
Symptom lists

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What are the symptoms of Lyme disease?

Lyme Disease is most often categorised into three stages.

Stage One of Lyme Disease:

- Flu-like symptoms;
- Rash (that may look like a "bull's-eye");
- High temperature;
- Fever;
- Chills;
- General feeling of illness;
- Neck stiffness (a stiff neck);
- Joint pain;
- Muscle pain;
- Swollen lymph glands;
- Fatigue.

Stage Two of Lyme Disease:

- Joint pain;
- Headache;
- Disturbed vision;
- Blurry vision;
- Swelling of the joints (swollen joints);
- Tingling sensation in the hands and feet;
- Numbness of the skin (a numbing sensation);
- Problems with concentrating (lack of concentration);
- Short-term memory loss;
- Forgetfulness;
- Heart rhythm disturbances (a difference to the rhythm of the heart, i.e. fast heartbeat or slower heartbeat), heart palpitations.

More serious symptoms may develop if Lyme disease is left untreated or is not treated early on, as the bacteria spreads to other parts of the body.

Stage Three of Lyme Disease

Later disease symptoms may include:

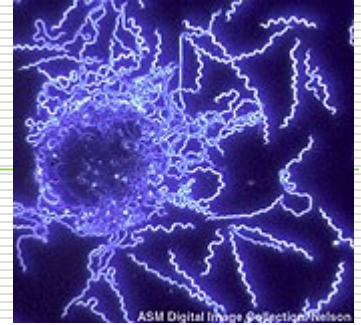
- Arthritis of the large joints: knees, hips, etc.
- Severe headaches;
- Heart arrhythmia;
- Brain disorders and brain disturbance, including: memory loss, mood disturbances and sleep interruption;
- Difficulty concentrating;
- Mental 'fogginess';
- Mood changes/mood swings;
- Aggression;
- Panic attacks;
- Anxiety;
- Temporary amnesia / forgetfulness;
- Difficulty following conversations;
- Difficulty speaking;
- Numbness or tingling in limbs: arms, legs, feet or hands;
- Extreme fatigue/tiredness;
- Temporary paralysis of facial muscles ('facial palsy', where there is a drooping or loss of muscle tone in the face);
- Peripheral nerve dysfunction.

Ticks can transmit more than one type of infection. To learn more about Lyme Disease Co-infections, please [click here](#)

Sources:

1. *Textbook of Clinical Neuropsychiatry and Behavioral Neuroscience*, D. Moore and B. Puri, 2012. Hodder Arnold
2. <https://www.nhsinform.scot/illnesses-and-conditions/infections-and-poisoning/lyme-disease>

Borrelia/Lyme Disease is a Chameleon ...



- ME
- Fibromyalgia
- Chronic EBV
- Rheumatoid arthritis
- Polymyalgia rheumatica
- Polymyositis/dermatomyositis
- Lupus
- Multiple Chemical Sensitivity
- Bipolar d/o
- Schizoaffective d/o
- Multiple Sclerosis
- Amyotrophic lateral sclerosis
- Alzheimer's disease
- Parkinson's Disease
- Thyroid disease
- Addison's disease
- Hyperparathyroidism
- ADHD
- Autism
- Etc.

Clinical presentation of Babesia



- Headaches
- Night sweats
- Fevers
- Dry cough
- Air hunger
- Easy bruising
- Tinnitus
- Rage
- Despair
- Chills
- Flushing
- Sleep disturbance
- Vivid or violent dreams
- Dysphagia
- Psychic phenomena
- Severe neurological illnesses
- Thirst/Polydipsia
- Fatigue
- Rheumatoid arthritis
- Nausea (severe)
- Malaise
- Anaemia, thrombocytosis, thrombocytopenia
- Abdominal pain

Babesia: Symptoms

Commonly associated with severe Babesia:

