



Lyme disease: A summary of Nice Guidance April 2018

Tuesday 16th October 2018
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Background¹

- Lyme disease (Lyme borreliosis) is a tick-borne infectious disease. It is caused by different species of *Borrelia* e.g. *B. Burgdorferi*, which can be transmitted to humans through a bite from an infected tick.
- Infection is **more likely the longer** a tick is attached to the skin.
- Ticks live in grassy and wooded areas, both in rural and urban locations.
- People who spend time in these areas for work or recreation are at increased risk of tick exposure.

- Lyme disease can occur anywhere in the UK, although some areas have a higher reported incidence.
- Approximately 50% of laboratory-confirmed cases are diagnosed in the South East and South West of England. High incidence is also reported in Scotland.
- Worldwide, Lyme disease occurs mainly in the northern hemisphere, and travellers to areas of Europe, North America and elsewhere may be at risk.
- However, the true incidence of Lyme disease is unknown as many diagnoses will be made clinically without laboratory testing.

Raising awareness of Lyme Disease¹

Be aware that:

- Ticks are mainly found in grassy and wooded areas, including urban gardens and parks.
- Ticks are found throughout the year but are most active in Spring and Autumn.
- Ticks don't fly or jump – they wait on vegetation for a host to pass by and then climb on.
- They bite and attach to the skin and feed on blood for several days before dropping off .

- Tick bites may not always be noticed.
- Most tick bites do not transmit Lyme disease.
- Prompt, correct removal of the tick reduces transmission of the bacteria that causes Lyme disease.
- PHE have a leaflet and posters regarding checking for ticks, preventing tick bites, how to remove them safely and symptoms/signs of Lyme disease [Public Health England Tick Awareness Leaflet](#)

How to remove a Tick²

If you have been bitten

- remove ticks as soon as possible
- the safest way to remove a tick is to use a pair of **fine-tipped** tweezers or a tick removal tool
- grasp the tick as close to the skin as possible
- pull upwards slowly and firmly, as mouthparts left in the skin can cause a local infection
- clean the bite area, and monitor it for several weeks for any changes
- contact your GP promptly if you begin to feel unwell with flu-like symptoms or develop a spreading circular red rash. Remember to tell them you were bitten by a tick or have recently spent time outdoors



Diagnosis of Lyme Disease¹

- The presence of Erythema Migrans is diagnostic of Lyme disease

Erythema Migrans is a red rash that:

- ❖ increases in size and may sometimes have a central clearing
- ❖ is not usually itchy, hot or painful
- ❖ usually becomes visible from **1 to 4 weeks** (but can appear from 3 days to 3 months) after a tick bite and lasts for several weeks
- ❖ is usually at the site of a tick bite

Rashes following tick bites¹

- [Erythema Migrans images - NICE guidance](#)
- Be aware that a rash, which is not erythema migrans, can develop as a reaction to a tick bite that:
 - ❖ usually develops and recedes **during 48 hours from the time of the tick bite**
 - ❖ is more likely than erythema migrans to be hot, itchy or painful
 - ❖ may be caused by an inflammatory reaction or infection with a common skin pathogen

Other symptoms of Lyme Disease¹

- Consider the possibility of Lyme disease as an uncommon cause of symptoms in those presenting with several of the following (without the erythema migrans rash) :
 - ❖ Fever and sweats
 - ❖ Lymphadenopathy
 - ❖ Malaise
 - ❖ Fatigue
 - ❖ Neck pain or stiffness
 - ❖ Migratory joint or muscle aches and pain
 - ❖ Cognitive impairment such as memory problems and difficulty concentrating “brain fog”
 - ❖ Headache
 - ❖ Paraesthesia

- Consider the possibility of Lyme disease in people presenting with symptoms and signs relating to **1 or more organ systems** (focal symptoms) because Lyme disease is a possible but uncommon cause of:
 - ❖ neurological symptoms, such as facial palsy or other unexplained cranial nerve palsies, meningitis, mononeuritis multiplex or other unexplained radiculopathy; or rarely encephalitis, neuropsychiatric presentations or unexplained white matter changes on brain imaging
 - ❖ inflammatory arthritis affecting 1 or more joints that may be fluctuating and migratory
 - ❖ cardiac problems, such as heart block or pericarditis
 - ❖ Eye symptoms, such as uveitis or keratitis
 - ❖ skin rashes such as acrodermatitis chronica atrophicans or lymphocytoma.

