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Öffentliche Gesundheit

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Tick bites: Protective measures and recommendations

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Why can a tick bite be dangerous?

Be they in forests, gardens or parks, ticks feel most at home where there are plants. These inconspicuous animals are mainly found close to the ground, on blades of grass or in bushes.

If ticks bite, they can transmit pathogens. The most important diseases that can be transmitted to humans by ticks in Germany include tick-borne encephalitis (TBE) and Lyme disease. Information on the clinical presentations can be found from page 6 onwards in this brochure.

Climate change is making winters in Germany milder. Consequently, ticks and other vectors of pathogens are increasingly able to spread and be active for longer periods of the year, for example.

The right precautionary measures can help to avoid tick bites and prevent the transmission of pathogens.

How to avoid tick bites:

- Wherever possible, avoid tall grass or undergrowth when walking.
- Wear closed shoes, long trousers and long-sleeved tops if you are likely to have any contact with tall grass, bushes or undergrowth. Pulling socks over trouser legs will also help.
- Choose light-coloured, plain clothing if possible. This makes it easier for you to spot and remove ticks.
- You can also apply tick repellent to the skin. Do follow the instructions for use on the packaging. Some products are not suitable for small children. Applying a repellent to clothing as well can be sensible too. Check whether the product is suitable for that.
- Ticks do not usually bite immediately, but first look for a suitable spot. So check your body thoroughly for ticks after spending time outdoors.

Ticks prefer protected skin areas

Head and hairline, behind your ears, around your neck, under your armpits, on your elbows, navel, groin, genital area and the backs of your knees.

If a tick has bitten you, you should remove it as quickly as possible. If possible, all parts of the tick should be pulled out.

How to remove a tick properly:

- Grip the tick with tweezers or a special tick removal tool as close as possible to the skin on the head of the tick and pull it out **slowly**.
- Make sure that you do not grab or squeeze the tick by its full body. This could make it more likely that pathogens will be transmitted.
- Disinfect the site of the bite afterwards to prevent inflammation.
- If you were unable to remove the tick completely or are unsure, you should consult a doctor.

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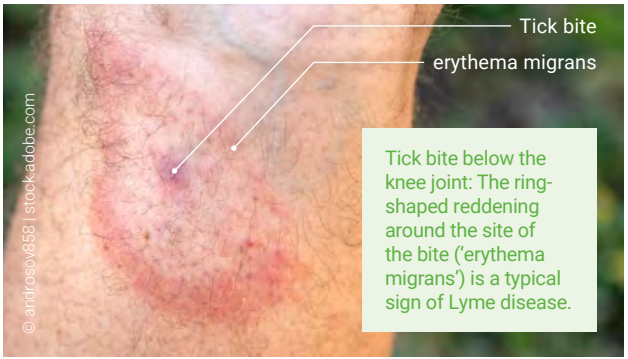
What should I do after a tick bite?

After you have removed the tick, you should watch the site of the bite for some time. If a ring-shaped reddening of the skin develops after a few days to weeks, you should consult a doctor.

You should also seek medical advice if you display general signs of illness after a tick bite, such as headaches, muscle aches or exhaustion.



