

BASICS

Tularemia is a bacterial disease caused by the organism *Francisella tularensis*. Tularemia most commonly affects lagomorphs (rabbits, hares) and rodents but can be a serious disease in people.

In both humans and animals, acute fever is common. **CLINICAL SIGNS** can include anorexia, dehydration, listlessness, enlarged lymph nodes, draining abscesses, oral or tongue ulceration, pneumonia, enlarged liver and spleen, and icterus (yellowish color of skin and eye). **NONSPECIFIC SIGNS** include lethargy (low energy), anorexia, vomiting, and diarrhea.

F. tularensis is highly infectious and can be **TRANSMITTED** by contact with just a few bacteria from an infected animal or the bite of an infected tick or deerfly. The most common **ARTHROPOD VECTORS** in the United States are the American dog tick, the Lone Star tick, the Rocky Mountain wood tick, and deerflies.

Tularemia can be definitively **DIAGNOSED** by isolating the organism from blood, fluid, or biopsies of lesions or lymph nodes. Samples may also be sent for specialized secure laboratories for confirmation.

Antibiotics are used to **TREAT** tularemia. Commonly used antibiotics include streptomycin, gentamicin, doxycycline, and ciprofloxacin.

Tularemia is considered a "**SELECT AGENT**" which means the federal government considers it a **POTENTIAL BIOLOGIC WEAPON**. All cases must be reported to state and federal agencies.



**ZOONOTIC
RISK &
SELECT
AGENT**

**TICK BITE,
DIRECT
CONTACT,
INHALATION,
OR INGESTION**

**MAMMALS,
BIRDS, &
HUMANS**

DETAILS

There are **FOUR** proposed subspecies of the organism, with types A and B responsible for most clinical disease. Type A, *F. tularensis tularensis*, is highly virulent and is found in the United States. Type B, *F. tularensis holarctica*, is found throughout the northern hemisphere.

F. tularensis is capable of infecting a broad variety of species, including **OVER 190 SPECIES** of mammals and several species of birds, amphibians, and invertebrates. In North America, cottontail rabbits, black-tail jackrabbits, snowshoe hares, beavers, and muskrats are most commonly affected.

CLINICAL SIGNS The presentation of the disease can depend on the mode of transmission. Cats seem to be more susceptible to illness than dogs, and severity of illness in cats can **VARY SIGNIFICANTLY** from asymptomatic to life threatening. Clinical illness is rare in dogs and may be self-limiting. Outbreaks have occurred in sheep and signs included fever, low body weight, enlarged lymph nodes, and diarrhea. There have been reports of nonhuman primate infections in which several animals died.

In **HUMANS**, nonspecific signs include general discomfort, chills, headache, and muscle aches that usually begin about 3 to 5 days after infection with *F. tularensis*.

Very few *F. tularensis tularensis* (Type A) bacteria are needed to cause disease in humans. Only 10 bacteria injected under the skin or 25 bacteria in an aerosol can cause disease, making *F. tularensis* an **EXTREMELY INFECTIOUS HUMAN PATHOGEN**.

There are **SIX CLINICAL SYNDROMES** in humans depending on the mode of infection, which are ulceroglandular, pneumonic, glandular, pharyngeal, oculoglandular, and typhoidal tularemia. Ulceroglandular tularemia is most common and occurs when the bacteria enter through the skin or mucous membranes, resulting in ulceration and regional lymph node enlargement. The glandular form is also the result of skin entry but lacks an ulcer, and can also be caused by the bite of an infected tick or fly.

The pharyngeal and oculoglandular forms have signs related to the throat and eye, respectively. Pneumonic tularemia occurs when the bacteria are inhaled and tends to be most severe. Typhoidal tularemia has no localizing signs, which can make diagnosis difficult.

TRANSMISSION of the bacteria can also occur through contact with blood or tissues of infected animals. Inhalation of aerosolized particles or ingestion of contaminated water or meat can also result in disease. Human to human transmission has not been reported. Type A, subspecies *tularensis*, is most commonly transmitted by direct contact, tick vectors, or by aerols. Type B, subspecies *holarctica*, is usually much less severe than Type A and is mainly associated with water sources and semi-aquatic animals.

EPIDEMIOLOGY Tularemia is **RARE** in New York State with only a handful of cases reported in humans in the New York City area in the last decade. Transmission by ticks is more common during summer when tick bites are more likely to occur. Cases must be reported to state and federal authorities. The organism is classified as a possible bioterrorism agent because of its highly infectious nature and ability to be aerosolized and contaminate food or water.

PRECAUTIONS AND PREVENTION Reducing exposure to the vectors that transmit the bacteria, ticks and biting flies, will help prevent infection with tularemia as well as other tick-borne diseases. In addition, hunters should use gloves when handling animals and cook game meat thoroughly before eating. There is **NO VACCINE** generally available at this time.

If left untreated, type A tularemia can cause **SERIOUS DISEASE** and possibly mortality, so prompt diagnosis and treatment is important. Consult your physician if you experience the following symptoms and have been in contact with wild rabbits or rodents or had a recent tick bite: high fever, progressive weakness, malaise, anorexia, and weight loss; non-healing ulcerated wounds. Depending on whether the organism was inhaled or ingested, respiratory symptoms or gastrointestinal symptoms may be present.