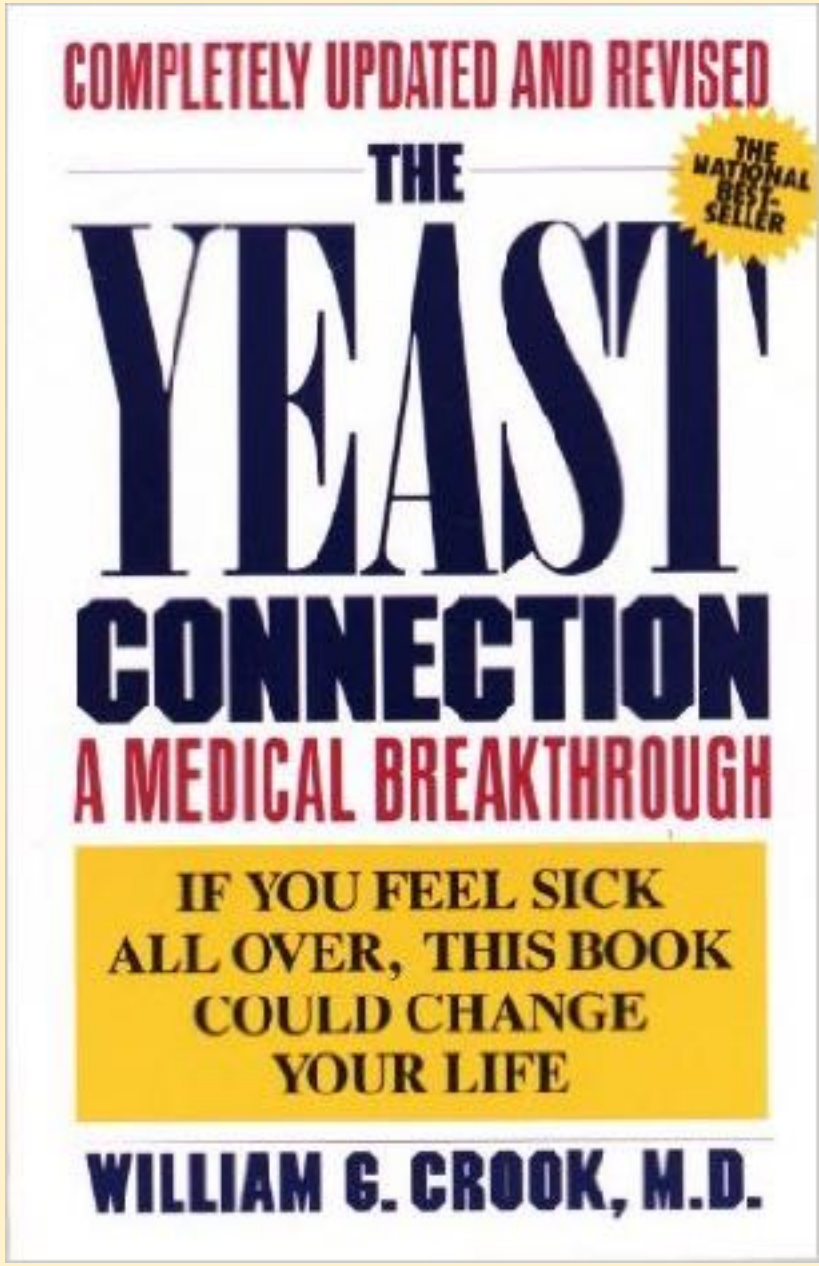
What's the big deal about Candida?

Candida has been blamed for hundreds of diseases and conditions including:

- Chronic headaches
- Sinus problems
- Depression
- Chronic Fatigue Syndrome
- Fibromyalgia
- Skin Issues like Eczema or Dermatitis
- Sexual dysfunction
- Digestive disorders like IBS, Crohn's and Ulcerative Colitis
- Autism
- All Types of Cancer
- Autoimmune Diseases

When did Candida become such a huge problem?

- Dr. William Crook wrote the first edition of this book in 1986 which **proposed the idea that systemic candidiasis or candida hypersensitivity was responsible for a host of common conditions and non-specific symptoms** such as fatigue, sexual dysfunction, asthma, and psoriasis.



What is Candida Hypersensitivity?

- Candida hypersensitivity remains an unproven claim, but articles like the one from the Huffington Post in 2009 by Kim Evans claims:

"**an estimated 90 percent of the population has a problem with candida overgrowth**, although most don't know it. And second, **candida overgrowth can be the root cause of literally hundreds of different problems in the body**."

