Lyme Disease

Dr. John Bergman

What is Lyme Disease?

"Lyme disease is caused by the bacterium Borrelia burgdorferi and is transmitted to humans through the bite of infected blacklegged ticks. The tick must be attached to its host for 36 to 48 hours to transmit the bacteria."

CDC

What are the Symptoms of Lyme Disease?

- Fever, chills, headache, fatigue, muscle and joint aches, and swollen lymph nodes
- Erythema migrans (EM) rash

Later Signs and Symptoms (days to months after tick bite)

- Severe headaches and neck stiffness
- Additional EM rashes on other areas of the body
- Arthritis with severe joint pain and swelling, particularly the knees and other large joints.
- Facial or Bell's palsy (loss of muscle tone or droop on one or both sides of the face)
- Intermittent pain in tendons, muscles, joints, and bones
- Heart palpitations or an irregular heart beat (**Lyme carditis**)
- Episodes of dizziness or shortness of breath
- Inflammation of the brain and spinal cord
- Nerve pain
- Shooting pains, numbness, or tingling in the hands or feet
- Problems with short-term memory

What is Lyme Carditis?

"Lyme carditis occurs when Lyme disease bacteria enter the tissues of the heart. The result is something physicians call "heart block," which can be mild, moderate, or severe."

How Common is Lyme Carditis?

- "Based on national surveillance data from 2001-2010, Lyme carditis occurs in **approximately 1%** of Lyme disease cases"

Can Lyme Carditis be fatal?

- "Yes. Between 1985 and 2008, medical journals reported **four deaths, worldwide**, as a result of Lyme carditis."

CDC

Lyme Disease Statistics

- **Lyme disease is the most commonly reported vectorborne illness in the United States.**
- This disease does not occur nationwide and is concentrated heavily in the northeast and upper Midwest.
- Each year, approximately **30,000 cases** of Lyme disease are reported to CDC by state health departments

CDC

How does the CDC get its Statistics?

- CDC uses the **best data available and makes reasonable adjustments—based on related data, previous study results, and common assumptions—to account for missing pieces of information.**
- To improve public health, CDC wants to know how many people are actually diagnosed with Lyme disease each year and for this reason has conducted two studies:

CDC

How does the CDC get its Statistics?

- Project 1 and Project 2 are two studies that estimated the number of people with Lyme disease based on **information reported to insurance companies and a survey of clinical laboratories.**
- Results of these studies suggest that the number of people diagnosed with Lyme disease each year in the United States is around **300,000**.

CDC

What Medical Treatments are available?

"Patients treated with appropriate antibiotics in the early stages of Lyme disease usually recover rapidly and completely.

Antibiotics commonly used for oral treatment include **doxycycline, amoxicillin, or cefuroxime axetil**. Patients with certain neurological or cardiac forms of illness may require **intravenous treatment with drugs such as ceftriaxone or penicillin.**"

CDC

What is Post-Treatment Lyme Disease Syndrome?

"It is not uncommon for patients treated for Lyme disease with a recommended 2 to 4 week course of antibiotics to have lingering symptoms of fatigue, pain, or joint and muscle aches at the time they finish treatment. In a small percentage of cases, these symptoms can last for more than **6 months**.

Although sometimes called "**chronic Lyme disease**," this condition is properly known as "**Post-treatment Lyme Disease Syndrome**" (PTLDS)."

CDC

What causes PTLDS?

"The exact cause of PTLDS is not yet known."

"Most medical experts believe that the lingering symptoms are the result of **residual damage to tissues and the immune system that occurred during the infection.**"

CDC

What Medical Treatments are available for PTLDS?

"Regardless of the cause of PTLDS, **studies have not shown that patients who received prolonged courses of antibiotics do better in the long run than patients treated with placebo.**

Furthermore, long-term antibiotic treatment for Lyme disease has been associated with serious complications. The good news is that patients with PTLDS almost always get better with time; the bad news is that it can take months to feel completely well."