- **High fever (105° F)**
- **Severe fatigue and malaise**
- **Shaking chills**
- **Recurrent severe drenching sweats, esp. at night**
- **Severe headache**
- **Muscle aches (myalgia)**
- **Joint pain (arthralgia)**
- **GI: nausea, abdominal pain, diarrhea**
- **Decreased blood pressure**
- **Jaundice (probably due to lysis of red blood cells)**
- **Bruising**
- **Petechiae**
- **Decreased cognition (from intravascular coagulation)**
- **Dark urine**
- **Pulmonary oedema**

Source: Vannier E. et al. Human Babesiosis. Infect Dis Clin North Am. 2008 Sep; 22(3): 469–ix.; Akel T, Mobarakai, N. Hematologic manifestations of babesiosis. Annals of Clinical Microbiology and Antimicrobials 2017;16:6

Babesia: Signs/abnormal labs

Thrombocytopenia (decreased platelets)

- **Enlarged spleen and liver**
- **Anaemia (low haemoglobin)**
- **Evidence of haemolysis (destruction of red blood cells)**
- **Elevated liver function**
- **Mild neutropenia/leukopenia (decreased white blood cells)**
- **Low or unstable blood pressure**
- **Organ malfunction (heart attack, stroke, respiratory distress, kidney failure)**

Source: Rosenblatt JE et al. Laboratory Diagnosis of Infections Due to Blood and Tissue Parasites. Clinical Infectious Diseases, Volume 49, Issue 7, 1 October 2009, Pages 1103–1108

Clinical presentation of Bartonella

- Brain Fog
- Fever
- Headaches (ice pick)
- Photophobia
- Tachycardia
- Bowel problems IBS>>>>IBD
- Swollen glands
- OCD behavior
- Anxiety
- Endocarditis
- Retinitis
- Peripheral neuropathy
- Psychiatric issues
- Plantar pain, costal margin pain
- Rapid mood shifts
- Abdominal tenderness
- Subcutaneous nodules
- Anxiety
- Swollen joints
- Swollen lymph nodes
- Purple non-blanching abdominal striae
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Bartonella: Manifestations

Lymph: Frequently the cardinal symptom – enlargement, tenderness, leukocytosis, fever

Ocular: Redness, blurred vision, retinitis, uveitis, optic neuritis, etc.

Ear: Otitis media, vertigo, labyrinthitis

Neurological issues: Headaches, encephalopathy, seizures, facial nerve paralysis, neuralgia, panic attacks, muscle spasms, unexplained rage, multiple other symptoms

Hepatosplenic issues: Hepatosplenomegaly, abscesses/granulomas in liver/spleen, gallbladder may be involved

Renal issues: Glomerulonephritis, microabscesses, urogenital pain, proteinuria, dark urine

Orthopaedic: Bone infection: pain, osteomyelitis, arthritis. Knee, wrist, elbow, ankle, bunion; spine and pelvic girdle. Myalgia, tendonitis.

Skin: Rashes, striae, non-healing ulceration, purpuras, vasculitis

Source: Berghoff W. Chronic Lyme Disease and Co-infections: Differential Diagnosis. [Open Neurol J. 2012; 6: 158–178.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3565243/table/T3/)
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3565243/table/T3/>; Buhner, SH. Healing Lyme Disease Coinfections: Complementary and Holistic Treatments for Bartonella and Mycoplasma. Healing Arts Press

Striae/stretch marks characteristic of Bartonella



The Lyme Disease Association thanks Dr. Martin Fried, Jersey Shore University Medical Center, for this picture of a Bartonella rash.

