



# Clinical Practice Guidelines: Toxicology and toxinology/Envenomation – Tick

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<b>Date</b>	July, 2022
<b>Purpose</b>	To ensure a consistent approach to patients who have been exposed to tick envenomation.
<b>Scope</b>	Applies to Queensland Ambulance Service (QAS) clinical staff.
<b>Health care setting</b>	Pre-hospital assessment and treatment.
<b>Population</b>	Applies to all ages unless stated otherwise.
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# Envenomation – Tick

July, 2022

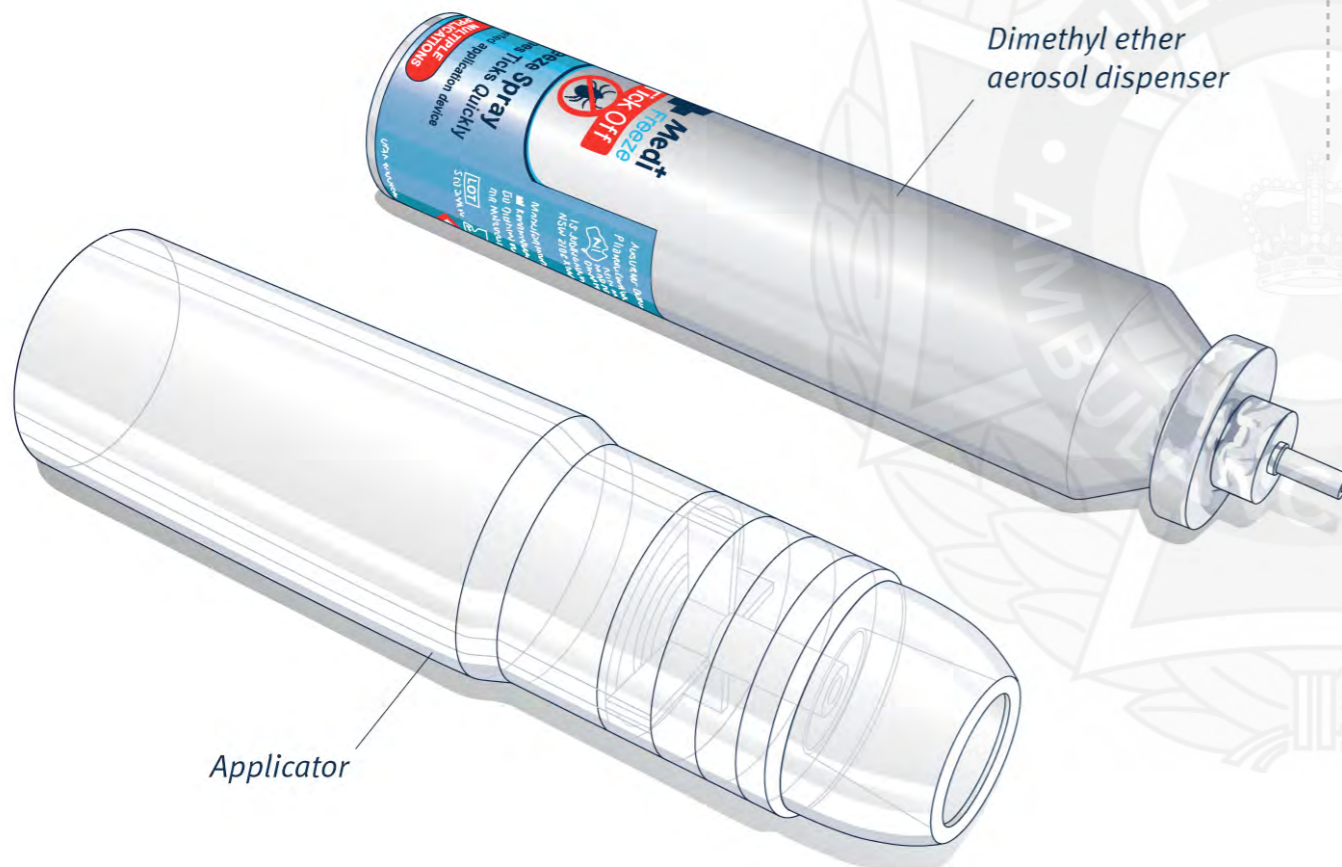
Ticks are arachnid parasites that feed on animal and human blood. There are around 70 species in Australia and the most clinically important local species is the Paralysis tick, *Ixodes Holocyclus*, commonly known as the bush tick, which accounts for around 95% of human tick bites in Eastern Australia. Ticks are most prevalent on the East Coast from Winter to the start of Summer but can be found all year round.