CDC

Side Effects of Doxycycline

- severe headache, dizziness, blurred vision;
- fever, chills, body aches, flu symptoms, swollen glands, rash or itching, joint pain, or general ill feeling;
- urinating less than usual or not at all;
- diarrhea that is watery or bloody
- pale or yellowed skin, dark colored urine, fever, confusion or weakness;
- severe pain in your upper stomach spreading to your back, nausea and vomiting, fast heart rate;
- loss of appetite, jaundice (yellowing of the skin or eyes); 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 Amoxicillin

- white patches or sores inside your mouth or on your lips;
- fever, swollen glands, rash or itching, joint pain, or general ill feeling;
- pale or yellowed skin, yellowing of the eyes, dark colored urine, fever, confusion or weakness;
- severe tingling, numbness, pain, muscle weakness;
- easy bruising, unusual bleeding (nose, mouth, vagina, or rectum), purple or red pinpoint spots under your 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 Cefuroxime Axetil

- nausea, vomiting, stomach pain, mild diarrhea, gas, upset stomach;
- cough, stuffy nose;
- stiff or tight muscles, muscle pain;
- joint pain or swelling;
- headache, drowsiness;
- feeling restless, irritable, or hyperactive;
- white patches or sores inside your mouth or on your lips;
- unusual or unpleasant taste in your mouth;
- diaper rash in an infant taking liquid cefuroxime;
- mild itching or skin rash; or
- vaginal itching or discharge

More Side Effects of Cefuroxime Axetil

- diarrhea that is watery or bloody;
- fever, chills, body aches, flu symptoms;
- chest pain, fast or pounding heartbeats;
- unusual bleeding;
- blood in your urine;
- seizure (convulsions);
- pale or yellowed skin, dark colored urine, fever, confusion or weakness;
- jaundice (yellowing of the skin or eyes);
- fever, sore throat, and headache with a severe blistering, peeling, and red skin rash;
- skin rash, bruising, severe tingling, numbness, pain, muscle weakness;
- increased thirst, loss of appetite, swelling, weight gain, feeling short of breath; or
- painful or difficult urination, urinating less than usual or not at all.

Intravenous Antibiotic Treatment

- **Side Effects of Ceftriaxone**
- a hard lump where the injection was given;
- nausea, vomiting, upset stomach;
- headache, dizziness, overactive reflexes;
- pain or swelling in your tongue;
- sweating; or
- vaginal itching or discharge.
- diarrhea that is watery or bloody;
- fever, chills, swollen glands, rash or itching, joint pain, or general ill feeling;
- white patches or sores inside your mouth or on your lips;
- unusual bleeding (nose, mouth, vagina, or rectum), purple or red pinpoint spots under your skin;
- skin rash, bruising, severe tingling, numbness, pain, muscle weakness;
- pale or yellowed skin, dark colored urine, confusion or weakness;
- urinating less than usual or not at all;
- seizure (convulsions);
- swelling, pain, or irritation where the injection was given;
- chalky-colored stools, stomach pain just after eating a meal, nausea, heartburn, bloating, and severe upper stomach pain that may spread to your back; 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 IV Penicillin

- fever/chills
- rash, itching/swelling (especially of the face/tongue/throat)
- severe dizziness, trouble breathing
- worsening of skin sores
- fast heartbeat, fast breathing, Flushing
- joint/muscle pain, muscle weakness, swelling of ankles/feet
- dark/cloudy urine, change in the amount of urine
- extreme tiredness
- fast/slow/irregular heartbeat
- new signs of infection (e.g., fever, persistent sore throat)
- easy bruising/bleeding
- numbness/tingling of arms/legs
- seizures, uncontrolled movements, confusion

FDA Warnings for IV Penicillin

"Skin rashes ranging from maculopapular eruptions to exfoliative dermatitis;urticaria; and reactions resembling serum sickness, including chills, fever,edema, arthralgia and prostration. Severe and occasionally fatal anaphylaxis has occurred"

"Hemolytic anemia, leucopenia, thrombocytopenia, nephropathy, and neuropathy are rarely observed adverse reactions and are usually associated with high intravenous dosage. Patients given continuous intravenous therapy with penicillin G potassium in high dosage (10 million to 100 million units daily) may suffer severe or even fatal potassium poisoning, particularly if renal insufficiency is present. Hyperreflexia, convulsions, and coma may be indicative of this syndrome.

