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THE NATUROPATH'S GUIDE — LYME DISEASE

A focus on the herbal approach
for managing Lyme disease

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JAPANESE KNOTWEED
(*Polygonum cuspidatum*)

LYME DISEASE

Lyme disease, a multisystem inflammatory disorder, has become an increasingly prevalent and contentious condition. Its elusive diagnosis and diverse presentation confound even the most seasoned practitioners, earning it the reputation of a ‘silent but devastating epidemic.’^{1,2}

Lyme disease, often referred to as “the great imitator,” is a complex and multifaceted condition that challenges both patients and practitioners alike. It is a bacterial infection that can be transmitted to humans who are bitten by certain species of *Ixodes* ticks carrying different species of *Borrelia* bacteria (corkscrew-shaped spirochaetes related to the spirochete that causes syphilis) collectively known as *Borrelia burgdorferi sensu lato*. The late Stephen Harrod Buhner, considered the world’s leading authority on treating Lyme disease, describes *Borrelia* bacteria as “like rabies for ticks.” This tick-borne illness, also known as Lyme Borreliosis, can manifest in a wide array of symptoms, mimicking other diseases and complicating diagnosis. While it is most commonly associated with the Northern Hemisphere, where it is endemic in regions such as North America, Europe and Asia, its prevalence in other parts of the world, including Australia, remains a subject of ongoing research and debate.^{3,4,5,6}

Condition Overview

Lyme disease was first identified in the 1970s when an unusual cluster of juvenile rheumatoid arthritis cases emerged in Lyme, Connecticut, and surrounding areas. Researchers soon linked the outbreak to bites from infected deer ticks, prompting further investigation. In 1977, Dr Allen Steere and colleagues coined the term “Lyme arthritis” to describe the phenomenon. As additional symptoms, such as neurological involvement and profound fatigue, were identified the condition was renamed “Lyme disease” in 1979 to reflect its broader clinical scope. In 1982, Dr. Willy Burgdorfer identified the causative spirochete, now known as *Borrelia burgdorferi*, confirming Lyme disease as a tick-borne bacterial infection and permanently linking his name to the illness.⁷

Ticks are tiny, eight-legged arachnids, about the size of a sesame seed in their juvenile stages, commonly found in long grass or wooded areas. They feed on the blood of mammals including deer, mice, rats, dogs, cats and humans, by crawling onto their hosts rather than flying. Ticks are often referred to as “dirty syringes” because of the astonishing number and variety of pathogens they can carry. A single tick can harbour dozens of microorganisms simultaneously including bacteria, viruses, protozoa and fungi many of which have the potential to infect humans or animals. When an

infected tick bites, the saliva produces anticoagulant compounds that deactivate the inflammatory response normally triggered by an insect bite.

Pain signals and itching of the skin are dampened, allowing the tick to continue to feed. Once infected, in the case of Lyme disease the *B. burgdorferi* cells move slowly into the blood and lymphatic system.⁸

Lyme disease is an ecological disease. Globally, the incidence of Lyme disease is on the rise due to a combination of factors such as increased habitat range of the main tick vectors and the intersection of human dwellings with ticks and animal hosts. In addition extended warmer seasons, and greater tick activity due to climate change, permits the expanding population of ticks to sites previously considered too cold and this has now been reported as the main driver for increased risk of tick-borne diseases in humans.^{9,10}

Lyme disease is currently the fastest-growing vector-borne illness in the United States. In 2023, over 89,000 cases were reported to the US Centers for Disease Control and Prevention (CDC). However, alternative surveillance methods estimate that as many as 476,000 individuals may be diagnosed and treated for Lyme disease annually in the US.¹¹

Lyme disease or “Lyme-like” illness in Australia is a contentious, polarising issue as the very existence of locally acquired Lyme disease is disputed. Studies have not conclusively identified *Borrelia burgdorferi* species in Australian ticks, nor in non-travelling patients using Lyme diagnostic protocols accredited by the National Association of Testing Authorities, Australia (NATA) or the Royal College of Pathologists of Australasia (RCPA). However, other *Borrelia* species carried by ticks on Australian fauna, as well as other novel viruses in Australian ticks, have been identified. Whether these microbes can be transmitted to humans by ticks, and how they affect a human host, is unclear. What is clear is that a growing number of Australians are experiencing chronic and debilitating symptoms that they attribute to tick bites. Their illnesses are poorly understood and treatment options are “currently suboptimal”. This uncertainty has led to ongoing controversy, with the Australian Government continuing to withhold recognition of locally acquired Lyme disease.^{12,13}

As a result the true number of Australians affected

by Lyme disease remains unknown, as public health authorities do not currently collect national surveillance data on it, its most common co-infections or related tick-borne conditions. Instead, the Australian Government Department of Health and Aged Care uses the term Debilitating Symptom Complexes Attributed to Ticks (DSCATT), formerly referred to as “Lyme-like illness”, to describe a chronic, debilitating symptom picture linked to tick exposure. Importantly, DSCATT is a descriptive term, not a formal clinical diagnosis. Commonly reported symptoms among DSCATT patients include profound fatigue, cognitive dysfunction (“brain fog”), sensory disturbances, joint pain and persistent headaches.¹⁴

In 2025 the Australian Senate released a Final Report from its inquiry into access to diagnosis and treatment for tick-borne diseases. Among its key recommendations were replacing the term DSCATT with a clearer, non-stigmatising descriptor that better reflects patient experience, and developing evidence-based GRADE-informed clinical guidelines in place of the current DSCATT pathway. The report also called for increased investment in research into tick-borne pathogens and their management, as well as national awareness campaigns and updated public health resources to ensure accuracy and relevance.^{15,16}

Despite ongoing controversy, recent research and advocacy have helped bring greater attention to tick-borne diseases in Australia, emphasising the urgent need for improved diagnostics, practitioner education and investment in research. Key challenges remain, including the lack of consensus around diagnostic criteria, limited access to reliable testing and the absence of a nationally accepted treatment protocol. These barriers often leave patients navigating prolonged and distressing diagnostic journeys in search of answers for persistent, often disabling, symptoms. Further complicating clinical assessment is the potential overlap with other tick-associated conditions such as rickettsial infections, babesiosis, Q fever, Queensland tick typhus and tick-induced allergies, notably mammalian meat allergy (alpha-gal syndrome). This complexity highlights the importance of a nuanced, whole-person approach to case-taking and differential diagnosis in practice.¹⁷

Early symptoms of Lyme disease typically include fever, fatigue, headache and a distinctive skin lesion known as erythema migrans, a red, expanding rash that often resembles a bull's-eye at the site of the tick bite. However, not all patients develop this hallmark sign, making early recognition challenging. If left untreated, *Borrelia spirochetes* can disseminate throughout the body affecting multiple organ systems. This can lead to diverse clinical manifestations such as arthritis, generalised musculoskeletal pain, neurological dysfunction and cardiac involvement. Disease progression is highly variable and influenced by both the *Borrelia* species involved and the patient's baseline immune competence. Individuals with compromised or underperforming immune systems are more susceptible to severe or persistent illness. In some cases, a robust immune response may eliminate the pathogen without overt disease, but *Borrelia* has evolved sophisticated immune evasion mechanisms that can lead to persistent infection and chronic symptomatology. The three different forms of *Borrelia* make it harder to treat and harder for the immune system to mount defences against it. *Borrelia* is a biofilm bacteria, which means it secretes substances which also offers it protection from the immune system. Notably, it is not the spirochete itself that causes direct tissue toxicity, but rather the host's inflammatory response, a process that may result in damage to cardiac tissue, the nervous system and joints. Importantly, previous infection does not confer immunity.¹⁸

Diagnosing Lyme disease presents significant challenges due to the broad variability of symptoms, the possibility of co-infections with other tick-borne pathogens and the limitations of current diagnostic testing. Symptoms may wax and wane, mimic other chronic conditions and differ, depending on the stage of infection, making clinical assessment complex. Misdiagnosis, or delayed diagnosis, can lead to prolonged illness, increased tissue damage and greater difficulty in treatment, often resulting in frustration for both patients and practitioners. Further complicating diagnosis is the symptomatic overlap with conditions such as chronic fatigue syndrome (CFS/ME), fibromyalgia, autoimmune

diseases and mood disorders. This can obscure the underlying infectious origin and delay appropriate interventions. However, recent research efforts have focused on enhancing diagnostic sensitivity and specificity, deepening understanding of Lyme disease pathophysiology, and exploring novel treatment strategies including those drawn from both conventional and complementary medicine.¹⁹

