

Tularemia Cause, Transmission, Treatment & Symptoms

- Tularemia is an acute febrile zoonotic illness caused by the highly infectious organism called ***Francisella tularensis***.
- In humans, **ulceroglandular tularemia** is the most common form of the disease and is usually occurs as a consequence of a bite from an [arthropod](#) vector which has previously fed on an infected animal.

▶ Signs and Symptoms

- After an incubation period ranging from a few days to 3 weeks, acute symptoms of headache, backache, fever, chills, malaise, and weakness appear.
- Further clinical manifestations are tied to the portal of entry. They include ulcerative skin lesions, swollen lymph glands, conjunctival inflammation, sore throat, intestinal disruption, and pulmonary involvement. The death rate in the most serious forms of disease is 30%, but proper treatment with gentamicin or streptomycin reduces mortality to almost zero.

▶ Causative Agent

- The causative agent of tularemia is a facultative intracellular gram-negative bacterium called ***Francisella tularensis***.
- It has several characteristics in common with *Yersinia pestis*, and the two species were previously often included in a single genus called ***Pasteurella***.
- It is a zoonotic disease of assorted mammals endemic to the Northern Hemisphere. Because it has been associated with outbreaks of disease in wild rabbits, it is sometimes called **rabbit fever**.
- It is also known as "hunters' disease", "deerfly fever", "tick fever", "O'Hara's Disease" and "Francis' Disease"
- It is currently listed as a pathogen of concern on the lists of bioterrorism agents.

▶ Transmission and Epidemiology

- Tularemia is abundantly distributed through numerous animal reservoirs and vectors. This disease is noteworthy for its complex epidemiology and spectrum of symptoms.

- Although rabbits and rodents (muskrats and ground squirrels) are the chief reservoirs, other wild animals (skunks, beavers, foxes, opossums) and some domestic animals are implicated as well.
- The chief route of transmission in the past had been through the activity of skinning rabbits, but with the decline of rabbit hunting, transmission via tick bites is more common.
- Infection can also occur via inhalation, ingestion, and contact with mucous membranes of infected animals.
- Ticks are the most frequent arthropod vector, followed by biting flies, mites, and mosquitoes.
- Tularemia is strikingly varied in its portals of entry and disease manifestations.
- Although bites by a vector are the most common source of infection, in many cases infection results when the skin or eye is inoculated through contact with infected animals, animal products, contaminated water, and dust.
- Pulmonary forms of the infection can result from aerosolized soils or animal fluids and also from spread of the bacterium in the bloodstream.
- The disease is not communicated from human to human. With an estimated infective dose of between 10 and 50 organisms, *F. tularensis* is often considered one of the most infectious of all bacteria.
- The term **“lawnmower”** tularemia refers to tularemia acquired while performing grass-mowing or brush-cutting chores.
- Cases of tularemia have appeared in people who have accidentally run over dead rabbits while lawn mowing, presumably from inhaling aerosolized bacteria.
- There is evidence that the bacterium can persist in watercourses, possibly in association with amoebae

▣ Prevention and Treatment

[Enzyme-linked immunosorbent assay](#)- and [PCR](#)-based methods have been used to detect bacteria in clinical samples. Because the intracellular persistence of *F. tularensis* can lead to relapses, antimicrobial therapy must not be discontinued prematurely. Protection is available in the form of a live attenuated vaccine. Laboratory workers and other occupationally exposed personnel must wear gloves, masks, and eyewear.



Disease Table

Tularemia

Causative Organism(s)	<i>Francisella tularensis</i>
Most Common Modes of Transmission	Vector, biological; also direct contact with body fluids from infected animal; airborne
Virulence Factors	Intracellular growth
Culture/Diagnosis	Culture dangerous to lab workers and not reliable; serology most often used
Prevention	Live attenuated vaccine for high-risk individuals
Treatment	Gentamicin or streptomycin

References

1. <https://www.ncbi.nlm.nih.gov/books/NBK430905/>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC126859/>
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4115998/>