**Candida Protocol**

*Candida albicans* is a fungus that normally grows in small amounts in the intestines, mouth, and skin. It can grow as either an oval-shaped budding yeast (blastospore) or as pseudohyphae or true fungal hyphae.1 Both yeast and fungal forms are usually found in infected tissues.1  Under certain conditions, a *Candida* overgrowth can occur whereby it proliferates in excessive amounts. This is known as candidiasis and can lead to many health problems including diarrhea, constipation, and other digestive issues, itchy skin and anal itching, fatigue, and recurrent vaginal yeast infections and nail fungus infections. Even a minor alteration of an individual’s immune defense system or gut microbiota environment, can lead to the transformation of *C. albicans* into a pathogen responsible for infections. The following factors can lead to candida overgrowth:1,2-5

• Antibiotics as medication or in the food supply

• An impaired immune system

• Diets high in sugar or refined carbohydrates

• Excessive stress

• Surgery

• Oral contraceptives

• Diabetes

• High intake of alcohol

The key is to create a healthy gut ecology that is not conducive to yeast growth and that eliminates the presence of existing fungal overgrowth. Patience and perseverance will be required as the yeast overgrowth developed over time and has proliferated. Candidiasis can also impair intestinal permeability (i.e. cause leaky gut),6 which can take time to heal.

**Testing Considerations**

**Candida Antibodies and Antigen Panel**

*Candida* overgrowth (Candidiasis), especially when this yeast has colonized directly on or has become invasive into the mucosal tissues, can produce elevated concentrations of specific antibodies in the lgG, lgA, and lgM classes. Therefore, screening for anti-*Candida*-specific antibody and *Candida* antigens is appropriate. Test results should be interpreted according to the patient’s medical history.

**• lgG antibodies** – High concentrations of specific lgG antibodies against *Candida* species may indicate past or chronic infections. The lgG antibodies are the major class of human immunoglobulins and are evenly distributed throughout both our intra- and extravascular fluids. Specific lgG antibodies may linger for a number of years post-infection.

**• lgA antibodies** – These encompass only 15%-20% of human serum immunoglobulins, but are the primary antibody class in seromucus secretions. Elevated serum concentrations of specific lgA antibodies against *Candida* species are thought to correlate with mucosal epithelial, tracheobronchial, and genito-urinary candida infections.

**• lgM antibodies** – IgM antibodies reside primarily in our intravascular tissues and are generally considered the main immunoglobulins involved in early stage infections. Often, during reinfection, lgM antibody levels may not be as high as during the initial infection.

**• *Candida* antigen** – The detection of *Candida* antigen in serum is indication that mucosal and immunological barriers have been overwhelmed. In cases where *Candida* antigen is absent, *Candida* can’t necessarily be eliminated as a principle pathogen, nor does it completely exonerate *Candida* as the cause or exacerbation of your patient’s problems.

Sera antibody values within the Equivocal range are considered indeterminant. Following up with another test 2 to 4 weeks later can be useful. This assay does not speciate *Candida* but is sensitive to numerous pathological *Candida* species.

**Salivary Cortisol Test**

Ongoing psychological stress can cause the adrenal glands to overproduce cortisol, which in turn impairs immunity. After long periods of producing excessive cortisol, the adrenal glands may eventually “burn out,” and severely underproduce cortisol, which also lowers immune system function. This can leave patients susceptible to candidiasis.7 Therefore, a salivary cortisol test is warranted. (**Product: Adreno Care Plus & Stress Response**)

**HA1c**

This test will allow you to determine the average blood sugar levels for the individual over the last 90 to 120 days. By measuring HA1c a quantitative determination of average blood sugar levels and its role in fueling a potential candida infection or other infection can be elucidated. Higher blood sugars increase risk for candida overgrowth. (**Product: PRO Gluco Adjust**)

**Candida** **At-A-Glance Supplement Considerations**

**Eliminating Candida Overgrowth**

**(GUT 90-X)**

**Start with 1 capsules 2 times a day; gradually work up to 2 capsules 2 times a day.**

* Calcium Undecylenate
* Pau D’arco Extract (*Tabebuia avellanedae*)
* Enzymes (Cellulase, hemicellulase, proteases, serrapeptase, amylases, lipase, and chitosanase)
* Berberine
* Resveratrol
* Sorbic Acid

**Gut Healing**

**Multi-Prebiotic SS**

**2 capsules 2 times a day (does contain shellfish for N-acetyl glucosamine)**

* L-Glutamine
* Inulin
* Acacia Senegal
* N-Acetyl-D-Glucosamine

**Probiotics and Prebiotic for Biofilm Mitigation and Post-Antibiotic Support**

**ProBiotic Plus 1 capsule with smallest meal of day**

* Bifidobacterium bifidum
* Bifidobacterium breve
* Lactobacillus rhamnosus
* *Saccharomyces boulardii*

**GI DR-PRO 1 capsule 2 times a day way 30 minutes before meal or 60 minutes after (not for patients with ulcers or gastritis)**