Treatment is typically curative in early-stage Lyme disease, with more than 80% of patients experiencing full resolution of symptoms following appropriate antibiotic therapy. However, successful treatment can be complicated by delayed diagnosis, antibiotic failure or co-infection with other tick-borne pathogens. For a subset of patients, approximately 10 to 20%, non-specific symptoms such as fatigue, musculoskeletal pain and cognitive disturbance may persist for six months or longer following treatment. This is known as Post-Treatment Lyme Disease Syndrome (PTLDS) and resembles a severe, protracted variant of chronic fatigue syndrome. The cause of PTLDS remains uncertain. Hypotheses include the presence of residual antigenic debris, immune dysregulation or bacterial persists, a concept sometimes described as the "dandelion phenomenon," where antibiotics act as the mower, removing the visible parts of the spirochete but leaving behind a 'root' that may regrow and perpetuate symptoms. It is also possible that a multifactorial interplay of these mechanisms is involved. Continued research is needed to fully understand the pathogenesis of PTLDS and to develop targeted therapeutic strategies. Many patients do recover with time but there is considerable variability in the course of the disease. Unnecessary anxiety can be avoided if patients understand that further medical treatment with antibiotics may not be needed and may even be counterproductive. More controversial still is the term 'chronic Lyme disease' which has been proposed to encompass PTLDS as well as presentations of medically unexplained physical symptoms attributed to Lyme disease but without validated serological or clinical evidence of *Borrelia* infection.^{20,21,22}

Common Symptoms

The symptomatology of Lyme disease is as diverse as it is diagnostically challenging. Early symptoms are often nonspecific and easily mistaken for other conditions, contributing to frequent misdiagnosis. The disease is classically described in three stages, **early localised, early disseminated** and **late disseminated**, though not all individuals experience these phases in a linear or distinct way. Clinical presentation can vary widely depending on the stage of infection, the infecting *Borrelia* species and the individual's immune response. This variability makes diagnosis particularly difficult in the absence of the hallmark erythema migrans rash. Symptoms frequently overlap with other chronic conditions such as fibromyalgia, chronic fatigue syndrome and autoimmune disorders, further complicating assessment.²³

Recognising the evolution of symptoms is essential for accurate diagnosis and the development of a targeted, integrative treatment strategy. Following exposure to an infected tick symptoms may emerge within days to several weeks. While some manifestations are more typical of specific stages, many patients do not present with the complete clinical picture.²⁴

Early Symptoms (Stage 1: Early Localised)

- **Erythema migrans (EM) rash:** A hallmark symptom, appearing as a red, expanding rash that may resemble a bull's-eye, usually around seven to 14 days post-infected tick bite.
- **Flu-like symptoms:** Fever, chills, headache, muscle aches and fatigue.
- **Swollen lymph nodes:** A sign of immune activation, often accompanying early systemic symptoms.

Intermediate Symptoms (Stage 2: Early Disseminated)

- **Multiple EM rashes:** As the spirochetes spread, additional lesions may appear on other areas of the body.
- **Neurological symptoms:** Facial palsy (Bell's palsy), tingling or numbness in extremities and meningitis-like symptoms.

- **Joint pain and stiffness:** Typically migratory, often affecting large joints like the knees.
- **Cardiac involvement:** Though less common, some patients develop Lyme carditis, which may present as palpitations, chest discomfort or conduction abnormalities which can cause irregular heartbeat.

Late Symptoms (Stage 3: Late Disseminated)

- **Chronic arthritis:** Persistent inflammation in large joints, particularly the knees. In some cases this develops into inflammatory Lyme arthritis, with significant impairment in mobility.
- **Neurocognitive and psychiatric symptoms:** Difficulty concentrating, memory impairment, mood disturbances (such as depression, anxiety) and neuropathic pain.
- **Severe fatigue:** Debilitating and often disproportionate to activity level, this symptom is commonly reported and significantly impacts daily functioning.
- **Muscle weakness and myalgia:** Often widespread and persistent, potentially mimicking fibromyalgia.

Other possible symptoms of Lyme disease include: ringing in the ears (tinnitus), vision problems or inflammation around the eyes, vertigo, dizziness and liver problems such as hepatitis. Symptoms of Lyme disease in dogs are similar to those in humans, including stiff, swollen joints, tiredness and loss of appetite.

It is important to note that symptom severity and progression can vary widely between individuals. Some patients may remain in an early, relatively mild state, while others progress to chronic, debilitating illness. This variability underscores the importance of thorough clinical evaluation and a high index of suspicion, especially in endemic areas or when there is a known history of tick exposure.²⁵

Risk Factors ^{26,27,28}

Lyme disease is influenced by several risk factors that increase the likelihood of infection. Understanding these can help both practitioners and patients implement targeted preventive strategies.

Environmental Exposure

Tick Habitats: Exposure to wooded, brushy or tall grassy areas, especially transitional edges, is the primary environmental risk factor. Activities such as hiking, fishing, camping, mushroom foraging, gardening, military training and forestry work increase the likelihood of tick encounters. In endemic areas, 5-40% of ticks may carry *Borrelia*. Pets that roam outdoors can also introduce ticks into the home.

Geographic Location: High-risk areas include the northeastern and upper midwestern United States, parts of central Europe (such as Germany and Austria), and certain coastal or forested regions of Australia harbour tick borne diseases.

Seasonality: Ticks are most active during warmer months, particularly in late spring and early summer, when nymphs dominate. These immature ticks are extremely small and more likely to go unnoticed, increasing transmission risk. Adult ticks can also be active during warmer winter days.

Tick Attachment Period: Transmission risk increases with longer attachment. In the US, transmission typically occurs after 36-48 hours and risk exceeds 20% after 72 hours. European studies suggest that *Borrelia* transmission may occur in under 24 hours, likely due to differences in species or vector biology.

Personal Factors

Age: Children and older adults may be more susceptible due to increased outdoor exposure or weakened immune responses.

Occupational Risks: Forestry workers, park rangers and outdoor labourers face higher exposure.

Lifestyle Factors: Inadequate use of tick repellents and protective clothing, such as wearing shorts and short sleeves in tick-prone areas, increases the likelihood of bites.

Biological and Health Factors

Immune System Function: Individuals with weakened immune systems may experience more severe symptoms. Certain demographics, including individuals with compromised immune systems or those with conditions that affect circulation, may be more prone to developing severe manifestations of the disease.

Genetic Susceptibility: Some genetic factors may influence the severity of Lyme disease symptoms. Genetic factors, although not fully understood, might also play a role in how an individual responds to tick bites and the subsequent infection. In this context, an understanding of the geographical distribution and seasonal peaks of tick activity is essential for both prevention and early detection. Public health resources emphasise the importance of education and tick surveillance in mitigating these risks.

Co-infections: Ticks are sometimes referred to as “nature’s dirty needle”. Common tick-borne co-infections such as *Babesia*, *Anaplasma*, *Ehrlichia*, *Rickettsia spp* and *Bartonella* can alter the clinical course of Lyme disease, making symptoms more severe and complicating diagnosis and treatment.

Co-stressors: Mould toxicity, methylation defects,



pyroluria and heavy metal toxicity are co-stressors that are frequently present and can be closely related but hard to delineate due to overlap of symptoms.

“Ticks are sometimes referred to as “nature’s dirty needle”...

How To Get The Correct Diagnosis^{29,30,31,32}

Diagnosing Lyme disease accurately is as much a clinical art as it is a science. Its diverse symptom presentation and frequent overlap with other chronic conditions make it a diagnostic challenge. In Australia, diagnosis is based on clinical presentation, exposure history and laboratory testing performed in NATA-accredited pathology laboratories. Like other aspects of Lyme disease, laboratory testing is complex and controversial. A comprehensive clinical assessment is essential and early recognition improves outcomes. However, one of the major diagnostic hurdles is that many patients have no recollection of a tick bite or erythema migrans rash.

