

TULAREMIA

(Rabbit Fever, Deer Fly Fever)

REPORTING INFORMATION

- **Class A: Report immediately via telephone** the case or suspected case and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report immediately via telephone to the local public health department in which the reporting health care provider or laboratory is located. Local public health departments should report immediately via telephone the case or suspected case and/or a positive laboratory result to the Ohio Department of Health (ODH). Cases should also be entered into the Ohio Disease Reporting System (ODRS) within 24 hours of the initial telephone report to ODH.
- Reporting Form(s) and/or Mechanism:
 - *Immediate telephone reporting* is required.
 - For the local health department, Ohio Disease Reporting System (ODRS) after the telephone report.
 - The Centers for Disease Control and Prevention (CDC) [Tularemia Case Investigation Report \(CDC 56.50, rev. 1/06\)](#) is required. Information collected from the form should be entered into ODRS **and** sent to ODH. The mailing address for this form is: ODH, Outbreak Response and Bioterrorism Investigation Team (ORBIT), 246 N. High St., Columbus, OH 43215. Fax number is 614-564-2456.
- Additional reporting information, with specifics regarding the key fields for ODRS Reporting can be located in [Section 7](#).

AGENT

Francisella tularensis, a small, gram-negative coccobacillus.

Infectious Dose:

By whatever route, fewer than 10-50 bacilli. Case fatality rate is 1% - 15%, depending on the strain of the bacillus.

CASE DEFINITION

Clinical Description

An illness characterized by several distinct clinical forms, including:

- Ulceroglandular: cutaneous ulcer with regional lymphadenopathy
- Glandular: regional lymphadenopathy with no ulcer
- Oculoglandular: conjunctivitis with preauricular lymphadenopathy
- Oropharyngeal: stomatitis or pharyngitis or tonsillitis and cervical lymphadenopathy
- Intestinal: intestinal pain, vomiting and diarrhea
- Pneumonic: primary pleuropulmonary disease
- Typhoidal: febrile illness without early localizing signs and symptoms

Clinical diagnosis is supported by evidence or history of a tick or deerfly bite, exposure to tissues of a mammalian host, primarily rabbits, of *Francisella tularensis* or exposure to potentially contaminated water.

Laboratory Criteria for Diagnosis

Presumptive

- Elevated serum antibody titer(s) to *F. tularensis* antigen (without documented four-fold or greater change) in a patient with no history of tularemia vaccination or

- Detection of *F. tularensis* in a clinical specimen by fluorescent assay

Confirmatory

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

Case classification

Probable: A clinically compatible case with laboratory results indicative of presumptive infection.

Confirmed: A clinically compatible case with confirmatory laboratory results.

SIGNS AND SYMPTOMS

The onset of tularemia is usually abrupt, with fever (38°C–40°C), headache, chills and rigors, lymphadenopathy, generalized body aches (often prominent in the lower back), coryza, and sore throat. A pulse-temperature dissociation has been noted in as many as 42% of patients. A dry or slightly productive cough and substernal pain or tightness frequently occur with or without objective signs of pneumonia, such as purulent sputum, dyspnea, tachypnea, pleuritic pain, or hemoptysis. Nausea, vomiting, and diarrhea may occur. Sweats, fever, chills, progressive weakness, malaise, anorexia, and weight loss characterize the continuing illness.

DIAGNOSIS

Laboratory Isolation

The organism can be isolated from lesions or blood in the first two weeks of illness. Isolation can be performed by the ODH Laboratory (ODHL) or the Centers for Disease Control and Prevention (CDC). Proper protocol for CDC testing is to send the sample(s) via ODHL. Call ODHL, 1-888-ODH-LABS (888-634-5227) select option #2- Microbiology, for shipment of serum or other specimens to CDC. A convalescent serum should be obtained two weeks later. The micro-agglutination test for antibodies is generally available in hospital laboratories.

EPIDEMIOLOGY

Source

Wild animals such as rabbits, hares, muskrats, and beaver. *F. tularensis* may also be found in some domestic animals and can be carried by several common species of ticks.

Occurrence

The disease is found throughout North America and parts of Europe, Russia and Japan. Most Ohio cases have winter onset (November - January) and are associated with hunting.

Mode of Transmission

Tularemia is transmitted by inoculation of skin, conjunctival sac or oropharyngeal mucosa as a result of handling infected animals. It can also be transmitted by bite of a variety of arthropods. Case histories in Ohio have included cleaning wild animals (especially rabbits), tick bites, and ingestion of improperly cooked meat. Most Ohio cases have been associated with handling rabbits (95%) or muskrats (5%).

F. tularensis could be used as a biological weapon in a number of ways, but an aerosol release would likely have the greatest adverse consequences. Release in a densely

populated area would be expected to result in an abrupt onset of large numbers of acute, nonspecific febrile illness beginning 3–5 days later (incubation range 1–14 days), with pleuropneumonitis developing in a significant proportion of cases during the ensuing days and weeks.

