

Biofilm Protocol

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Biofilm is a polysaccharide-type matrix (think of a large gelatinous glob) secreted not only by pathogenic and opportunistic bacteria and yeast, but the normal bacteria (flora) in our digestive system as well. The opportunistic pathogens secrete biofilm as a defense mechanism to prevent immune detection which allows them to survive in an otherwise hostile environment.

Unfortunately, with expansion of abnormal bacteria and yeast biofilm, the normal flora in the digestive system can be reduced in number and overtime the digestive system becomes more stressed with increasing numbers of bad bacteria and yeast. In many situations these bacteria and yeast secrete toxins which adversely affect health. An example of biofilm in medicine is dental cavities. Bacteria in the mouth can produce biofilm which leads to cavity formation. A brand of mouthwash is available called Biotene (found in most drug stores) which is designed to help breakdown biofilm in the mouth.

The biofilm is held together by a combination of charged minerals (aka. ions) such as calcium, magnesium, and iron. In fact, iron seems to play a role in how many different types of pathogenic bacteria evade the immune system. Because the biofilm is charged with ionic minerals, they are vulnerable to a certain chelator called EDTA (ethylenediaminetetraacetic acid). The EDTA helps bind these ions which makes the biofilm less stable. The addition of specific enzymes helps to break down the polysaccharide matrix, and the combination of the two – enzyme plus EDTA – makes the bacteria and yeast encased in the biofilm sludge exposed and vulnerable to attack. This not only allows the immune system access to the hiding pathogens, but antibiotics, antifungals, or natural remedies such as herbs are now able to adversely affect the colonies of hiding bacteria and yeast.

The Biofilm Protocol is an intervention that can be employed in those individuals where conventional anti-bacterial or anti-yeast treatments have not resolved the issue. Listed here are a few things to consider with the use of this protocol:

Lack of stool culture findings for yeast and/or bacteria, but individual seems to improve when placed on antibiotics or antifungal medication.

- Adverse behavior in autism-spectrum disorders such as aggression, agitation, head-banging, and others, that is thought to be gut related, but no direct evidence of digestive pathogens.
- Individuals with Obsessive-Compulsive Disorder (OCD), perseverative and/or repetitive behaviors who tend to get worse in the spring and/or fall, yet do not test positive for strep infections.
- Persistent and unresolved yeast and/or bacteria as evidenced on Organic Acid Test from Great Plains Laboratory (such as arabinose for yeast or HPHPA for clostridia bacteria).

Listed below is an outline for the Biofilm Protocol. Please keep in mind that these steps are suggestions only and what is outlined is just an example of how certain supplements can be administered.

NOTE: See Suggested Supplement List at end of this document

Step #1 - Lysis (breakdown) and Detachment of the Polysaccharide Matrix, e.g., Biofilm

Take remedy on an empty stomach (30 to 45 minutes before food) minimally 30 to 60 minutes before Step #2

- **Interfase Plus** (*Klaire Labs*) – 2 to 4 capsules before or in-between meals (15 to 30 minutes prior or 90 minutes after meals).
- **Muco-Solve** (*True Healing Naturals*) – 1 to 2 capsules 2 times per day in-between meals (15 to 30 minutes prior to a meal).

NOTE: These combination products include specific digestive enzymes that help degrade the biofilm matrix, as well as disodium EDTA to help bind the biofilm matrix ions such as iron. Ideally, calcium, magnesium, and iron supplementation should be taken away from the Interfase Plus or Muco-Solve by at least 60 to 90 minutes since the sodium EDTA in the products could complex with these supplements minerals instead of what is in the biofilm itself.

Step #2 – Attacking the Microbe(s) – yeast and bacteria

- **Vancomycin (prescription antibiotic)** dosed at 7.5 to 15mg/kg per dose. If clostridia bacteria are present as HPHPA on Organic Acid Test or C. difficile toxin is detected on stool testing.

Example: 40lbs. child weighs 18 kilograms (kg). 18kg x 15mg = 272mg. Vancomycin commonly come in 125, 250, and 500mg capsules. Rounding down the 250mg capsule would be appropriate for this child. Vancomycin can be compounded into an oral suspension as well from specialized pharmacies. An alternative is Flagyl (Metronidazole) dosed at 3x/day too.
- **Strep Bacteria** – if you are suspicious that strep bacteria are causing continued problems, such as that seen in OCD, TIC's perseverative behavior than using a penicillin type medication such as amoxicillin may be warranted.
- **Other antibiotic (prescription) examples that could be used:** Alinia, Keflex, Zithromax
- **Diflucan (prescription antifungal)** dosed at 5mg/kg. Other options are Lamisil and Sporanox, or even Nystatin. Nystatin can also be used along with these medications or by itself to assist in biofilm reduction and keeping the yeast colonies off the wall of the intestinal mucosa. Nystatin should be dosed minimally three times daily, but can be given more often as well, i.e., 4 times daily. Example dosing of Nystatin is 250,000 to 750,000 units per dose – average 500,000 units.

- **Natural Remedies (herbs, supplements) which have both antibacterial and antifungal properties:**
 - Grapefruit Seed Extract
 - Oil of Oregano
 - Caprylic Acid
 - Uva Ursi
 - Combination Herbal Remedies for bacteria and yeast such as Biocidin (capsule, liquid), Candida Formula (capsule) or Candida Yeast Formula (liquid) – from New Beginnings – <https://nbnus.com>).