If symptoms persist despite negative test results, referral to a specialist may be warranted for further investigation. Practitioners should also remain aware that no single test can definitively exclude Lyme disease, particularly in the early stages or in the presence of co-infections.

Clinical Evaluation

Medical History: A detailed exploration of recent or past tick exposure, travel to endemic regions (including abroad), symptom chronology and prior treatments is essential.

Physical Examination: Clinicians should look for signs such as erythema migrans, swollen lymph nodes, joint swelling, cranial nerve palsies (such as Bell’s palsy), meningitis-like symptoms or arrhythmias.

Laboratory Testing: While clinical assessment

forms the backbone of diagnosis, laboratory testing remains an essential adjunct. However, clinicians must be mindful of the timing of testing, limitations of current technology and geographic testing restrictions in Australia i.e. a positive laboratory test is required for a Lyme diagnosis however these tests can only be ordered by infectious disease specialists or microbiologists and will only be requested if the patient has travelled overseas. Most Lyme disease tests are designed to detect antibodies made by the immune system in response to an infection. These antibodies can take several weeks to develop, so people may test negative if infected only recently.

- Two-Step Serological Testing: The recommended protocol, endorsed by the CDC and European guidelines utilises a two-tier approach:
 - Screening immunoassay
 - An initial screening called Enzyme-linked Immunosorbent Assay (ELISA) to measure IgG and IgM (two different kinds of antibodies) levels. If ELISA shows a positive or uncertain result, a more specific test called the Western blot is performed to confirm the result, but false positives are common. Tests for the multiple co-infections of Lyme disease are not often done.
 - Testing should be done in NATA-accredited labs using validated assays.
 - It is essential to include relevant clinical history on the pathology request such as travel history, date of exposure, symptom onset and prior antibiotic use.
 - In Australia, testing is generally restricted to patients who have travelled internationally, creating a barrier for those with suspected local exposure.
 - Polymerase Chain Reaction (PCR): Direct detection testing for the organism by nucleic acid testing (PCR) from biopsy specimens of suspected skin lesions is encouraged.
 - Private and Overseas Laboratory Testing: Some patients seek testing through private or international laboratories often due to limited access within Australia. While some overseas labs may offer broader *Borrelia* strain panels, test validity, methodology and interpretation can

vary widely. Practitioners are advised to critically assess the reliability of these results and interpret them in light of the full clinical context.

- **Cross-reactivity and Serological Interference:** False positives can occur due to cross-reactivity with other infections such as Epstein-Barr virus (EBV), cytomegalovirus (CMV), syphilis or autoimmune conditions. This underscores the importance of not relying solely on serology in isolation.

Challenges in Diagnosis

False Negatives: Antibody testing may not detect early infections due to the delay in seroconversion.

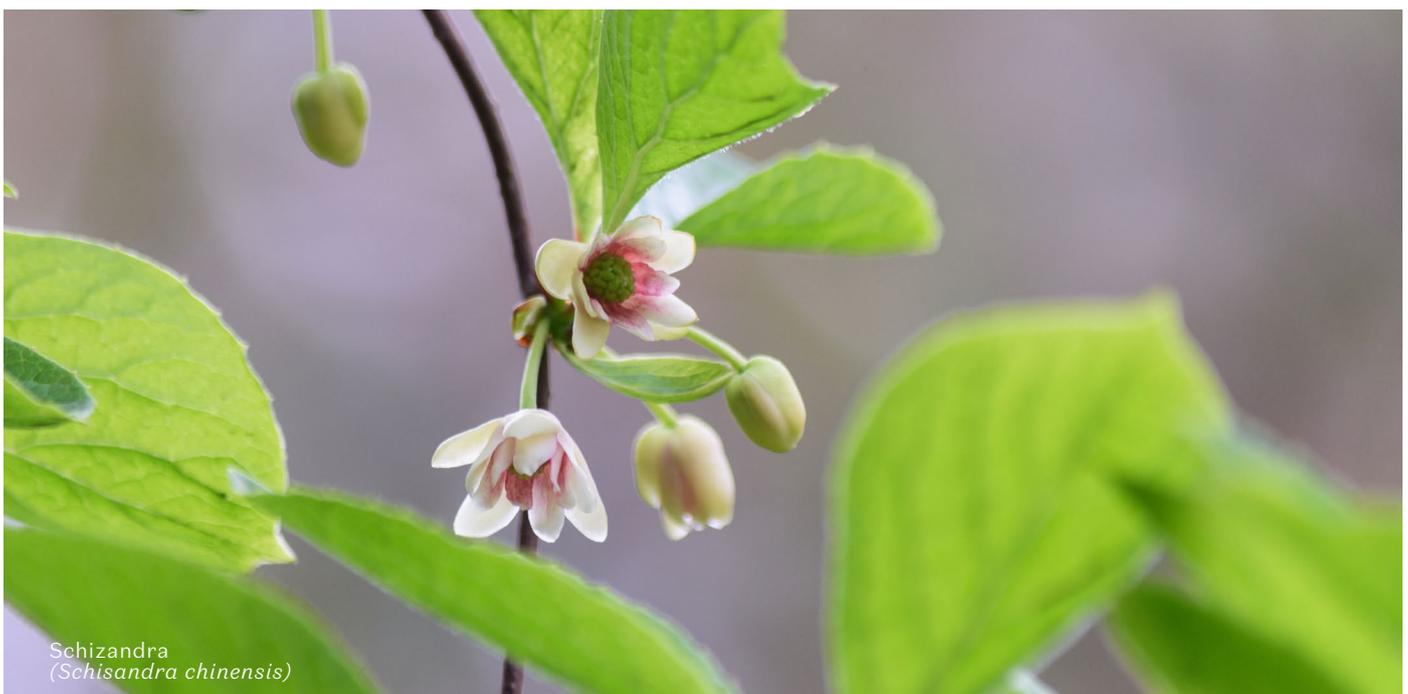
Co-infections: Other tick-borne infections, such as *Babesia*, *Anaplasma* and *Bartonella*, can complicate the clinical picture and make interpretation of symptoms and lab results more difficult.

Geographical Considerations: In Australia the ongoing controversy over locally acquired “Lyme-like” illness limits access to standardised testing and may delay diagnosis or treatment. A patient will almost never receive a diagnosis of Lyme disease, regardless of test results (even if they present Lyme-positive tests from overseas labs), if they

have not travelled overseas. In that case another tick-borne disease is suspected. If a patient has not travelled overseas the Lyme Association of Australia recommends finding a Lyme-literate practitioner in Australia to assist with testing, ordering tests privately or travelling overseas for diagnosis and/or medical assistance.

Clinical Integration

Ultimately, Lyme disease diagnosis should be guided by a high index of suspicion, particularly when a patient presents with multisystem symptoms following tick exposure even if laboratory findings are inconclusive. For example, unexplained neurological or cardiac symptoms in a patient with a history of tick exposure may warrant further investigation or a carefully considered clinical response, even in the absence of positive test results. No diagnostic test can replace clinical judgement. An integrative diagnostic strategy, combining detailed history, physical findings and carefully timed laboratory testing, remains the most effective approach. It enables timely treatment, reduces the risk of chronic complications and ensures patients receive appropriate care across both conventional and complementary frameworks.



Schizandra
(*Schisandra chinensis*)

Patient 7 “I learned... to stop saying...Lyme disease... but even if I said...I’ve been sick since a tick bite and then you sometimes hear the...‘there’s no Lyme in Australia’ and I’m thinking ‘I never said there’s Lyme in Australia...I’m telling you I was sick after a tick bite.’”

Conventional Treatment & Prevention ^{33,34,35,36}

Conventional management of Lyme disease typically involves a combination of antibiotic therapy, symptom management and preventive measures to reduce the risk of infection. Early diagnosis and appropriate treatment are crucial in preventing complications associated with Lyme disease.