Acrodermatitis chronica atrophicans (ACA)³

- Acrodermatitis chronica atrophicans (ACA) is an uncommon skin condition affecting distal parts of the limbs.
- It is the most common manifestation of the late stage of Lyme disease.
- ACA is caused by ongoing active skin infection by the bacteria *Borrelia afzelii*, found mostly in Europe. These bacteria are transmitted by a tick bite several months or years before ACA develops.
- ACA most often presents as an unilateral violet discolouration of the extensor parts of the upper or lower limbs, especially the dorsum of the hand, elbow, instep, ankle or knee.

- However, it can appear anywhere on the body, and can be bilateral.
- <http://casereports.bmj.com/content/2016/bcr-2016-216033.full>
- Treatment of ACA is with antibiotics.

Dos and Don'ts...¹

- If symptoms suggest the possibility of Lyme disease –
 - **Do** explore duration of symptoms and whether there is a history of tick exposure
 - **Do not** rule it out in people with symptoms but no clear history of tick exposure
 - **Do not** diagnose Lyme disease in people without symptoms but a history of a tick bite

- **Do** be cautious about diagnosing Lyme disease in people without a supporting history or positive serology due to the risk of :
 - ❖ missing an alternative diagnosis
 - ❖ inappropriate treatment with antibiotics

