

A Sour Twist of Lyme

The Ticking Time Bomb of the Lyme Epidemic

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A few summers ago, after experiencing four days of a very high fever followed by intense chills, I was diagnosed with Lyme disease (LD). I live in the very small wooded Massachusetts town and in the months following my diagnosis and recovery, though I have been treating LD in my practice on and off for 10 years, I was astonished by the large number of friends and neighbors who shared with me that they, too, had been recently infected with Lyme. The stories I was hearing were so dramatic and recent that LD was clearly on a major up-swing...people spoke of having debilitating symptoms, months of recovery, intravenous antibiotics and more. I began to research and ask more questions. Where had this disease originated? Why is it so mysterious, misdiagnosed, and misunderstood? Why are the symptoms so varied? I began to update myself and read lots of books and articles about this unusual tick-borne illness. I discovered that the prevalence of Lyme in our area is increasing at astounding rates. It has become clear to me that there remains a lot of mystery about Lyme, and that there is a growing need to understand treatment options, and that we need to educate ourselves about prevention. In this article I will explain what I have learned and to try to make some sense about integrative treatment options and give some prevention guidelines.

Lyme disease (LD) is an infection caused by *Borrelia burgdorferi*, a type of bacterium called a spirochete that is carried inside the stomachs of ticks. These ticks are in turn, carried by deer, mice and chipmunks. (Ticks can be as small as the period at the end of this sentence, sometimes barely visible to the naked eye.) Transmission has also been confirmed to come from mites, and biting flies. When an infected tick bites, it can take up to 12 to 48 hours of feeding to transmit the spirochete bacteria. The degree of infection and how severe or chronic the symptoms become is directly related to the health of our immune system. If left un-treated or un-defeated by our immune system, and a beachhead is established, this amazing stealth bacterium can thrive and multiply. It travels through the bloodstream, and tries to establish itself in various body tissues. It has a special affinity for joints, collagen in skin, knees, (causing joint pain and swellings,) the aqueous humor of the eye, the meninges of the brain and heart tissue.



LD is called the “New Great Imitator” because, like syphilis, it attacks multiple organ systems and mimics many diseases. (Both diseases are caused by a spirochete.) If ignored, the early symptoms may disappear but more serious problems can develop

months, even years later. LD has been linked to over 300 diseases including Parkinson's, MS, ALS, Chronic Fatigue Syndrome and Fibromyalgia.

Many of us have heard of the “bull’s eye rash,” the known indicator that we’ve had a tick bite. The “bull’s-eye” usually appears 3 to 30 days after infection; however this is not fool proof; I have discovered that only 30-50% of those infected have had such a rash. (In my case there was no bulls-eye or sign of a bite). Some of us may also know that LD can produce arthritic-like symptoms; yet most are really surprised to learn that if left unchecked, it can become chronic. In these cases, symptoms may cover a broad spectrum, often appearing similar to other diseases, which can camouflage accurate diagnoses. Symptoms can range from meningitis, Bell's palsy, heart problems, nervous system abnormalities, neurological complications, headaches, depression, disturbances in memory, and disruption of sleep.

LD was first recognized in the United States in 1975 by Dr. Allen Steere, following a “mysterious” outbreak of juvenile rheumatoid arthritis near the community of Lyme, Connecticut. The rural location of the Lyme outbreak and the onset of illness during summer and early fall, suggested that the transmission of the disease was by an insect, or tick. It was only in 1982 that researchers began to connect the dots. The trouble causing bacterium was discovered by Dr. Burgdorfer, who had the dubious honor of giving his name to this formidable spirochete, *Borrelia burgdorferi* (*Bb*). Since then, reports of LD have increased dramatically to the point where the disease has become a critical public health concern in some areas of the United States. Today, LD is the most prevalent tick-borne illness in the United States, spreading in a concentric circle from its epicenter, Lyme, CT, and infecting the suburban and rural Eastern seaboard at an alarming epidemic-like rate.

Presence of co-infections that go along on LD's ride

Other tick-borne infections can further complicate an already complex picture. *Bb* may be co-transmitted with *Babesiosis*, *Ehrlichiosis*, and *Bartonella* co-infections. One study found, that 1-in-5 were seropositive for *Bb* also *Ehrlichiosis* (DeMartino, Carlyon et al. 2001). 10%-to-60% for *Babesiosis* (Rubel, 2003c; Kraus, McKay et al, 2002).

How fast is this danger to ourselves and our families growing?

Dan Kinderleher, M.D., an expert on Lyme disease, stated on the Today Show on June 10, 2002, that the number of cases may be 100 times higher than reported (With eighteen million in the United States alone).

Kenneth Singleton, M.D., in his book, The Lyme Disease Solution, reports, that... “In 2005, there were potentially more than 460,000 new cases of Lyme disease.” However, in order to report a case to the Center for Disease Control and Prevention, [CDC] it takes 3 blood tests. Most people, (myself included), test positive to antibodies (giving proof that dead spirochetes have been cleaned-up,) and having no further symptoms, do *not*

go on to get the second and third tests. Many researchers therefore believe that the real numbers the CDC reported should be much higher.

The double whammy that spikes the LD infection rates.