"It's also fascinating that an oncologist in Rome, Dr. Tullio Simoncini, says that **cancer is a fungus and actually an advanced form of candida overgrowth**."

What is Candidiasis?

"Candidiasis is a fungal infection caused by yeasts that belong to the genus Candida. There are over 20 species of Candida yeasts that can cause infection in humans, the most common of which is Candida albicans.

Candida yeasts normally live on the skin and mucous membranes without causing infection; however, overgrowth of these organisms can cause symptoms to develop."

CDC

What are the Symptoms of Candidiasis?

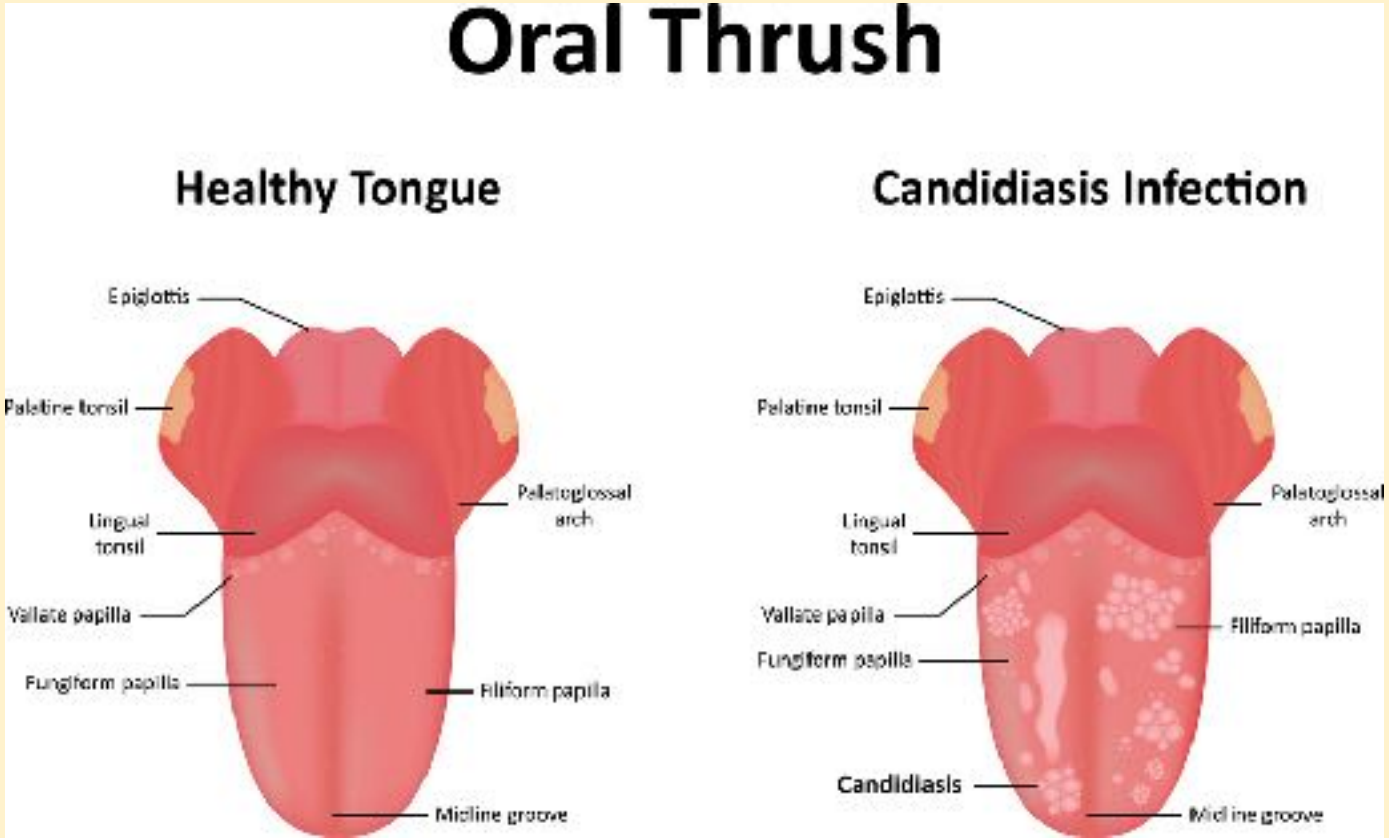
- "Symptoms of candidiasis vary depending on the area of the body that is infected."