Antibiotic Treatment

Early Lyme Disease: A short course of antibiotics, typically doxycycline, amoxicillin or cefuroxime axetil, is the standard treatment ranging from 14 to 21 days. Some patients with persistent symptoms advocate for prolonged antibiotic therapy, arguing that it helps alleviate chronic manifestations of the disease PTLDS. Patients can expect a minimum of six weeks if being treated by a “Lyme literate” practitioner. For patients with neurological or cardiac involvement, intravenous antibiotics may be indicated. However, the medical community is divided on the efficacy of prolonged antibiotic treatment as studies have yielded mixed results and potential risks, such as antibiotic resistance and

adverse effects, need to be considered. Striking a balance between addressing the genuine concerns of patients with persistent symptoms and adhering to evidence-based medical practices is essential in navigating this ongoing controversy in the management of Lyme disease.

A Jarisch-Herxheimer reaction (JHR), also known as a Herxheimer reaction, is a temporary but potentially serious side effect that can occur when treating spirochete infections like Lyme disease with antibiotics. It is triggered by the rapid death of spirochetes, releasing toxins that cause a systemic inflammatory response. The reaction occurs within 24 hours of antibiotic treatment of spirochete infections and usually manifests as fever, chills, rigors, nausea and vomiting, headache, tachycardia, hypotension, hyperventilation, flushing, myalgia and exacerbation of skin lesions. It is considered a sign that the treatment is working.

Disseminated Lyme Disease: If the infection has spread, longer antibiotic courses or intravenous antibiotics may be required.

Post-Treatment Lyme Disease Syndrome (PTLDS):

Some individuals experience lingering symptoms despite treatment. Management focuses on symptom relief rather than prolonged antibiotic use.

Symptom Management

Pain Relief: Nonsteroidal anti-inflammatory drugs (NSAIDs) may help alleviate joint pain and inflammation.

Neurological Support: In cases of Lyme neuroborreliosis, additional treatments such as corticosteroids or physical therapy may be recommended.

Cardiac Care: Lyme carditis may require hospitalisation and specialised cardiac monitoring.

Patient 3 “...in Australia... tick borne illness is a really taboo subject...I stopped telling specialists [that I had

tested positive for Lyme disease, Babesia and Bartonella], because when I did, they started treating me like I was a little bit...crazy or something.”

Preventive Considerations

Tick Prevention Strategies:

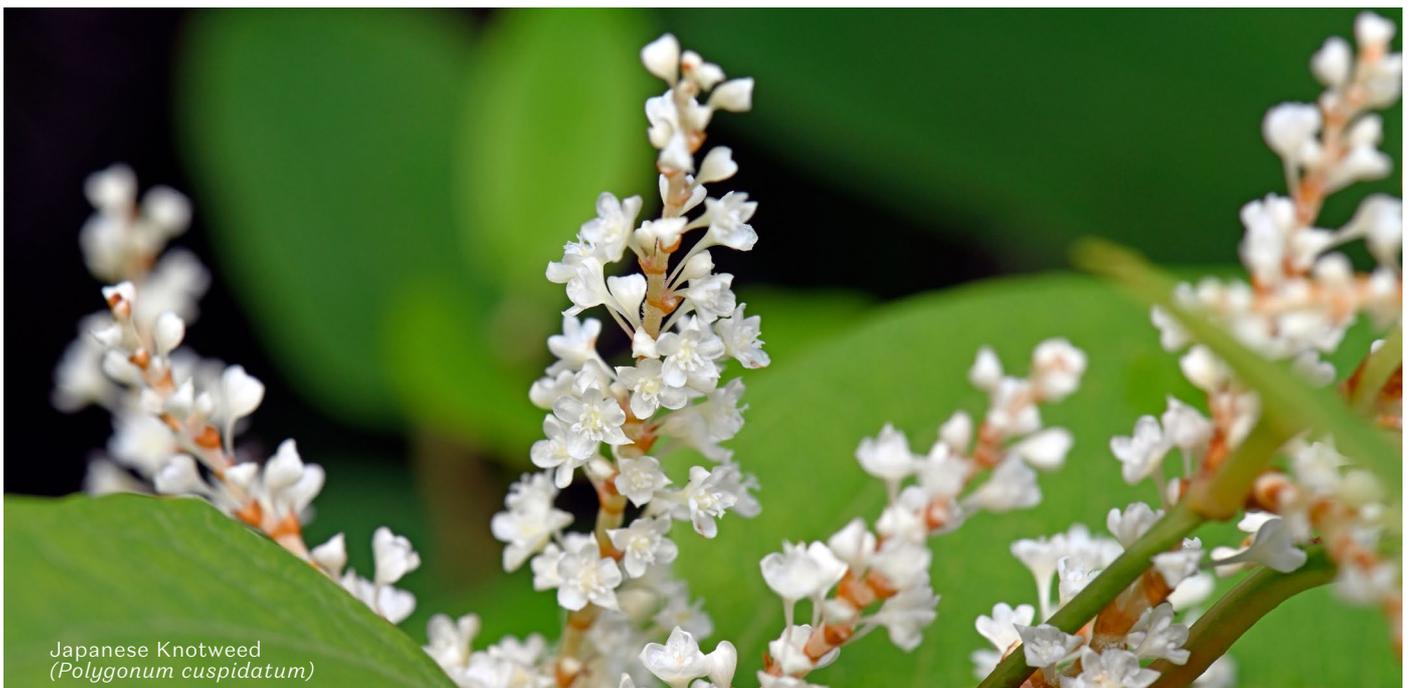
Lyme and other tick-borne diseases are largely preventable with an integrated approach. Preventive measures are especially critical for individuals who are immunocompromised, as well as for young children and older adults, who may have reduced immune resilience.

Key strategies include:

- Avoiding tick-infested areas when possible.
- Be informed about how to recognise early.

symptoms of tick-borne diseases.

- Wearing light-coloured protective clothing (long sleeves, long trousers) and clothing treated with permethrin.
- Using repellents such as DEET or picaridin (found in Tropical Aeroguard, Tropical RID and Bushman), or oil of lemon eucalyptus such as Bug-grrr Off natural repellent spray. It is important to be aware of potential side effects of repellents, especially with higher concentrations, and to use as directed and seek professional advice when needed.
- Using camp beds when camping.
- Checking clothing for ticks, then placing in a hot dryer for 20 minutes, if available, to kill the ticks.
- Performing full-body tick checks after time outdoors. Thorough tick checks should include the scalp, behind the ears, under the arms, in the groin and behind the knees, favourite hiding spots for nymph-stage ticks.
- Showering within two hours of outdoor exposure may help wash off unattached ticks and provides an opportunity for a thorough tick check.



Japanese Knotweed
(*Polygonum cuspidatum*)

Patient 13 “...the GP... that I had for 10 years...she said...‘Lyme disease doesn’t exist in Australia...and if you want to go down this... road, I think you need to find another GP.’ So when I was at my sickest, I had to find another GP.”

Early Tick Removal: A tick bite may appear as a small, dark freckle or scab. Immediate removal is critical. For tick-allergic individuals, medical assistance must be sought before attempting removal. Removal should occur in a medical facility equipped for advanced life support in the event of anaphylaxis.

Australian guidance:

- For visible ticks (adult): Freeze it, don’t squeeze it (Use an ether-containing spray such as Tick Off)
- For tiny, nearly invisible ticks (larvae/nymphs): Dab it, don’t grab it. (Apply permethrin cream such as Lyclear)

If removal is not possible, or the tick is not dislodged, leave it in place and seek urgent medical help. Proper removal reduces the risk of developing tick-induced allergies, tick-borne infections and tick paralysis.

Environmental Modifications: Reduce tick habitats by:

- Keeping lawns trimmed and clearing leaf litter
- Storing firewood in dry, rodent-proof areas
- Keeping patios and play areas away from brushy

edges and in a sunny location if possible

- Removing clutter like old furniture or rubbish that could provide tick refuges

Patient 2 “...my GP had said, ‘Look off the record, you’ve got Lyme disease. On the record, it doesn’t exist.’...