Cardiac arrhythmias and cardiac arrest may also occur. (High dosage of penicillin G sodium may result in congestive heart failure due to high sodium intake.)"

Could the Antibiotics be causing symptoms of Lyme Disease?

- Symptoms of Lyme Disease
- Fever, chills, headache, fatigue, muscle and joint aches, and swollen lymph nodes
- Erythema migrans (EM) rash

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- Arthritis with severe joint pain and swelling, particularly the knees and other large joints.
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- Inflammation of the brain and spinal cord
- Nerve pain
- Shooting pains, numbness, or tingling in the hands or feet
- Problems with short-term memory

So What do we know about Lyme Disease so far?

- Lyme disease is caused by the bacterium Borrelia burgdorferi
- The tick must be attached to its host for 36 to 48 hours to transmit the bacteria
- There are only an average of **30,000 confirmed cases** of Lyme Disease annually
- There could be as many as **300,000 according to estimations from studies**
- The symptoms of late stage Lyme Disease could be a result of antibiotic usage

So What do we know about Lyme Disease so far?

- According to the CDC, about 10-20% of Lyme disease patients treated with antibiotics for the recommended 2-4 weeks experience adverse health effects, such as fatigue, pain, or joint and muscle aches.
- In some of these patients, the adverse effects last for more than 6 months. **These patients are often labeled with "chronic Lyme disease," or "post treatment Lyme disease syndrome."**

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

The Business of Antibiotics

"Over **$10.7 billion** was spent in 2009 on antibiotic therapy in the USA"

Journal of Antimicrobial Chemotherapy

"The use of antibiotics is the single most important factor leading to antibiotic resistance. Up to 50 percent of all the antibiotics prescribed for people are not needed or are not prescribed appropriately."

"Studies have estimated that, in the United States, antibiotic resistance adds **$20 billion** **in excess direct healthcare costs**."

CDC Press Release

Are Antibiotics even Effective for Lyme Disease?

- B. burgdorferi has a complex life cycle, and can exist in radically different forms: spirochetes, spheroplast (or L-form which lacks a cell wall), round bodies or cyst form (which allows for dormancy and escaping PCR detection), and highly antibiotic-resistant biofilms.

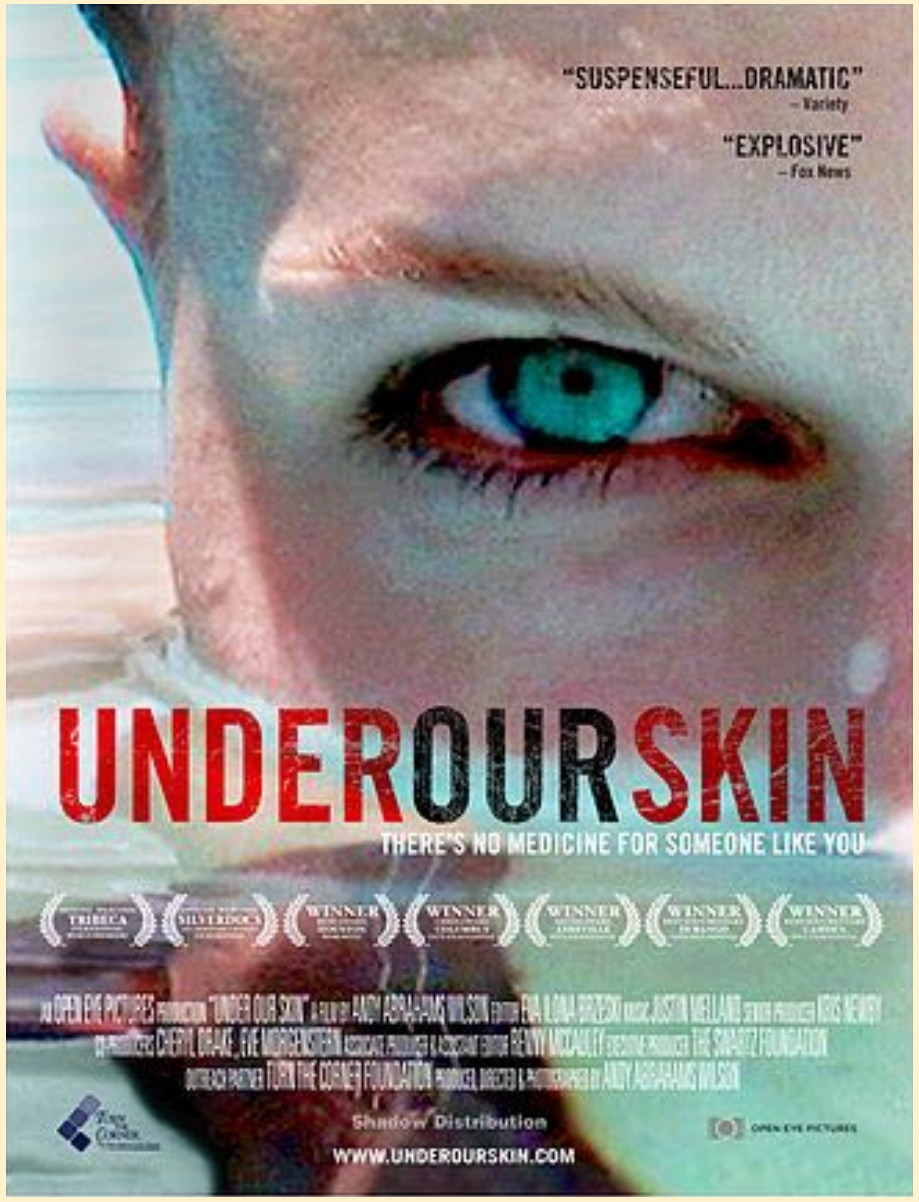
- This pleomorphic property makes conventional treatment exceptionally difficult because **while some conventional antibiotics are effective against forms with a cell wall such as spirochetes, they are ineffective against those without a cell wall.**