Types of Candidiasis

- Thrush (oropharyngeal/Esophageal Candidiasis)
- Vaginal Yeast Infections (Genital/Vulvovaginal Candidiasis)
- Invasive Candidiasis

Symptoms of Thrush

- Redness or soreness in the affected areas
- Difficulty swallowing
- Cracking at the corners of the mouth (angular cheilitis)



Symptoms of Vaginal Yeast Infections

“Genital / vulvovaginal candidiasis (VVC) is also sometimes called a **Yeast infection**.”

“Women with VVC usually experience **genital itching, burning, and sometimes a "cottage cheese-like" vaginal discharge.** Men with genital candidiasis may experience an itchy rash on the penis."

CDC

Are other Fungi dangerous?

The “Global Emergence of Candida Auris”

“Healthcare facilities in several countries have reported that a type of yeast called **Candida auris** has caused severe illness in hospitalized patients. This yeast often does not respond to commonly used antifungal drugs, making infections difficult to treat.”

CDC

There are Many Types of Fungal Diseases

- Aspergillosis
- Blastomycosis
- Coccidioidomycosis (Valley Fever)
- C. Neoformans
- Cryptococcus Gattii
- Histoplasmosis
- Mucormycosis
- Pneumocystis Pneumonia
- Sporotrichosis
- Exserohilum
- Cladosporium
- Ringworm (Tinea, Dermatophytosis)

What's so special about Candida?

- Aspergillosis
- Blastomycosis
- Coccidioidomycosis (Valley Fever)
- C. Neoformans
- Cryptococcus Gattii
- Histoplasmosis
- Mucormycosis
- Pneumocystis Pneumonia
- Sporotrichosis
- Exserohilum
- Cladosporium
- **Candidiasis**

Out of all the Types of Fungal Diseases and types of fungi, **Candida is one of the only ones that "lives on our skin and in our mucus membranes."**

Fungi are Part of our Environment!

"Fungi are everywhere. There are approximately 1.5 million different species of fungi on Earth, but only about 300 of those are known to make people sick. Fungal diseases are often caused by fungi that are common in the environment.

Fungi live outdoors in soil and on plants and trees as well as on many indoor surfaces and on human skin. Most fungi are not dangerous, but some types can be harmful to health."

CDC

It's all about the Immune System!

"Aspergillosis is an infection caused by *Aspergillus*, a common mold (a type of fungus) that lives indoors and outdoors. Most people breathe in *Aspergillus* spores every day without getting sick.

However, people with **weakened immune systems** or lung diseases are at a higher risk of developing health problems due to *Aspergillus*."

CDC

It's all about the Immune System!

"Cryptococcus neoformans is a fungus that lives in the environment throughout the world. People can become infected with C. neoformans after breathing in the microscopic fungus, although most people who are exposed to the fungus never get sick from it. C. neoformans infections are extremely rare in people who are otherwise healthy; most cases occur in people who have **weakened immune systems**"

CDC

It's all about the Immune System!

"People can get histoplasmosis after breathing in the microscopic fungal spores from the air. Although most people who breathe in the spores don't get sick, those who do may have a fever, cough, and fatigue. Many people who get histoplasmosis will get better on their own without medication, but in some people, such as those who have **weakened immune systems**, the infection can become severe."

CDC

It's all about the Immune System!

"Pneumocystis pneumonia (PCP) is a serious illness caused by the fungus *Pneumocystis jirovecii*. PCP is one of the most frequent and severe opportunistic infections in people with **weakened immune systems**"

CDC

Who Gets Fungal Infections?

"Anyone can get a fungal infection, even people who are otherwise healthy. Fungi are common in the environment, and people breathe in or come in contact with fungal spores every day without getting sick.

However, in people with **weak immune systems**, these fungi are more likely to cause an infection."

CDC

What can cause Fungal Infections?

- Chemotherapy
- Hospitalization
- Medications

"Chemotherapy and radiation cause many changes in the body. One major change is that these treatments **weaken your immune system**, which can increase your chances of getting an infection, including a **fungal infection.**"

CDC

What can cause Fungal Infections?

<u>Hospitalizations</u>

"Even though you're staying in the hospital to get better, it's possible to get an infection while you're there. If you're staying in the hospital for an injury or an illness, you may be at risk for getting a **fungal infection**, especially if you're very sick or have a **weak immune system.**

These types of infections are called healthcare-associated infections (HAIs)."

CDC

What can cause Fungal Infections?

Medications

"Overall, most serious fungal infections are rare, but they do happen. They are most common among people with **weak immune systems**.

People with certain health conditions may need to take medications with side effects that can weaken your immune system and put you at risk for fungal infections. Specifically, **corticosteroids and TNF (tumor necrosis factor) inhibitors** are two types of medications that can increase your chances of getting a fungal infection."