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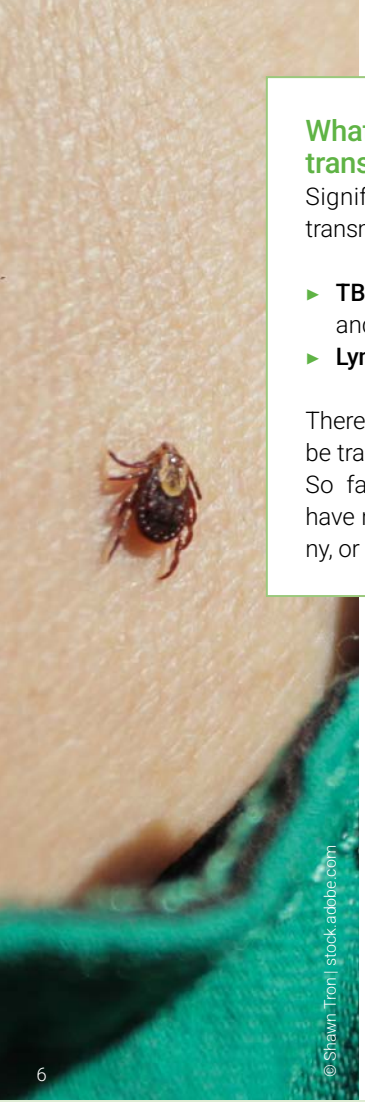
Tick bite below the knee joint: The ring-shaped reddening around the site of the bite ('erythema migrans') is a typical sign of Lyme disease.

Good to know

Not every tick bite transmits a disease. For example, only around one in 100 tick bites in Germany results in the person bitten contracting Lyme disease.



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What diseases can be transmitted by ticks?

Significant infectious diseases transmitted by ticks in Germany are

- **TBE (tick-borne encephalitis)** and
- **Lyme disease**.

There are other diseases that can be transmitted to humans by ticks. So far, however, these diseases have not been observed in Germany, or only rarely.

Good to know

Both TBE and Lyme disease are **not** transmitted from person to person. Hence sick people are not contagious.

TBE (tick-borne encephalitis)

Tick-borne encephalitis (TBE) is an inflammation of the brain and meninges caused by viruses. The pathogens are found in many European countries, in Russia and in Asia. The TBE virus spreads primarily in small rodents such as mice. It can subsequently be transmitted to humans by infected ticks.

TBE risk areas in Germany

TBE diseases are particularly common in some regions. In Germany, Baden-Württemberg, Bavaria, southern Hesse, south-eastern Thuringia, Saxony and south-eastern Brandenburg are the main risk areas. Individual districts in five other federal states are also affected.

Good to know

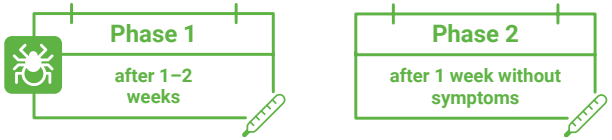
The main transmission period for TBE is between April and November. In mild weather, however, ticks are also active in winter.

Symptoms and course of the disease

Symptoms of TBE disease typically occur in two phases. And yet in most cases (approx. 70–95%) the infection is symptom-free or the second phase of the disease does not occur.

The **first phase of the disease** begins about one to two weeks after the tick bite, less commonly after up to four weeks. Flu-like symptoms such as fever, headache and aching limbs and a general feeling of malaise will occur.

After a symptom-free period of about a week, some of the patients will develop a **second phase of the disease**. This phase is characterised by inflammation of the meninges (meningitis), the brain (encephalitis) or the spinal cord (myelitis). The inflammation is again accompanied by fever, and headaches and aching limbs may also recur. There are also symptoms of nervous system failure. In serious cases, the disease may result in paralysis of the arms and legs, difficulty with swallowing and speech, respiratory paralysis and severe drowsiness, for example.