Two major factors contribute to the vast spread of LD. One, the deer population has increased extensively. Since 1900, the U.S. deer population has multiplied 70-80 times, from 500,000 to 35-40 million, providing the environment that contributes to a wild-fire spread of LD. Along with this, the percentage rate of infection of ticks has increasing alarmingly. The increasing hidden epidemic lurks in our back yards, woods and hiking trails. Add to this the school of medical thought that is denying the existence of chronic Lyme, and we have a potent mix for a dangerous epidemic. *The time bomb is ticking*

In one of the few counties in the country where long-term studies have been done, an increase of infection of ticks 41.5% nymphal-tick stage was reported. The more that deer ticks are infected, the more people will become infected. The infection rate of ticks and people seems to be increasing dramatically, carried farther a field, every year by deer.

New Jersey infection rate of ticks doubles over four years.

In a random selection of ticks in 2004 in New Jersey, results showed that 33.6% tested positive for *Borrelia burgdorferi* (Bb), (Adelson, Rao et al., 2004). Recently in May of 2008, the Connecticut Easton Courier reported, "The average infection rate of ticks collected from multiple sites was reported at 60%; 78% at one location." That's an increase in the infection rate of ticks that has doubled over 4 years!! *The time bomb is ticking louder...*

A few towns are beginning to form alliances to better manage deer and understand ticks and their lyme infections. There are 14 towns in the alliance in Connecticut, the Courier also states, "Previously reported rates of infection in ticks have been in the range of 22% to 38% over the last four years. Increasing winter survival of deer and reduced hunting in the suburbs is contributing to the growing populations of ticks in our towns," said Dr. Georgina Scholl, the Alliance's research chairman. Clearly the infection rate within ticks is rapidly increasing and therefore increasing our exposure to LD. "It was as high as 78% at one site."

Massachusetts, 109% increase over 2006

Acton, MA. 5% infection rate;

Dover, MA. 10% infection rate;

Nantucket, MA. 100% increase since 2006.

In 2007, Massachusetts reported 2,988 blood test confirmed cases to the CDC; making the actual number well over 30,000 infected. Showing an increase of 109% over 2006. (lymediseaseassociation.org)

According to the Acton Health Department, in fiscal year 2008, there were 83 blood test-confirmed cases of LD in Acton, compared to just 19 the year before. So let's take Acton's population of 20,000 with a possible infection rate of ten times the reported number! That's an infection rate increase up by 400% in the last year. Approximately 5% of Acton could be infected.

Quoted recently in the Dover Sherborn Press, Dr. Kruskall at Metro West Medical Center, and a Dover resident, said "Dover is ground zero for Lyme disease in Massachusetts, in my experience. I would venture to say that 10 percent of Dover residents have had Lyme disease, and that's a horrendous number. Dr. Kruskall goes on to say, "...up to 500 deer may need to be killed or removed from Dover."

According to the Boston Globe, "Nantucket is reporting a spike in cases of Lyme disease, with 262 people already diagnosed this summer of 2008, up nearly 39 percent from last year, with time (4 more months left) to climb." This is a 100% increase in infection over 2006! (Multiply that number by 10, and you get the true probability.)

It appears we are reaching a tipping point of a pandemic. We need an urgent effort to reach out and educate people, especially in high risk towns and for those with high risk jobs.

In my opinion, it is not the deer alone that create the biggest risk factor, it is our pets. It is our beloved dogs and cats that are carrying the ticks into our homes. If we let our pets up on the furniture and beds, the risk factor increases again.

Three Stages of LD identified

1. Early Infection. Some get a bull's-eye rash. However, not all rashes that occur at the site of a tick bite are due to Lyme disease. An allergic reaction to tick saliva can be the trigger.



2. Spreading Stage. Occurs days-to-weeks following infection. At this stage the spirochetes spread through the blood to other far-flung body tissues. Often those infected complain of: fatigue, chills and fever, headache, muscle and joint pain, swollen lymph nodes, secondary annular skin lesions.

3. Persistent Infection. Some symptoms and signs of Lyme disease may not appear until weeks, months, or years after a tick bite. This typically involves intermittent episodes of joint pain, meningitis, Bell's palsy, cardiac involvement, migratory pain to joints, tendons, muscle and bone. Arthritis-like symptoms, especially in the knees is common, also erosion of cartilage and/or bone. Nervous system abnormalities can include numbness, pain, and depression, disturbances in memory, mood, or sleep patterns, and sensations of numbness and tingling in the hands or feet. Neuro-psychiatric symptoms are common, due to brain swelling.

Joseph Burrascano, MD, known for his work on Lyme, defines chronic Lyme disease: "To be said to have chronic LB (Lyme Borrelia), these three criteria must be present:

1. Illness present for at least one year (this is approximately when immune breakdown attains clinically significant levels),
2. Have persistent major neurological involvement (such as encephalitis/encephalopathy, meningitis, etc.) or active arthritic manifestations (active synovitis),
3. Still have active infection with *B. burgdorferi* (Bb), regardless of prior antibiotic therapy (if any)."

Blood Tests are not 100% accurate because Bb is known to dwell deep within the body's tissues, making it really difficult for proper detection. If that's not bad enough it shape-shifts... Bb is known as "polymorphic", meaning that it "morphs" into different forms in the body. Three forms are known to date including: *spirochete*, *spheroplast* and *cyst forms*, probably the result of an evolutionary adaptation to stressful environments where the organism can change into "dormant" forms to avoid harsh conditions. They gravitate to areas in the body that exhibit a high density of fatty acids such as the brain, and feed there. Spirochetes also utilize sugar as an energy source which is why a diet low in sugar intake is recommended during treatment to prevent further proliferation.