This study provides hope that it need not be defined by the reductive argument over the presence or otherwise of Lyme disease in Australia, and that there is scope for a more sophisticated model of understanding and treating DSCATT.” The challenges of living with Debilitating Symptom Complexes Attributed to Ticks (DSCATT) – A qualitative study Aug 2024. ³⁷

INTERVENTION	Immune modulators	Anti-inflammatory, antioxidants	Antimicrobials	Adaptogens, adrenal support, sedatives, nervines	Neuroprotective	Hepatoprotective
Andrographis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
Astragalus	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Cat's Claw	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Cordyceps	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Echinacea	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Garlic	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
Japanese Knotweed	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Lion's Mane	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	
Reishi	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Schizandra		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Teasel Root	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Turmeric	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Natural Therapies For Treatment & Prevention^{38,39,40,41,42,43}

While conventional antibiotic regimens are effective for early-stage Lyme disease, limitations such as delayed treatment, antibiotic resistance and persistent symptoms in some patients have led many to explore complementary therapies. Increasingly literature supports the role of integrative approaches, including herbal medicine, in addressing not only the infectious component of Lyme disease but also the associated immune dysregulation and inflammation.

For naturopaths and clinical herbalists a holistic approach is essential. This means considering not just *Borrelia burgdorferi*, but also the patient's immune resilience, potential co-infections, detoxification capacity and constitutional vitality. Within this broader framework natural therapies, particularly herbal, dietary and lifestyle interventions, can serve as valuable adjuncts to conventional care.

Herbal medicine offers immunomodulatory, adaptogenic, antimicrobial and anti-inflammatory actions that may help reduce microbial burden, alleviate systemic inflammation and support the restoration of homeostasis in cases of persistent symptoms or PTLDS. The complexity of Lyme disease requires a personalised, systems-based, comprehensive treatment plan that evolves with the patient's presentation. It is essential to investigate and address potential contributing factors that can exacerbate the symptoms or hinder recovery. These factors may include issues such as mineral deficiencies, blood sugar imbalances, allergies, gut dysbiosis, hormone imbalance and autoimmune disorders. By taking a holistic approach, and considering the broader context of an individual's health, healthcare professionals can better tailor treatment plans to address the multifaceted nature of Lyme disease and enhance the overall well-being of those affected.

One of the key naturopathic aims in managing persistent Lyme disease is supporting the body's response to biofilm formation, which are protective microbial coatings, or clusters, that can shield *Borrelia burgdorferi* and fuel ongoing inflammation. These biofilm communities are a hallmark strategy

of stealth pathogens, microorganisms that evade, suppress or misdirect immune responses, often contributing to chronic, treatment-resistant infections. Biofilms have been identified in autopsy tissues of patients with long-standing Lyme disease despite extended antibiotic therapy, suggesting they may shield bacterial debris from immune clearance, sustaining inflammation and potentially triggering autoimmunity. This may help explain the development of PTLDS, where symptoms such as fatigue, cognitive dysfunction and pain persist for months or years despite appropriate antibiotic treatment. Because biofilm-forming capacity is common among bacteria, and influenced by environmental and microbial factors, they represent a significant barrier to complete resolution of infection. For this reason disrupting biofilms, with natural biofilm disruptors, modulating immune responses and restoring microbiome balance, forms an important part of the naturopathic strategy, particularly in cases where symptoms persist after standard antibiotic therapy.

Naturopathic Treatment Aims

- Lower the burden of stealth pathogens.
- Preserve endothelial integrity and collagen structures, which may be vulnerable to *Borrelia*-induced matrix degradation.
- Support immune system function, cytokine modulation and adrenal reserves to improve resilience and modulate chronic immune activation. In Lyme (and similar conditions like long COVID or mould illness) cytokine imbalance is a major driver of symptoms including fatigue, neuroinflammation, joint and muscle pain, mood and cognitive disturbance.
- Enhance nervous system regulation, support cognition, sleep quality, mood balance and vagal tone.
- Manage pain and inflammation through both systemic and targeted anti-inflammatory strategies.
- Address dominant or distressing symptoms first, improving quality of life and providing momentum in the healing process. Hope and reassurance are vital elements of any long-term treatment strategy. Symptoms include:
 - muscle and neck pain and spasms (withania,

scullcap, black cohosh)

- joint pain (teasel root, devil's claw, ginger, meadowsweet, sarsaparilla, cat's claw, turmeric, white willow)
- neurological and cognitive symptoms including poor memory, lack of concentration and confusion (St. John's wort, gotu kola, bacopa, ginkgo, lemon balm, rosemary, schizandra, holy basil)
- Bell's palsy (St. John's wort, mullein, prickly ash)
- insomnia (hops, passion flower)
- anxiety (bacopa, motherwort, oats green)
- fatigue and HPA-axis depletion (Korean ginseng, schizandra, withania, Siberian ginseng, cordyceps, liquorice)
- immunodeficiency in PLDS (astragalus, reishi, cat's claw)
- antibiotic side effects (liver protection: St. Mary's thistle, turmeric, schizandra; to help prevent yeast overgrowth: epilobium, barberry)
- Support detoxification pathways, particularly during antimicrobial protocols, to manage Herxheimer reactions and ensure proper elimination of endotoxins via liver, kidneys, lymphatics and skin.
- Optimise digestive function including gut barrier integrity, microbiota balance and nutrient absorption, all of which are commonly disrupted in chronic Lyme presentations.

Diet

Dietary modifications play a pivotal role in reducing systemic inflammation, supporting detoxification and improving outcomes for patients with Lyme disease. While the path to recovery may be long, nutrition can significantly enhance resilience and support healing.

Encourage patients to make gradual, step-by-step changes rather than overhauling everything at once. Provide consistent support and practical tools such as food lists, meal ideas and shopping guides.

Focus on small, frequent meals composed of light, nutrient-dense foods that are easy to digest such as smoothies, bone broths, green juices, soups and stewed vegetables.

To minimise toxin exposure, and support detoxification pathways, prioritise organic produce wherever possible to reduce pesticide and chemical load.

Include:

Anti-inflammatory Foods: Emphasise whole foods rich in antioxidants and phytonutrients such as leafy greens, cruciferous vegetables, berries, nuts, seeds, turmeric, ginger and omega-3-rich fish.

Gut Health Support: Incorporate probiotic-rich foods such as yoghurt, kefir, sauerkraut, kimchi and miso. Include a variety of dietary fibres, such as flaxseeds, chia, psyllium husk and cooked root vegetables, to support microbiota diversity and bowel regularity.

Hydration: Encourage at least two litres of filtered water daily. Herbal teas such as nettle, dandelion, ginger and peppermint can further support hydration and gentle detoxification.

Nutrient Density: Ensure consistent intake of key micronutrients, especially vitamin D, magnesium, zinc, B vitamins, and vitamin C, to support immune and mitochondrial function.

Protein: Recommend lean, organic, high-quality protein such as eggs, legumes, wild fish and pasture-raised meat to supply amino acids essential for immune cell repair, antibody production and tissue regeneration.

Liver-loving Foods: Garlic, onions, broccoli, beetroot, spinach, lemon, artichoke, turmeric and small amounts of cayenne may enhance hepatic clearance and bile flow.

Avoid:

Processed and Packaged foods: Especially those high in preservatives, additives and refined carbohydrates.

Refined Sugars: Natural sugars like raw honey, maple syrup and fruit are generally less immunosuppressive but may still need to be restricted in cases of gut dysbiosis, Candida overgrowth or when patients are on antibiotics.

Inflammatory Fats: Reduce intake of trans fats, hydrogenated oils and excess saturated fats from processed animal products. Prioritise cold-pressed olive oil, avocado, nuts and seeds.

Gluten, Wheat, Dairy and Soy: These common inflammatory triggers may exacerbate gut permeability, immune dysregulation or sensitivities. Trial removal may benefit many patients.

Caffeine and Alcohol: Both can burden the liver, impair sleep and worsen neurological symptoms. Recommend limiting or eliminating during active treatment phases.

Lifestyle

Lifestyle measures play a pivotal role in restoring immune regulation, reducing inflammatory load and enhancing the body's intrinsic healing capacity in Lyme disease. An integrative approach that combines movement, rest, stress modulation, environmental awareness and herbal support offers holistic benefits for both body and mind.