Mycoplasma: symptoms

Pulmonary: Pneumonia, bronchitis, pharyngitis, rhinitis, earaches, sinusitis

Gastrointestinal: Hepatitis, pancreatitis

Rheumatic: Arthritis, arthralgias, myalgias, polyarthritits

Kidneys: Glomerulonephritis

Ocular: Uveitis

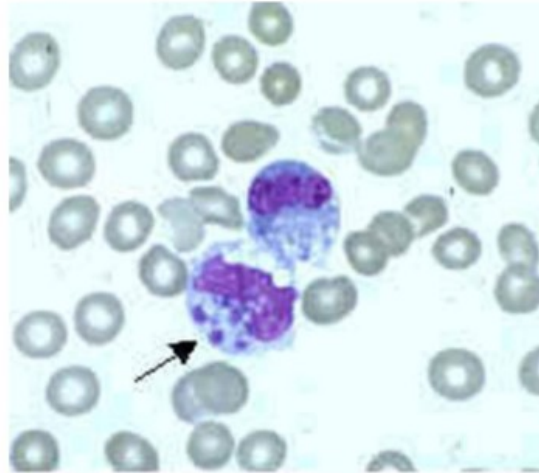
Neurological: Myelitis, Guillain-Barré syndrome, encephalitis, meningitis, polyradiculopathy, peripheral facial paresis optical neuritis, hemorrhagic leukoencephalitis, peripheral polyneuropathy, cranial nerve neuritis, radiculitis

Source: Berghoff W. Chronic Lyme Disease and Co-infections: Differential Diagnosis. *Open Neurol J.* 2012; 6: 158–178. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3565243/table/T3/>; Kashyap S, Sarkar, M. Mycoplasma pneumonia: Clinical features and management. *Lung India.* 2010 Apr-Jun; 27(2): 75–85.

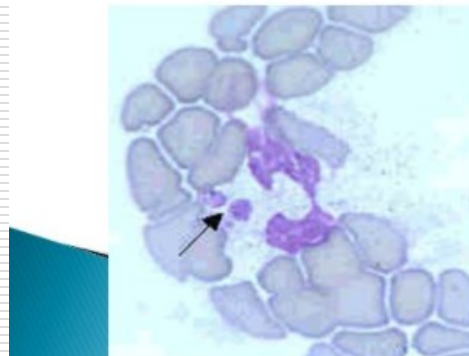
Ehrlichia/Anaplasma: rod shaped bacteria that live inside white blood cells

Small intracellular gram-negative bacteria that cannot exist outside host cells.

Ehrlichia prefers mononuclear phagocytes, while Anaplasma prefers neutrophils



Ehrlichia chaffeensis primarily infects mononuclear leukocytes (predominantly monocytes and macrophages),



The pathogen that causes human granulocytic ehrlichiosis (HGE) (Anaplasmosis) primarily infects granulocytes (neutrophils and rarely eosinophils).

Source: https://en.wikipedia.org/wiki/Ehrlichia_chaffeensis;

Ehrlichia: spread/symptoms

Most commonly infects monocytes and macrophages. The bacteria increase granulocytes in the spleen tenfold – this swells the spleen. The natural killer cells are disproportionately distributed to the liver where they produce inflammation, so the liver enzymes AST are elevated in 90% of cases/ALT in 84%. Cholestasis is quite common, sometimes with bile duct injury.

Vectors: Ticks, possibly fleas (cats/dogs)

Symptoms: (incubation time: days up to 4 weeks): rapid onset of beginning illness with fever, headache and prostration, headaches are "sharp, knife-like and often located behind the eyes", muscle pain, not joint pain, neurological symptoms, psychiatric symptoms, rarely: diffuse vasculitic rash, including palms and soles (<10%)

Anaplasma: spread/symptoms

Most commonly infects neutrophils.

Most commonly affected organs/tissues: bone marrow, erythrocytes, liver, spleen, lymph system, lungs

Men more commonly affected than women (2:1).

