

ANIMAL AND HUMAN HEALTH PREVENTION OPPORTUNITIES

Tularemia

Tularemia (also known as “rabbit fever” or “deerfly fever”) is a rare, but potentially serious zoonotic disease caused by the bacterium *Francisella tularensis*. *F. tularensis* is highly infectious, and humans can be exposed through arthropod bites, direct contact with infected animals or infected tissues, inhalation of contaminated aerosols, or ingestion of contaminated food or water. Clinical presentations can vary depending on how the person was infected. Tularemia is present in the northern hemisphere, and it has been reported in 49 out of 50 states, the exception being Hawaii. In the United States, there has been a total of 698 human cases from 2011 through 2014. In Montana, there has been a total of 20 human cases from July 2011 through June 2016. Additionally, there have been ten cases of tularemia in Montana animals in the past year. These cases included cats, rabbit, wolf, grizzly bear, and beaver. In this issue of *Montana One Health*, we will describe animal and human tularemia infection, treatment, and prevention.

Animal Tularemia Infections

While tularemia is also known as “rabbit fever,” rabbits are not the only animals that can become infected. Tularemia affects more than 250 species of wild and domestic animals.

In domestic animals, sheep are the most commonly infected, and there have been outbreaks with high mortality in Canada, the U.S., and Russia. Additionally, there have been outbreaks in commercially bred mink, beaver, and fox. Infection has also been reported in cats, dogs, pigs, horses, rabbits, hares, and rodents.

Domestic animals can become infected through the bite of an infected arthropod, ingestion of contaminated tissues or water, or inhalation of aerosolized bacteria.

The incubation period is one to ten days. Clinical signs of tularemia are often associated with tick bites and can include increased pulse and respiratory rates, lymphadenopathy, hepatosplenomegaly, coughing, polyuria, and diarrhea. Death may occur in hours or days. Signs of septicemia are the best way to recognize sporadic cases. However, affected animals may have subtle or no signs of infection. Early diagnosis and treatment of tularemia is vital to reduce the risk of fatality.

The Merck Veterinary Manual states that streptomycin, gentamicin, and tetracyclines are effective at recommended doses and should be continued for ten days. Because tetracycline and chloramphenicol are bacteriostatic, they should be continued for fourteen days to minimize the risk of relapse. However, practitioners must be aware of limitations on use of

some of these antibiotics in food animals.

The standard method of identifying infection is serologic testing. Additional methods include culture of the bacterium and autopsy of suspected animals. However, *F. tularensis* is highly contagious and only informed and qualified personnel should perform these tests.

While tularemia can be treated effectively, prevention is best. For animals, there are many tick and insect repellents that can be applied. Pets should also be checked for ticks when they return indoors and all ticks should be removed as quickly as possible.

Tularemia in Humans

Any infected animal can transmit tularemia to humans through several routes. Tularemia is not reported to be spread through person to person contact. In the U.S., dog ticks, wood ticks, lone star ticks, and the deer flies have been shown to be vectors for *F. tularensis* transmission. Tularemia is usually more common from May through September because of bites from ticks and deer flies. Infections from tick or deer fly bites usually present as ulceroglandular or glandular tularemia. Ulceroglandular is the most common form of tularemia and manifests as a skin ulcer at the site where the bacteria entered the body (**figure 1**). People can help prevent infection by applying tick or insect repellent and checking and removing ticks.

Humans can also become infected through handling or eating under-cooked infected animal tissue. This transmission can occur when hunters skin rodents, rabbits, or hares. Rarely, eating under-cooked infected meat or drinking contaminated water can cause Oropharyngeal tularemia. Rabbit or rodent skinning should be completed in a well ventilated area and hunters should wear gloves.

Heat kills *F. tularensis*, so thorough cooking of rabbits or other game will render it safe.

Domestic animals, including cats and hamsters, have been known to transmit the bacteria to humans through bites and scratches. Handling infected animals can cause glandular, ulceroglandular, or oculoglandular tularemia. People working with sick or dead animals should wear appropriate personal protective equipment, such as eye protection, gown, disposable gloves, and N-95 mask, to decrease the risk of infection.

One of the rarest but most severe forms of the disease, pneumonic tularemia, can be acquired through inhaling aerosols containing *F. tularensis*. This usually occurs during farming or landscaping activities, when machinery runs over an infected animal or its carcass.

Symptoms of tularemia usually appear within three to five days after exposure, but it can take up to fourteen days. Symptoms may include sudden fever, chills, headaches, nausea, vomiting, and progressive weakness. Other symptoms depend on the manner in which the person was infected.

Other symptoms can include ulcers on skin or mouth, swollen and painful lymph glands, swollen and painful eyes, and sore throat.

Tularemia can be difficult for clinicians to diagnose, because it is a rare disease and symptoms can be easily misdiagnosed. Providers can enhance diagnosis by asking patients about exposure to dead or sick animals and tick or deer fly bites.

Cultures and fourfold elevation in serum antibody titer is diagnostic. Physicians will most likely prescribe antibiotics, and almost all treated patients completely recover in several weeks.

In Montana, tularemia is a reportable communicable disease (ARM 37.114.203) and animal disease (ARM 32.3.104). All suspected or confirmed cases of tularemia must be reported immediately to the local public health jurisdiction. If your local public health jurisdiction is unavailable call 406-444-0273. All cases of tularemia in animals must be reported immediately to the Montana Department of Livestock at 406-444-2043.

Tularemia Key Points

- Persons handling sick or dead animals should wear appropriate personal protective equipment.
- Clinicians should collect a detailed patient history of animal exposure and tick or deer fly bites to help diagnose generalized symptoms in human tularemia cases.
- If a health care provider suspects tularemia, contact the local public health jurisdiction.
- If a veterinarian or animal health care worker suspects tularemia in an animal, contact the Montana Department of Livestock.

Figure 1. Ulcer from tularemia infection



References available on web version. Visit <http://www.dphhs.mt.gov/publichealth/publications.shtml>.

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