Stress Management and Emotional Support:

Living with undiagnosed or chronic Lyme disease can be profoundly distressing. In Australia many patients report psychological harm due to being erroneously labelled as hypochondriacs or receiving misdiagnoses such as conversion disorder or Munchausen's syndrome. These mislabellings often lead to invalidation by family, friends, healthcare providers and the wider community. Once a diagnosis is confirmed psychological support becomes vital. Therapeutic interventions such as psychotherapy, counselling and trauma-informed care help patients process their experiences and manage the emotional burden of chronic illness. Psychologists and counsellors can support emotional regulation and coping strategies and their work can be effectively integrated with herbal and pharmacological therapies where appropriate. Encouraging patients to build a support network, including family, friends, peer support groups and online communities, can reduce isolation and promote emotional resilience.

- Mindfulness and meditation
- Gentle yoga and breathwork
- Trauma-informed psychotherapy
- Connection to peer-led Lyme support groups

Physical Activity: Physical movement helps regulate circulation, lymphatic flow, immune activity and mood. However patients with Lyme disease often experience exercise intolerance, fatigue and post-

exertional symptom exacerbation.

- Begin with gentle, anaerobic movement (not aerobic) such as stretching, walking or tai chi.
- Exercise every second day only, to allow immune recovery.
- Build gradually up to 45 minutes, broken into shorter sessions if needed.
- Severely deconditioned patients may benefit from support from a physiotherapist or exercise physiologist.

Sleep Hygiene: Restful sleep is essential for immune regulation, hormonal balance, detoxification and neurological repair. Lyme disease patients frequently report sleep disturbances including insomnia, night waking, non-restorative sleep and circadian rhythm disruption.

- Maintain a regular sleep schedule
- Sleep in a cool, dark, quiet room
- Use herbal nervines or adaptogens to assist sleep onset and regulation
- Nap or rest when fatigued but avoid excessive daytime sleeping to preserve circadian rhythm

Environmental Factors: The patient's living environment can directly affect recovery. A mould-free, low-toxin, sensory-friendly home is ideal.

- Reduce noise, light and sensory overload
- Ensure easy access to bathroom, bed and kitchen for those with mobility challenges
- Maintain dry, mould-free air and use HEPA filters if needed
- Minimise chemical exposure such as in cleaning and personal care products and synthetic fragrances

Environmental fragmentation is also a key factor in the rise of tick-borne illness. As habitat loss drives birds into urban areas, the spread of ticks, and therefore *Borrelia* and co-infections, increases. Avoid installing bird feeders, as birds are one of the major carriers of ticks. With fewer natural predators, tick populations can rise unchecked.

Additional Measures:

- Dry skin brushing to assist with lymphatic clearing especially if patient is bedbound

- Epsom salts baths
- Coffee enemas
- Acupuncture

Adjunctive Therapies (reported by patients): A number of additional therapies are often pursued by patients with chronic or treatment-resistant Lyme. While not officially endorsed by the Australian Government anecdotal reports and international integrative clinics note potential benefit from:

- Ozone therapy
- Hyperthermia treatment
- Infrared sauna therapy
- Hot baths combined with taking a diaphoretic tea (yarrow, elder flowers, ginger)

- Hyperbaric oxygen therapy
- Supportive oligonucleotide therapy

If patients inquire about these therapies practitioners should take an open, yet evidence-informed stance ensuring any choices are made with full understanding of risks, benefits and regulatory context. Integrative practices that combine these lifestyle measures with herbal medicine aim to enhance the body's intrinsic healing capacity while alleviating the chronic inflammatory burden associated with Lyme disease. This multimodal approach not only aids in symptom management but also helps in restoring optimal immune function and metabolic balance.^{44,45}

Potential Treatment Plans

Early Lyme disease	Andrographis	Echinacea	Japanese Knotweed	Teasel Root	Schizandra
Disseminated Lyme disease	Japanese Knotweed	Reishi	Turmeric	Andrographis	Teasel Root
PTLDS	Cat's Claw	Reishi	Garlic	Lion's Mane	Cordyceps
Naturopath Lara Ryan's acute tick bite support*	Teasel Root	Astragalus	Echinacea	Cat's Claw	Japanese Knotweed

**(also includes Sweet Wormwood and Pomegranate)
Use age appropriate dosing, three times daily for one month*

Desired Herbal Actions and Potential Herbs Include:

Herbal medicine plays a crucial role in supporting patients with Lyme disease by addressing symptoms, enhancing immune function and promoting overall wellness. Clinicians seek herbs that can counteract the persistent low-grade inflammation and immune dysregulation seen in many Lyme patients. By selecting herbs that work synergistically practitioners can craft personalised protocols that not only target the infection but also restore systemic balance.

It is worth noting that while many herbal medicines have demonstrated *in vitro* activity against human immunodeficiency virus (HIV) in the past, none have translated into clinically effective antiviral therapies comparable to conventional antiretroviral treatment. Similarly, in the case of Lyme disease, some herbs exhibit broad antimicrobial activity but lack specific anti-*Borrelia* effects, highlighting that general antimicrobial action does not necessarily equate to efficacy against *Borrelia burgdorferi*.

Human clinical trials specifically on herbs for Lyme disease are extremely limited. At the time of writing no single herbal medicine has been confirmed in well-designed human clinical trials to have direct anti-*Borrelia* effects comparable to antibiotics. Most of the evidence is *in vitro* (test tube) studies, animal models, case reports or observational data and traditional use or empirical observations in integrative clinical practice. This means that, from a clinical evidence standpoint, herbs cannot currently replace antibiotics in acute Lyme disease, though they may support immune response, reduce inflammation and address coinfections or chronic symptoms. There are many herbs with promising *in vitro* anti-*Borrelia* activity but extrapolation is limited. Some of the most studied herbs *in vitro* for anti-*Borrelia* effects include Japanese knotweed, sweet wormwood, baical scullcap and cat's claw. Other herbs such as garlic, andrographis, clove, cinnamon and oregano have shown potential for disrupting *Borrelia* biofilms and targeting persister forms, which are notoriously difficult to eradicate with antibiotics alone.

While these herbs have not been clinically validated with anti-*Borrelia* activity yet it is mechanistically

plausible, given their immune modulating and broad antimicrobial effects, and they are empirically supported in Buhner's protocols and widely used by herbalists in Lyme and other tick-borne illnesses. Importantly, herbal protocols often rely on phytochemical synergy rather than isolated compound activity, a concept poorly captured in reductionist research models. The combined effect of whole plant extracts may support immune surveillance, reduce pathogenic load and help restore tissue homeostasis in ways that are not easily quantified.

The clinical reality of *in vitro* and *in vivo* in herbal medicine is herbs that work in a petri dish might be poorly absorbed in the human gut, be rapidly metabolised or excreted, require concentrations unachievable *in vivo* and act via synergistic mechanisms not reflected in isolated compound testing. Also, *Borrelia* is a highly evasive, tissue-hiding pathogen. Just because a compound kills it *in vitro* does not mean it can reach or affect it in the body. Stealth pathogens like *Borrelia* also exhibit immune evasion and intracellular persistence, meaning that immune restoration and systemic support may be as important as direct antibacterial action. A few observational studies and small trials are emerging, especially from integrative Lyme clinics in the US and Europe, however these are often non-randomised, use polyherbal or combined protocols and are difficult to compare due to variability in strains and patient presentations. In summary:

- There are no validated herbal monotherapies with proven human clinical efficacy against *Borrelia*.
- Many herbs have *in vitro* anti-*Borrelia* activity but these findings cannot be directly extrapolated to clinical outcomes.
- Herbal medicine still plays a vital role in an integrative strategy: modulating immune response, managing symptoms, supporting detoxification pathways and addressing coinfections.

Immune Modulators

These herbs help regulate immune responses while reducing excessive inflammation. Some of these, such as Japanese knotweed, garlic and andrographis, may also support immune surveillance

against stealth pathogens like *Borrelia* by enhancing innate immunity and interfering with microbial evasion strategies. Herbs such as andrographis, astragalus, baical scullcap (said to remodulate cytokines to support the body's immune and inflammation responses), cat's claw, cordyceps, echinacea, garlic, ginger, holy basil, Japanese knotweed, Korean ginseng, liquorice (acts as a potent synergist), pau d'arco, reishi, schizandra, Siberian ginseng, teasel root, turmeric, withania.

