



### KEY FACTS

<ul style="list-style-type: none"> <li>Bacterial infection caused by spirochaete <i>Borrelia burgdoferi</i></li> <li>Commonest tick-borne disease in Northern Hemisphere</li> <li>Bites are painless and easily missed</li> </ul>	<ul style="list-style-type: none"> <li>Affects both rural and urban areas</li> <li>Tick hosts are urban and rural e.g. small mammals, birds and deer</li> <li>Main symptoms in Europe are skin/neurological</li> </ul>	<ul style="list-style-type: none"> <li>Easily misdiagnosed: imitates other conditions</li> <li>UK incidence is uncertain and likely underestimated</li> </ul>
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### PRESENTATION

Early LD – Erythema migrans (EM)	Early disseminated LD	Late disseminated LD
<ul style="list-style-type: none"> <li>EM rash diagnostic of LD</li> <li>Usually 3-30 days after bite</li> <li>Absent in ~30% of cases</li> <li>Differentials include other insect bites, ringworm</li> <li>Classic Bull's eye rash in only 30%</li> <li><u>Expanding red rash</u></li> <li>Can last days/weeks/months, comes and goes, can be heat-sensitive</li> <li>Different appearance on darker skin; location may be different to site of bite</li> <li>Treat even if rash resolves</li> </ul>	<ul style="list-style-type: none"> <li>Days/weeks/months post-infection</li> <li>Flu-like symptoms ± EM rash</li> <li>Multiple rashes possible</li> <li>Myalgia, neck ache, arthralgia, arthritis, fatigue, headache</li> <li>Fever, sweats, lymphadenopathy</li> <li>Neuropathy, facial palsy</li> <li>Cognitive dysfunction, anxiety</li> <li>Palpitations, arrhythmias</li> <li>Chest pain, shortness of breath</li> <li>Disrupted sleep, weight loss</li> <li>First presentation may be with disseminated disease</li> </ul>	<ul style="list-style-type: none"> <li>Occurs months/years post infection</li> <li>Fluctuating, migratory</li> <li>Typically characterised by focal symptoms relating to at least one organ system (see below), which is <u>important in treatment choice</u></li> <li>Extreme fatigue</li> <li>Unexplained or unusual rashes</li> <li>Visual disturbance, hyperacusis</li> <li>Early disseminated symptoms may also be present</li> </ul>

### DIAGNOSIS

History	Presentation	Investigations
<p>When to consider LD:</p> <ul style="list-style-type: none"> <li>Tick bite (often uncertain) or outdoor exposure/travel</li> <li>Unusual, undiagnosed rash</li> <li>Symptoms non-specific, multi-system, fluctuating &amp; migratory</li> <li>New onset neurological symptoms</li> <li>Previously fit person becoming increasingly unwell</li> <li>Multiple multi-systemic diagnoses</li> </ul>	<ul style="list-style-type: none"> <li>Diagnosis based on history &amp; clinical exam ± testing</li> <li>Diagnose without testing in people with EM</li> <li>Easily misdiagnosed as can imitate other conditions</li> <li>Symptom pattern may evolve over time</li> <li>Consider in patients with otherwise unexplained symptoms</li> </ul>	<ul style="list-style-type: none"> <li>Lyme serology – local ELISA first line, <u>immunoblot if indicated</u> using <u>national request form</u></li> <li>Bloods – including CRP - may be normal, even in unwell patients</li> <li>Specialist tests may include echocardiogram, imaging, joint aspirate, skin biopsy</li> <li>Investigations may confirm but not exclude diagnosis</li> </ul>

### MULTI-SYSTEM PRESENTATIONS

Neurological (neuroborreliosis)	Cardiovascular	Musculoskeletal
<ul style="list-style-type: none"> <li>Facial/other cranial nerve palsies</li> <li>Sensory/motor neuropathies</li> <li>Radiculopathy/neuropathic pain</li> <li>Meningitis/encephalitis</li> <li>Dysautonomia, gait abnormalities</li> </ul>	<ul style="list-style-type: none"> <li>Arrhythmia, AV conduction defects</li> <li>Myocarditis, pericarditis</li> <li>Rarely cardiomyopathy</li> <li>Risk of sudden cardiac death in Lyme carditis/heart block</li> </ul>	<ul style="list-style-type: none"> <li>Lyme arthritis: oligo/monoarthritis</li> <li>Myositis, bursitis</li> <li>Tendonitis</li> <li>Fibromyalgia-type symptoms</li> </ul>
Psychiatric	Paediatric	Other presentations
<ul style="list-style-type: none"> <li>Neuropsychiatric presentation</li> <li>Anxiety, depression, psychosis</li> <li>Memory &amp; concentration</li> <li>Verbal fluency</li> <li>Suicidal ideation</li> </ul>	<ul style="list-style-type: none"> <li>Loss of appetite/nausea</li> <li>Facial palsy – may be bilateral</li> <li>Behavioural change</li> <li>Deteriorating school performance</li> </ul>	<ul style="list-style-type: none"> <li>Skin: EM, Borrelial lymphocytoma, <u>acrodermatitis chronica atrophicans</u></li> <li>Eye: keratitis, episcleritis, uveitis</li> <li>Endocrine abnormalities: especially thyroid, adrenal &amp; sex hormones</li> </ul>