Flu-like symptoms with **fever, headache and aching limbs**

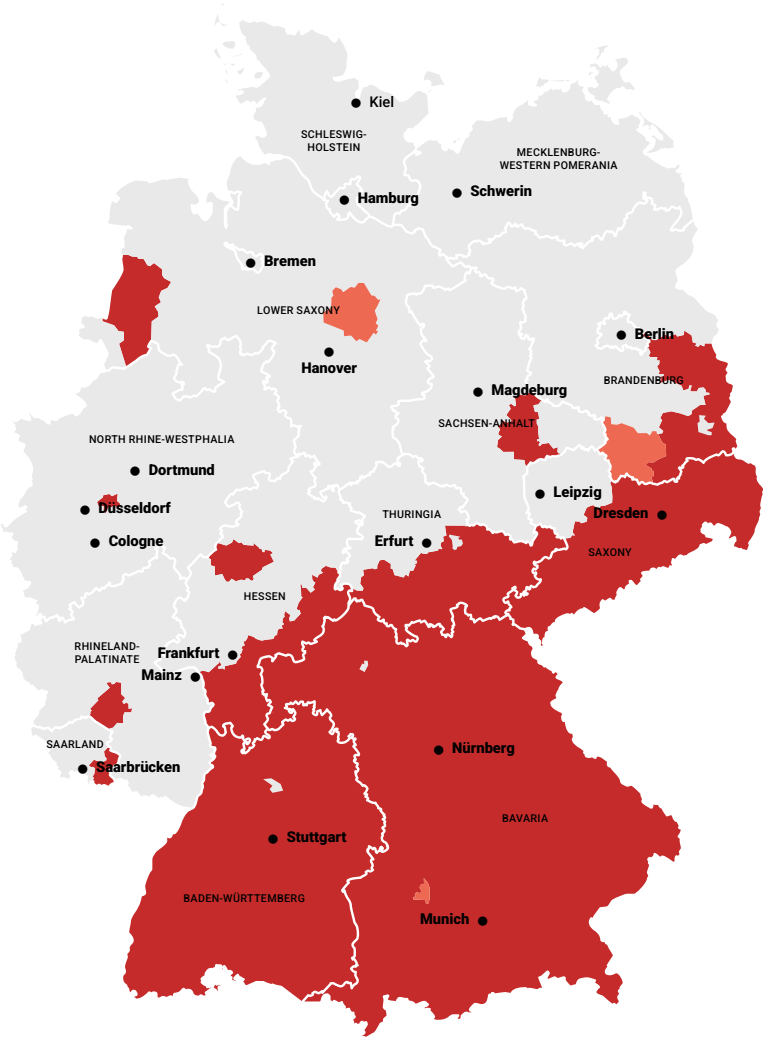
Inflammation of the meninges, brain and spinal cord may occur

Long-term consequences can include fatigue, headaches and concentration problems or paralysis that can last for several months. It is possible to recover from a TBE infection completely even after a long period of time. However, permanent damage can also occur. Approximately 1% of the sufferers die from the disease.

Good to know

The risk of a severe disease with TBE increases with age. People aged 40 and over in particular are at increased risk of developing a severe case of TBE disease. The elderly in particular are more prone to complications.

TBE risk areas in Germany 2025



The map shows the TBE risk areas as defined by the Robert Koch Institute: A district is defined as a TBE risk area if more than one TBE case per 100,000 inhabitants was contracted and reported in the district or district region (consisting of the district plus all neighbouring districts) over a five-year period between 2002 and 2024.

Source: Robert Koch Institute (RKI), Epid Bull 09/2025, www.rki.de

Further information

Vaccination against TBE – for whom is it recommended?

A vaccination is available to protect against TBE. The Standing Committee on Vaccination (STIKO) recommends vaccination for all people who are staying or living in TBE risk areas and could be bitten by ticks. This applies to anyone who spends time in nature, such as walking, camping, cycling, jogging and those working in agriculture. Depending on the destination, a TBE vaccination is also recommended as a travel vaccination.

Good to know

If a tick is infected with TBE viruses, the viruses are transmitted to humans within a short time of the tick bite. Hence vaccination is a particularly important measure to protect you from TBE besides avoiding tick bites.

Children can generally be vaccinated against TBE from their first birthday onwards. Severe cases of TBE are less common in children than in adults, however. Hence you should discuss with your doctor whether a vaccination is advisable for your child.

How many vaccine doses are needed for complete protection?

3 doses of vaccine are required for basic immunisation. In order to be protected at the start of the tick season in spring, it makes sense to start the vaccination course during the winter months.

An initial booster vaccination is recommended after 3 years if the risk persists. Depending on age and vaccine, subsequent booster vaccinations are required every 3 to 5 years.