The Complexity Lyme Disease

- This enables B. burgdorferi to change form to evade eradication through conventional means.
- **Biofilm formation creates a significant barrier against most conventional antibiotics**, even when used in combination, and has been recently suggested to be the most effective mechanism of resistance.

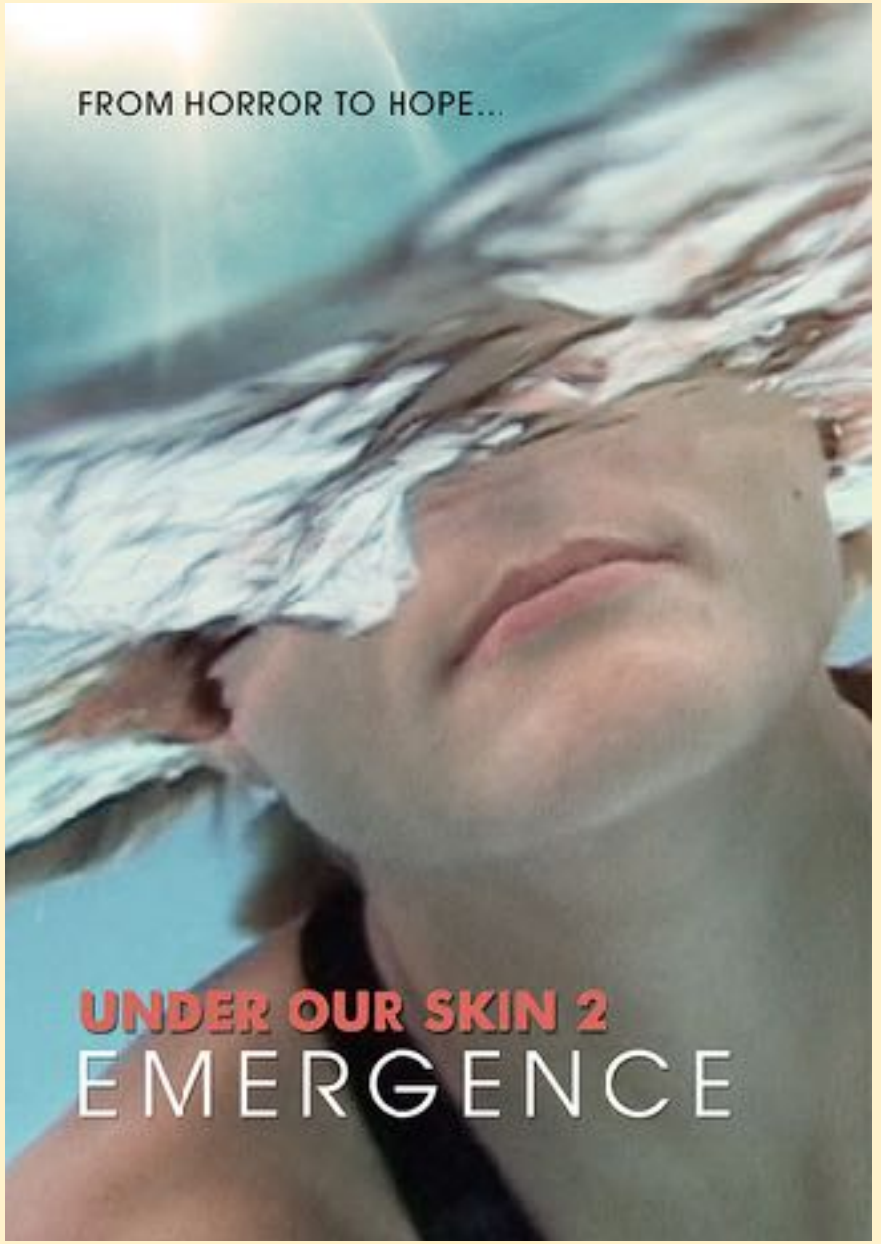
Why Are Doctors Prescribing Antibiotics?

