

Lyme disease is preventable

Tick encounters are more likely to occur when bushwalking, mountain biking or gardening in tick-infested areas. Tick bites may go unnoticed as larvae and nymphs are difficult to detect and their bites are painless. Below are eleven tips to help prevent tick encounters.



- 1 Always use insect repellent ::**
Use a product with a minimum of 20% DEET. Apply to skin and clothing. Use pyrethrin products on children. Reapply as required.



- 2 Tuck in your clothes ::**
Tuck the legs of your pants into your socks or boots and keep your shirt tucked into your waistband. Wear a wide-brimmed hat.



- 3 Wear light-coloured clothes and limit exposed skin ::** Ticks are easily seen on light-coloured clothing, allowing for detection and quick removal. Wear long-sleeved shirts and wear long pants.



- 4 Always walk on the track ::**
Ticks wait on long grass for a passer-by. Staying on the track will decrease the chance of brushing past plants where ticks may be found.



- 5 Be tick aware ::**
After being outdoors, check for ticks on your clothes and body. Check children and pets. If you find an attached tick remove immediately.



- 6 Place your clothes in the dryer on high heat ::**
Put all clothing into a dryer for 30 minutes to kill ticks. Ticks can make it through the washing machine, but most will die during a dryer cycle.



- 7 Keep your backyard tidy ::**
Regularly remove plant debris and undergrowth. Ticks thrive in moist vegetation. Lower humidity and higher temperatures are detrimental to ticks.



- 8 Mow lawns regularly ::**
Ticks like to live in tall grass as it allows easier access. Mow your lawns to less than 5cm tall. Trim trees so that sunlight saturates lawn.



- 9 Grow insect repelling plants ::**
A simple measure to repelling ticks is to use garden-friendly herbs. Grow chrysanthemums, citronella, lavender, sage or garlic in your garden.



- 10 Keep firewood dry ::**
Store firewood in a sunny/dry place away from vegetation to discourage ticks from living there. It should be covered and raised off the ground.



- 11 Don't encourage native wildlife ::**
This includes animals such as bandicoots, possums, wallabies and lizards.

About the foundation

The Karl McManus Foundation was set up in memory of Karl McManus, a truly special man who sadly passed away in July 2010 from complications with Lyme disease. Karl's memory lives on through the foundation and the many lives he touched. Karl's story reminds us that there are thousands of lives that are devastated by Lyme disease. It is a silent but deadly killer. Lyme disease takes lives, cripples families and most importantly— it is a disease that not many Australians are aware of. What makes our mission even harder is that it is a disease not yet recognised in Australia. The aim of the Karl McManus Foundation is to erode the barriers to the recognition and treatment of borreliosis in Australia and to contribute to knowledge about borreliosis and other tick-borne infections.

About the appeal

Through the 2011 September Lyme Disease Appeal we hope to increase awareness of Lyme disease in Australia. Our goal is to raise \$1 million to fund Lyme disease research and prevention in Australia. The donations you make will contribute to opening The Lyme Disease Research Centre at The University of Sydney and educating Australian doctors in the diagnosis and treatment of Lyme disease.

How you can help us

The need for your support is great. We hope that you can assist us in our quest to prevent this infectious disease, to find treatment and a cure. You can help us achieve these goals by placing a donation into the donation can at your local pharmacy, online through the Karl McManus Foundation website: www.karlmcmanusfoundation.org.au or make a cheque out to Karl McManus Foundation and post to the address below. Your donation is very much appreciated. You can also help raise awareness of this terrible disease by discussing Lyme disease with your friends and family. We hope this brochure will help save lives, because prevention is more important than a cure.

Further information

This leaflet can be downloaded from the Karl McManus Foundation website where you can find out more about Lyme disease:
karlmcmanusfoundation.org.au

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Disclaimer: Karl McManus Foundation publications are not a substitute for professional medical advice and are intended as general information only. If you have, or suspect you may have Lyme disease you should consult a Lyme doctor immediately.