99% of all TBE disease patients in 2023 had not been fully or partially vaccinated against TBE.

Is vaccination also useful if you have already had TBE?

After surviving a TBE infection, those affected are usually immune, so they cannot initially become infected a second time. Those who continue to be exposed to a TBE risk should nevertheless refresh their protection after 3 to 5 years with a vaccination, as there is not yet sufficient evidence on how long this immune protection lasts.

Lyme disease

Lyme disease is the most common tick-borne disease in Europe. Lyme disease is caused by bacteria of the species *Borrelia burgdorferi*, also known as Borrelia.

Borrelia mainly multiply in mice and birds, though other animals such as reptiles, hedgehogs, foxes and rabbits are also hosts. The bacteria can subsequently be transmitted to humans by infected ticks.

In contrast to TBE pathogens, Borrelia **bacteria are widespread throughout Germany**. Depending on the region, up to a third of ticks are infected with Borrelia. Lyme disease occurs more frequently from June to August.

Good to know

In contrast to TBE viruses, Borrelia bacteria are usually only transmitted to humans after several hours of the tick being latched on. Removing a tick as early as possible is therefore particularly important for protection against Lyme disease!

Symptoms

An infection with Borrelia bacteria usually goes unnoticed. If symptoms occur, they can be very varied and occur at different times, individually or in tandem. This means that Lyme disease is not always readily identifiable.

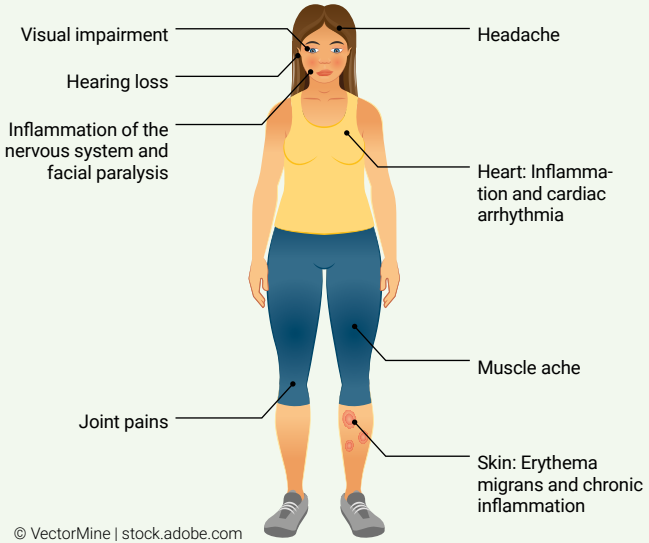
Skin symptoms

About 3 to 30 days after the tick bite, a so-called migratory redness (erythema migrans) can form around the site of the bite. It occurs in around 90% of patients. This is a ring-shaped reddening of the skin, at least 5 cm in diameter, which slowly spreads outwards over a period of days. The appearance of the redness may also differ from the typical appearance.

In most cases, erythema migrans is the only sign of the disease. As the disease progresses, however, fever, swelling of the lymph nodes and muscle and joint pain may also occur.

Good to know

If you notice a ring-shaped reddening on the skin (see illustration on page 5), you should consult your doctor immediately, even if you cannot remember having been bitten by a tick.



The symptoms of Lyme disease at a glance: These are varied and can affect different organs.

Much more rarely, and predominantly in children, there are nodular or blue-red swellings of the skin. These skin changes are mainly found on the ears, nipples or in the genital area.

In some cases it can lead to chronic inflammation of the skin. The skin on the inside of the arms, legs, fingers or toes changes and becomes paper-thin and bluish in colour.