CDC

Medications that are Directly linked to Fungal Infections

"Corticosteroids taken by mouth can increase your chance of getting a **serious fungal infection**. Oral corticosteroids include the following:"

- Budesonide (Entocort EC)
- Cortisone (Cortone)
- Dexamethasone (Decadron)
- Hydrocortisone (Cortef)
- Methylprednisolone (Medrol)
- Prednisolone (Prelone)
- Prednisone (Deltasone)
- Triamcinolone

Medications that are Directly linked to Fungal Infections

"Inhaled corticosteroids used to treat asthma can increase your chance of developing **oral (thrush).** Inhaled corticosteroids include the following:"

- Beclomethasone (QVAR®)
- Budesonide (Pulmicort®, Symbicort®*)
- Ciclesonide (Alvesco®)
- Flunisolide (AeroBid®)
- Fluticasone (Flovent®, Advair®*)
- Mometasone (Asmanex Twisthaler®, Dulera®
- Triamcinolone (Azmacort®)

Medications that are Directly linked to Fungal Infections

"TNF inhibitors can increase your chance of getting **a serious fungal infection**, particularly histoplasmosis. TNF inhibitors include the following:"

- Adalimumab (Humira®)
- Certolizumab pegol (Cimzia®)
- Etanercept (Enbrel®)
- Golimumab (Simponi®)
- Infliximab (Remicade®)

Medical Treatment for Fungal Infections

Popular antifungal drugs

- clotrimazole
- econazole
- miconazole
- terbinafine
- fluconazole
- ketoconazole
- amphotericin

Common Side Effects of Antifungal Drugs:

- nausea or stomach upset, vomiting,
- itching, or hives
- an unpleasant sensation in the mouth.
- Difficulty breathing
- Closing of your throat
- Swelling of your lips, tongue or face
- severe blistering, redness, peeling, dryness, swelling, or irritation of the skin.

Side Effects of Terbinafine

- upset stomach, gas, diarrhea, mild nausea or stomach pain;
- headache, dizziness or spinning sensation;
- mild skin rash or itching; or
- unusual or unpleasant taste in your mouth.
- fever, chills, body aches, flu symptoms, sores in your mouth and throat;
- joint pain or swelling, swollen glands, patchy skin color, or a butterfly-shaped skin rash over your cheeks and nose;
- changes in mood or behavior;
- hearing problems;
- weight loss due to taste changes;
- raised, silvery flaking of the skin; or
- severe skin reaction -- fever, sore throat, swelling in your face or tongue, burning in your eyes, skin pain, followed by a red or purple skin rash that spreads (especially in the face or upper body) and causes blistering and peeling.

Side Effects of Fluconazole

- mild stomach pain, diarrhea, upset stomach;
- headache;
- dizziness; or
- unusual or unpleasant taste in your mouth.
- nausea, upper stomach pain, itching, loss of appetite, dark urine, clay-colored stools, jaundice (yellowing of the skin or eyes);
- fever, chills, body aches, flu symptoms;
- severe blistering, peeling, and red skin rash;
- easy bruising or bleeding, unusual weakness; or
- seizure (convulsions)

Side Effects of Ketoconazole

- mild nausea, vomiting, or stomach pain;
- mild itching or skin rash;
- headache;
- dizziness;
- breast swelling; or
- impotence or loss of interest in sex.
- dizziness, fainting, fast or pounding heartbeat;
- easy bruising or bleeding, unusual weakness;
- numbness or tingly feeling;
- severe depression, confusion, or thoughts of hurting yourself; or
- nausea, stomach pain, low fever, loss of appetite, weakness, dark urine, clay-colored stools, jaundice (yellowing of the skin or eyes).

Side Effects of Amphotericin

- chills;
- nausea, diarrhea;
- stomach pain;
- headache;
- flushing (warmth, redness, or tingly feeling);
- sleep problems (insomnia); or
- mild skin rash.
- chest pain, pounding heartbeats or fluttering in your chest;
- feeling light-headed or short of breath;
- low potassium (confusion, uneven heart rate, extreme thirst, increased urination, leg discomfort, limp feeling);
- loss of appetite, vomiting, urinating less than usual or not at all;
- swelling, rapid weight gain;
- pale skin, weakness, rapid heart rate, trouble concentrating; or
- muscle pain, tenderness, or weakness (especially if you also have fever, unusual tiredness, and dark colored urine).

Antifungal Resistance from Antifungal Drugs

"...just like some bacterial infections are resistant to antibiotics, some fungi no longer respond to the antifungal medications that are designed to cure them. This emerging phenomenon is known as **antifungal resistance**, and it's primarily a concern for invasive infections with the **fungus Candida**."