* Glucoamylase
* Chitosanase
* Cellulase
* Hemicellulase
* Beta-Glucanase
* Protease/Peptidase, endopeptidase, exopeptidase, DPP-IV
* Lysozyme
* Serratia peptidase

***Candida* Protocol**

**Research Supporting Use of Recommended Supplements**

**Eliminating Candida Overgrowth**

**Calcium Undecylenate, Pau D’arco Extract (*Tabebuia avellanedae*), Enzymes (Cellulase, hemicellulase, proteases, serrapeptase, amylases, lipase, and chitosanase), Berberine, Resveratrol, Sorbic Acid**

Calcium Undecylenate has potent antifungal effects against *Candida*. It disrupts *Candida* biofilms,8 colonies of microorganisms that adhere to a surface and together are more resistant to antibiotics and antifungals compared to single microorganisms alone. It can inhibit the transition from the yeast form of *Candida* to the more pathogenic fungal form.9 Enzymes such as cellulase are also used in clinical practice to break down *Candida* cell walls while proteases assist with the digestion of proteins in yeast cell walls. Furthermore,berberine has been found to disrupt the cell wall membrane of *Candida*10 and it inhibits the alteration of *Candida* from yeast into the pathogenic fungal filamentous form.10 Pau D’arco Extract (*Tabebuia avellanedae*) also exhibits anti-*Candida* effects,11,12

while resveratrol induces apoptosis (programmed cell death) in *Candida* cells,13 blocks the formation of *Candida* biofilms, and interferes with already formed biofilms.14Sorbic acid is an antifungal agent that builds up in the cytosol of *Candida* cells where it disrupts the cellular pH and energy homeostasis.15

**Gut Healing**

**L-Glutamine, Fructooligosaccharides, Acacia Senegal, N-Acetyl-D-Glucosamine**

Passage of ions, water, and molecules through the intestinal wall is controlled by tight junctions of the epithelium. Disruption of this pathway can result in increased intestinal permeability (leaky gut), which can lead to the translocation of endotoxins from the intestines into systemic circulation.16

Glutamine is the most abundant free amino acid in human plasma and skeletal muscle.16 Its roles include serving as fuel for cells of the gut mucosa and immune system.16 Intestinal permeability is thought to increase after intestinal glutamine is depleted, and glutamine supplementation can strengthen the intestinal barrier.16 L-glutamine has been found in numerous human trials to reduce intestinal permeability.16-18

Fructooligosaccharides are prebiotics that work synergistically with probiotics to support intestinal health. Acacia Senegal (Gum Arabic) supports colon health and has been found to reduce colon tumors in mice.19 N-acetyl-D-Glucosamine strengthens the intestinal barrier.20 For example, in a study of rats with induced diarrhea predominant irritable bowel syndrome, the microvilli and tight junctions of intestinal epithelial cells were spaced more widely apart and the tight junction gap was widened.20 After treatment with N-acetyl glucosamine, the microscopic structure of the intestinal mucosa largely normalized.20

**Probiotics and Prebiotics for Biofilm Disruption and Post-Antibiotics**

**Bifidobacterium bifidum, Lactobacillus rhamnosus, Inulin, *Saccharomyces boulardii*, and Bifidobacterium *breve***

Restoring the gut microbiota during candidiasis can improve healing, while ongoing probiotic support can inhibit future *Candida* overgrowth. Lactic acid bacteria exhibits antifungal activity against *Candida*.21 A combination of *L. rhamnosus*, and *B. bifidum* was found to inhibit the colonization of the oral cavity with *Candida*in elderly denture wearers.22 One mechanism by which probiotics exert anti-*Candida* actions is through disruption of *Candida* biofilms.23,24 Prebiotics such as fructooligosaccharides fuel probiotic organisms and can have synergistic actions when combined with probiotics.

To offset the damaging effects of antibiotics on the gut microbiota and to discourage candidiasis, it is advised that patients taking antibiotics supplement with a high-dose post-antibiotic probiotic formula that includes *Saccharomyces boulardii*, *L. rhamosus*, *B. bifidum*, and *B. breve*. *S. boulardii* is a yeast-based probiotic that is not killed by antibiotics and is therefore especially supportive during antibiotic therapy.25

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**Diet**

The success of an anti-*Candida* protocol is greater if a patient adheres to an anti-*Candida* diet for three to six months. Avoiding carbohydrates is critical to restoring the health of patients with candidiasis. Carbohydrates feed yeast, as illustrated by the fact that bread needs yeast to rise. Fermented foods such as beer also require yeast, which is why fermented foods are excluded on a typical anti-*Candida* diet. This diet also excludes sugar, sweeteners of any kind including honey, white potatoes, and refined carbohydrates including baked goods and white pasta. Many practitioners also ask their *Candida* patients to avoid cheese due to the mold content. Eating foods that contain gluten is also discouraged. Permitted on the diet are organic meats, non-starchy vegetables, brown rice, and quinoa.

**Lifestyle**

Stress-reduction techniques such as meditation, yoga, and exercise can be highly beneficial, as stress and high cortisol levels can exacerbate *Candida*.

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