Infection of the nervous system

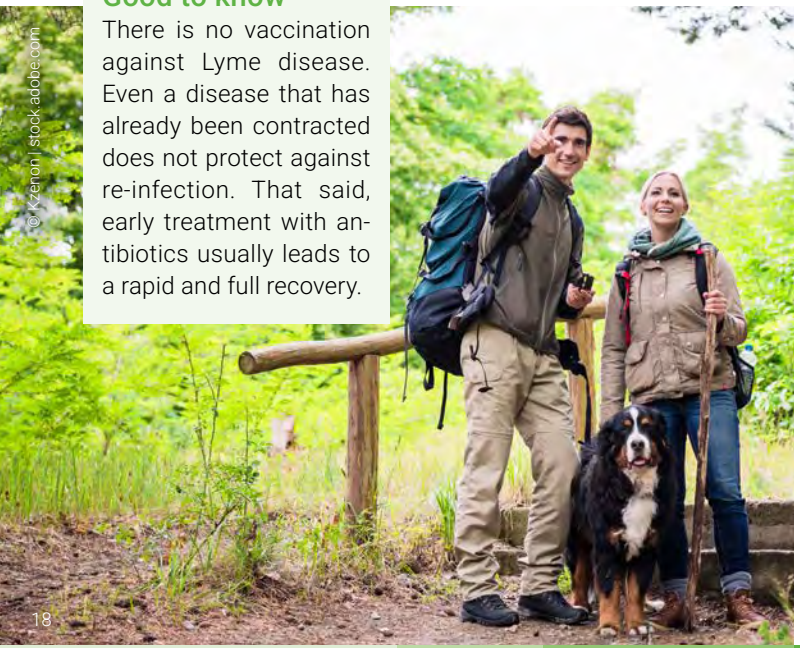
When Borrelia bacteria infect the nervous system, this is known as neuroborreliosis. This occurs in about 3 out of 100 patients. The symptoms usually begin a few weeks to months after the tick bite. Burning pains are typical, which mainly worsen at night. This commonly results in unilateral or bilateral facial paralysis. It can also cause numbness, impaired vision or hearing and, in rare cases, paralysis. In children, neuroborreliosis often manifests itself in the form of meningitis, which can be accompanied by severe headaches or sudden facial paralysis. Very rarely, late-onset neuroborreliosis can also develop over months to years.

Inflammation of the joints and heart

Joint inflammation occurs in around 5 out of 100 people with the disease. This most commonly affects the knee joints, less frequently the ankle or elbow joints. The inflammation of the joints is usually intermittent and recurrent. Very rarely, the heart can also be affected during the course of Lyme disease. This can lead to inflammation of the heart and arrhythmias.

Good to know

There is no vaccination against Lyme disease. Even a disease that has already been contracted does not protect against re-infection. That said, early treatment with antibiotics usually leads to a rapid and full recovery.



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What effects is climate change having?

Due to climate change, the average temperature in Europe is rising and the winter months in Germany are becoming milder. The upshot of this is that ticks are better able to survive the winter and be active all year round. Furthermore, ticks, mosquitoes and other vectors of pathogens can spread geographically. This applies to native tick species such as the castor bean tick *(Ixodes ricinus)*, though also to species that are originally native to Asia or Africa. New species are likely to carry pathogens that were previously little known.

The Robert Koch Institute (RKI) is currently researching which tick species are newly appearing in Germany as a result of climate change and which pathogens they carry. You can find out more about the project and how you can get involved at www.rki.de/DE/Themen/Infektionskrankheiten/Infektionskrankheiten-A-Z/Z/Zeckenuebertragene-Erkrankungen/Climatick-Untersuchung-von-Zecken-im-RKI.html.

Good to know

Climate change affects our entire ecosystem and therefore our health in many different ways. In addition to infectious diseases, the effects of heat waves and UV radiation also play a role. Further information on the effects of climate change on our health can be found at www.klima-mensch-gesundheit.de.

Further information

- www.impfen-info.de
- www.infektionsschutz.de
- www.klima-mensch-gesundheit.de
- www.rki.de

Am I advised to get a TBE vaccine?
You can check here:

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