"Some species of fungi are **naturally resistant** to certain types of antifungal medications. Other species may be normally susceptible to a particular type of medication, but **develop resistance over time as a result of improper antifungal use**"

CDC

Antibiotics could be causing Antifungal Resistance!

"Some studies have indicated that antibacterial medications may also contribute to antifungal resistance; this could occur for a variety of reasons, **one of which is that antibacterials reduce bacteria in the gut and create favorable conditions for *Candida* growth.**"

"It's not yet known if decreasing the use of all or certain antimicrobial agents can reduce *Candida* infections, but appropriate use of antibacterial and antifungal agents is one of the most important factors in fighting drug resistance."

CDC

Are Antibiotics being Over-prescribed?

- **Approximately 50% of antibiotic prescriptions** written in the outpatient setting may be inappropriate
- In one year, **262.5 million courses of antibiotics** are written in the outpatient setting. This equates to more than 5 prescriptions written each year for every 6 people in the United States.

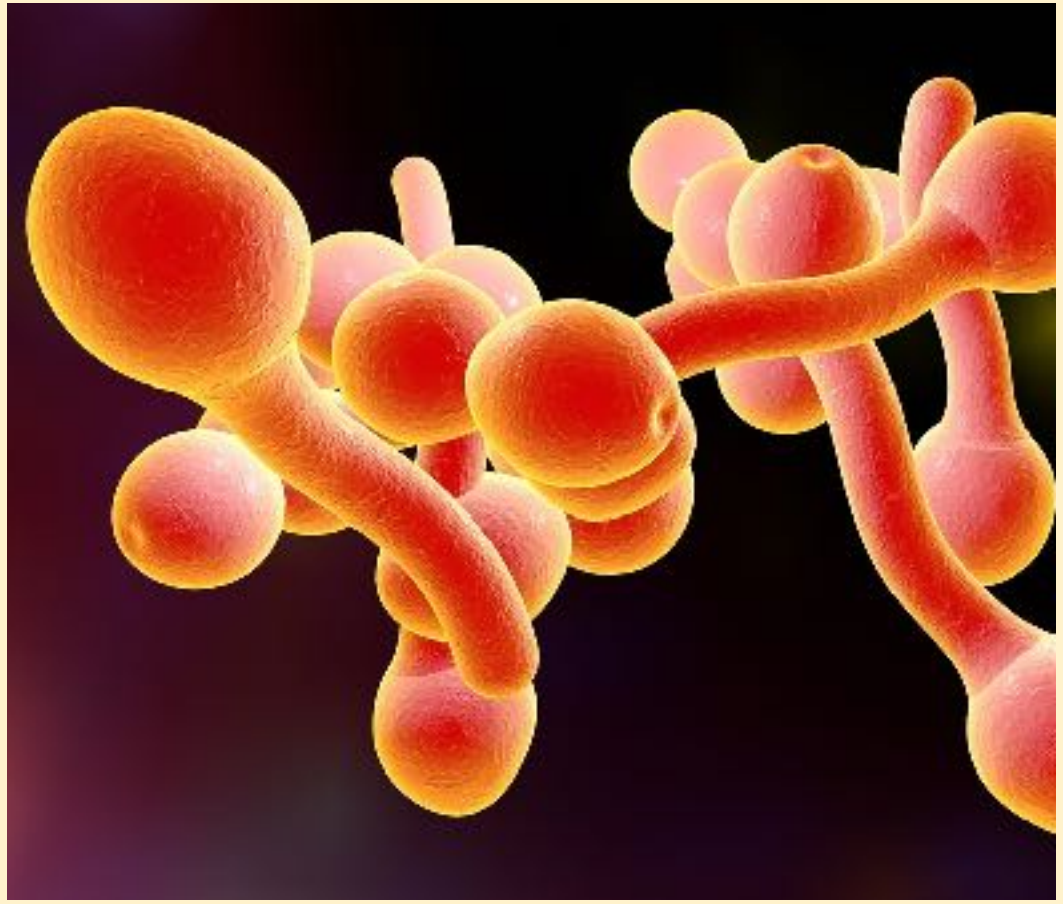
CDC

Why are Antibiotics so Harmful?

