

Preventing and treating tick bites

What are ticks?

Ticks are parasites that feed on animal and human blood. There are more than 800 species of ticks around the world, with 70 found in Australia and 16 species have been reported as feeding on humans.

There are two major groups of ticks: hard ticks and soft ticks.

Hard ticks (family: *Ixodidae*) have a hard flat body and elongated mouthparts with rows of backward pointing teeth. This group includes the most important species that bite humans.

Soft ticks (family: *Argasidae*) have a wrinkled leathery appearance. Only a few species of this type are found in Australia and they rarely come into contact with people.

The most important tick in Australia is the Paralysis Tick, *Ixodes holocyclus*, and over 95% of tick bites in Eastern Australia are due to this species. Most tick-borne illnesses are due to this species.

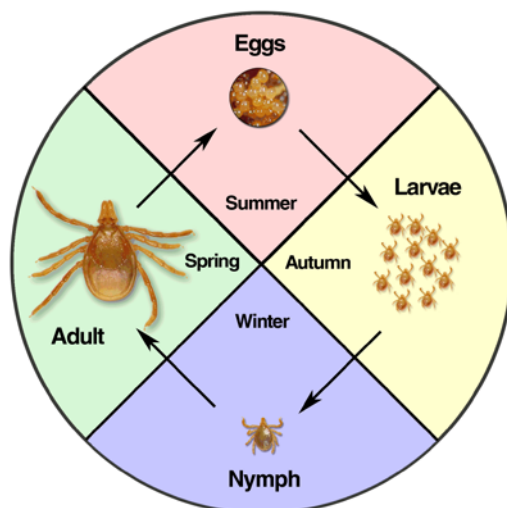
The Paralysis Tick

The Paralysis Tick, *Ixodes holocyclus*, is found along the eastern seaboard of Australia east of the Great Dividing Range, and possibly into Tasmania. It is commonly referred to as the grass tick, seed tick and bush tick depending upon its stage of development. It is not known to occur in South Australia, Western Australia or the Northern Territory.

While *I. holocyclus* is the most common, there are two other *Ixodes* species in Australia which cause paralysis: *I. hirsti*, which occurs in South Australia and also has been documented in NSW and Tasmania, and *I. cornuatus*, which occurs in Tasmania and Victoria.

There are four stages in the life cycle of a tick; the egg, larvae (around 1 mm and light brown in colour when not full of blood), nymph (around 2 mm and pale brown) and the adults (4–5 mm in length, without blood). The Paralysis Tick needs to feed on blood to develop through its lifecycle from the larvae stage to a nymph and to an adult. The adult female takes blood to obtain protein for the laying of eggs.

When fully engorged it is grey-blue in colour up to around 1 cm in length.



Tick life cycle (S.L. Doggett, Department of Medical Entomology, Westmead Hospital) as described above

The Paralysis Tick is most common in moist, humid coastal areas with abundant native animals that serve as hosts for the tick. Long grasses and bushland provide ideal environments for ticks, and if you live close to these areas, it is not uncommon to have Paralysis Ticks in your garden. This tick has a distinct seasonality; the larval stage is most active during the autumn months, the nymph during winter and the adult during the spring. This tick is most active during periods of high humidity, especially after rain, and this is when you should take particular care to avoid tick bites.

Paralysis Ticks are not particularly mobile, and rely on passing animals for a blood meal. The Paralysis Tick will crawl up the stems of grasses or along branches and 'perch' ready to latch on to a passing animal, including humans. They rarely climb higher than 50 cm in their habitat, so do not drop out of trees, despite this common belief. However, after landing on a person or animal they can walk up the body and attach to the head area.



Female *Ixodes holocyclus* (S.L. Doggett, Department of Medical Entomology, Westmead Hospital) photograph above

How does the Paralysis Tick affect humans?

A tick attaches itself by piercing its sharp mouthparts into skin. It then injects an anticoagulant (a substance that prevents blood from forming clots) saliva which allows it to feed without the blood clotting. In the case of the Paralysis Tick, the saliva may be highly toxic to some animals and, potentially, humans.