Markers: Leukopenia (72%), thrombocytopenia (73%), raised AST/ALT, anaemia (55%)

Symptoms: Similar to Ehrlichia, but central nervous system involvement less common than with HME

Vectors: Ticks (Ixodes, Dermacentor, Rhipicephalus, Haemaphysalis Amblyomma), person to person transmission, through respiratory secretions (& through blood transfusion/bone marrow transfer)

Source: Buhner, SH. Healing Lyme Disease Coinfections: Complementary and Holistic Treatments for Bartonella and Mycoplasma. Healing Arts Press

Rickettsia

Bacteria: Rickettsia conorii (Boutonneuse Fever), R. rickettsia (RMSF), R. helvetica, R. slovaca, R. prowazekii (gram-negative, obligate intracellular in endothelial cells)

Vector/hosts: rodent, dogs, humans, Ixodes ricinus, Dermacentor reticulatus

Symptoms (incubation period 5 - 7 days): fever, nausea, vomiting, severe headache, lymphadenitis, exanthema

Complications (app. 13%): peri-/myocarditis, kidney insufficiency, pneumonia, encephalitis, gastrointestinal bleedings, anaemia, hepatitis, myalgia, meningitis

Chlamydia pneumoniae

Bacteria: Chlamydophila pneumoniae (gram-negative, intracellular); cystic and aberrant forms, biofilms

Vector/transmission: airborne infection, human to human, ticks? Or reactivated in Lyme disease (horses, koalas, frogs are infected), aerogen transmission (cough) from horses to horse-riders?

Symptoms: cough, slight throat pain, hoarseness, sinusitis, atypical pneumonia, meningoencephalitis, bronchiolitis obliterans, myocarditis, Guillain-Barre Syndrome; arthritis, tendovaginitis (4-6 weeks)

Associations: Alzheimer's, Multiple Sclerosis, depression, Fibromyalgia, ME/CFS, heart attacks, acute ischemic stroke (AIS), arteriosclerosis, autism, Parkinsonism, Rheumatoid Arthritis, etc.

Epstein Barr Virus (EBV)

Virus: Epstein Barr Virus (obligate intracellular), double stranded DNA virus, one of the Herpesviruses, "Mononucleosis"

Transmission: "kissing disease", saliva, drinking from the same glass, toothbrush, blood, sex, blood-transfusion, organ transplantation

Symptoms (incubation period several weeks): fatigue, fever, flu-like symptoms, nausea, loss of appetite, lymphadenitis (swollen lymph nodes in the neck), rash, sore throat, weakness, sore muscles

Complications: enlarged spleen, swollen liver, association with Non-Hodgkin Lymphoma

Cytomegalovirus (CMV)

Virus: Cytomegalovirus (obligate intracellular), double-stranded DNA virus, one of the Herpes viruses

Transmission: body fluids (urine, saliva, breast milk, sexual transmission), organ transplantation, blood transfusion

Symptoms (incubation period several weeks): fatigue, fever, flu-like symptoms, lymphadenitis (swollen cervical lymph nodes), sore throat, splenomegaly

Complications: congenital infection with hearing loss, vision loss, seizures, mental disabilities, lack of coordination; immune suppressed patients: hepatitis, colitis, retinitis, pneumonitis, esophagitis, polyradiculopathy, transverse myelitis, subacute encephalitis; arterial hypertension, arteroscleroris, aortic aneurysms; association with Non-Hodgkin Lymphoma

Herpes Simplex Virus 1 / 2 (HSV 1 / 2)

Virus: Herpes Simplex Virus (Human Herpes Virus HHV 1 / 2) (obligate intracellular), double-stranded DNA virus, one of the Herpes viruses

Transmission: Saliva, sharing drinks, sexually transmitted

Symptoms (incubation time 2-20 days): Watery blisters on the skin or mucous membranes of the mouth, lips, genitals, anus, flu-like symptoms (fever, muscle aches, swollen lymph nodes, problems urinating, herpes keratitis (pain, light sensitivity, discharge))

Complications: Multiple Sclerosis (neurovirulent), loss of vision, encephalitis, latent infection; reactivation by organ transplantation or HIV: encephalitis, pneumonitis, bone marrow suppression