- Kill both beneficial and pathologic bacteria
- Upset the delicate balance of your intestinal terrain

Yeasts are opportunistic organisms and will take over = **Dysbiosis**

Yeast use their hyphae (tendrils) to literally poke holes through the lining of your intestinal wall = **Leaky Gut**



Other Exposures to Antibiotics

Confined animal feeding operations (CAFO's)

- American factory farms used ***29 million pounds*** of antibiotics in 2009 alone
- Estimated non-therapeutic use of antibiotics in livestock accounted for **70 percent** of the total antibiotic use (FDA)

Other Exposures to Antibiotics

Glyphosate is a very powerful **selective antibiotic** that kills beneficial, but not pathogenic, microorganisms in the soil and intestine.

Residue levels permitted in food are **40 to 800 times** the antibiotic threshold and concentrations shown in clinical studies to damage mammalian tissues.

Medications that Disrupt your Microflora

- Antibiotics
- Antacids
- Birth Control Pills
- Steroids
- NSAIDs
- Antidepressants
- Statins

The Importance of Microflora

Bacteria

- **80 percent** of your immune system resides in your Gut
- Bacteria outnumber your cells **10 to 1**
- 100 trillion bacteria—about *two to three pounds* worth of bacteria
- You should have about **85 percent "good" bacteria** and 15 percent “bad."
- Beneficial bacteria keep the bad bacteria and yeasts in check
- Produce nutrients your body needs, such as B vitamins.

The Importance of Microflora

Viruses

- Bacteriophages: beneficial viruses in your body
- Outnumber your body's bacteria 10 to 1
- Roughly 4 Quadrillion viruses in your body

"Viral elements are a large part of the genetic material of almost all organisms,"

"We humans are well over 50 percent viral"

Dr. Phillip Sharp,

Nobel Prize Winner

Center for Cancer Research M.I.T.

Functions of your Gut Flora

- Digestion and absorption of carbohydrates
- Production of vitamins
- Absorption of minerals
- Elimination of toxins
- Distinguish between pathogens and non-harmful antigens
- Keep harmful bacteria under control
- Aid in production of antibodies to pathogens
- Provide support to the Immune System

So What are the causes of Fungal Infections?

- A Weakened Immune System
- Medications especially Antibiotics
- Chemotherapy
- Toxic Food especially Meat from CAFO's
- An Unhealthy Microflora

Optimize Your Gut Flora

- Organic plant based diet (Locally grown, seasonal foods)
- Healthy fats such as coconut oil and olive oil
- Fermented Vegetables
- Probiotic Supplements
- Juice Vegetables
- Blend Fruits
- Raw Dairy
- Reduce Omega 6 and Increase Animal based Omega 3

Fermented Foods

- Help promote growth of beneficial bacteria, supports healthy immune function
- Help increase vitamin b, omega 3, digestive enzyme, and lactase/lactic acid

- Kefir (fermented milk)
- Kombucha
- Sauerkraut
- Pickles
- Miso
- Kimchi

Black Seed

Over **800** published, peer reviewed studies proving the benefits of Black Seed including:

- Analgesic (pain killing)
- Anti-Bacterial
- Anti-Inflammatory
- Anti-Ulcer
- Anti-Fungal
- Antioxidant
- Antiviral
- Bronchodilator
- Gluconeogenesis Inhibitor (Anti-Diabetic)
- Insulin Sensitizing
- Hepatoprotective (Liver Protecting)
- Hypotensive
- Interferon Inducer
- Renoprotective (Kidney Protecting)

Black Seed and Fungal Infections

"These results indicate that the aqueous extract of Nigella sativa seeds exhibits **inhibitory effect against candidiasis** and this study validates the traditional use of the plant in fungal infections."

Phytotherapy Research

"This study confirms the potential **antioxidant and antimicrobial activities** of ethanolic extract of Nigella sativa which can be considered not only as a diet supplement but can be used against a variety of free radical induced damage diseases."

Pakistan Journal of Pharmaceutical Sciences

Turmeric

"Turmeric (Curcuma longa), a commonly used spice throughout the world, has been shown to exhibit **anti-inflammatory, antimicrobial, antioxidant, and anti-neoplastic properties.**

Phytotherapy Research

Turmeric and Fungal Infections

"The results of the present study clearly indicate that curcumin by its antioxidant activity showed neuroprotection against 3-NP-induced behavioral and biochemical alteration. (Fungal toxin causing neurotoxicity) "

Methods and Findings in Experimental and Clinical Pharmacology

"In the present study, we have investigated the antifungal effects of a natural polyphenol, Curcumin (CUR), against albicans and non albicans species of Candida and shown its ability to inhibit the growth of all the tested strains."

"…our results provide the first evidence that CUR acts as an antifungal agent, via generation of oxidative stress, inhibits hyphae development..."