Most tick bites pose no medical problems apart from some localised swelling and redness at the bite site if the tick is removed promptly. However, in some cases people can experience more severe conditions such as tick paralysis or allergic reactions including anaphylactic shock. Early symptoms of tick paralysis may include rashes, headache, fever, influenza like symptoms, tenderness of lymph nodes, unsteady gait, intolerance to bright light, increased weakness of the limbs and partial facial paralysis. Tick paralysis, while rare, is usually seen in children rather than adults. Allergic reactions can result in swelling of the throat, and may lead to breathing difficulties or collapse. It is important to seek medical attention quickly if such symptoms occur. If you have had similar symptoms in the past after being bitten by a tick, then it is a good idea to always be prepared.

Some serious tick-borne diseases also occur in Australia including, Queensland tick typhus and Flinders Island spotted fever. There are concerns that other serious illnesses, such as a Lyme disease-like syndrome, may be caused by exposure to Australian ticks, however there is no evidence yet this is the case ([Lyme Disease](http://www.health.gov.au/lyme-disease) (www.health.gov.au/lyme-disease)).

Recently a new syndrome known as “tick-induced mammalian meat allergy” has been described, whereby people bitten by the Paralysis Tick, which is found in coastal Eastern Australia, can subsequently develop an anaphylactic reaction to consuming meats and animal by-products such as gelatine. This syndrome has also been described overseas.

How to prevent tick bites?

The best way to prevent tick bites is to avoid tick-infested areas.

If this is not possible, wear appropriate clothing such as:

- a long sleeved shirt
- long pants tucked into socks
- light coloured clothing to make it easier to see ticks on clothes before they attach to the skin

Before entering possible tick infected environments apply an insect repellent containing diethyl-meta-toluamide (DEET) or picaridin to the skin. The repellent should be applied and re-applied according to the manufacturer’s instructions. Clothing treated with permethrin is also recommended.

Permethrin wash kits for treating clothes can be obtained from outdoor recreational stores and it is important to follow the label directions. Permethrin-treated clothing is considered the most effective means of preventing tick bite in tick infested areas.

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All clothing should be removed after visiting tick infested areas and placed into a hot dryer for 20 minutes to kill any tick that could be still on the clothing. The entire body should be then checked for ticks of all sizes and stages, paying particular attention to areas behind the ears and the back of the head or neck, especially on children.

Removing ticks

If you suffer from allergic reactions to ticks, only attempt to remove a tick whilst at a medical facility such as an Emergency Department.

In non-allergic individuals or for larval or nymphal stage ticks:

- When removing a tick with fine tipped forceps (not household tweezers unless fine tipped forceps are not available), grasp the tick as close to the skin's surface as possible. Pull upwards with steady pressure and avoid jerking or twisting the tick.
- Prior to removal, the tick may be sprayed with an aerosol insect repellent containing pyrethrin or a pyrethroid chemical, although there is currently no evidence to suggest that this is of benefit. Permethrin based creams, which are available from chemists may also be used. Apply at least twice with a one minute interval between applications.
- If you have difficulty removing the tick or suffer any symptoms after removal, seek medical attention urgently.

Tips

- Use only *fine tipped forceps* and avoid squeezing the body of the tick.
- Don't use folklore remedies such as matches or pins because they will irritate the tick and make it harder to completely remove.
- Avoid scratching and do not use irritant chemicals such as methylated spirits or kerosene.

Note

The Australasian Society of Clinical Immunology and Allergy has recently recommended killing an adult tick in place by using an ether-containing spray to kill the tick by freezing it. These products are normally used for the treatment of warts and skin tags and are readily available from chemists.

This document does not recommend this method until evidence-based research becomes available. When new evidence is published this document will be reviewed.

Further information

If you are concerned about ticks, contact:

- your Medical Practitioner
- the Poisons Information Centre: 13 11 26
- your state or territory health department
- your local council Environmental Health Officer

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www.allergy.org.au (Australasian Society of Clinical Immunology and Allergy).