

Atypical zoonotic bacterial pneumonia – Brucellosis, Leptospirosis, Psittacosis, Q-fever and Rickettsia

When patients present with flu-like symptoms AND have an animal-related risk exposure, please consider these infections.

What is brucellosis, leptospirosis, psittacosis Q-fever and rickettsia?

Brucellosis, leptospirosis, psittacosis, Q-fever, and Rickettsia are infections caused by the bacteria *Brucella spp*, *Leptospira spp*, *Chlamydia psittaci*, *Coxiella burnetti*, and *Rickettsia spp*. respectively. Animals such as cattle, sheep, goats, birds, pigs, kangaroos and rodents are reservoirs for these bacteria, and close contact with infected animals can cause disease in humans.

Psittacosis and Q-fever are commonly caused by inhaling the bacteria. Leptospirosis and brucellosis are more commonly caused by bacteria entering the body through broken skin or abrasions, or through direct contact with mucous membranes, however leptospirosis can also be caused by inhaling the bacteria. Brucellosis can be caused by eating undercooked meat from an infected animal. These zoonotic diseases are more common in rural areas compared to other areas.

Rickettsia is a large and diverse family of bacteria which are transmitted to humans via bites from fleas, lice, ticks, mites, rodents and reptiles. Several Rickettsia species present in Australia can cause disease in humans, including *Rickettsia australis* (Queensland tick typhus), *orientia tsutsugamushi* (scrub typhus), *Rickettsia honei* (Flinders Island spotted fever), *Rickettsia typhi* (murine typhus) and *Rickettsia prowazekii* (Epidemic typhus). Although rickettsial infections are rare, they have been reported along the Eastern Australia seaboard, Flinders Island and the east coast of Tasmania, as well as the Fleurieu Peninsula in South Australia and southern coast of Western Australia. Of these bacteria, *Rickettsia prowazekii* (Epidemic typhus) is the only species notifiable in NSW¹.

Common symptoms

Brucellosis, leptospirosis, psittacosis, Q-fever and Rickettsia may present as a flu-like illness, including fever, chills, headache, myalgia, arthralgia, fatigue, chest pain, and breathlessness.

Many people infected with these diseases present with mild symptoms, while others will develop severe conditions such as pneumonia, osteomyelitis, meningitis and meningoenzephalitis, Weil's disease or endocarditis.

Infections caused by Rickettsia groups can also present with rash and vasculitis. Some spotted fever infections can be associated with multiorgan failure including as respiratory failure, heart failure, renal failure, bleeding and neurological complications².

Who is at risk?

As atypical zoonotic bacterial diseases are primarily spread through close contact with animals, people at risk include those who have contact with farm, domestic or wild animals and those who have occupational or recreational animal exposures. This includes veterinarians/vet nurses, abattoir/slaughterhouse workers, wildlife workers and farmers.

Animal reservoirs for Q-fever in NSW include cattle, sheep, goats and kangaroos. Exposure to birthing fluids, wool or faeces from these animals can also cause infection. Cases have also resulted from mowing over infected animal faeces.

Q-fever is preventable by vaccination. <https://www.health.nsw.gov.au/Infectious/factsheets/Pages/q-fever-vaccine.aspx>

Psittacosis is also known as 'parrot fever' and is associated with exposure to either wild and domestic birds or their feathers and faeces. The bacteria have also been observed to be spread to humans from horses, especially through foals and birthing fluid, in NSW³.

Leptospirosis can be spread to humans from infected urine of rodents, cattle, sheep, goats, pigs, horses and dogs. Exposure to contaminated water and soil, including flood waters, has resulted in infections.

Brucellosis is commonly spread to humans from infected feral pigs, and people are often exposed through amateur or professional pig hunting. Infected domestic dogs can also be a source of infection. Cases are most commonly seen in the west and north-west of NSW.

Rickettsia while rare, can affect people of all ages and more common among those who have contact with fleas, lice, ticks, mites, rodents and reptiles.

How is it diagnosed?

PCR testing is available for brucellosis, leptospirosis, psittacosis, Q-fever and rickettsia and is recommended when disease is highly suspected and symptom onset is relatively recent.

When PCR testing is not done, blood tests can be used to diagnose if illness has a zoonotic cause. Testing in parallel of repeat samples is needed to confirm the diagnosis.

Treatment

Brucellosis, leptospirosis, psittacosis Q-fever and Rickettsia can be treated with doxycycline as per TGA guidelines. Alternative treatments are also available. Gentamicin for the first week is recommended for brucellosis.

Please direct any queries regarding diagnosis and treatment to an infectious disease physician:

- Dr Ian Marr (works out of Queanbeyan Hospital) **(02) 6150 7000** and ask to be transferred through
- ID physicians at The Canberra Hospital **(02) 5124 0000**

Notification

Brucellosis, leptospirosis, psittacosis, Q-fever and *Rickettsia prowazekii* – (Epidemic typhus) are all notifiable diseases under the *Public Health Act, NSW, 2010*. The Public Health Unit will investigate all cases to determine potential exposures and any ongoing risks to the community.

The Infectious Disease staff at the PHU are available 24/7 by calling **1300 066 055**.

¹ South Australia Health, 2022, Rickettsial infections – including symptoms, treatment and prevention, accessed 11 August 2022, <https://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/conditions/infectious+diseases/rickettsial+infections/rickettsial+infections+-including+symptoms+treatment+and+prevention#:~:text=The%20Rickettsiae%20are%20a%20diverse,Rickettsia%20australis%20%2D%20Queensland%20tick%20typhus>

² Heymann, D.L (2015). Control of Communicable Disease Manual: An official report of the American Public Health Association (20th Edition)

³ Chan, J, Doyle, B, Branley J et al, An outbreak of psittacosis at a veterinary school demonstrating a novel– source of infection, One Health. 3 (2017), 29–33.