Bioscience Reports

Turmeric and Fungal Infections

"…curcumin's potent antifungal activity against different strains of Candida, Cryptococcus, Aspergillus, Trichosporon and Paracoccidioides have been reported…"

"The aim of this review is to discuss curcumin's dual pharmacological activities regarding its applications as a natural anticancer and antifungal agent. These dual pharmacological activities are expected to lead to clinical trials and to improve infection survival among cancer patients."

European Journal of Pharmacology

Boost your Immune System with Vitamin D

"Vitamin D exerts important regulatory functions on cells from the innate as well as from the adaptive immune response. Indeed, accumulating evidence has shown that insufficient vitamin D levels may lead to dysregulation of immune responses, and thus contribute to autoimmune diseases."

Frontiers in Immunology

Vitamin D and Fungal Infections

“Vitamin D supplementation decreases Aspergillus fumigatus specific Th2 responses in Cystic Fibrosis patients with aspergillus sensitization”

“Daily vitamin D supplementation was associated with reduced Aspergillus induced IL-13 responses from peripheral. . CD4+ T cells and Aspergillus-specific IgE levels, as well as increased serum vitamin D levels. This treatment was well tolerated and the study supports further investigation of the use of vitamin D supplementation in Th2 mediated diseases.”

Asthma Research and Practice

Optimize Your Vitamin D levels

- **UVB exposure** from the Sun is the best way to optimize your vitamin D levels
  - At least 20 minutes of **sun exposure daily** during mid day
  - Your shadow shouldn't be longer than your height

- Most regions of the planet don't get proper sunlight for **6 months** out of the year
- Vitamin D3 supplementation during the winte
- Adults required about **8,000 IUs per day**

Vitamin D and Vitamin K2

- Vitamin K2 is essential for proper utilization of vitamin D

Sources of Vitamin K2

- Grass-fed organic animal products (eggs, butter, dairy)
- Fermented foods
- Certain cheeses (Brie, Gouda)

Breast Feeding and Fungal Infections

"The aim of the present study was to determine the influence of serum from formula and breast-fed infants on neutrophil function (as measured by the attachment and phagocytosis of Candida albicans) as well as the chemoattractant activity of the serum."

"**…serum from breast-fed infants induces a greater phagocytic capacity against C. albicans in neutrophils than serum from formula-fed infants.**"

Comparative Immunology, Microbiology, and Infectious Diseases

Breast Feeding and Fungal Infections

"This study aimed to determine the occurrence of Candida spp. in the oral cavity of predominantly breastfed infants and in their mothers' mouths and breasts, as well as in the oral cavity of bottle-fed infants and in non-lactating women."

"Candida species were much less frequent in infants who were predominantly breastfed than in those who were bottle-fed."

Pesqui Odontol Bras

Clove and Fungal Infections

"These findings demonstrate that oral intake of an herbal food, clove, **may suppress the overgrowth of C. albicans** in the alimentary tract including the oral cavity."

Nippon Ishinkin Gakkai Zasshi

*"It is clear that **clove oil shows powerful antifungal activity**; and it can be used as an easily accessible source of natural antioxidants and in pharmaceutical applications."*

Journal of Mycoses

Garlic and Fungal Infections

“The ubiquitous opportunistic pathogen C. albicans is sensitive to garlic; resistance to the broad spectrum of active principles present is unlikely so that its anticandidal effects may provide an important alternative route to chemotherapy.”

Journal of Applied Microbiology

“The antimicrobial effects of aqueous garlic extract (AGE) against **133 multidrug-resistant gram-positive and gram-negative bacterial isolates … and against 10 Candida spp. were studied**.”

“The results of this study support the use of garlic in health products and herbal remedies...”

Journal of Medical Food

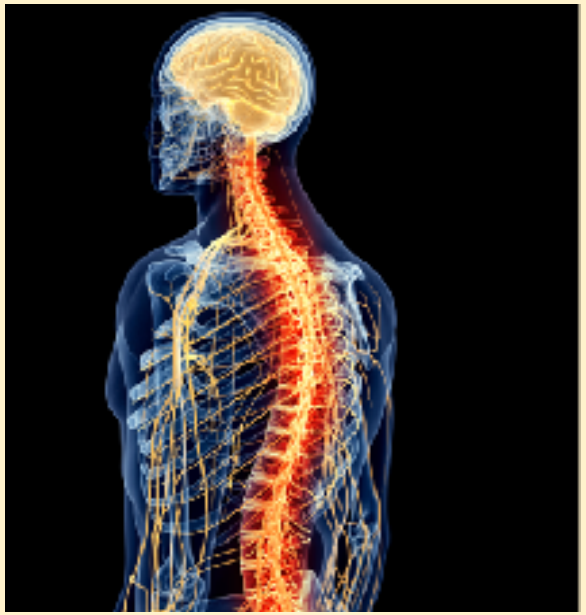
Antifungal Essential Oils

- Clove
- Tea Tree
- Oregano
- Lemongrass
- Cinnamon Bark
- Thyme
- Lavender
- Geranium
- Chamomile
- Cassia