Step #3 – Cleaning Up

This is an important step in this biofilm intervention program.

Give the remedy(s) 1-2 hours after Step #2 if possible or at night (depending on when you give the biofilm protocol remedies). Step #3 is about binding the broken-down matrix debris, and other byproducts of yeast and bacteria die-off.

Also, because biofilm is held together by ions such as iron, calcium, magnesium, they may encase heavy metals as well such as mercury, aluminum, lead, etc. The EDTA that was used in Step #1 will help bind some of these toxins, but also the incorporation of other products listed below can help as well.

Remedy Examples:

All can be mixed in juice (or food) if needed.

- **Activated Charcoal** (approximately 400 to 500mg). This is best mixed in juice. 1 to 2 capsules twice daily.
- **Apple Pectin** – can be found at most health food stores. 1 to 2 tablespoons. Apple Pectin is another source of gentle fiber.
- **GI Detox+** - this binding formula supports enhanced clearance of endotoxins, metals, and xenobiotic compounds. Contains Zeolite Clay, Activated Charcoal, Aloe Vera Extract, MMST Silica, Apple Pectin, Humic and Fulvic acids. 1 to 2 capsules twice daily.

NOTE: In some cases, many different products at the same time can be used. One of the effects of these agents is to bind toxins generated in the gut and prevent them from being absorbed back into the body. Once these gut toxins are bound to one of these remedies, they are effectively eliminated through the stool.

Other Considerations:

As part of an ongoing intervention program the continuation of dietary modifications such as healthy and non-toxic foods (such as organic and hormone-free), as well as low sugar, gluten and casein-free, etc. is critical. The addition of other food items can be helpful as well to help promote normal flora and health to the digestive system:

- Cultured Vegetables
- Kefir – coconut milk
- Kombucha – this is a fermented tea product

Also, the use of probiotics, essential fatty acids, and other basic vitamins and minerals (multi-vitamin/mineral formula) is important.

If you are using an antibiotic such as Vancomycin, Amoxicillin, Keflex, etc. then the additional use of Nysatin (minimally) is recommended to prevent yeast overgrowth. Also, the use of natural anti-yeast herbs such as caprylic acid), grapefruit seed extract, oil of oregano, garlic extracts, etc. may also be effective.

Alternative Program:

At times the above listed protocol can be difficult to maintain because of the timing of supplement/medication dosing. A less often used, but potentially effective alternative program can be implemented to help with dosing compliance. All the remedies are the same, but the dosing schedule is a little different.

Step #1 – Give Interfase Plus/Muco-Solve and antibacterial and/or antifungal remedies (medications, herbs, supplements) at the same time 30 minutes before food.

Step #2 – Take the prebiotic fiber, e.g., Inulin, and probiotics (Probiotic Support Formula, TherBiotic Complete, Culturelle, etc.) together two hours away from the anti-biofilm/anti-pathogen remedies.

Step #3 – Use Activated Charcoal (1 to 2 capsules), or other binder as appropriate, e.g., GI Detox+ only as needed to help reduce or eliminate die-off reactions induced from the disintegration of biofilm bacteria and yeast. Make sure to dose away from food or other supplements. Die-off generally can manifest as increased irritability, hyperactivity, agitation, malaise, or a worsening of existing symptoms.

Final Comment:

The Biofilm Protocol is not necessarily done in isolation which means you would not want to discontinue or avoid other therapies such as dietary intervention (GF/CF, Specific Carbohydrate, Low Oxalate), Methyl-B12 therapy, etc. when doing this program. However, it is important to remember that the Biofilm Protocol is meant to eradicate suspected persistent infections that are not being resolved through normal measures. The process takes time, sometimes 2 to 6 months (longer in some cases) and should not be viewed as a short-term fix.

Also, each person is unique in how they will respond to this program. Some individuals who have deep-seated infections may experience irritability, agitation, or exacerbation of other chronic symptoms they have been experiencing in the initial stages of this program. These typical die-off reactions are not uncommon. Step #3 is important to help bind the intestinal toxins that are produced from pathogenic bacteria and yeast die-off.

Expect to do some experimentation with different remedies to find the right combination. The goal is to restore normal flora and normal flora biofilm in the digestive system. This takes time, and the process will not happen overnight. However, patience and persistence will pay-off over time. Whenever you are starting a new intervention, particularly one that involves the treatment of intestinal bacteria and yeast, it is important to start low and go slow. What this means is be patient with your approach as you implement more remedies. You can also increase the dosage of a supplement or herbal remedy overtime as the treatment process moves forward.

Suggested Supplement List:

New Beginnings (<https://nbnus.com>) or **877-575-2467:**

- **Interfase Plus®**
- **Muco-Solve®**
- **Activated Charcoal**
- **GI Detox™**
- **MycoPul®**
- **Grapefruit Seed Extract**
- **Oregano Oil (Oreganol)**
- **Caprylic Acid**
- **Uva Ursi**
- **Biocidin®**
- **Inulin**

Health Food Store:

Apple Pectin

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