



Lyme Protocol

It can be intimidating to work with the complexity and multisystemic nature of Lyme disease (Borreliosis). Diagnosis and management of these patients can be challenging for practitioners. However, there is a great need for informed, compassionate caregivers for this patient population, as they are often maligned by conventional medicine and may arrive at your office desperate for support. With some well-applied therapeutics, these patients can experience improvement and restored hope.

Lyme defines the infection caused by *Borrelia* species bacteria, transmitted by parasitic insect vectors. According to the CDC, it is the most common vector-borne disease in the United States with approximately 30,000 new cases reported each year,¹ although many integrative practitioners believe the number is significantly higher.

Transmission

The transmission of *Borrelia* organisms occurs within 10 minutes to 72 hours following a tick attachment. Ultimately, transmission rate depends on many factors: the type of tick (hard vs. soft), species, location of spirochetes in the tick, if the tick is partially fed (most are), and the health of the host's immune system.¹

Symptoms

A "bulls-eye" rash is considered diagnostic for *Borrelia* infection but is not present in every case. The rash is only seen in approximately one-third of people who contract Lyme.² Because of its ability to infect multiple body systems, Lyme frequently presents with other symptoms, including fatigue, headaches, fever, joint pain, arrhythmia, and neuropathy, including paresthesias.

If acute Borreliosis is not resolved, Lyme can become persistent. In its persistent stage, Lyme is known as the "Great Imitator" and can easily be confused with other illnesses and infections. Its symptoms often overlap with common chronic conditions such as myalgic encephalomyelitis (aka chronic fatigue syndrome), fibromyalgia, inflammatory arthritic conditions, MS, and more.

Complications

Once Lyme becomes persistent, it is important to provide support to all body systems involved. Here, we will focus on the application of botanicals and binders. For in-depth information, please see [this article](#) series by Dr. Emily Hernandez, ND.

A thorough intake must include assessment of the following areas:

- Immune regulation
- Inflammatory balance
- Sleep disturbances
- Gut barrier function
- Integrity of the blood-brain barrier
- Neuroinflammation
- Cardiovascular integrity
- Autonomic nervous system

¹ www.cdc.gov/lyme/index.html

² Buhner, Stephen Harrod. Healing Lyme: Natural Healing of Lyme Borreliosis and the Coinfections Chlamydia and Spotted Fever Rickettsiosis. 2nd ed., Raven Press, 2015, p.37.

Possible Coinfections² and Opportunistic Organisms

Coinfections refer to pathogens transmitted simultaneously with *Borrelia*. Careful consideration should be given to addressing coinfections, as well as previously existing opportunistic infections. Additionally, opportunistic organisms already present in the host can rise as the immune system is challenged by new microorganisms. In fact, coinfections can become opportunistic infections and present as flares or persistent illnesses causing the chronic conditions discussed earlier.

This is one of many reasons the broad-spectrum activity of botanicals is extraordinarily useful as a primary clinical tool. Biocidin® provides the combination of immunomodulation, removal of harmful organisms, biofilm disruption, and support for healthy inflammatory response.*

Possible Lyme Coinfectious Organisms	Possible Opportunistic Organisms
<i>Anaplasma</i>	EBV
<i>Babesia</i>	CMV
<i>Bartonella</i>	HHV-6
<i>Chlamydia</i>	HSV-1, HSV-2
<i>Ehrlichia</i>	Fungal (<i>Aspergillus</i> , <i>Candida</i>)
<i>Rickettsia</i>	
<i>Mycoplasma</i>	

Biofilms

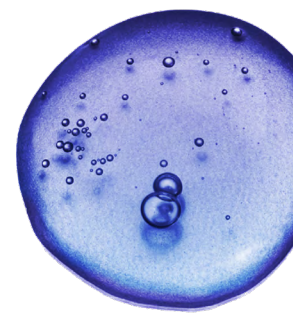
Addressing biofilms is often overlooked in clinical management of Lyme. Biofilms are communities of bacteria embedded in an extracellular matrix, making them resistant to eradication. They are responsible for most chronic and recurrent infections and contribute to toxic load and inflammatory burden. They can be found almost anywhere in the body.

Biofilms are a survival mechanism used to outmaneuver antimicrobials, antibiotics, and coinfections by *Borrelia* species. Research shows that Biocidin® has potent activity against biofilm communities, including *Borrelia* specifically.