Anti-Inflammatories, Antioxidants

Chronic inflammation is a hallmark of Lyme disease. Reducing the burden placed on the body by the inflammatory response to the invading bacteria is a key feature of addressing it. These herbs help reduce systemic inflammation and oxidative stress, reduce neurological inflammation and pain and support overall tissue healing. Several of these herbs, notably Japanese knotweed, baical scullcap and reishi, also play a role in reducing inflammation associated with microbial biofilms, a key contributor to chronic immune activation in post-treatment Lyme disease. Their antioxidant actions may help to buffer tissue damage caused by both persistent infection and overactive immune responses. Herbs such as andrographis, astragalus, bacopa, baical scullcap, black cohosh, cat's claw, cordyceps, devil's claw, echinacea, epilobium, garlic, ginger, ginkgo, gotu kola, green tea, holy basil, Jamaica dogwood, Japanese knotweed, Korean ginseng, lemon balm, liquorice, maritime pine, meadowsweet, motherwort, passion flower, pomegranate, prickly ash, reishi, rosemary, saffron, St John's Wort, sarsaparilla (traditional syphilis treatment), schizandra, scullcap, sweet wormwood, teasel root, thyme, turmeric, withania, white willow.

Antimicrobials

These herbs support the body's defences against *Borrelia burgdorferi* and its associated co-infections by exhibiting broad-spectrum antibacterial, antiviral and antifungal properties. While human clinical trials demonstrating direct anti-*Borrelia* effects are lacking, several herbs have shown promising *in vitro* activity against *Borrelia*, biofilms and persister forms. In clinical practice they are often used synergistically within formulas to reduce microbial load, modulate immune response and support recovery in both acute and persistent cases. Their roles may also

include targeting secondary infections, disrupting biofilms and addressing microbial dysbiosis that often accompanies chronic illness. Herbs such as andrographis, astragalus, baical scullcap, cat's claw, cinnamon, clove, cordyceps, devil's claw, echinacea, epilobium, fennel, garlic, gentian, ginger, ginkgo, holy basil, Japanese knotweed, lemon balm, liquorice, motherwort, olive leaves, pau d'arco, paw paw, peppermint, prickly ash, reishi, rosemary, sage, Siberian ginseng, sweet wormwood (especially *Babesia*), teasel root, thyme, turmeric, wormwood.

Japanese knotweed, garlic, sweet wormwood, clove and cinnamon have demonstrated biofilm-disrupting potential *in vitro* and may improve access to deep tissue or intracellular infections by exposing hidden pathogens to the immune system and other antimicrobials. This makes them key players in addressing stealth pathogens that may persist even after conventional treatment has ceased.

Adaptogens, Adrenal Support, Sedatives, Nervines

Support stress resilience and energy levels. Gentle and nourishing sedative and nerve-calming herbs ease pain and promote restful and consistent sleep. Herbs such as astragalus, bacopa, Californian poppy, chamomile, cordyceps, hops, Korean ginseng, gotu kola, holy basil, lemon balm, liquorice, motherwort, mullein, oats green, passion flower, rehmannia, reishi, rhodiola, saffron, schizandra, Siberian ginseng, valerian, withania.

Neuroprotective

Lyme disease can affect the nervous system leading to cognitive and neurological symptoms. These herbs support brain health and nerve function. Herbs such as bacopa, ginkgo, holy basil, Japanese knotweed, lemon balm, lion's mane, reishi, scullcap, St John's wort, saffron, turmeric.

Hepatoprotective Herbs

These herbs support liver function and assist in clearing toxins from the body. Supporting liver function is one of the highest priorities in Lyme treatment for those on antibiotic therapy. Herbs such as andrographis, astragalus, baical scullcap, bupleurum, burdock, dandelion root, globe artichoke, garlic, holy basil, Japanese knotweed, lemon balm, liquorice, peppermint, rosemary, St. John's wort, St. Mary's thistle, sarsaparilla, schizandra, turmeric.

Herbal Support Could Include:

HERB NAME	DESCRIPTION	ACTIONS
<p>Andrographis (<i>Andrographis paniculata</i>)</p> 	<p>Andrographis is widely used in Lyme protocols. In traditional Chinese medicine andrographis is seen as a herb to rid the body of heat and fever and to dispel toxins from the body. One of the reasons it may be helpful in the treatment of Lyme disease is due to its anti-inflammatory action and protecting cell membranes. In this way symptoms of nerve cell irritation such as headaches, tingling, burning and numbness can be reduced. Buhner says this works as an antispirochetal in 60% of people. He also says that if andrographis liquid extract is placed directly onto a tick bite it will reduce infection rates by 80% if taken with astragalus. While direct antispirochetal effects against <i>Borrelia burgdorferi</i> have not been demonstrated in clinical trials, it remains a cornerstone herb in empirical treatment strategies. Its traditional use and strong immunomodulatory actions provide a rationale for inclusion in supportive protocols, particularly in combination with other herbs targeting <i>Borrelia</i> and coinfections. It may also help disrupt microbial communication (quorum sensing), a mechanism used by stealth pathogens and biofilm-forming microbes. ^{47,48}</p>	<p>Immune Modulator Antimicrobial (Antiviral Antibacterial Antifungal Anthelmintic) Anti-inflammatory Antioxidant Hepatoprotective</p>
<p>Astragalus (<i>Astragalus membranaceus</i>)</p> 	<p>Astragalus has a long history of use as a tonic and immune modulator, traditionally employed to increase the number and activity of immune cells. It is often paired with other adaptogenic herbs, such as liquorice, to enhance resilience and support convalescence. Buhner recommends long-term use of astragalus as a prophylactic in endemic areas, citing its ability to help prevent infection or reduce symptom severity if exposure occurs (typically 1000-3000mg daily). However, caution is advised in cases of chronic or late-stage Lyme disease, as astragalus may stimulate immune activity in a way that exacerbates inflammatory symptoms in some individuals. ⁴⁹</p>	<p>Immune Modulator Adaptogen Anti-inflammatory Antiviral Antibacterial Antioxidant Hepatoprotective Cardioprotective</p>

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS
<p>Cat's Claw (<i>Uncaria tomentosa</i>)</p> 	<p>Cat's claw is one of the most commonly used herbs in chronic Lyme protocols, valued for its ability to modulate immune function and support the body in addressing <i>Borrelia</i> spirochetes. It may assist by reducing inflammatory load, enhancing immune surveillance and improving symptom resilience. Cat's claw has demonstrated the capacity to increase white blood cell counts in human studies, an important mechanism for sustaining immune responsiveness. Preliminary clinical trials have also shown that it may reduce pain and joint inflammation in conditions such as osteoarthritis and rheumatoid arthritis, especially when used alongside conventional treatments, suggesting its potential role in addressing both infectious and autoimmune aspects of chronic Lyme disease. Emerging data also suggests it may help break down bacterial biofilms and reduce microbial persistence in chronic infections. ⁵⁰</p>	<p>Immune Modulator Antimicrobial Anti-inflammatory Antioxidant</p>
<p>Cordyceps (<i>Cordyceps militaris</i>)</p> 	<p>Cordyceps is a functional medicinal mushroom traditionally used in Asian herbal medicine to support endurance, recovery and immune resilience. Known for its ability to reduce fatigue and enhance mitochondrial function, it is commonly indicated during convalescence following infection, periods of chronic stress or when addressing post-viral or post-infectious syndromes such as Lyme-related fatigue. Cordyceps may also improve vitality, lung function and adenosine triphosphate (ATP production), making it a valuable daily tonic in long-term wellness and immune support protocols. ATP is the body's primary energy molecule which is essential for cellular function, especially in energy-demanding tissues like the muscles, brain and immune system. In chronic infections like Lyme disease, where fatigue and mitochondrial stress are common, supporting ATP production can enhance energy levels and overall recovery. ⁵¹</p>	<p>Adaptogen Antioxidant</p>