**KARL
MCMANUS
FOUNDATION**

Lyme Disease :: The Facts in Australia
September :: National Lyme Disease Appeal



LYME DIS- EASE



Pass this leaflet on to help spread awareness of Lyme.



Karl McManus Foundation ::
for Lyme Disease Research and Awareness

What is Lyme disease?

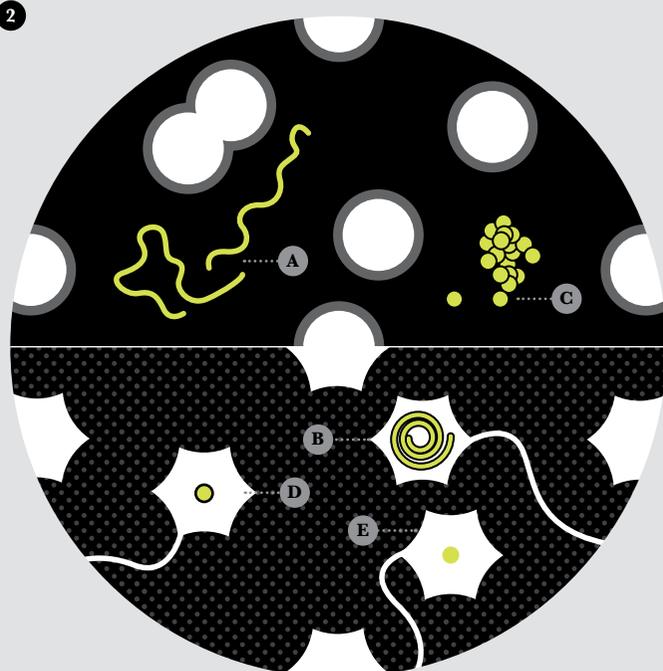
Lyme disease (also known as *Lyme borreliosis*) is an infectious disease transmitted by ticks or other insects. The bacteria that causes Lyme disease, comes from a group called *Borrelia burgdorferi sensu lato*. At least twenty species are known to infect humans and cause disease. They are part of the spirochete family, which have a distinctive corkscrew shape (see image 1).

What are the symptoms and signs?



Lyme disease can have three stages: 1: early, 2: disseminated/ dispersed and 3: chronic. Symptoms can appear within days, weeks or months. Different areas of the body are affected in varying degrees and symptoms come and go. They may include: **Dermatological**; a rash of variable size and shape, sometimes a bullseye shape (erythema migrans, see image 4). A skin condition called acrodermatitis chronica atrophicans. **General**; fever, sweat attacks, prolonged tiredness, sore throat, stiff neck, muscle and joint pain. **Neurological**; muscle twitches, tingling, numbness, light and noise sensitivity, headache, dizziness, Bell's palsy and muscle weakness. **Arthritic**; unexplained joint swelling and painful joints. **Psychological**; confusion, difficulty concentrating, forgetfulness, disorientation, dyslexia, depression, paranoia, panic attacks, anxiety, hallucinations. **Respiratory & cardiovascular**: cough, shortness of breath, heart failure, rib soreness, chest pain. **Gut**: nausea, vomiting, constipation, diarrhoea.

Images: 1. Depiction of Borrelia as a spirochete. 2. Depiction of the three different forms of Borrelia in the body as: **A.** Spirochete outside red blood cells. **B.** Spirochete inside a nerve cell. **C.** Cyst form outside red blood cells. **D.** Cyst form inside a nerve cell. **E.** Cell wall deficient form inside a nerve cell.



Information about ticks

Ticks feed only on blood and are described as 'nature's dirty needles'. The most common tick associated with bites is the paralysis tick. Other species include the bush tick and brown dog tick (see image 6). Ticks go through four stages in their life cycle; egg, larvae, nymph and adult (see image 5). Ticks have eight legs in the nymph and adult stages (six as larvae) and are related to spiders and mites.