Bb also has an uncanny ability to "evade" the immune system by hanging-out deep within tissues and in areas such as joint capsules that are insulated from immune system effects. This may be one of the reasons that LD can be a "latent" infection that requires some sort of "trigger" to initiate symptom onset. Other factors such as the strength of the host's immune system, the spirochetal load inserted at the time of the tick bite, and the presence of co infections may contribute to a "dormant" appearance of the disease. Nonetheless, silent proliferation of the bacteria over time can render a host chronically ill with fatigue, malaise and a plethora of other disabling symptoms.

The CD-57 Test

Dr. Burrascano also states: "Our ability to measure CD-57 counts, represents a breakthrough in LB, (Lyme Borrelia) diagnosis and treatment. Chronic LB infections are known to suppress the immune system and can decrease the quantity of the CD-57 subset of the natural killer cells. In HIV infection, abnormally low T-cell counts are

routinely used as a marker of the activity level of the infection; in LB, we can use the degree of decrease of the CD-57 count as an indicator how active the Lyme infection is and whether, after treatment ends, a relapse is likely to occur. It can even be used as a simple, inexpensive screening test, because at this point we believe that only *Borrelia* (Bb) will depress the CD-57. Thus, a sick patient with a high CD-57 is probably ill with something other than Lyme, such as a co-infection.”

More evidence has accumulated indicating the severe detrimental effects of the concurrent use of immunosuppressant drugs, including steroids in the patient with active *B. burgdorferi* infection. Many LD friendly M.D.s believe strongly that steroids or any other immunosuppressant should never be given to any patient who may even remotely be suffering from LD, because serious, permanent damage may result, especially if given for anything greater than a short course.

LD's Minefields

I want to offer some background information about the two major controversies bubbling around LD. One is related to the two warring conventional treatment camps. And the second is related to the location of what is known as the epicenter of the disease... Lyme, Connecticut.

1. Conflicting Medical Treatment Camps Confuse Patients

One conventional medical camp the Infectious Disease Society of America (IDSA) says for treatment of Lyme, take 10 to 21 days of antibiotics and you are cured! The other says LD can be chronic for many years. The existence of chronic and persistent LD is hotly debated in medical communities. The 2006 guidelines of the IDSA denies a need for long-term treatment, effectively leaving chronic LD sufferers high and dry, recommending no more than 21-28 days of antibiotic treatment, (after that, its all in your head). Many health professionals and researchers in this camp, claim that chronic LD is over-diagnosed and not only that, it will censure MDs practicing outside of their guidelines.

In the other camp, are the Lyme-literate health practitioners, the International Lyme and Associated Diseases Society (ILADS) takes a much more progressive approach to treatment and diagnosis, claiming under-diagnosis is rife among non-Lyme-literate-medical-professionals and that long-term antibiotic treatment may be necessary. Many chronic LD sufferers have found themselves cut-off by their insurance companies and their MDs because of IDSA guidelines.

However, things are shifting. An investigation by the Attorney General of Connecticut forced the IDSA to re-consider. Attorney General Richard Blumenthal's antitrust investigation has uncovered serious flaws in the Infectious Diseases Society of America's (IDSA) process for writing its 2006 LD guidelines and the IDSA has agreed to reassess them with the assistance of an outside arbiter.

2. LD's Lyme, Connecticut Origin Controversy

Enter the conspiracy theorists. Some things to consider: the LD bacteria, Bb is an ancient bacteria, estimated to have lived in ticks for a 100 million years (Buhner). There is some evidence of Bb in the Tchefuncte Indians of Louisiana between 500 BCE and 300 CE and, Bb may have spread to Europe around 1492. So, these bacteria have co-existed with humans causing disease for quite a while. Why, then, did it spring up suddenly in 1976 in a cluster of juvenile arthritis cases? Why is Lyme, Connecticut the epicenter? Since 1976, Bb has spread out, like a wild fire in a concentric circle from Lyme, Connecticut.



Hmmm...

Less than 2 miles off the East end of Long Island and a few miles from Lyme in Connecticut lies Plum Island, an 840-acre island not listed on any map (try mapquesting it). A top secret government Type 3 Bio-Hazard lab is authorized to use lethal force for any incursion on the island. Workers have been ferried over to this Island, from....yes, you've guessed it ...Lyme, Connecticut for decades. The first cases of LD in 1976 were reported in people living yards from the ferry dock.



According to Michael Carroll in his book, Lab 257, reveals the frightening true story of an unknown island situated in the shadow of New York City, nestled within the playground of America's elite, the Hamptons. Unveiled as a Cold War biological warfare laboratory, Plum Island struggled for half a century in the name of animal science for the U.S. Department of Agriculture, and is now in the hands of the new Department of Homeland Security. Yet its achievements have been marred by outrageous biological and environmental mishaps. A shoddily built and poorly managed germ lab that threatens our environs with biological and ecological pollution, Plum Island remains -- at this very moment, as Lab 257 shows -- a ticking time bomb.

Is it a coincidence that there was work being conducted on Plum Island with dangerous animal diseases, that there were apparently sloppy safety measures of its weaponizing bacteria protocols in the 1950's and 60's*, that there is some evidence of its work with ticks, that the workers are ferried to the island from Lyme, that there was an outbreak of LD in Lyme, Connecticut? (*Note that the Lab had to aggressively suppress a full scale foot-and-mouth virus outbreak on the Island that leaked from its research.) Is it a far-fetched idea that this weaponizing research into, or enhancing, a tick's ability to infect, has leaked out into the tinder-box like environment of the mainland, and sparked the wild-fire spread throughout the Eastern seaboard? It may sound incredible, but I've heard that some reputable researchers quietly, consider this a highly possible and credible contributing factor to the outbreak of LD in this area, if not the downright instigator.