"A chilling tale of microbes, medicine and money, this Oscar shortlisted film has changed the landscape of the Lyme epidemic, bringing unprecedented awareness in an engaging and accessible way. The definitive record of the Lyme controversy, UNDER OUR SKIN exposes a hidden story of medical and scientific malfeasance and neglect."



The Controversy of Lyme Disease

This highly-anticipated sequel investigates the deepening Lyme disease crisis and follows its casualties and controversies around the world. As the Lyme epidemic explodes globally, medical collusion and conflicts of interest incriminate the very healthcare systems meant to protect us. Despite the obstacles that researchers, physicians and patients continue to face, promising new findings are emerging.



The Real Cause of Lyme Disease

- A weakened Immune system
- An Unhealthy Microflora
- Inhibited cellular function and protection

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

Avoid Disruptions to Your Microflora and Immune System

- Vaccinations
- Antibiotics
- Medications
- Processed Foods

Antibiotics

Confined animal feeding operations (CAFO's)

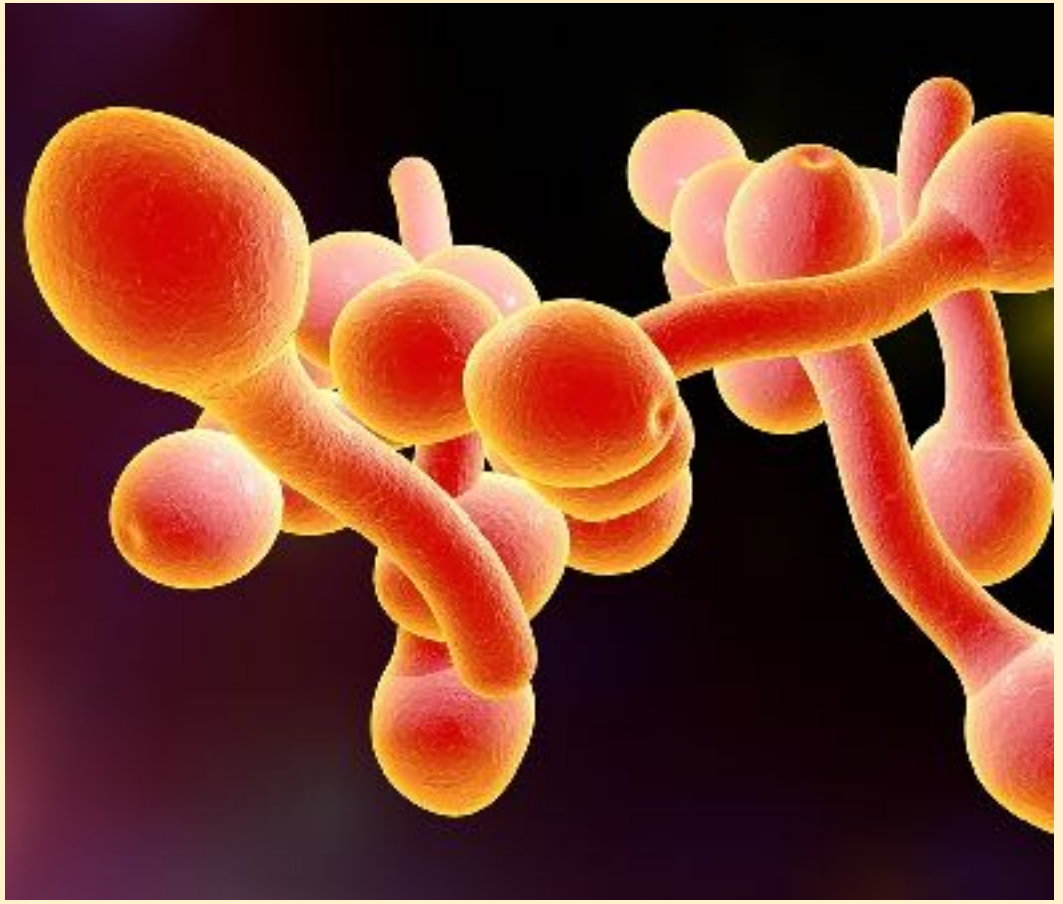
- American factory farms used ***29 million pounds*** of antibiotics in 2009 alone
- Estimated non-therapeutic use of antibiotics in livestock accounted for **70 percent** of the total antibiotic use (FDA)

