



TULAREMIA
(Rabbit fever, Deer-fly fever, Ohara disease, Francis disease)
Fact Sheet

Agent: *Francisella tularensis*, a small non-motile gram-negative coccobacillus. Human disease is primarily associated with 2 of 4 subspecies. The highly virulent *F. tularensis* subspecies *tularensis* (type A) is found only in North America. *F. tularensis* subspecies *holarctica* (type B) is less virulent and found throughout the Northern hemisphere.

Brief Description: The symptoms of this disease are highly variable. Disease begins with fever, headache, malaise, and anorexia, and can be followed by symptoms that fall into six categories. Subspecies and site of entry determine the type/category of disease.

- Ulceroglandular disease: characterized by an indolent ulcer appearing at the site of infection, accompanied by lymphadenopathy,
- Glandular disease: suppurative lymphadenopathy that follows infection without ulcer or in which an ulcer was not recognized,
- Typhoidal disease: primarily septicemia, with a highly fatal course,
- Pleuropneumonic disease: organisms localize in the lungs and pleura,
- Oropharyngeal disease: typified by a painful cough and sore throat, accompanied by watery diarrhea, and
- Oculoglandular disease: the conjunctiva are the site of invasion; disease is usually unilateral, with painful purulent conjunctivitis and regional lymphadenopathy.

Reservoir: Numerous wild animals, including rabbits, hares, voles, muskrats, beavers, and various hard ticks. A rodent-mosquito cycle of subspecies *holarctica* has been identified in the former Soviet Union.

Mode of Transmission: Transmission can occur by tick or insect vector, including the wood tick, *Dermacentor andersoni*, and the dog tick, *D. variabilis*, among others. Transmission also can occur through inoculation of oropharyngeal or conjunctival tissue with contaminated water, blood, or tissue during the skinning of animals or by inhalation of bacteria in dust during the handling of infected animal carcasses. Ingestion, including eating undercooked contaminated meat and drinking contaminated water, has also been connected with cases. Bites from animals like skunks, squirrels, cats, or dogs that may have eaten another infected animal are rarely

implicated as sources. Laboratory-acquired infections usually result in pleuropneumonic or typhoidal disease.

Incubation Period: Related to the virulence of the infecting strain and to the size of the inoculum; the range is 1-14 days, usually 3-5 days.

Laboratory Criteria for Diagnosis:

Presumptive

- Elevated serum antibody titer(s) to *F. tularensis* antigen (without documented fourfold or greater change) in a patient with no history of tularemia vaccination, or
- Detection of *F. tularensis* in a clinical specimen by fluorescent antibody.

Confirmatory

- Isolation of *F. tularensis* in a clinical specimen, or
- Fourfold or greater change in serum antibody titer to *F. tularensis* antigen.

Diagnostic Testing: (INFORM LABORATORY OF SUSPICION OF *F. tularensis* BEFORE SUBMITTING SPECIMEN)

A. Culture

1. Specimen Needed: Pure culture.
2. Outfit: Culture referral outfit, order #0505.
3. Form: 3410.
4. Lab Test Performed: Isolation of *F. tularensis*.
5. Lab Performing Test: Bacteriology Laboratory, Georgia Public Health Laboratory (GPHL) in Decatur.

Case Classification:

- ***Probable:*** a clinically compatible case with laboratory results indicative of presumptive infection.
- ***Confirmed:*** a clinically compatible case with confirmatory laboratory results.

Period of Communicability: Not directly transmitted person-to-person. Unless treated, the infectious agent can be found in the blood for two weeks and in lesions for a month, sometimes longer. Flies can be infective for two weeks and ticks throughout their lifetime (about two years). Rabbit meat frozen at 15°C (5°F) can remain infective for three years.

Vaccination: There is no commercially available vaccine to prevent tularemia.

Treatment: Streptomycin is the treatment of choice; gentamicin is an acceptable alternative. These should be given for 7-14 days. Tetracycline is bacteriostatic and effective if given for no less than 14 days; relapses are reported to occur more often than with streptomycin. Aspiration or incision and drainage of an infected lymph node must be covered with an antibiotic because of the risk of disseminated infection from the procedure.

Post-exposure Prophylaxis: Tetracycline for two weeks is effective as prophylaxis when given after exposure.

Investigation: Investigation of multiple cases is important, with attention focused on the potential source of the infection. The source could be arthropods, animals, soil, crops, or water. *F. tularensis* is a potential agent of bioterrorism as well. Any cluster of cases should be reported **immediately** to the local health department, District Health Office, or Epidemiology Section, which will notify the FBI.

Reporting: Report **all** cases **IMMEDIATELY** to the local health department, District Health Office, or the Epidemiology Section at 404-657-2588. If calling after regular business hours, it is very important to report cases to the Epidemiology Section answering service (770-578-4104). After a verbal report has been made, please transmit the case information electronically through the State Electronic Notifiable Disease Surveillance System (SENDSS) at <http://sendss.state.ga.us>, or complete and mail a GA Notifiable Disease Report Form (#3095).

Reported Cases of Tularemia in Georgia, 1993-2008

| Year | Number of Cases |
|-------------|------------------------|
| 1993 | 0 |
| 1994 | 1 |
| 1995 | 0 |
| 1996 | 0 |
| 1997 | 0 |
| 1998 | 0 |
| 1999 | 1 |
| 2000 | 1 |
| 2001 | 1 |
| 2002 | 0 |
| 2003 | 0 |
| 2004 | 0 |
| 2005 | 0 |
| 2006 | 0 |
| 2007 | 0 |
| 2008 | 0 |

References:

1. Centers for Disease Control and Prevention. Case Definitions for Infectious Conditions under Public Health Surveillance. *MMWR* 1997; 46(RR10): 1-55.
2. Chin J, Ed. Tularemia. In: Control of Communicable Diseases Manual. 17th Ed. Washington, DC: American Public Health Association, 2000: 532-535.
3. Cross J, and Penn R. *Francisella tularensis* (Tularemia). In: Mandell: Principles and Practice of Infectious Diseases, 5th Ed. Churchill-Livingston: 2000: 2393-2401.
4. U.S. Army Medical Research Institute of Infectious Diseases. Tularemia. In: Medical Management of Biological Casualties. 3rd Ed. Fort Detrick, Frederick, Maryland, July 1998: 46-51.

Links:

CDC tularemia website - <http://www.cdc.gov/Tularemia/>