Varicella Zoster Virus (VZV)

Virus: Varicella Zoster Virus (Human Herpes Virus HHV 3) (obligate intracellular organism), double-stranded DNA virus

Transmission: airborne, touching shingles blisters

Symptoms (incubation time 10-21 days): “Chickenpox” in younger people, “Herpes Zoster” in adults: Watery blisters on the skin, fever, tiredness, loss of appetite, headache

Complications: Encephalitis, pneumonia, bronchitis, 10-20% reactivation from nerve ganglia (Herpes Zoster), post-herpetic neuralgia, Mollaret’s meningitis, Zoster multiplex, “Ramsay Hunt syndrome” (painful blisters on tongue/ear, facial weakness, hearing loss),

Inflammation of arteries (new study Journal of the American College of Cardiology, Vol. 70, Issue 2, July 2017, “Herpes Zoster increases risk of stroke and myocardial infarction” 23,233 patients had a higher risk of apoplectic stroke (35%) and myocardial infarction (59%) after Herpes Zoster

Human Herpes Virus 6 (HHV6)

Virus: Human Herpes Virus 6 (obligate intracellular), double-stranded DNA virus, one of the Herpes viruses

Transmission: Saliva, latency in salivary glands, haematopoietic (blood-building) system

Symptoms: Exanthema subitum (roseola infantum, sixth disease) with high temperature followed by a rash

Complications: Multiple Sclerosis (neurovirulent), cofactor in CFS, fibromyalgia, AIDS, optic neuritis, cancer, temporal lobe epilepsy, Hashimoto thyroiditis, liver dysfunction, liver failure; reactivation by organ transplantation: encephalitis, pneumonitis, bone marrow suppression,

Coxsackie Virus

Virus: Coxsackie Virus (obligate intracellular), belongs to Picornaviridae/ enterovirus family, is a single-stranded RNA virus divided into group A and group B

Transmission: fecal-oral contamination, droplets, body fluids, utensils, toys, diaper-changing table

Symptoms: Group A: Herpangina, AHC (acute hemorrhagic conjunctivitis, HFM (hand-foot-and-mouth disease), Group B: myocarditis, pericarditis, pleurodynia, hepatitis; Group A and B: fever, rashes, sore throat, diahorrea, cough, fatigue, conjunctivitis, loss of appetite, headache, night sweats, aseptic meningitis

Complications: CNS disease similar to poliomyelitis, systemic neonatal disease, IDDM (insulin-dependent diabetes mellitus), Group A: generalized myositis with flaccid paralysis, Group B: focal muscle injury, degeneration of neuronal tissue with spastic paralysis

Symptoms of Yersinia

Table 7. Yersiniosis (*Y. enterocolitica*) Symptomatology

Stages	Symptoms
Early stage	<p>Gradual development of gastroenteritis, pharyngitis, complications due to inflammation of the intestinal wall, mesenteric lymphadenopathy.</p> <p>Excretory for months after abatement of gastroenteritis</p>
Late stage	<p>Articular manifestations: Reactive arthritis in hip, knee, upper ankle, sacroiliac joints, arthralgias, ankylosing spondylitis, rheumatoid arthritis, sacroiliitis</p> <p>Erythema nodosum, iridocyclitis, conjunctivitis, gastrointestinal complaints, abdominal pain, diarrhea, ulcerative colitis, nephritis, insulin-dependent diabetes mellitus, hepatitis (ANA positive, rheumatoid factor positive), myocarditis (rare), central and peripheral nervous system manifestations, multisystem disease</p> <p>Disease progression in stages with intervals of fewer complaints</p> <p>Correlation with thyroiditis</p> <p>Positive LTT</p> <p>Oscillating serological findings (correlation with disease expression)</p>

Source: Berghoff W. Chronic Lyme Disease and Co-infections: Differential Diagnosis. *Open Neurol J.* 2012; 6: 158–178