Effects of Antibiotics

- 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**



Dangers of Glyphosate

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

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

Stevia and Lyme Disease

"Stevia whole leaf extract, as an individual agent, was effective against all known morphological forms of B. burgdorferi."

"The leaf extract of Stevia possesses many phytochemicals, which include austroinullin, β-carotene, dulcoside, nilacin, rebaudi oxides, riboflavin, steviol, stevioside, and tiamin with **known antimicrobial properties against many pathogens**. The role of these compounds is mainly to protect the plant from microbial infection and adverse environmental conditions"

European Journal of Microbiology and Immunology

Stevia and Lyme Disease

- The researchers explored Stevia's potential effectiveness against B. burgdorferi cultures, comparing it to three common antibiotics sometimes used to treat Lyme's disease: doxycycline, cefoperazone, daptomycin, as well as their combination.

- The study found that the most **antibiotic resistant form of B. burgdorferi, the biofilm form, *actually increased* in mass when individual antibiotics were administered**. Stevia, on the other hand, reduced the biofilm mass on both tested surfaces (plastic and collagen) by about 40%

Stevia and Lyme Disease

- The stevoside extract, by itself, was not found to be an effective antimicrobial agent against B. burgdorferi; nor did it have any effect on resistant cells.
- Mass market stevia products, including Coca-cola's Truvia, would not, therefore, have the medicinal property associated with the whole herb extract.

“Results from this study suggest that a natural product such as Stevia leaf extract could be considered as an effective agent against B. burgdorferi."

European Journal of Microbiology and Immunology

Essential Oils For Lyme Disease

Clove Oil

- a 2014 study of the effect that citronella and clove oils have on ticks, clove came out on top. While citronella was reasonably effective, clove outperformed it substantially with over 90% efficacy
- Try adding 8 drops of clove essential oil per 1 oz of coconut oil and apply throughout your body before hiking and spending time outdoors.

Oregano Oil

- Has powerful antibacterial effects and can be applied topically but it must be diluted because it’s very harsh on the skin

Essential Oils For Lyme Disease

Vetiver

- Like clove, vetiver essential oil seems to be more effective against ticks than citronella.
- *Mix 30 drops of vetiver in a 16 oz spray bottle with tap water. Spray around the openings to your home (windows, doors, etc.); use diluted topically with clove.*

Garlic

- Researchers looked into this more closely by extracting the essential oil from garlic bulbs to test against ticks. Upon exposure to garlic essential oil, tick mortality rates were nearly 100%

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)

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

Omega 3

- **Animal based Omega 3: Sardines, Mackerel, and Anchovies**

"Among the fatty acids, it is the omega-3 polyunsaturated fatty acids (PUFA) which possess the most potent immunomodulatory activities, and among the omega-3 PUFA, those from fish oil—eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)—are more biologically potent than α-linolenic acid (ALA)."