Antifungal Foods and Spices

- Turmeric
- Cumin
- Black Seed
- Garlic
- Apple Cider Vinegar
- Coconut oil
- Cinnamon

The 5 Keys to Health and Healing



Proper nerve supply

Regular Exercise

Proper Nutrition

Sufficient Rest

Prayer and Meditation

References

1. http://www.yeastconnection.com/ftb_dr_crook.html
2. http://www.huffingtonpost.com/kim-evans/antibiotics-cause-cancer_b_186968.html
3. http://www.candidasupport.org/resources/candida-related-diseases/
4. https://www.cdc.gov/fungal/diseases/candidiasis/
5. https://www.cdc.gov/fungal/diseases/candidiasis/thrush/
6. https://www.cdc.gov/fungal/diseases/candidiasis/genital/index.html
7. https://www.cdc.gov/fungal/diseases/candidiasis/invasive/index.html
8. https://www.cdc.gov/fungal/diseases/index.html
9. https://www.cdc.gov/fungal/infections/cancer-patients.html
10. https://www.cdc.gov/fungal/infections/index.html
11. https://www.cdc.gov/fungal/infections/immune-system.html
12. http://www.rxlist.com/lamisil-drug/patient-images-side-effects.htm
13. http://www.rxlist.com/monistat-derm-drug/patient-images-side-effects.htm
14. http://www.rxlist.com/spectazole-drug/patient-images-side-effects.htm
15. http://www.rxlist.com/mycelex-drug/patient-images-side-effects.htm
16. http://www.rxlist.com/nizoral-drug/patient-images-side-effects.htm
17. http://www.rxlist.com/diflucan-drug/patient-images-side-effects.htm
18. https://www.cdc.gov/fungal/antifungal-resistance.html
19. Comp Immunol Microbiol Infect Dis. 1997 Jan ;20(1):21-7. PMID: 9023037
20. Pesqui Odontol Bras. 2003 Apr-Jun;17(2):151-5. Epub 2003 Oct 10. PMID: 14569358
21. Am J Chin Med. 1996;24(2):103-9. PMID: 8874667

References

22. Asthma Res Pract. 2015;1. Epub 2015 Jun 4. PMID: 27011794
23. HIV Clin Trials. 2002 Sep-Oct;3(5):379-85. PMID: 12407487
24. BMC Infect Dis. 2006 Nov 3;6:158. PMID: 17083732
25. Phytother Res. 2003 Feb;17(2):183-6. PMID: 12601685
26. Methods Find Exp Clin Pharmacol. 2007 Jan-Feb;29(1):19-25. PMID: 17344940
27. Nippon Ishinkin Gakkai Zasshi. 2005;46(1):27-33. PMID: 15711533
28. Eur J Pharmacol. 2015 Dec 23. Epub 2015 Dec 23. PMID: 26723514
29. J Prosthodont. 2015 Jun ;24(4):296-302. Epub 2014 Sep 14. PMID: 25219289
30. Med Hypotheses. 2001 Aug;57(2):258-75. PMID: 17562569
31. Mycoses. 2006 Jul;49(4):316-23. PMID: 16784447
32. Mycoses. 2007 Sep;50(5):403-6. PMID: 17714361
33. J Med Food. 2007 Jun;10(2):384-7. PMID: 17651080
34. Food Chem Toxicol. 2010 Aug-Sep;48(8-9):2186-92. Epub 2010 May 17. PMID: 20488223
35. Pharm Biol. 2010 Jul ;48(7):834-8. PMID: 20645785
36. Biosci Rep. 2009 Dec 17. Epub 2009 Dec 17. PMID: 20017731
37. J Antimicrob Chemother. 2009 Feb;63(2):337-9. Epub 2008 Nov 26. PMID: 19038979
38. Can J Microbiol. 2011 Mar;57(3):204-10. PMID: 21358761
39. Mycopathologia. 2007 Mar;163(3):137-43. Epub 2007 Mar 14. PMID: 17356790
40. J Appl Microbiol. 2002;93(3):398-405. PMID: 12174037
41. Pak J Pharm Sci. 2016 Jan ;29(1):231-7. PMID: 26826815
42. J Med Food. 2004;7(3):327-33. PMID: 15383227