Incubation Period

Incubation period is 1-14 days, usually about 3 days, and is related to the virulence of the infecting strain and the size of the inoculum.

PUBLIC HEALTH MANAGEMENT

Case

Investigation

Routine investigation to determine the source of infection

Treatment

Treatment consists of antibiotics (gentamicin, streptomycin, tetracycline, chloramphenicol, or ciprofloxacin). Clinical relapses are frequent in patients treated with tetracycline and chloramphenicol.

Isolation and Follow-up Specimens

No isolation is required as there is no person-to-person transmission. Use standard precautions in hospitalized patients with cutaneous or pulmonary infection. Follow-up specimens are not indicated.

Public Health Significance

Typically low due to sporadic occurrence of cases. If bioterrorism is suspected, post-exposure prophylaxis may be recommended for persons who may have been exposed to the bacteria. Please note that there is an existing standing medical order issued by the Director of the Ohio Department of Health for Ohio local health departments in an emergency situation to dispense prophylactic antibiotics to persons with known or suspected exposure to *Francisella tularensis*. For further details, see <http://www.odh.ohio.gov/pdf/idcm/btstandorders.pdf>.

Contacts

No prophylaxis is indicated. Person-to-person transmission is unlikely. If an attack is discovered only after individuals become ill, persons potentially exposed should begin a fever watch. Those who develop an otherwise unexplained fever or flu-like illness within 14 days of presumed exposure should begin treatment as listed above.

Prevention and Control

Source Investigation

Not indicated unless a large number of cases have been identified. Water sources may be involved in an outbreak.

Hunters and Food Handlers

Small game hunters and trappers should wear rubber gloves when skinning or dressing game. Avoid handling a rabbit that is sluggish or appears ill. Wild game should be thoroughly cooked. Rabbit season in Ohio is generally from early November until late January.

Vaccination

A vaccine for tularemia was used in the past to protect laboratory workers, but it is not currently available.

SPECIAL INFORMATION

Because of buboes and/or severe pneumonia, tularemia may be confused with bubonic plague and other infectious diseases, including streptococcal and staphylococcal infections, cat-scratch fever and sporotrichosis.

Because this agent may be acquired by a waterborne route, it has potential for use in acts of biologic terrorism.

Care should be exercised with this agent in the laboratory. Laboratory acquired infections have been reported. Researchers working with live bacilli may apply for an experimental, live-attenuated vaccine from the U.S. Army Medical Research and Material Command, Fort Detrick, Maryland.

REFERENCE

CDC Tularemia information: <http://www.bt.cdc.gov/agent/tularemia>

What is tularemia?

Tularemia, also known as "rabbit fever," is a disease caused by the bacterium *Francisella tularensis*. Tularemia is typically found in wild animals, especially rodents, rabbits, and hares. Humans and domestic animals such as cats and sheep can also acquire it.

About 200 human cases of tularemia are reported each year in the United States. Most cases occur in the south-central and western states. Ohio averages less than one case per year.

How is tularemia spread?

Typically, people become infected through the bite of infected insects (most commonly, ticks and deerflies), by handling infected sick or dead animals, by eating or drinking contaminated food or water, or by inhaling airborne bacteria. Since very few bacteria are needed to cause an infection and they are able to survive in the environment for weeks, tularemia is viewed as a potential bioweapon. Tularemia cannot be spread from one person to another.

Who is at risk for getting tularemia?

Hunters, trappers, hikers, campers and others who spend a great deal of time outdoors and are exposed to tick and deer fly bites or handle wild animals are at risk.

How long after exposure before symptoms appear?

Symptoms may appear 2-10 days after exposure, but are generally evident after 3 days.

What are the symptoms of tularemia?

Tularemia is usually recognized by the presence of skin lesions and swollen glands. Ingestion of the organism may produce a sore throat, intestinal pain, diarrhea and vomiting. Inhalation of the organism may produce a fever alone or in combination with a pneumonia-like illness. Tularemia can be fatal if the person is not treated with appropriate antibiotics.

How is tularemia diagnosed?

Samples of blood or saliva can be tested in a laboratory. Preliminary results are available in a few hours, but confirmation may take a few days.

How is tularemia treated?

Antibiotic treatment is recommended whenever it is likely a person was exposed or has been diagnosed with tularemia. Several antibiotics are effective including gentamycin and tetracyclines.

Is there a vaccine available for tularemia?

A vaccine was used in the past to protect laboratory workers, but it is no longer available.

What can be done to prevent tularemia?

- Rubber gloves should be worn when skinning or handling animals, especially rabbits.
- Wild rabbit and rodent meat should be cooked thoroughly before eating.
- Avoid bites of flies and ticks and avoid bathing, swimming, or working in untreated water where infection might prevail among wild animals.

For more information visit these websites:

CDC tularemia facts <http://www.bt.cdc.gov/agent/tularemia/facts.asp>

CDC tularemia FAQ <http://www.bt.cdc.gov/agent/tularemia/faq.asp>