"Animal experiments and clinical intervention studies indicate that omega-3 fatty acids have anti-inflammatory properties and, therefore, might be useful in the management of inflammatory and autoimmune diseases."

Journal of the American College of Nutrition

Iodine

- Iodine deficiency is one of the three most common nutritional deficiencies, along with magnesium and vitamin D

Functions of Iodine

- Stabilization of metabolism and body weight
- Optimization of your immune system
- **Is a potent anti-bacterial, anti-parasitic, anti-viral and anti-cancer agent**

Solution For Iodine Deficiency

- Iodine supplementation or adding sea vegetables to your diet.
- **Non-commercially harvested seaweeds**
- 5 grams a day or about one ounce per week
- Tyrosine, selenium, vitamins A and D, zinc, B vitamins, and omega-3 fats are all needed in order to utilize iodine properly

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

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)

Vitamin A and E

"These results may suggest that low serum concentrations of **vitamin A and E may have influence on Borrelia burgdorferi infection development.**"

Przegląd Epidemiologiczny
(Journal of Epidemiology)

"**Vitamin A deficiency** predisposes the host for a strong inflammatory response, suggesting that it may foster susceptibility to diseases, such as **Lyme arthritis**, in which activated macrophage and inflammatory cytokine production are pathogenic."

Journal of Infectious Diseases

Sources of Vitamin A

- Beef Liver
- Carrots
- Sweet potato
- Kale
- Spinach
- Apricots
- Broccoli
- Butter
- Eggs
- Winter Squash

Natural Sources of Vitamin E

- Almonds
- Spinach
- Sweet Potato
- Avocado
- Wheat germ
- Sunflower seeds
- Palm oil
- Butternut squash
- Trout
- Olive Oil

Carnitine and Lyme Disease

"Lyme borreliosis (LB) is a serious infectious disease. Carnitine plays a crucial role in metabolism and inflammatory responses. Carnitine may be important in improving neuronal dysfunction and loss of neurons."

Conclusion:

"**LB patients exhibit a significant decrease of their serum carnitine concentrations**. The largest changes were in the neuroborreliosis (NB) and post-Lyme disease (PLD) patients. To prevent late complications of the disease a possibility of early supplementation with carnitine should be considered."

Postępy Higieny i Medycyny Doświadczalnej

(Progression of Experimental Hygiene and Medicine)

Sources of Carnitine

- Red Meat (highest source)
- Pork
- Seafood
- Chicken
- Dairy (raw dairy)
- Nuts
- Seeds
- Artichokes
- Asparagus
- Broccoli
- Brussels sprouts
- Collard green
- Garlic
- Mustard greens

