

Rickettsia

Rickettsial diseases are caused by a variety of obligate intracellular, gram negative bacteria from the genera *Rickettsia*, *Orientia*, *Ehrlichia*, and *Coxiella*. These organisms are all gram negative obligate intracellular parasites that cannot survive outside host cells. These organisms require CoA and NAD⁺ for replication that it must obtain from eukaryotic hosts. Rickettsial infections that cause diseases in humans include Rocky Mountain spotted fever, typhus, Ehrlichiosis. All these except Q fever are transmitted by arthropod vectors like ticks, fleas, and lice and have similar disease presentations including headache, fever, and rash. Q fever, caused by *Coxiella burnetii*, is an atypical Rickettsia because it is not transmitted from an arthropod vector and does not cause a rash. Rickettsial diseases also have a positive Weil-Felix reaction while *Coxiella* infections do not.



PLAY PICMONIC

Need CoA and NAD

Coin A and (NAD) Nicotine Character

These organisms are obligate intracellular organisms that require CoA and NAD from eukaryotic host cells to survive.

Rocky Mountain spotted fever

Rocky Mountain and Spotted Fever-beaver

This is the most lethal and common Rickettsial infection in the United States, caused by the bacteria *Rickettsia rickettsii*. Signs and symptoms include sudden onset of fever, headache, muscle, and rash.

Typhus

Typhoon on a Tablet

Typhus is caused by several species of *Rickettsia* including *Rickettsia prowazekii* and *Rickettsia typhi*. Common symptoms include chills, high fever, joint pain, severe headaches and muscle pain. Typhus also has a rash that characteristically starts on the trunk and spreads outward without involving the palms or soles.

Ehrlichiosis

Ear-lick

Tickborne bacterial infection can infect and kill white blood cells. Common symptoms include headache, muscle aches, and fatigue. A rash may occur but is not common.

Q fever

(Q) Queen Fever-beaver

It is important to know that Q Fever is not in the *Rickettsia* genus, but is closely related. Q fever is the disease caused by *Coxiella burnetii* and commonly manifests as flu-like symptoms with fever, malaise, myalgia, nausea, vomiting, and diarrhea. During the course of disease, it can progress to pneumonia, which can result in life-threatening acute respiratory distress syndrome.

Arthropod vector

Tick

Many of the Rickettsial disease are transmitted by arthropod vectors like ticks, fleas, and lice.

Fever

[Fever-beaver](#)

Many of the Rickettsial diseases have a classic triad of headache, fever, and a rash.

Headache

[Head-egg lump](#)

Many of the Rickettsial diseases have a classic triad of headache, fever, and a rash.

Rash

[Dermatologist examining Rash](#)

Many of the Rickettsial diseases have a classic triad of headache, fever, and a rash. The rash is often caused by vasculitis.

Weil-Felix reaction

[Whale](#)

A Weil-Felix test is an agglutination test used for the identification of rickettsial infections. When patient serum is mixed with Proteus antigens, anti rickettsial antibodies cross-react to Proteus O antigens causing agglutination. It is important to note that Q fever has a negative Weil-Felix reaction.

Treatment doxycycline

[Dachshund-cycling](#)

Doxycycline is a tetracycline antibiotic that is effective against Rickettsial organisms.