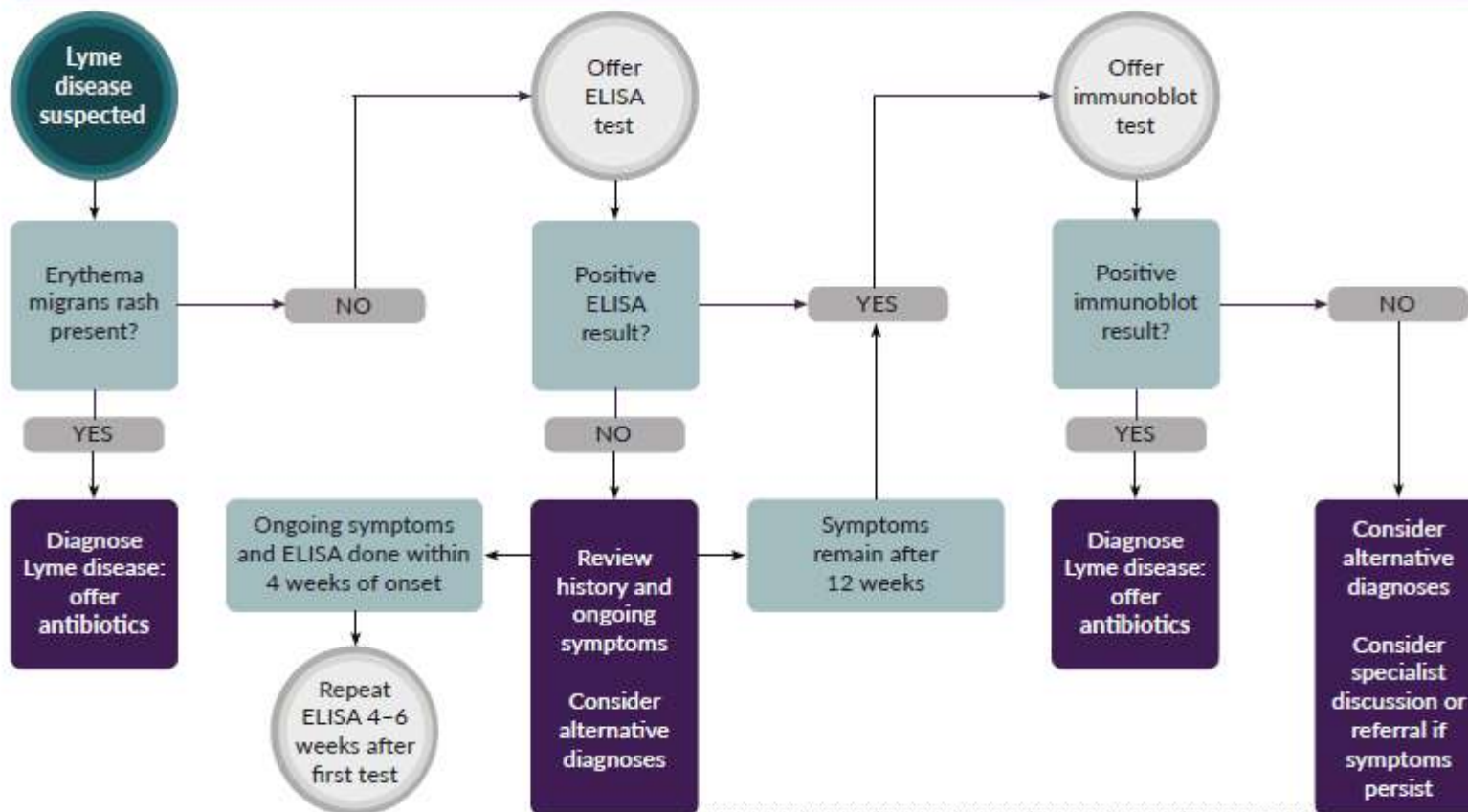
Diagnostic testing¹

- Diagnose and treat Lyme disease **WITHOUT** testing in those with Erythema Migrans.
- Use a combination of clinical presentation and laboratory testing to guide diagnosis and treatment in people without Erythema Migrans. [NICE visual summary to lab testing and diagnosis](#)
- **Do not** rule out diagnosis if tests are negative but there is high clinical suspicion of Lyme disease.

Lyme disease: laboratory investigations and diagnosis

Use clinical presentation and laboratory testing to guide diagnosis. If there is a high clinical suspicion of Lyme disease:

- consider starting treatment while waiting for test results
- do not rule out Lyme disease even if results are negative



- If there is a clinical suspicion of Lyme disease in people without erythema migrans:
 - ❖ offer an enzyme-linked immunosorbent assay (ELISA) test for Lyme disease **and**
 - ❖ consider starting treatment with antibiotics while waiting for the results if there is a high clinical suspicion.
- Explain the limitations of tests – false positives and false negatives may occur. Most tests assess presence of antibodies and accuracy may be reduced if :
 - ❖ The test is performed too early (before antibodies have formed)
 - ❖ The patient is immunosuppressed which might affect development of antibodies

- **Do not** routinely diagnose Lyme disease based only on tests done outside the NHS, unless the laboratory used is accredited, participates in formal external quality assurance programmes and uses validated tests.

If there is any doubt about tests:

- ❖ review the person's clinical presentation **and**
- ❖ carry out testing again using a UKAS-accredited laboratory and/or seek advice from a national reference laboratory.

Management¹

- Refer as an emergency or seek specialist advice depending on clinical presentation. Treatment for Lyme disease is with antibiotics.
- Antibiotic treatment – **Adults and children over 12 years old**

Lyme disease without focal symptoms (Erythema Migrans or non-focal symptoms)

1st line: Oral Doxycycline 100mg bd or 200mg od for 21 days

2nd line: Oral Amoxicillin 1g tds for 21 days

3rd line: Oral Azithromycin 500mg od for 17 days

Avoid azithromycin in those with cardiac abnormalities/prolonged QT interval. Ensure antibiotic is appropriate for stage in pregnancy if patient is pregnant.