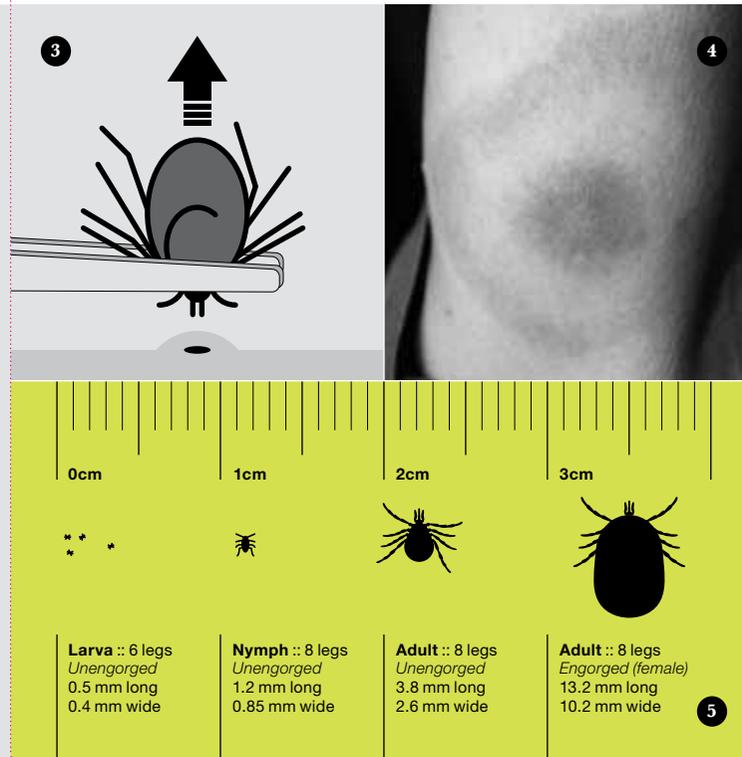
What if I have been bitten?

Don't panic! If you are bitten by a tick it doesn't always mean you will get ill as not all ticks carry the disease. Make sure the tick is removed as quickly as possible and in the correct way. If you get a rash or you feel ill after a tick bite, this may indicate a Borrelia infection, see your doctor immediately. Some people may also have an allergic reaction to the tick and may require antihistamines.

How do you remove a tick?

Use high-quality pointed tweezers or specific tick-removal devices that are available in your pharmacy. Grab the tick by the mouth parts very close to the skin, and pull gently upwards (see image 3). Don't crush the tick, as this will expel its gut contents into you and increase the risk of infection. Don't apply chemicals (eg. methylated spirits, petroleum jelly or kerosene) as this may cause more toxins and bacteria to be released.

Images: 3. Safe removal of a tick. 4. Erythema migrans (EM) or bullseye rash. 5. Comparison of tick size and life stages.



Treatment

Many Australian doctors are not familiar with treating Lyme disease and there is an urgent need to provide training. If affected, see a doctor that is aware of Lyme disease. Always keep your GP involved and informed. Lyme disease is a bacterial infection and is treated with antibiotics. Other medicines may also have a place in treatment. Early treatment is crucial for full recovery. If treatment is delayed the risk of developing chronic Lyme disease is increased. Chronic Lyme treatment is complex, usually long-term and is further complicated by immunosuppression by the Lyme bacteria.

Testing for Lyme

Tests for Lyme disease are difficult as they have not yet been developed to suit the Australian situation. They can give negative results due to the immunosuppressive nature of Borrelia. A negative result doesn't mean absence of the disease. Research in this area is vital to establish correct diagnosis.

Co-infections

A tick bite can deliver not only the Lyme bacteria but a raft of other parasitic, bacterial and viral infections, such as Rickettsia, Babesia and Bartonella. The co-infections complicate the illness and treatment of Lyme disease. It is vital that appropriate antibiotics are used to treat co-infections for recovery.

Image: 6. Distribution of Australian ticks. For images of ticks please visit our website: www.karlmcmannusfoundation.org.au