The paralysis tick generally has a flat, oval, seed-shaped body. Larvae have six legs while nymphs and adults have eight legs like their arachnid relatives. As ticks become engorged from feeding over several days, their bodies expand to a bulbous shape that may resemble a mole or similar skin lesion.

Ticks attach to their host by biting, digging their sharp mouth parts which have backward facing barbs into the skin to firmly attach themselves. In order to prevent the host's blood from clotting as they feed, they inject their saliva, which acts as an anti-clotting agent, into the host. It is the injected saliva that causes adverse reactions in the host, and the longer they feed, the higher the total volume of toxin that is injected.

Most tick bites rarely produce serious clinical effects if removed promptly, with the most common reaction being local irritation, itching, swelling or a hard lump at the bite site. In some cases however, more serious reactions can occur, especially if the tick has been feeding for an extended time (several days). Severe reactions include:<sup>[1-5]</sup>

- Tick paralysis – more likely in small children than in adults
- Allergic reaction – ranging from mild to anaphylactic shock
- Transmission of diseases such as Tick Typhus (*Rickettsiae* bacteria)
- Tick induced meat allergy syndrome



## Clinical features



### Signs of tick envenomation

- Unsteady gait
- Limb weakness
- Partial facial paralysis

### Signs and symptoms of rickettsial infection (Tick Typhus)

- Localised eschar at bite site
- Fever
- Rash
- Tender lymphadenopathy
- Muscle aches & malaise

## Risk assessment



- The only approved method of tick removal for QAS clinicians is with the use of Tick Off, an aerosol spray that instantly freezes ticks that will then usually fall out of their own accord within a few minutes, or with a gentle flick of a finger.
- Tick Off must **NOT** be used in the following circumstances:
  - Patients less than 4 years of age;
  - Ticks on or around the face, chest, genitals, breasts or buttocks;
  - Patients with a current or past diagnosis of skin cancer or keratoses;
  - Irritated, infected or sensitive skin;
  - Sensitisation or allergy to extreme cold;
  - Diabetics and persons with circulatory problems;
  - Patients treated with immunosuppressive treatments or confirmed diagnosis for autoimmune or collagen disease;
  - Patients on anti-coagulation medication and haemophilia patients;In these cases, the patient must be transported to hospital for tick removal.
- Tick Off Freeze Spray aerosol is extremely flammable; the pressurised container may burst if heated. Protect from direct sunlight and store under 50 degrees Celsius.

## Risk assessment (cont.)



- Patients who develop significant reactions after application must be transported to hospital.
- The patient may experience a slightly painful or tingling sensation on application, however this should gradually disappear within a few minutes.

### TICK OFF INSTRUCTIONS FOR USE<sup>[6]</sup>



1. Insert the aerosol dispenser into the applicator.



2. Position the opening of the applicator 1 cm above the tick.



3. Hold the aerosol dispenser as vertical as possible, as shown in the diagram.



4. Press the canister into the applicator to deliver the cryoliquid, using 3 short bursts.



5. If the tick still moves after 10 minutes, repeat the application.



6. A few minutes after freezing, the tick should fall out of its own accord, or by lightly brushing it off.

## Additional information

- Tweezers and/or solvents of any kind should never be used to remove a tick. Allergic reactions are more likely to occur if the tick is disturbed by trying to remove it with tweezers or applying methylated spirits or kerosene, as this causes the tick to inject more allergen-containing saliva.<sup>[3]</sup>
- Children are more susceptible to problems from tick bites, due to their small body mass and as they may be unable to recognise/communicate that they have a tick, therefore making it more likely for ticks to feed for several days, by which time signs and symptoms are more likely to be well advanced.<sup>[4]</sup>
- There is no current evidence that Australian tick bites can cause Lyme Disease-like syndromes.<sup>[1]</sup>
- Tick Off will only be carried by ambulance clinicians working in known tick infestation areas. Station OICs must receive authority to purchase Tick Off from their regional managers.