See our [Biofilms Protocol Sheet](#) for more information.



*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.



Biocidin® *Borrelia* Research Summary

In vitro research evaluating the activity of Biocidin® and Biocidin® LSF on *Borrelia* species came to the following conclusions:

- Biocidin® Liquid and Biocidin® LSF are equally effective at inhibiting and eliminating all forms of *Borrelia* (97% cell death in 10 minutes).
- No apparent induction of pleomorphic or persister forms, unlike many antibiotics.³
- Biocidin® LSF demonstrated a 74% increased intracellular uptake over Biocidin® liquid (vital when managing intracellular pathogens).³
- Lyme biofilms were effectively eradicated.³
- Biocidin® Liquid and Biocidin® LSF both disrupt the efflux system of bacteria – a mechanism of resistance.³
- High level of synergy with Biocidin® LSF and Ceftriaxone.³

Chronic Lyme is multifactorial, affecting every system of the body; thus, an integrative and systematic approach is the best way to successfully support recovery. Besides nutrient and botanical therapies, lifestyle changes should be addressed. For chronic patients, using a low-and-slow approach and implementing therapies strategically and simultaneously is the best way to achieve remission.

See our [Product Usage Guide](#) for more details on titration.

There is no one approach that will work for every person, so evaluating each individual's presentation, labs, history, and symptoms will give the best insight into where to begin and how to build a successful support strategy.

Lifestyle Recommendations

- Stress support. Deep breathing, simplifying, and learning to say “no” are all ways to help balance cortisol and mitigate stress-induced inflammation.
- Include oral health evaluation and treatment as part of a strategy for whole-body microbial balance.

See our [Oral Health Care Guide](#) for more details.

- Evaluate lifestyle habits. Smoking, alcohol, and sugar consumption are all pro-inflammatory and cause neuroinflammation.
- Sleep disturbances. Maintain a healthy circadian rhythm to allow the immune response to work optimally against Lyme and other coinfections.

³ https://www.researchgate.net/publication/330317612_Effective_killing_of_Borrelia_burgdorferi_in_vitro_with_novel_herbal_compounds



Clinical Pearl #1 – Include Detoxification Support

Use a Binding Agent

Tick-borne pathogens generate proinflammatory mediators that increase toxic load. These must be eliminated through the liver via bile and the kidneys via urine. Additionally, biofilms harbor bacterial metabolites and toxins, including mycotoxins. (In fact, they are so sticky they are used for bioremediation of toxic waste sites!) Biofilms can impact patient comfort, compliance, and tolerance of a therapeutic protocol. When biofilms are broken down, the mobilized proinflammatory metabolites (toxins) may cause damage and inflammation to the surrounding tissues. Unfortunately, toxins bound to bile can be metabolized and reabsorbed via enterohepatic circulation once excreted into the small intestine. Including a binder, such as Biocidin Botanical's G.I. Detox[®]+, can prevent the reabsorption of toxins and reduce the burden on the liver, making detoxification more efficient, improving the patient experience, and promoting compliance.

Optimize liver and kidney function

Additionally, while treating Lyme and coinfections, consider including botanicals, such as those found in Liver GB+[™], to support the liver and kidneys, including:

Artichoke	Stimulates bile flow, enhances fat digestion, supports detoxification, liver and kidney health
Milk Thistle	Enhances absorption, detoxification, and digestion, protects liver and kidneys
Turmeric	Helps support & stimulate bile flow, protects and supports the liver and kidneys
TUDCA	Supports healthy bile flow and gallbladder health, protects and supports the liver, thins bile, protects kidneys
Ginger	Improves production and flow of bile, promotes gastric emptying and reduces intestinal transit time, helps ease indigestion, belching, gas, and feelings of fullness after eating, and protects kidneys

Clinical Pearl #2 – Chronic Pain is Connected to Oral Health

Poor oral health and oral dysbiosis are associated with an increased risk of systemic inflammation, which can increase the risk of chronic pain. Therefore, every patient presenting with chronic pain should be assessed for oral health and oral dysbiosis. Include a basic oral exam and questionnaire as part of your physical exam, and address oral dysbiosis.

- Here is our [Oral Health Exam](#) for functional practitioners.
- See our [Periodontal Disease Protocol](#) for more information.