Vitamin C and the Immune System

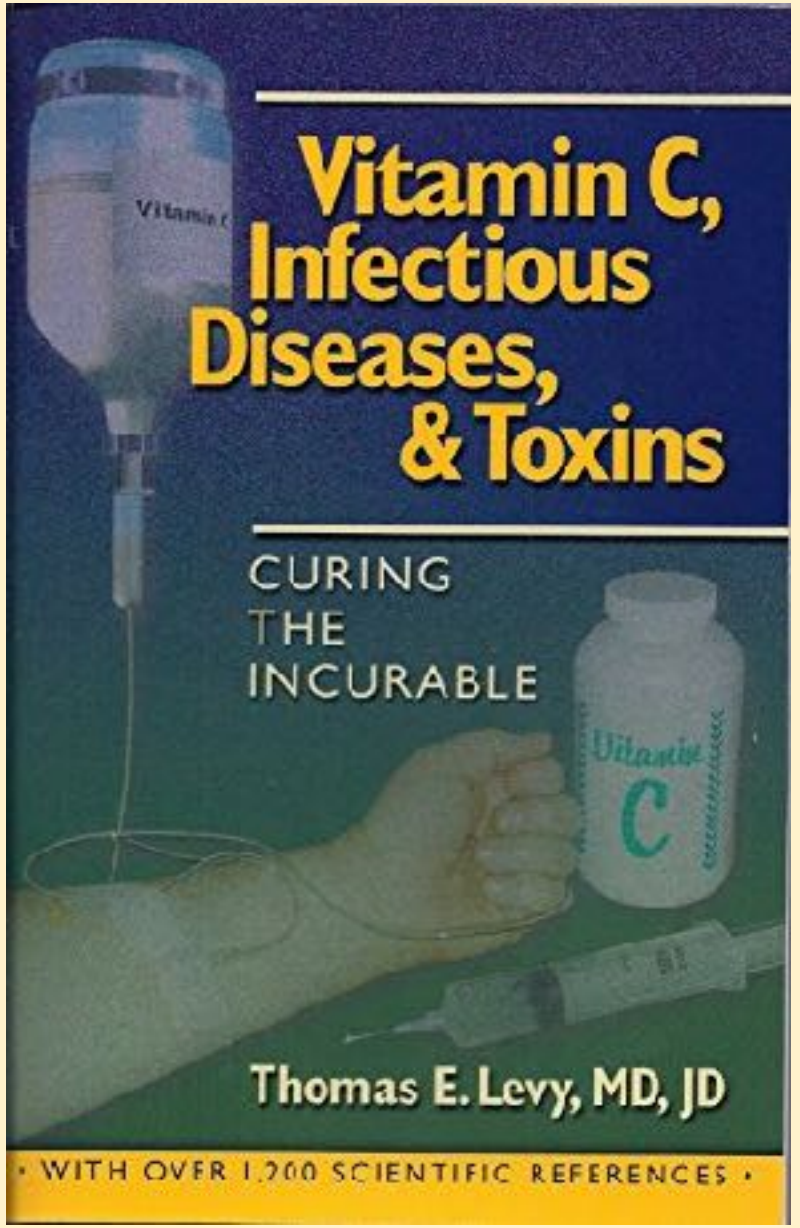
- Vitamin C supports the production of interferons. Interferons are produced when the presence of pathogens is detected. They facilitate the ability of cells to launch protective cellular defenses.
- Vitamin C enhances the function of phagocytes. Phagocytes are a type of white blood cell that envelop pathogens and other dangerous particles. Once the invaders are captured in this manner, they are enzymatically digested.
- Vitamin C neutralizes oxidative stress
- Vitamin C supports the cell-mediated immune response.
- Vitamin C supports antibody production and activity

Natural Sources of Vitamin C

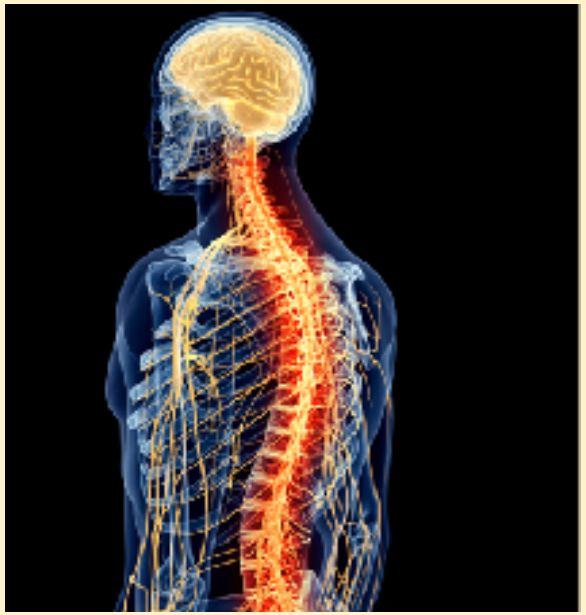
- Oranges
- Red Peppers
- Kale
- Brussels Sprouts
- Broccoli
- Strawberries
- Grapefruit
- Guava
- Kiwi
- Green Peppers

Intravenous Vitamin C

- **Vitamin C works when all else fails**
- This book has over 1,200 scientific citations
- Dr. Levy explains how IV vitamin C has been used to cure several “incurable” conditions



The 5 Keys to Health and Healing



Proper nerve supply

Regular Exercise

Proper Nutrition

Sufficient Rest

Prayer and Meditation

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