

Just the Facts...

Q fever is an infection caused by Coxiella burnetii (COX-ee-ELL-ah burn-ETT-eye), a type of bacteria that is distributed worldwide. The first outbreak of Q (for "query") fever occurred in 1935 among slaughterhouse workers in Brisbane, Australia. The full public health impact of Q fever was realized when outbreaks of Q fever occurred among American and German troops during World War II. Q fever became a notifiable disease in the U.S. in 1999. Due to the highly infectious and persistent nature of the organism, the potential for its use as a biological warfare agent is a concern. The Centers for Disease Control and Prevention categorizes C. burnetii as a Category B agent (i.e., those that are moderately easy to disseminate).

How is Q fever spread?

Livestock are the most frequent sources of human *C. burnetii* infection. Cattle, camel, goats, and sheep are likely the primary reservoirs from which human contamination occurs in the U.S. Central Command Area of Responsibility. Infected dogs, cats, and poultry (hens, ducks, geese, turkeys, and pigeons) can also transmit *C. burnetii* to humans. Organisms are excreted in birth products, milk, urine, and feces of infected animals and can survive for long periods of time in the environment. Infection of humans usually occurs by inhalation of these organisms from contaminated aerosols. The wind can carry these aerosolized particles great distances, so it's important to note that exposures may occur among patients without any evident contact with animals. Humans are very susceptible to the disease and few organisms are required to cause infection. In rare instances, people may acquire Q fever via the ingestion of raw milk or eggs, by tick bites, or by human-to-human transmission.



Photo: U.S. Air Force, Kirkuk province, Iraq, April, 2008

How common is Q fever?

Q fever is found in nearly every country but is under-diagnosed and under-reported. In the U.S., 255 human Q fever cases (average of 51 per year) were reported with illness onset during 2000 through 2004. Worldwide, the incidence varies from country to country. At least 25 cases of Q fever among U.S. military serving in Iraq have been reported in the literature since 2003. An additional 90 cases with symptom onset from January 2007 through June 2008 have been identified through the U.S. Army Center for Health Promotion and Preventive Medicine, Directorate of Epidemiology and Disease Surveillance.



Photo: U.S. Army, East Anbar province, Iraq, May, 2008

Who is at risk for Q fever?

Military personnel deployed to areas where livestock are present, in addition to veterinarians, workers at slaughterhouses and meat processing plants, farmers, and laboratory workers.

What are the symptoms of Q fever?

There are two forms of human Q fever disease: acute (abrupt onset and short course) and chronic (long-term). Acute Q fever begins with a sudden onset of flu-like symptoms and can progress to pneumonia or hepatitis. Atypical manifestations or asymptomatic infections may also occur. The most common symptoms among U.S. military personnel deployed to Iraq have been fever, headache, chills, malaise (generalized feeling of discomfort, illness, or lack of well-being), fatigue, and nausea. Other reported symptoms include non-productive cough, muscle aches, vomiting, sweats, diarrhea, abdominal pain, shortness of breath, and chest pain. Infection with greater numbers of organisms will result in shorter incubation periods and more severe disease.

How is Q fever diagnosed?

Since the clinical symptoms of Q fever are often non-specific and flu-like, it is difficult to make an accurate diagnosis without appropriate laboratory testing. Diagnosis of acute Q fever is made by a blood test (indirect immunofluorescence antibody test) and usually requires a test at the time of illness and again upon recovery. A positive result usually occurs by 3 weeks after symptom onset; however, Q fever cannot be definitively ruled out unless a negative test is obtained from a blood sample collected at least one and a half months after the onset of symptoms. Q fever should be considered in the diagnosis of deployed, or recently redeployed, military and civilian personnel with unexplained fever. The U.S. Air Force School of Aerospace Medicine Public Health Lab, Brooks City-Base, Texas, is the DoD reference lab for Q fever testing.

What is the treatment for acute Q fever?

Patients can recover from Q fever without treatment, but the antibiotic doxycycline is recommended to shorten duration of symptoms and prevent more severe complications and chronic disease. All acute Q fever cases should be treated with 100 mg of doxycycline taken orally twice daily for 21 days. Due to diagnostic challenges downrange, the addition of 21 days of doxycycline to the therapeutic plan is reasonable when a patient has symptoms that could be consistent with acute Q fever.

Is any follow-up necessary after being diagnosed with acute Q fever?

The doctor should order a transthoracic echocardiogram (or heart imaging) to document any heart valve abnormalities, but this may be postponed until redeployment (if infection occurred while downrange). In addition, follow-up blood testing should be performed for at least 2 years following acute illness (quarterly the first year and biannually the second year) to detect development of chronic disease.

What is the risk of chronic Q fever?

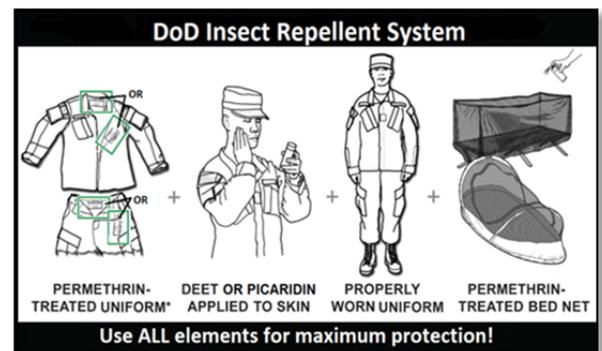
Chronic Q fever appears to be uncommon and may not develop until years after initial infection. The disease course in humans may be related to strain of the infecting organism. Chronic Q fever most commonly appears as endocarditis (or inflammation of the inner layer of the heart) and occurs almost exclusively among patients with preexisting heart disease. Diagnosis of chronic Q fever is usually serologic and not standardized. Treatment requires at least 18 months of doxycycline plus hydroxychloroquine.

Is there a Q fever vaccine?

A vaccine for Q fever is not commercially available in the U.S., although a human vaccine (Q-VAX®) is produced and licensed for use in Australia. A similar product, which is not licensed, is administered as an Investigational New Drug in the U.S. This vaccine is available through the U.S. Army Medical Research Institute of Infectious Diseases for vaccinating at-risk persons. A vaccine for use in animals has also been developed, but it is not available in the U.S.

How can Q fever be prevented?

- It is difficult to prevent Q fever infection when deployed to areas with livestock. However, you can reduce your exposure by practicing these preventive measures whenever possible:
- Avoid getting directly exposed to, or being downwind from, farms and other livestock areas (such as barns or stables).
- Avoid inhalation of dust that is aerosolized by vehicles, aircraft, or by other activities (such as detonations).
- Avoid livestock slaughtering facilities.
- Avoid handling livestock carcasses and unprocessed wools or animal hides (such as sheepskins).
- Do not smoke.
- Do not adopt camp animals or mascots.
- Practice good hygiene techniques (such as frequent hand washing).
- Protect yourself from tick bites; use the DoD Insect Repellent System.



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