There are two sides to every story, however. The prevailing scientific view suggests that Bb infections were a fact of life in early American history that went largely unnoticed amid the harsh reality of frontier life. They argue that mass deforestation of the Northeast due to the clearing of land for agriculture and settlement in the 19th and early 20th century resulted in a collapse of white-tailed deer populations, the primary carriers of the deer tick, and hence the tick became too scarce to infect people with Bb. Many theorize that Long Island served as a refuge for relict populations of deer in the area. Then, as land-use patterns changed in the latter half of the 20th century, woodlands and forests recovered in the Northeast, along with deer and deer ticks. (Ranga, Trivedi, et al. 1997; Stricker, 2006). Infected ticks have been found on migratory birds that travel between states, countries and continents (Gardner, 2001).

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“If the (LD) infection has become chronic, my preference would be treatment with modern Chinese medicine”-- Dr Andrew Weil

Primary Integrative Lyme Disease Protocol

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| <ol style="list-style-type: none"> 1. Antibiotics, 1 month 2. LD Support, (2 to 4 capsules, 3 times daily) 6 months 3. LD+CO, (2 capsules, three times daily) 6 months 4. Multi-Probiotics, (one capsule, three times daily) 1 month |
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1. Antibiotics

Use of antibiotics, for a minimum of 4 weeks, is suggested. Work with your Lyme-literate M.D. to determine the antibiotics that are right for you. Antibiotics have to be the primary treatment for LD especially when you consider the high stakes involved in a possible progression into chronic LD. It’s best to work with your Lyme-literate M.D. to consider your best approach. Antibiotics are recommended, even knowing that long-term antibiotic use can create some problems by depleting good bacteria and damage the ecology of the stomach and intestines, thereby impacting immunity and absorption of vitamins in the gut. Supplementation with Multi-Probiotics is highly recommended to help correct this whilst taking antibiotics and after.

2. LD-Support: Herbal Formula

This formula incorporates herbs known to either directly kill Bb and/or aid our bodies in eliminating the organism, or improving the function of systems of our bodies. I suggest a formula of three ‘anti-lyme-spirochete’ herbs at strong concentrations.

Andrographis paniculata	200 mg
(Standardized 10% andrographolides)	

Japanese Knotweed, *Polygonum cuspidatum*, 150 mg
(5:1 concentrate)

Cats Claw, *Uncaria tomentosa* 150 mg

Andrographis, *Andrographis Paniculata*. Used in Traditional Chinese Medicine (TCM) and Ayyurvedic Medicine for over two thousand years, Andrographis is one of my favorite herbs, from the extensive infectious disease category of TCM. This category of herbs is called *qing jie du zao shi* – meaning “heat clearing, toxin-relieving, and damp resolving.” Andrographis is a powerful anti-toxin, “heat-and-damp clearing,” and alleviates pain and swelling. It is used for “fire-toxin” rashes, with thousands of years of experience treating infectious disease of all kinds. Many modern studies have demonstrated its use as a remarkable anti-bacterial, anti-spirochetal and anti-viral herb. These studies have proven its use as an anti-parasite herb with a wide range of use against infection in the body, particularly against the following at the following sites:

1. *Leptospira spirochetes*, (*infects a wide range of tissues*) causing leptospirosis. Andrographis is a proven anti-spirochetal herb used against the *Leptospira spirochete*; *leptospira spirochetes* have surprising similarities to LD, and recently found by practitioners to be effective against LD. It is especially important because of its similarities with LD, andrographis was found to be 80% effective against leptospirosis spirochetes.
2. Malaria, (*blood*), great for co-infection of *Babesia*, similar to malaria parasite.
3. Leishmaniasis, (*skin and internal organs*) such as human roundworm.
4. *Dipetlonema* (*connective tissue*) as in canine parasitic worm.

Chronic inflammatory conditions with nerve pain also respond well to treatment with andrographis. I have used it effectively for many years in my practice against Hepatitis B and C. It also has had a lot of research against influenza virus; research in Sweden has shown relief of flu symptoms by 50%. Studies show great results in reducing HIV viral loads because it enhances AZT activity. Studies also show significant activity against a wide range of cancers. Research in Chile has shown effectiveness against Multiple Sclerosis.

What's Andrographis's application to LD?

- 1) It is anti-spirochetal;
- 2) It is protective and healing for neurological aspects of LD, and has shown significant protective effects on inflammation-mediated neuro-degeneration of the brain;

- 3) Anti-inflammatory: *Andrographolide*, the major active component from *Andrographis*, has shown to possess major anti-inflammatory activity. It is used for the central nervous system, reduces swelling and fights Bb in the collagen at joints (another favorite of Bb);
- 4) Counteracts periodic/intermittent parasitic diseases (Bb and babesia);
- 5) Immune enhancement: increases white cell (scavengers of bacteria and other foreign matter) phagocytes, inhibits HIV-1, hepatitis B and C, influenza virus replication, and improves CD4+ and T lymphocyte counts;
- 6) Cardio-protective: it protects heart muscles, dissolves clots, and decreases heart muscle damage after heart attacks, normalized EEG readings; (Bb like heart tissue)
- 7) Supports liver and detoxification of Bb's neuro-toxins and alters the properties and flow of bile;
- 8) A mild relaxing herb;
- 9) Has a broad protective activity throughout the body protecting and killing Bb spirochetes where they may lodge. Studies show extracts have the ability to enhance DNA repair;
- 10) Due to its ability to treat rashes and other skin disorders, by aiding in the reduction of heat and elimination of toxins from the body, it can be very useful early on in an infection of Bb; specifically when one has a Lyme rash or bulls-eye.

