

Typhus (epidemic, murine and other rickettsial diseases)

Epidemic typhus is a serious bacterial infection spread by human body lice and is a risk in conflict settings and refugee camps. Murine typhus is a related bacterial infection spread by rodent fleas which occurs worldwide and all over Australia.

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What is typhus?

Typhus is a term used to describe infections by several types of rickettsial bacteria. Rickettsiae are a diverse group of bacteria some of which can be transmitted to humans by ectoparasites such as fleas, lice, ticks or mites. The typhus group of rickettsia includes:

- **Epidemic typhus** (*Rickettsia prowazeki*), transmitted through the bites of human body lice.
- **Murine typhus** (*Rickettsia typhi*), transmitted by fleas carried by rats and mice. Also known as endemic typhus.
- **Spotted Fever group rickettsiae**, including Queensland Tick Typhus (*R. australis*) and Flinders Island Spotted Fever (*R. honei*) which are spread through the bite of infected ticks. Cat Flea typhus (*R. felis*) is now recognised worldwide, including Australia, and is transmitted by infected fleas.
- **Scrub typhus** (*Orientia tsutsugamushi*), transmitted by the bites of larval mites which live on rodents. It occurs widely in rural settings in Asia and is a risk in parts of tropical northern Australia.

What are the symptoms?

In most forms of typhus, symptoms usually develop 1 to 2 weeks after exposure. Common symptoms include fever, chills, headache, muscle aches, and malaise. There may be a prominent scab ('eschar') at the site of the ectoparasite bite.

Epidemic and scrub typhus are usually associated with more severe symptoms which typically begin suddenly. A flat, macular rash often develops on the trunk after 5-6 days and may spread to the entire body but usually not the face, palms or soles. As the illness progresses there may be a severe cough, haemorrhagic rash and delirium. In epidemic typhus outbreaks where there is no access to antibiotic treatment, from 10 to 40 per cent of cases are fatal.

In murine and Spotted Fever group typhus, a rash is common and as the illness progresses, nausea and vomiting, a cough and neurological symptoms (eg confusion, unsteady gait, and seizures) may develop. However, most infections are uncomplicated and may be incorrectly diagnosed as due to a virus.

How is it spread?

In most forms of typhus, the faeces or salivary glands of the ectoparasite contain large numbers of rickettsial bacteria. Ectoparasite faeces contaminate the bite site and pass on the infection. Ticks and mites inject rickettsia as they feed.

Epidemic typhus occurred in Australia in the 18th and 19th centuries but does not naturally occur now. The risk of infection is greatest in communities where human body lice are prevalent, such as in refugee camps and when people live in over-crowded conditions. Outbreaks have occurred during wars and after natural disasters, particularly in colder months and when louse-infested clothing is not washed. Epidemic typhus is not spread directly from person to person but the infected human body louse may move from one person to another person through close contact or shared clothing.

Murine typhus is reported from all over Australia. It occurs widely around the world but is particularly prevalent in tropical and sub-tropical coastal areas where rodents are commonly found. Murine typhus infections may also be caused by inhalation of airborne infected flea faeces, such as when cleaning out a rodent-infested shed.

The risk of scrub typhus increases in secondary vegetation near dense forests, especially when sitting, lying or pitching tents, and sleeping in tents without attached floors. While infections can occur throughout the year, the risk of transmission of scrub typhus and other tick and flea-borne rickettsial infections increases during spring and summer months when ticks and fleas are most active and when camping and other outdoor activities are more common.

Who is at risk?

People of all ages are at risk of typhus rickettsia if exposed but infection usually confers long-lasting immunity. Epidemic typhus may occasionally recrudescence many years after the primary attack; this form of the disease (called Brill Zinsser disease) is usually milder.

How is it prevented?

No vaccine is available to prevent any type of typhus infection.

The best way to prevent typhus infections is to minimize exposure to the ectoparasite vectors (human body lice, fleas, ticks and mites) and rodents which may carry infected fleas. This includes the use of personal insect repellents and self-examination of the skin after visits to vector-infested areas.

Wearing protective clothing impregnated with tick-repellent when in the bush further reduces the risk of tick and mite bites.

People at increased risk epidemic typhus include those who work with displaced populations in impoverished areas, such as in refugee camps. The risk increases during the colder months when human activities encourage the spread of human body lice. Residual insecticide powders may be regularly applied to clothes or to the skin for people living in these high risk conditions.

Protective masks should be worn when cleaning areas heavily infested by rodents to reduce the risk of murine typhus from inhaled dust contaminated by rodent faeces.

Antibiotics are generally only used for treatment of symptomatic typhus infections. Antibiotics should not routinely be used as prophylaxis but may be occasionally recommended for use by people at high risk of exposure, such as those working in endemic areas (e.g. soldiers at risk of scrub typhus may be prescribed doxycycline prophylaxis)

How is it diagnosed?

Typhus infections can be difficult to diagnose but a doctor may suspect it in someone who develops typical symptoms after travelling in an endemic or high risk area, particularly if there is a history of bites from human body lice, fleas, ticks or mites.

Confirmation of a typhus infection is usually done by a blood or skin biopsy test (by PCR) that identifies the rickettsia bacteria. The diagnosis may also be made by blood tests (by serology) taken two weeks apart which detects the body's immune response to the infection.

How is it treated?

Typhus infections are most commonly treated with tetracycline antibiotics such as doxycycline. If there is a strong clinical suspicion of infection, treatment should be commenced without waiting for the results of laboratory tests.

What is the public health response?

Laboratories and hospitals are required to notify cases of epidemic typhus to their local public health unit under the Public Health Act (2010). Public health units investigate cases to identify possible sources of infection and increase awareness of risk.

Further information

For further information please call your local public health unit on **1300 066 055**.