Clinical Pearl #3 – Consider Inflammatory Foods and Food Sensitivities

Dietary factors can be direct or indirect causes of inflammation and are primarily important in chronic pain conditions. Functional abdominal pain disorders have been associated with food intolerance/malabsorption. Similarly, food sensitivities can activate an immune response, increasing the production of inflammatory cytokines, which may contribute to chronic pain. Food additives can further act as inflammatory mediators.

Food reactivity can be identified using food sensitivity testing or an elimination diet and symptom tracking. Following an elimination diet for a period of time often leads to an improvement in symptoms, and foods may eventually and gradually be reintroduced. The most common food sensitivities are lactose/dairy, gluten, FODMAPs (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols), soy, corn, eggs, coffee, yeast, wine, food colorings, preservatives, sulfites, and fructose.



Therapeutic Plan Suggestions

Lyme and Coinfections – Acute Support			
CORE PROTOCOL			
Biocidin® LSF, Biocidin® Liquid, or Biocidin® Capsules	Titrate to 3 pumps 4x/day	Titrate to 15 drops 4x/day	Titrate to 2 capsules 4x/day
G.I. Detox®+	2 capsules at bedtime. 1 hour away from food, supplements, and medications. Temporarily increase dose to 2 capsules 2-3x/day if Herxheimer reaction observed/worsens.		
Liver GB+™	2 capsules daily, 15-20 minutes before a meal. May be taken in divided doses.		
Olivirex®	Titrate to 2 capsules 2-3x/day for suspected co-infections		
ADDITIONAL SUPPORT			
Proflora® 4R	1 capsule any time		

Lyme and Coinfections – Chronic Support			
PROTOCOL INCLUDES 2 PHASES			
PHASE I: USE <u>BIOCLEAR® MICROBIOME DETOX PROGRAM</u> FOR 1-2 MONTHS FOR GUT SUPPORT			
CORE PROTOCOL			
Biocidin® LSF, Biocidin® Liquid, or Biocidin® Capsules	Titrate to 2-3 pumps 2x/day	Titrate to 10 drops 2x/day	Titrate to 2 capsules 2x/day
G.I. Detox®+	2 capsules at bedtime. 1 hour away from food, supplements, and medications. Temporarily increase dose to 2 capsules 2-3x/day if Herxheimer reaction observed/worsens.		
Liver GB+™	2 capsules daily, 15-20 minutes before a meal. May be taken in divided doses.		
Proflora® 4R	1 capsule any time		
ADDITIONAL SUPPORT			
Dentalcidin®	Brush 2-3x/day		
Dentalcidin® LS	Swish with 2 pumps for 1-2 minutes, then spit. Use 2-3x/day after flossing and before brushing.		
Dentalflora®	Dissolve 1 tablet in mouth daily at bedtime, at least 30 minutes away from other oral care, food, or drinks		

PHASE II: USE COMPREHENSIVE CLEANSING PROGRAM™ FOR APPROPRIATE DURATION

CORE PROTOCOL

Biocidin® LSF	Titrate to 2 pumps 2x/day
G.I. Detox®+	2 capsules at bedtime. 1 hour away from food, supplements, and medications. Temporarily increase dose to 2 capsules 2-3x/day if Herxheimer reaction observed/worsens.
Proflora® 4R	1 capsule any time
G.I. InnerCalm®	1 stick pack mixed in water, 1-2 times daily, taken any time
Olivirex®	Titrate to 2 capsules 2x/day
Biotonic®	20 drops 2x/day
Dentalcidin®	Brush 2-3x/day
Dentalcidin® LS	Swish with 2 pumps for 1-2 minutes, then spit. Use 2-3x/day after flossing and before brushing.
Dentalflora®	Dissolve 1 tablet in mouth daily at bedtime, at least 30 minutes away from other oral care, food, or drinks

Additional Therapeutics/Supplements

Detoxification	Liposomal glutathione, Smilax glabra, Milk thistle, Burdock, Schisandra, Dandelion, Taurine
Inflammation	Curcumin, Boswellia, Red Sage, Chinese Skullcap, Proteolytic enzymes
Immune System	Cordyceps, Astragalus, Colostrum, Immunoglobulins, Reishi
Antimicrobials	Teasel Root, Cat's Claw, Japanese Knotweed, Andrographis
Single botanicals offering targeted therapeutics may be used in addition to Biocidin® products. For more information, please contact our clinical team at clinical@biocidin.com .	

Questions?

For clinical questions, email clinical@biocidin.com

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