Cats Claw, *Uncaria tomentosa*. Known to the Indians of the Amazon basin for millennia, Cats Claw, (*Una de Gato* in Spanish,) helps the larger white blood cells, known as natural killer cells (more specifically the CD-57 subset) that can gobble up & destroy the Lyme spirochetes. The problem is finding them, because the spirochetes don't like hanging out in the blood (too dangerous for them) and prefer to hide out and find their way to certain nerve & tissue cells. Cats Claw is believed to boost our CD57 subset and (that has been proven to be low especially when fighting LD). Cats Claw helps boost our specific immune response, to-get-out-there and fight the stealth bacterium Bb. A study showing Cat Claw, *Uncaria tomentosa*, to be remarkably effective in treating chronic LD (Cowen et al.) found 100% of patients experienced marked clinical improvement; and 85% were sero-negative for LD at the end of study. Unfortunately, this study is not definitive and has some flaws (Buhner). Several other studies show Cats Claw's immune stimulating qualities and major anti-inflammatory abilities; (22 of 100 studies and papers on Pub Med database).

The relevance of Cats Claw for LD:

Proven effective for modulating immune response, raising where necessary, and calming over-active reactions. It is especially effective against arthritis inflammation, helps with memory problems, (prevalent in chronic LD,) relaxes the central nervous system, protects the heart and is a general tonic.

Japanese Knotweed, *Polygonum cuspidatum*. This is an extremely invasive plant species that moves aggressively into new eco-regions. The new eco-regions have new emerging

diseases and, as a species, it has had to develop the abilities to protect itself against all the new and rapidly evolving viral and bacterial pathogens, in these new environments. The 'energetic' and skills of this herb are; its ability to adapt quickly, to evolve "push-back" qualities against new evolving viruses, fungi and bacteria. LD is also an extremely aggressive bacterium, also a master at adapting into new environments, (i.e., rapid deer over-population, new contact with humans pushing into the woods, longer tick life-cycles adaptation to human antibiotic compounds, and global warming.)

TCM records show this herb has been used medicinally for centuries against different infections. Modern studies demonstrate its activity against a number of gram-negative and gram-positive bacteria. It is especially relevant to LD in its activity against *Leptospira* and *Treponema denticola* spirochetes. It is also effective against viral infection and has proven to "clear toxins" from skin infections, snake bites and rashes. Again, this is another herbal star from the TCM category of *qing jie du zao shi* – "heat clearing, toxin-relieving, and damp resolving".

The frenzy of modern study on Japanese Knotweed however was instigated by research into the "French paradox." The French eat more cheese and fats in their diet, yet, paradoxically have *less* heart disease than the US. A compound identified in red wine, *resveratrol*, was believed to be partly responsible for this paradox. Japanese Knotweed has a high *resveratrol* content. This neat compound moves easily across the gastrointestinal mucosa and circulates free in the bloodstream, as well as crossing the blood brain barrier, with anti-inflammatory, anti-cancer and neuro-protective qualities (especially important for LD). And, there are more amazing compounds identified in this herb, *Emodin*, *polydatin* and *trans-resveratrol* have been found to be wonder drugs in their own right. This herb, as a whole, is more synergistically effective than these isolated active compounds. (Buhner)

In TCM, building herbal formulas follows a pattern that involves putting the herbs in appropriate roles: *Emperor*, *Minister*, *Assistant*, and *Messenger*. Thousands of years of practice have shown that formulas are more effective by placing herbs in these four roles. The Emperor, the main herb, in this case, *Andrographis*, is supported by the Minister, *Cats Claw*, and the Assistant, *Japanese Knotweed*, and also Messenger, *Japanese Knotweed*.

The "Messenger" delivers the compounds of the formula to the areas of the body for which it has an affinity. For example, in the LD Support Formula, the Messenger herb is Japanese Knotweed, that not only has an affinity to cross the blood-brain barrier to help with LD's neuro-psychiatric and neurological symptoms, but also helps to deliver detoxifying help to the liver, protecting against the neuro-toxins given off by Bb's chronic on-going activities and growth; and, also because of Knotweed's micro-circulation abilities to other LD targeted tissues.

Japanese Knotweed's relevance to LD (Buhner):

1. Stimulates microcirculation, esp. to the eyes, knees, heart and skin which helps deliver active constituents to these locations;
2. Reduces inflammation;
3. Protects and correcting the heart function;
4. Provides wide-spectrum antibiotic/antiviral action;
5. Reduces auto-immune responses to LD;
6. Immune enhancement;
7. Protects endothelial integrity from LD's spirochetes and co-infections;
8. Reduces reactive oxygen species production in the CNS and brain.

Caution. Do not take this formula if you are pregnant or nursing, or if you are on any blood thinning medications. Andrographis has been shown to suppress male and female fertility somewhat.

Dosage. Two capsules, three times per day; slowly increase over 2 months, to four capsules, three times per day.