Lyme disease with focal symptoms

Lyme disease affecting cranial nerves or peripheral nervous system

1st line: Oral Doxycycline 100mg bd or 200mg od for 21 days

2nd line: Oral Amoxicillin 1g tds for 21 days

Lyme disease arthritis and acrodermatitis chronica atrophicans

1st line: Oral Doxycycline 100mg bd or 200mg od for 28 days

2nd line: Oral Amoxicillin 1g tds for 28 days

3rd line: IV Ceftriaxone 2g od for 28 days

Lyme carditis

1st line: Oral Doxycycline 100mg bd or 200mg od for 21 days

2nd line: IV Ceftriaxone 2g od for 21 days

Lyme disease affecting central nervous system

1st line: IV Ceftriaxone 2g bd or 4g od for 21 days

2nd line: Oral Doxycycline 200mg bd or 400mg od for 21 days

- **Antibiotic treatment in children – seek specialist advice/review.**

Advice regarding duration of antibiotics¹

- Current guidelines give ranges for treatment duration, generally between 10 and 21 days, without guidance on when to use a longer or shorter course. The committee agreed that this is not clear enough for generalists.
- The evidence for treatment duration was limited.
- The committee decided that ***longer courses of 21 days of treatment should be offered as standard because of their concern at low cure rates in some studies*** and the lack of clear evidence for shorter courses. They also agreed that a longer course may be reassuring for people being treated for Lyme disease who continue to have symptoms.
- The evidence showed adverse event rates were not increased for longer courses.

Ongoing symptoms after antibiotics...¹

- If symptoms persist/do not improve or worsen, re-review and if suspect re-infection offer antibiotics according to their symptoms.
- If treatment failure suspected then consider a second alternative course of antibiotics.
- **Do not routinely** offer further antibiotics if 2 courses for Lyme disease have already been completed. Consider discussion with specialist/national reference laboratory.

- Explain to people with ongoing symptoms following antibiotic treatment for Lyme disease that:
 - ❖ continuing symptoms may not mean they still have an active infection
 - ❖ symptoms of Lyme disease may take months or years to resolve even after treatment
 - ❖ some symptoms may be a consequence of permanent damage from infection
 - ❖ there is no test to assess for active infection and an alternative diagnosis may explain their symptoms.

Counselling patients...

- Explain to people diagnosed with Lyme disease that:
 - ❖ Lyme disease is a bacterial infection treated with antibiotics
 - ❖ most people recover completely
 - ❖ prompt antibiotic treatment reduces the risk of further symptoms developing and increases the chance of complete recovery
 - ❖ it may take time to get better, but their symptoms should continue to improve in the months after antibiotic treatment
 - ❖ they may need additional treatment for symptom relief.

- Tell people who are starting antibiotics for Lyme disease that some people may have a Jarisch–Herxheimer reaction to treatment with worsening of symptoms early on.
- They should contact their doctor but continue the antibiotic treatment.

Jarisch–Herxheimer reaction

- This is a systemic reaction, thought to be caused by the release of cytokines when antibiotics kill large numbers of bacteria.
- Symptoms include a worsening of fever, chills, muscle pains and headache.
- The reaction can start between 1 and 12 hours after antibiotics are started but can also occur later and can last for a few hours or 1 or 2 days.
- The reaction is self-limiting and usually resolves within 24 to 48 hours

- Explain to people with Lyme disease that infection does not give them lifelong immunity and that it is possible for them to be re-infected and develop Lyme disease again.

Key messages

- Consider Lyme disease in those with symptoms and a history of tick exposure even if they cannot recall a tick bite.
- Diagnose and treat on the basis of Erythema Migrans rash being present. There is **no need for testing** in these patients.
- Use laboratory testing in those without Erythema Migrans but where there is a clinical suspicion of Lyme disease.
- Be alert to the limitations of tests for Lyme disease and possible alternative diagnoses.
- Consider longer courses of 21 days antibiotics as per NICE guidance.

References

1. <https://www.nice.org.uk/guidance/ng95/chapter/Recommendations>
2. <https://www.gov.uk/government/publications/tick-bite-risks-and-prevention-of-lyme-disease>
3. <https://www.dermnetnz.org/topics/acrodermatitis-chronica-atrophicans/>
4. <http://casereports.bmj.com/content/2016/bcr-2016-216033.full>