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Australian endemic tick-borne diseases – Q fever

This Factsheet on Q fever is reproduced from the Communicable Diseases Network Australia Guideline to Public Health Units published in 2018 on the Australian Government Department of Health website at www.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-q-fever.htm.

Important! Watch this video

<https://www.allergy.org.au/patients/insect-allergy-bites-and-stings>

What is Q fever?

Q fever is an illness caused by the bacterium *Coxiella burnetii*, carried by animals such as cattle, sheep, goats, and kangaroos. Humans usually catch the infection by breathing in droplets and dust contaminated by birth fluids, faeces, or urine from infected animals. The bacteria that cause Q fever not only exist in a variety of domestic and wild animal species, but also in the general environment (e.g. dust and soil), which can also lead to infection and disease. Spread of infection from person-to-person is rare. Q fever can be treated with antibiotics.

Q fever is usually an acute (immediate) infection, but sometimes it can lead to a chronic (long-term) illness.

What are the symptoms?

Many infected people have no symptoms. People who do become sick often have a severe flu-like illness. Symptoms begin about 2–3 weeks after exposure to the bacteria. However, this period can be as short as 4 days and as long as 6 weeks.

Typical symptoms of acute Q fever include:

- Fever and chills
- Sweats
- Severe headache (especially behind the eyes)
- Muscle pain
- Weakness and tiredness
- Weight loss.

A rash is uncommon in Q fever and often serves to distinguish it from the other tick-transmitted infections where a rash is common.

Some patients may develop pneumonia and hepatitis during the course of acute illness. Most people make a full recovery and become immune to future Q fever infections.

Occasionally people may develop chronic infections that affect the heart (endocarditis), bone (osteomyelitis), or joints. Some people develop chronic fatigue (post-Q fever fatigue syndrome) that can last for many years. Persons at increased risk for chronic Q fever after acute infection include immunosuppressed persons (e.g. cancer patients undergoing chemotherapy, patients who have had an organ transplant), pregnant women, and persons with heart valvular abnormalities.



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How is it spread?

The bacteria that cause Q fever are found in many animals, including cattle, sheep, goats, dogs, cats, horses, pigs, rodents, camels, and kangaroos. The bacteria are also found in ticks. Infected animals usually have no symptoms, but abortion, stillbirth, and infertility may result.

Infected animals shed high numbers of bacteria in birth by-products such as the placenta and birth fluids. The bacteria can also be shed to the environment from faeces, urine, and milk of infected animals. The bacteria are highly infective and can survive in the general environment (e.g. in dust and soil) for months and years.

Humans most commonly catch the infection by breathing in droplets and dust containing the bacteria from birth fluids, faeces, urine, or blood of infected animals, in circumstances such as:

- Assisting animal birth
- Animal slaughtering/skinning/meat processing
- Herding
- Shearing/wool processing
- Working with animal manure
- Transporting infected animals
- Veterinary/diagnostic procedures.

Infection can also occur through direct contact with infected animal tissue or fluids on broken skin (e.g. through cuts with contaminated knives or needle-stick injuries when working with animals).

Consuming unpasteurised (raw) milk or milk products from infected animals may carry a risk of contracting the infection.

Tick-to-human transmission occurs infrequently, through tick bites, breathing in tick excreta or direct contact (e.g. removal of ticks from domestic animals, aerosol-generating activities such as shearing, or crushing ticks with bare hands).

Person-to-person spread of infection is rare, but can occur through blood transfusion and mother-to-baby transmission.

Who is at risk?

People whose work exposes them to high-risk animals, animal products, and animal excreta have a high risk of developing Q fever. These high-risk occupations include:

- Abattoir and meat workers
- Agriculture, livestock and dairy farmers and workers
- Stockyard/feedlot workers and transporters of animals, animal products and waste
- Shearers, wool classers/sorters, pelt and hide processors
- Knackery workers
- Tannery workers
- Laundry workers handling clothing from at-risk workplaces



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- Pet food manufacturing workers
- Veterinarians, veterinary nurses/students/researchers, and others working with veterinary specimens
- Agriculture college staff and students working with high-risk animals
- Animal shooters/hunters
- Laboratory personnel working with materials containing the Q fever bacterium
- Wildlife/zoo workers, animal trainers
- Dog/cat breeders, and anyone regularly exposed to parturient animals.

Other people at risk of Q fever through non-occupational, environmental exposures include:

- Family members of the high-risk occupational groups described above, through exposures to contaminated clothing, boots or equipment
- People living on or in close proximity to a high-risk industry (e.g. neighbouring livestock farms, stockyards housing cattle/sheep/goats, meat works, land being fertilised by untreated animal manure)
- Visitors to at risk environment (e.g. farms, abattoirs, animal saleyards)
- People living near livestock transport routes with the potential of being exposed to contaminated dust from the passing animals
- People involved in mowing, which stirs up dust potentially contaminated by animal excreta, in areas where there are livestock or wild animals
- People who observe or assist animal births.