The herbs of this formula are covered in detail in Stephen Buhner's book, Healing Lyme. The Cat's Claw is not TOA*-free and shouldn't be. The research on the TOA-free Cat's Claw appears flawed, as a marketing twist for a company promoting TAO-free. (*Tetracyclic Oxindole Alkaloids)

The Die-Off. When the spirochetes are killed off, they can temporarily overload the body's detoxification system causing some unpleasant symptoms. This is referred to as an "Herxheimer Reaction," and occurs when large quantities of toxins are released into the body, typically when spirochetal bacteria are killed off due to antibiotic and herbal treatment. Usually the death of these bacteria and the release of endotoxins occurs faster than the body can remove the toxins via the natural detoxification process. It is manifested by fever, chills, headache, muscle pain, and exacerbation of skin lesions.

Basic Rules for Herxheimer Reaction

1. Ph balancing. During Herxheimer reactions, the body can become very acidic, aggravating symptoms. Balance pH using Buffered C Powder or other alkalizing minerals.
2. Support Organ Detoxification. The liver is working overtime detoxifying all the debris from the infection; use detoxification supportive supplements such as broccoli sprouts. Keep the colon moving, using bulk-forming fibers such as ground flax seeds, oatbran, psyllium seed husks, etc.
3. Encourage extra sleep and drinking extra water. The body needs help flushing out toxins and extra rest for cell & tissue repair.

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3. LD Co-Infection, Herbal Formula

Co-Infection of Bb with Babesia, or Bartonella or Ehrlichia

LD-Co-Infection (2 capsules, 3 times per day)	
Astragalus	200 mg
Artemisia Anua	100 mg
Boneset	100 mg
Coptis	75 mg

Some recent studies have demonstrated up to 50% Babesia co-infection rate with Bb.

In a recent 2008 study, (Finger R) infection and co-infection rates of sites in Indiana, Maine, Pennsylvania, and Wisconsin. Within 55% of infected ticks, a single agent was detected. In 45%, two or more agents were detected; 37% harbored two agents and 8% harbored three agents. Co-infection with Bb spirochetes makes the symptoms of both diseases even more acute and more severe. Added symptoms on top of those from Bb, tend to be severe headaches, hemolytic anemia, central-nervous system involvement, high fever and shaking with almost chattering chills.

Artemisia. Artemisia annua against Babesia

Artemisia may be of great interest in treating LD especially with a co-infection of *Babesi*. This LD co-infecting agent is a protozoa and a distant cousin of malaria. *Artemisia* is one of the most effective herbal agents for treating malaria on the planet; Malaria is a parasitic disease (though a very different pathogen) introduced directly into the blood stream by an insect (usually mosquito). Artemisinin, one of the active compounds of *Artemisia*, has a 100% clearance rate for Malaria (Zhang). It has become the treatment of choice for malaria worldwide due to its effectiveness against drug-resistant strains.

Artemisia was historically used in TCM for treatment of another spirochete, (similar to LD's Bb) disease of *leptospirosis*. Aside from being listed as an anti-spirochete based on laboratory evaluation, this herb also helps regulate the immune system in cases of autoimmune disorders. For example, it is found useful in treating the autoimmune attack against connective tissue (mainly found in skin and joints) in patients with lupus. The arthralgia experienced by persons with advanced Lyme disease may involve some autoimmune component (at this time, it is unclear whether persistence of the bacteria is solely responsible for persisting symptoms or if there is an induced autoimmune process that contributes to the symptoms). *Artemisia* is also able to cross the blood-brain barrier bringing along its anti-spirochete and anti-inflammatory actions.

Boneset, *Eupatorium perfoliatum* against Bartonella and Babesia,

This plant is native to America, used by native peoples here for millennia.

Bartonella recognized as early as 1899 (Cat-Scratch disease,) its symptoms include low grade fever, fatigue, enlarged spleen, anorexia, headache pharyngitis. *Bartonella* is

evolving and morphing recently on Martha's Vineyard as an unusual variant was found in a tick.

Boneset is exceptionally useful against Bartonella and Babesia. (Buhner) It stimulates the immune system, normalizes CD4/CD8 ratio, actively protects bone marrow macrophages, and stimulates their production. It reduces severity of the periodic fevers and pains. It needs to go along with the Japanese Knotweed included in the LD-Support Formula.

***Astragalus*, *Astragalus Membranaceous*. Against Ehrlichia**

This herb has been used in TCM for around four thousand years; described in the *Shen Nong Cao Jing* text two thousand years ago as being one of the superior tonic herbs of TCM. Today, especially with all of the studies documenting its superior status (799 citations on Medline, 2 patents), modern TCM certainly still agrees with this status, two millennia later. Astragalus is not about getting rid of the infection, but rather about boosting or modulating the host's own immune function to better fight Bb. The TCM principle of treating infectious disease applied for centuries says: "*fu zheng qu xie* support the righteous and dispel the evil" meaning to "boost the immune system, expel the pathogen". Ehrlichia are small, gram-negative bacteria that invade leukocytes, white blood cells, producing human granulocystic ehrlichiosis (HGE) and human monocytic ehrlichiosis (HME). Symptoms can include fever, headache, myalgia, malaise, thrombocytopenia leucopenia, etc.

