

Q FEVER

Bioterrorism Agent Profiles for Health Care Workers

Causative Agent: Q fever is a zoonotic disease caused by a rickettsia *Coxiella burnetii*.

Route of Exposure: Humans usually acquire Q fever through the inhalation of airborne particles. Sheep, cattle, and goats can serve as reservoirs for the agent. Consumption of contaminated food or water can also result in infection.

Infective Dose & Infectivity: 1-10 Organisms

Incubation Period: The incubation period ranges from 10 to 40 days.

Clinical Effects: Q fever generally occurs as a self-limiting illness lasting 2 days to 2 weeks. The disease generally presents as an acute non-differentiated febrile illness with headaches, fatigue and myalgias as prominent symptoms. Pneumonia with an abnormal chest X-ray occurs in about 50% of all patients. Non-productive cough and pleuritic chest pain can also occur. Uncommon complications of Q fever infection include: chronic hepatitis, endocarditis, aseptic meningitis, encephalitis, and osteomyelitis.

Lethality: While highly incapacitating, the death rate due to Q fever is very low (<1-3%).

Transmissibility (person to person): Transmission from person-to-person is extremely rare.

Primary Contamination & Methods of Dissemination: The most likely route of intentional dissemination would be through aerosolization. Alternatively, the organism could be disseminated through sabotage of the food supply.

Secondary Contamination & Persistence of Organism: Persons who are exposed to Q fever through the aerosol route do not present a risk for secondary contamination or re-aerosolization of the organism. The organism is highly resistant to many disinfectants.

Decontamination & Isolation:

Patients – Patients can be treated using standard precautions. Gross decontamination is not necessary.

Equipment & other objects – Contaminated surfaces and clothing can be decontaminated with 0.5% hypochlorite solution (one part household bleach and nine parts water = 0.5% solution) or a 1:100 solution of Lysol.

Outbreak control: Since secondary cases are unlikely, outbreak control measures are not recommended.

Bioterrorism Agent Profiles for Health Care Workers – Q Fever
(continued from previous page)

Laboratory Testing: Isolation of *C. burnetii* is usually not done due to the risk to laboratory workers. Diagnosis can be made acute and convalescent antibody titers (indirect immunofluorescence antibody or complement fixation antibody), polymerase chain reaction on tissue, or positive immunostaining on a heart valve.

Therapeutic Treatment: Tetracycline or doxycycline is the recommended treatment. A combination of erythromycin plus rifampin is also effective.

Prophylactic Treatment: Treatment with a tetracycline during the incubation period may delay, but will not prevent the onset of symptoms. A vaccine has been developed, but is not licensed for use in the United States.

Differential Diagnosis: Q fever must be differentiated from pneumonias caused by mycoplasma, *Legionella pneumophila*, *Chlamydophila psittaci*, or *Chlamydophila pneumoniae*.

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For more information call (602) 364-3289

Frequently Asked Questions About Q Fever

What is Q fever?

Q fever is a disease caused by the bacteria *Coxiella burnetii*. *C. burnetii* can be found in animals (especially cattle, sheep, and goats) throughout the world.

How do people become infected with the Q fever bacteria?

People usually become infected with Q fever by breathing in airborne particles that contain *C. burnetii* bacteria. This most often occurs in barnyard settings through the inhalation of dust contaminated with dried placental material, birth fluids, and excreta of infected herd animals. In the United States, Q fever outbreaks have resulted mainly from occupational exposure involving veterinarians, meat processing plant workers, sheep and dairy workers, livestock farmers, and researchers at facilities housing sheep. Other modes of transmission, such as tick bites and human-to-human transmission, are very rare.

Why are we concerned about Q fever as a bioweapon?

Coxiella burnetii is a highly infectious agent that is resistant to heat and drying. Humans are often very susceptible to the disease, and very few organisms may be required to cause infection. This agent could be developed for use in biological warfare and is considered a potential terrorist threat.

What are the signs and symptoms of Q fever?

Only about half of all people with Q fever show any symptoms. Acute cases of Q fever begin with a sudden onset of one or more of the following: high fevers (up to 104°-105° F), severe headache, general discomfort and fatigue, muscle pain, confusion, sore throat, chills, sweats, dry cough, nausea, vomiting, diarrhea, stomach pain, and chest pain. Fever usually lasts for 1 to 2 weeks. Weight loss can also occur and may continue for some time. The disease can cause abnormal results on liver function tests and can lead to hepatitis. Additionally, 30% to 50% of people with symptoms may develop pneumonia.

In general, most people will recover to good health within several months without any treatment. Only 1%-2% of people with acute Q fever die from the disease.

Though uncommon, people who have had acute Q fever may develop the chronic form of the disease within 1 to 20 years after first being infected.

How quickly would someone become sick if they were exposed to the Q fever bacteria?

Most people become sick within 2-3 weeks after being exposed to Q fever bacteria, but this depends on how many bacteria have entered the person. The more germs that infect a person, the less time it takes to get sick.

Frequently Asked Questions About Q Fever
(continued from previous page)

How is Q fever diagnosed?

If the health care provider suspects Q fever, blood samples will be collected and sent to the laboratory to look for antibodies to *Coxiella burnetii*. Because the signs and symptoms of Q fever are similar to other diseases, it is necessary to perform laboratory tests to make an accurate diagnosis.

Can Q fever be treated with antibiotics?

Yes. Q fever can be treated with antibiotics. Treatment is most effective when started early in the course of illness. Doxycycline is the treatment of choice for acute Q fever.

Is a vaccine available to prevent Q fever?

A human vaccine for Q fever has been developed and has successfully protected workers in occupational settings. However, this vaccine is not commercially available in the United States. A vaccine for use in animals has also been developed, but it is not yet available in the United States.

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