

Information on pathogens in humans

What is borreliosis?

Borreliosis, also known as Lyme borreliosis or Lyme disease, is a disease that is transmitted by ticks. Borreliosis can progress in many different ways and to different degrees of severity and generally affects the skin, but the nervous system, joints and heart can also be affected. Borreliosis is caused by bacteria of the 'Borrelia burgdorferi' genus, which can be transmitted by ticks anywhere in Germany. Borreliosis is most common between June and August.

How is borreliosis spread?

By tick bites

The pathogens that cause borreliosis, which are also known as borrelia, can be passed on to humans through a tick bite. In some parts of Germany, as many as a third of all ticks may carry borrelia, but a bite from an infected tick does not always lead to infection. The risk of infection is lower if the tick is removed quickly and greater if the tick is able to feed for extended periods of more than twelve hours. In Germany, only around one in every 100 tick bites leads to the victim developing borreliosis.

Please note that borreliosis cannot be spread on from person to person.

What are the symptoms?

Most infections pass unnoticed. If symptoms occur, they may be very different in nature and occur singly or in combination with others at different points in time. This means that borreliosis can be very hard to diagnose.

One typical symptom that presents in around 90% of cases is what is known as bull's-eye rash (Erythema migrans). This is a circular rash at least 5 cm in diameter, which is usually paler in the middle than on the outside and expands outwards over the course of several days. The rash develops at the site of the bite after three to 30 days, but it may also appear in other places, such as the legs, head or neck. A high temperature, swollen lymph glands and muscle and joint pain are also possible as the disease progresses. Much less frequently, and mostly in children, nodule-like or bluish-red skin swellings are also possible. These skin changes are most likely to occur around the ear, nipples or in the genital area.

In a small number of cases, chronic inflammation of the skin (Acrodermatitis chronica atrophicans) is possible, whereby the skin changes on the inside of the arms, legs, fingers or toes and becomes paper-thin and bluish in colour as the disease progresses.

If the borrelia affect the nervous system, this is termed neuroborreliosis. This occurs in around three out of every 100 sufferers. The symptoms of neuroborreliosis usually begin a few weeks or months after the tick bite and are characterized by burning nerve pain, which is particularly severe at night. This is often accompanied by facial paralysis on one or both sides. Inflammatory nerve irritation is also possible, which can lead to numbness, vision or hearing impairments and, in rare cases, to paralysis of the torso, arms or legs. In children, neuroborreliosis more frequently manifests in the form of a non-suppurative meningitis, which may be accompanied by severe headache or sudden visual impairment. Very infrequently, a late neuroborreliosis can develop after months or even years.

Around five out of every 100 sufferers will present with joint inflammation (Lyme arthritis). This most commonly affects the knee joints, less frequently the ankles or elbows, and generally progresses in recurrent phases.

Very rarely, the heart can also be affected in the course of the disease, with inflammation or arrhythmia of the heart.

When does the disease break out and how long is a person infectious?

Many infections run their course without any visible symptoms. A typical early sign of infection is the bull's-eye rash a few days or weeks after the tick bite. However, delayed forms of borreliosis can appear months or even years after the tick bite.

Sufferers are not infectious.

Who is most at risk?

People who are frequently bitten by ticks are most at risk. Ticks can be found in woods and gardens on blades of grass, bushes and undergrowth. From there, they are picked up and migrate over the skin to other regions of the body. Ticks can also be passed on by wild animals and pets that spend time outdoors.

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What should I do if I become ill?

- ▶ Prompt treatment with antibiotics usually leads to fast and full recovery. It can prevent severe outcomes.
- ▶ Taking antibiotics preventatively after a tick bite without symptoms is not recommended.
- ▶ If the bull's-eye rash described above appears, you should visit your doctor immediately, even if you cannot remember being bitten by a tick. You should also see your doctor if symptoms such as a high temperature or muscle pain and headaches occur after a tick bite.
- ▶ If you have a bull's-eye rash, borreliosis can be diagnosed by a physical examination by your doctor. If you have other symptoms suggesting borreliosis, a blood test can be carried out.
- ▶ If you have had borreliosis and recovered, this does not protect you from becoming infected again.

How can I protect myself?

No vaccination against borreliosis is currently available in Europe. Immunisation against the viral infection tick-borne encephalitis (TBE) does not protect against borreliosis. Avoiding tick bites is therefore the best protection. If you are bitten by a tick, you can reduce the risk of borreliosis by removing the tick as quickly as possible.

Avoiding tick bites

- ▶ Wear closed shoes, long-sleeved shirts and long trousers when walking in woods or fields. Tuck your trouser legs into your socks.
- ▶ Light-coloured clothing makes it easier to spot tiny dark-coloured ticks and remove them.
- ▶ If you apply tick repellent to your skin before walking in woods or fields, please follow the manufacturer's instructions closely. Please note: these products are only effective temporarily and do not offer full protection.
- ▶ In addition to your best preventative efforts, check your body thoroughly for ticks after spending time outdoors. Ticks like warm, soft places on the skin. Therefore, you should pay particular attention to the back of your knees, groin, armpits, behind your ears and your head and hairline.

Remove ticks quickly

Ticks should always be removed as quickly as possible. If a tick is removed in the first hours after the bite, the risk of borreliosis is very low.

- ▶ Grasp the tick by the head as close to the skin as possible and slowly pull it straight outwards. If possible, use tweezers, a tick card or a specialist tick removal instrument.
- ▶ Avoid manipulating the tick, for instance with oil, cream or by crushing it, as this may release more pathogens.
- ▶ Once the tick has been removed, carefully disinfect the area.
- ▶ Small parts of the tick may remain after removal, which can cause the skin around the bite site to become slightly inflamed. However, this does not increase the risk of borreliosis.

Where can I find out more?

Your local health authority can provide further advice and information. You can find additional (specialist) information on the Internet on the website of the Robert Koch-Institut (www.rki.de/borreliose). Further information about infection protection is available on the website of the Bundeszentrale für gesundheitliche Aufklärung (www.infektionsschutz.de, www.kindergesundheit-info.de).



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