How is it prevented?

A Q fever vaccine is available to protect people against the disease. Vaccination is recommended for all people over the age of 15 years who are working in, or intend to work in, a high-risk occupation (see *Who is at risk?*). High risk workplaces should have a vaccination program to protect their workforce.

People at risk of Q fever through non-occupational, environmental exposures (see *Who is at risk?*) are also recommended for vaccination.

People must be screened and tested before they are vaccinated against Q fever. Check the Australian Q fever Register (www.qfever.org) to find a doctor specially trained for Q fever vaccination services.

Apart from vaccination, people can take steps to reduce the risk of Q fever to the community, including:

- Washing their hands and arms thoroughly in soapy water after any contact with animals
- Wearing a P2 respirator (available from pharmacies and hardware stores) and gloves in handling and disposing of animal products, waste, placentas, and aborted fetuses
- Immediate removal of animal abortive and birth materials, preventing animals from eating placenta, and safe disposal by deep burial – do not use them in compost



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- Personal protective equipment and contaminated clothing should be removed at the workplace, and appropriately bagged and washed on site, to reduce the risk of exposing non-vaccinated individuals and family members outside of the workplace
- Appropriate treatment of animal manure: no removal of manure from the deep litter sheds or yards for at least one month after the kidding season; composting manure or alternatively storing manure for three months prior to spreading on farming land for fertiliser
- Manure should be covered during storage and transport and must be under-ploughed immediately when spreading on farming land
- Minimising dust and aerosols in slaughter and animal housing areas.

Q fever is recognised as an Australian endemic tick-borne disease. As such, follow the guidance and advice in the *Prevention and management of tick bites* in Australia Factsheet for information on personal preventive strategies to prevent tick bites on people, preventing tick bites around the home and managing tick bites in Australia.

Personal preventive strategies to prevent tick bites on people include:

- Avoiding tick infested/endemic areas and contact with ticks
- Wearing appropriate light-coloured protective clothing which makes it easier to see ticks before they attach to the skin
- Treating clothes with permethrin, an insecticide applied to clothing to kill ticks
- Using insect repellents according to manufacturer's instructions
- Using camp beds when camping to elevate the body above the ground/floor
- Checking clothing for ticks then placing clothing in a hot dryer for 20 minutes, if available, to kill ticks
- Checking the whole body for ticks.

To manage a tick bite, if bitten in Australia, medical professional organisations such as the Australasian Society of Clinical Immunology and Allergy (ASCI), researchers such as Tick-induced Allergies Research and Awareness (TiARA), and the Australian Government Department of Health advise leaving ticks undisturbed and killing them *in situ* (where they are) with ether-containing sprays to freeze attached adult ticks so as to prevent allergic reactions to ticks.

A short video on how to remove a tick by killing the tick where it is with ether-containing sprays is available here: <https://www.allergy.org.au/patients/insect-allergy-bites-and-stings>.

It is vital that anyone with a known tick allergy seek urgent medical attention as soon as they are aware of an attached tick and not attempt to remove it without medical help. For patients with known tick allergies, removing the tick must occur in a medical facility with capacity to initiate advanced life support in the event of anaphylaxis.



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How is it diagnosed?

Your doctor can diagnose Q fever based on symptoms, clinical examination, and laboratory tests on blood samples. Two or more blood samples on separate occasions are often required to confirm a Q fever diagnosis.

If you think you have Q fever, please see your GP. Early recognition and treatment of Q fever is important. The Debilitating Symptom Complexes Attributed to Ticks (DSCATT) Clinical Pathway (which is available on the Australian Government Department of Health website at: <https://www1.health.gov.au/internet/main/publishing.nsf/Content/ohp-lyme-disease.htm>) has further information on the diagnosis of Q fever.

How is it treated?

A two-week course of oral antibiotics is generally used to treat acute Q fever. Chronic Q fever requires prolonged treatment with antibiotics.

The DSCATT Clinical Pathway has further information on the treatment of Q fever.

People who have been bitten by a tick may require a tetanus injection depending on how long it is since their last tetanus dose. Your doctor may advise you to have a tetanus booster shot.

What is the public health response?

Q fever is a nationally notifiable disease in Australia. Laboratories must notify cases of Q fever to their local health department/Public Health Unit.

Public Health Unit staff talk to the treating doctor and patient (or carer) to determine the possible source of infection, identify other people at risk of infection, ensure control measures are in place, and provide information and education.

If Q fever cases are linked to a workplace (e.g. an abattoir or dairy farm), the local Public Health Unit will involve the local workplace health and safety regulator and the relevant animal health authority.

The role of the workplace health and safety regulator is to investigate and identify unsafe working conditions, make recommendations to the employer, and monitor the control measures implemented.