***Coptis*, *Coptidis Rhizome* against a **wide anti-infectious spectrum**.**

Coptis is also an ancient TCM anti-bacterial herb; modern science(133 papers and studies on Pub Med data base) is focusing research on *umbellatine*, its active ingredient, believed responsible for a lot of its antibacterial activity. Shown active against Staphylococcus aureus, streptococcus pneumococcus, anthrax bacillus, bacillus dysenteria, etc. Anti-viral actions shown to suppress influenza viruses and Newcastle disease virus, anti-cancer, anti-radiation, anti-protozoa infections such as trichomonas vaginitis and candida yeast infections that are common to long-term antibiotic use.

2-to-4 capsules, 3 times per day, depending on severity of symptoms.

Other Nutritional Supplements for Chronic Lyme (Optional)

<p>Multi Vitamin, Ultra Preventative X (manufacturer's suggested dosage.) CO-Q10, (200-400 mg. daily) Alpha-Lipoic Acid, (300 mg., twice daily.) B-Complex, (50 mg., once daily.) Magnesium, (Once daily.) Fish Oils – 2-4 grams daily. (EPA)</p>
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Studies on patients with chronic illnesses such as Lyme and Chronic Fatigue have demonstrated that some of the late symptoms are related to cellular damage and deficiencies in certain essential nutrients.

Multi-Vitamin (Ultra-Preventive X).

To quench free radicals and raise antioxidant levels in the blood and lipids.

CO-Q10. Deficiencies have been related to cardiac functioning, limitations of stamina, gum disease, and poor resistance to infections. Heart biopsy studies in Lyme patients indicated that they should take between 200 mg. daily)

Caution: do not use while taking the prescription drug atovaquone (Mepron, Malarone).

Alpha-Lipoic Acid

This facilitates entry of CoQ-10 into mitochondria. Dose is 300 mg. twice daily.

B-Complex

Clinical studies demonstrated the need for supplement Vitamin B in infections with *Borrelia*, to help clear neurological symptoms. Take one 50 mg B-complex capsule daily. If neuropathy is severe, an additional 50 mg of B-6 can be added.

Magnesium

Very helpful for the tremors, twitches, cramps, muscle soreness, heart skips and weakness. It may also help in energy level and cognition. Do not rely on “Cal-Mag”, calcium plus magnesium combination tablets, as they are not well absorbed. Take at least one tablet twice daily. Higher doses increase the benefit and should be tried, but may cause diarrhea.

In some cases, intramuscular or intravenous doses may be necessary.

Opti- EPA Omega 3 Fish Oils (required)

Studies show that when Essential Fatty Acids are taken regularly, statistically significant improvements in fatigue, aches weakness, vertigo, dizziness, memory, concentration and depression are likely. EPA (Omega-3 oils), derived respectively from fish oils. Fish Oil: 2 to 4 grams per day.

Other Individualized Optional Supplements

<p>Boost Energy/Stamina-- <i>Cordyceps</i> Immune Support---<i>Power Mushrooms</i>. Joint Symptoms—<i>Joint Ease+ Glucosamine+Bio Freeze</i> Liver Detoxification Support—<i>Broccoli Sprouts</i></p>
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To Boost Energy, -- *Cordyceps*

This well-known herb from Tibet and China and has been shown in clinical studies to improve stamina, fatigue, and enhance lung and antioxidant function. It also raises superoxide dismutase levels, important to prevent lesions in the central nervous system. The positive effects can be dramatic; can be used long term. Take four a day.

Immune Support, --*Power Mushrooms*

These organically grown enhanced spores of maitake, shiitake and reishi mushroom have been shown to augment function of the Natural Killer Cells as well as macrophages. Recommended in all patients who have a CD-57 count below 60. Take four a day.

Joint Symptoms:

1. --*Joint-Ease*. This formula may help symptoms that are aggravated by cold, damp weather. In Chronic LD intracellular pressure can cause an exacerbation. In Traditional Chinese Medicine, "bi" syndromes are obstructions in the flow of energy that cause pain and swelling. This formula, used for thousands of years, contains herbs for joint inflammation and has analgesic and circulation-promoting properties. Pubescent angelica is included for acute or chronic pain obstruction. Large gentian has recently been discovered to contain *gentianine*, a powerful anti-inflammatory agent. Turmeric contains *curcumin*, a powerful antioxidant shown to prevent free-radical damage of the joints to a greater extent than both Vitamin E and Vitamin C; it mobilizes the body's own anti-inflammatory system. Bromelain, a mixture of enzymes from pineapple, therapeutically breaks down fibrin which walls off inflamed areas, obstructing blood flow and tissue drainage. Take 2 x 3 x day
2. -- *Glucosamine and Chondroitin*. Glucosamine is a compound found naturally in the body, made from glucose and the amino acid glutamine. *Glucosamine* is needed to produce glycosaminoglycan, a molecule used in the formation and repair of cartilage and other body tissues. Production of glucosamine slows with age. *Glucosamine* is often combined with *chondroitin sulfate*, a molecule naturally present in cartilage. *Chondroitin* gives cartilage elasticity and is believed to prevent the destruction of cartilage by enzymes. Both ingredients help protect the collagen at the joints, from damage and toxins caused by LD's spirochetes.
3. --*Bio Freeze*, An amazing liniment-like product. Rub into troubled joints and painful muscles.

Liver Detoxification Support --*Broccoli Sprouts*.

According to studies by Dr. Paul Talalay and his colleagues at Johns Hopkins University School of Medicine, *sulphoraphane* the active ingredient in Broccoli induces Phase Two (detoxification) enzymes, these are the enzymes that help deactivate neuro-toxins produced by LD's. The 7-to-10 day old sprouts, contain nearly 30-to-50 times more *sulphoraphane* than the broccoli floret, therefore I recommend, 1 cap, 2 x day.