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS
<p>Echinacea (<i>Echinacea</i> spp.)</p> 	<p>Echinacea is a key immune herb in Lyme protocols, particularly valuable in the early stages of infection. It enhances host defences by stimulating phagocytosis, activating macrophages and modulating the activity of cytokines and natural killer (NK) cells. As a broad-spectrum immune stimulant and modulator, echinacea is often used as a baseline or foundational therapy, helping to prime immune function before introducing more targeted antimicrobial or anti-inflammatory interventions. Its role is especially relevant in acute presentations, or when the immune system requires robust yet balanced activation. Its immune modulating effects may also assist in recognising and targeting stealth pathogens which can evade early immune detection.⁵²</p>	<p>Immune Modulator</p> <hr/> <p>Antimicrobial</p> <hr/> <p>Anti-inflammatory</p> <hr/> <p>Antiviral</p> <hr/>
<p>Garlic (<i>Allium sativum</i>)</p> 	<p>Garlic is a potent broad-spectrum antimicrobial, traditionally valued for its activity against bacteria, viruses, fungi and protozoa making it particularly useful in addressing Lyme coinfections. Rich in organosulfur compounds garlic supports immune modulation, reduces systemic inflammation and helps mitigate oxidative stress, which are key drivers of chronic Lyme symptomatology. Clinical studies have shown that garlic supplementation can lower circulating markers of inflammation and improve redox balance, potentially alleviating fatigue, pain and cardiovascular burden in long-term presentations. It is also a valuable adjunct for supporting vascular integrity and circulation. Garlic is also one of the better studied natural agents for biofilm disruption, making it valuable in protocols where microbial persistence is suspected.⁵³</p>	<p>Antimicrobial</p> <hr/> <p>Immune Modulator</p> <hr/> <p>Cardiotonic</p> <hr/> <p>Anti-inflammatory</p> <hr/> <p>Antioxidant</p> <hr/> <p>Hepatoprotective</p> <hr/>

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS	
<p>Japanese Knotweed (<i>Polygonum cuspidatum</i>)</p>	<p>Japanese knotweed is considered one of the most important herbs in Lyme protocols, particularly for its role in protecting endothelial integrity, a critical intervention that can help mitigate many of the vascular and neurological symptoms associated with chronic Lyme disease. Its powerful antioxidant and anti-inflammatory properties help reduce oxidative stress, support cardiovascular function and enhance microcirculation, including cerebral and joint perfusion. Research also supports its role in disrupting biofilms and addressing microbial stealth mechanisms, key considerations in long-term Lyme cases. Beyond its pharmacological activity, herbalists often note the plant's ecological "signature": it thrives in disturbed environments, much like Lyme <i>borreliosis</i> takes hold in compromised physiological terrain. Many practitioners see the proliferation of Japanese knotweed as nature's response to the growing burden of tick-borne illness, especially given its noted ability to penetrate biofilms, modulate immune function and exert neuroprotective effects. ⁵⁴</p>	<p>Antimicrobial <hr/> (Antibacterial) <hr/> Anti-inflammatory <hr/> Neuroprotective <hr/> Immune-modulator <hr/> Antioxidant <hr/> Cardioprotective <hr/> Hepatoprotective</p>	
	<p>Lion's Mane (<i>Hericium erinaceus</i>)</p>	<p>Though primarily known for its neuroprotective effects, lion's mane also supports mucosal immunity and gut-brain axis repair, potentially modulating terrain exploited by stealth pathogens. Lion's mane is increasingly recognised for its potential to support nerve regeneration, cognitive function and digestive health, all areas commonly affected in chronic Lyme disease and related co-infections. Early human clinical trials, though limited in scale, have shown promising improvements in memory, focus, mood and reductions in anxiety and depression. Its ability to stimulate nerve growth factor and protect against neurodegenerative changes, including those associated with Alzheimer's disease, may underpin these cognitive benefits. However, most research to date remains preclinical or small-scale, highlighting the need for further robust human studies to fully validate its efficacy. ^{55,56}</p>	<p>Neuroprotective <hr/> Cognitive-enhancing <hr/> Immune-modulating</p>
			

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS
<p>Reishi (<i>Ganoderma lucidum</i>)</p> 	<p>Reishi is a medicinal mushroom renowned for its potent immune modulating and antiviral properties. Immune modulation means it can calm excessive inflammation while simultaneously enhancing the immune system's ability to target pathogens effectively. Numerous studies have documented reishi's anti-inflammatory effects, supporting its use in managing pain-related symptoms common in chronic Lyme disease. Additionally, reishi is frequently employed to combat fatigue and improve vitality, addressing one of the most debilitating symptoms experienced by Lyme patients. Its polysaccharides may also indirectly disrupt microbial persistence by enhancing macrophage activity and modulating biofilm tolerance. ⁵⁷</p>	<p>Immune Modulator</p> <hr/> <p>Adaptogen</p> <hr/> <p>Anti-inflammatory</p> <hr/>
<p>Schizandra (<i>Schisandra chinensis</i>)</p> 	<p>By enhancing phase I and II liver detoxification, schizandra may assist in eliminating microbial metabolites and biofilm debris during treatment. It is a revered herb in traditional Chinese medicine and is gaining traction in Western herbalism for its hepatoprotective properties, enhancing the liver's detoxification capacity, a key consideration for patients undergoing antibiotic therapy. Beyond liver support, schizandra acts as a powerful antioxidant, adaptogen, nervine tonic and mild antidepressant, helping to improve mental clarity, physical endurance and resilience to stress. Its multi-faceted actions make it a valuable ally in supporting both detoxification and overall vitality in Lyme disease management. ⁵⁸</p>	<p>Adaptogenic,</p> <hr/> <p>Hepatoprotective</p> <hr/> <p>Antioxidant</p> <hr/>
<p>Teasel Root (<i>Dipsacus asper</i>)</p> 	<p>While direct evidence remains anecdotal, teasel is traditionally believed to mobilise <i>Borrelia</i> from protective biofilm environments, making them more susceptible to immune targeting. It is valued in Lyme protocols as a supportive antimicrobial herb. Additionally, teasel root supports musculoskeletal health and enhances lymphatic and detoxification pathways, contributing to overall recovery and symptom relief. ⁵⁹</p>	<p>Immune-modulating</p> <hr/> <p>Antimicrobial</p> <hr/> <p>Anti-inflammatory</p> <hr/>

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS
<p>Turmeric (<i>Curcuma longa</i>)</p> 	<p>Turmeric possesses potent anti-inflammatory and antioxidant properties, making it effective in reducing systemic inflammation and oxidative stress, key factors in tissue repair and recovery. It offers pain relief, soothes digestive discomfort, improves circulation and supports brain function. Additionally, turmeric promotes wound healing, assists with skin conditions and enhances liver health by stimulating bile production and supporting enzymatic detoxification pathways.⁶⁰</p>	<p>Anti-inflammatory</p> <hr/> <p>Antioxidant</p> <hr/> <p>Antimicrobial</p> <hr/> <p>Neuroprotective</p> <hr/> <p>Immunomodulator</p> <hr/> <p>Hepatoprotective</p>

Conclusion⁶¹

Lyme disease remains a complex and often misunderstood condition, requiring a multifaceted approach to both diagnosis and treatment. While conventional medicine primarily relies on antibiotic therapy, the persistence of symptoms in many patients calls for a broader, more holistic strategy, one that integrates herbal medicine, nutrition and lifestyle modifications to support recovery and long-term wellness.

Naturopaths and herbalists are uniquely positioned to assist patients navigating this multisystem illness, which is frequently overlooked or misdiagnosed by conventional practitioners. By offering personalised, evidence-informed care they can effect meaningful improvements in patient outcomes. As research

continues to evolve it is essential for practitioners to stay abreast of emerging data and integrative approaches to Lyme disease management.

Patients with Lyme disease and DSCATT face significant challenges, particularly within Australia's often contentious healthcare environment surrounding chronic tick-related symptoms. This highlights the urgent need for empathetic, patient-centred and multidisciplinary treatment strategies. Embracing an integrative paradigm honours the complexity of both the disease and the human body, paving the way for therapies that not only target infection but also restore systemic harmony and promote whole-person healing.

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