Exercise for Lyme Disease Rehabilitation.

Despite the diligent use of antibiotic treatment and careful supplementation, patients may not return to normal unless they exercise! This is due, in most cases, to the fact that the chronic Lyme patient is de-conditioned. More importantly, a properly executed exercise program becomes part of the treatment as it can actually go beyond the antibiotics in helping to clear the symptoms and to maintain a remission. Therefore, a vital part of any plan for recovery must include serious efforts at physical reconditioning.

The program ultimately must evolve into a graded, strenuous exercise program that consists of a specific regimen of *non-aerobic* conditioning. Although the scientific basis for the benefits of exercises is not known, there are several reasonable theories. It is known that Bb will die if exposed to all but the tiniest oxygen concentrations. If an aggressive exercise program can increase tissue perfusion and oxygen levels, then this may play a role in what is being seen. Also, during aggressive exercise, the core body temperature can rise above 102 degrees; it is known that *B. burgdorferi* is very heat sensitive and will die at 102 degrees. Perhaps it is the added tissue oxygenation, or higher body temperature, or the combination of the two that weakens the Lyme Borrelia, and allows the antibiotics and supplementation and our defenses to be more effective. In addition, there is now evidence that a carefully structured exercise program may benefit T-cell function in the immune system, an obvious potential benefit in an illness like Lyme that is known to weaken immune responses. To reap this benefit, the exercise sessions should last at least one hour, but never be repeated more often than every other day. The following pages are an exercise prescription that outlines these recommendations in detail. NOTE: a cardiac stress test may be necessary prior to exercising to ensure.

Holistic Lyme Common Sense

1. Get enough sleep, and avoid becoming overtired. Sleep is critical for the body to do its repair work.
2. Caffeine or other stimulants should be avoided as they may impact the depth or duration of sleep, or reduce or eliminate naps.
3. Avoid alcohol!
4. Avoid smoking!
5. An aggressive exercise routine is required and should be initiated as soon as possible.
6. Diet must contain generous quantities of high quality protein and be high in fiber and low in fat and refined carbohydrates, no simple carbohydrates are allowed. Instead, use those with low glycemic index.
7. Certain key nutritional supplements should be added.



Borrelia burgdorferi the spirochete that causes Lyme Disease. FA stain (CDC)

Prevention

1. Dogs and Cats. Pets should **Not** be allowed in bedrooms nor on beds or other furniture. During tick seasons, my yellow Labrador must bring 5 to 10 ticks each time he comes in from his brief walk in the woods. During these times of the year, I

remove about two blood engorged ticks a-day from my dog. When doing this, gloves and tweezers are necessary!

2. Removing leaves and clearing brush and tall grass around houses and at the edges of gardens may reduce the numbers of ticks that transmit Lyme disease. A relationship has been observed between the abundance of deer and the abundance of deer ticks in some parts United States. Reducing and managing deer populations in geographic areas where Lyme disease occurs may reduce tick abundance.
3. Avoid tick-infested areas, especially in May, June, and July.
4. Wear light-colored clothing so that ticks can be spotted more easily. Tuck pant legs into socks or boots and shirt into pants or ape the area where pants and socks meet so that ticks cannot crawl under clothing.
5. Carefully spray insect repellent, containing DEET, on clothes and on exposed skin other than the face, or treat clothes (especially pants, socks, and shoes) with permethrin, which kills ticks on contact. Follow carefully instructions on bottles.
6. Wear a hat and a long-sleeved shirt for added protection.
7. Walk in the center of trails to avoid overhanging grass and brush.
8. After being outdoors, remove clothing and wash and dry it at a high temperature; inspect body carefully and remove attached ticks with tweezers, grasping the tick as close to the skin surface as possible and pulling straight back with a slow steady force; avoid crushing the tick's body. In some areas, ticks (saved in a sealed container) can be submitted to the local health department for identification.
9. Preventive antibiotic treatment with erythromycin or doxycycline to prevent Lyme disease after a known tick bite may be warranted.
10. Removing infected ticks within 48 hours of attachment can reduce the likelihood of transmission, and prompt antimicrobial prophylaxis of tick bites, although controversial, might be beneficial under certain circumstances. Exposure to ticks in yards, playgrounds and recreational areas can be reduced 50-90% through simple landscaping practices, such as removing brush and leaf litter or creating a buffer zone of wood chips or gravel between forest and lawn or recreational areas. Correctly timed applications of pesticides to yards once or twice a year can decrease the number of nymphal ticks 68-100%.
11. In addition to these interventions, several new approaches to Lyme disease prevention are under investigation and may soon be available. These include bait boxes and "four-poster" devices that deliver acaricides to rodents and deer without harming them, and the use of biologic agents, such as fungi that kill *Ixodes* ticks.

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Internet Resources:

www.ilads.com International Lyme and Associated Diseases Society (ILADS)
<http://lymediseaseassociation.org/> to find a specialist in your location.
www.lyme.org -- Lyme Disease Foundation
www.aldf.com -- American Lyme Disease Foundation
www.lymenet.org -- The Lyme Disease Network of NJ
<http://www.lymeinfo.net/alt.html>
http://www.virtualneurocentre.com/HumanAtlas/flash_content/clientNF.asp?anid=120
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Short Internet Video

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