Virginia Department of Health
Tularemia: Overview for Healthcare Providers

Organism	*Francisella tularensis*: gram-negative bacteria that are small, highly infectious, aerobic, nonspore-forming coccobacilli. Multiple strains have been recognized.
Reporting to Public Health	Suspected or confirmed cases require immediate notification to the local health department (LHD). See https://www.vdh.virginia.gov/health-department-locator/
Infectious Dose	Very low: 10 bacteria when injected subcutaneously and 25 when aerosolized
Occurrence	• Occurs throughout North America and in many parts of continental Europe, Russia, China, and Japan • ~230 cases in the United States and 2 cases in Virginia are reported annually • Tularemia is more common during May-September • Males are affected more frequently than females; children are affected more than adults
Natural Reservoir	• Small mammals (including rabbits, hares, muskrats, beavers, prairie dogs, voles, and other rodents) and various hard ticks • Numerous other wild and domestic animals (including cats and dogs) can be affected
Route of Infection	• Inhalation of dust with infective aerosols (from contaminated soil, grain, or hay), or inhalation of organisms from animal carcasses • Bite of infected arthropods (wood, dog, and lone star ticks; less commonly in deer flies and, in other countries, mosquitoes) • Ingestion of contaminated meat, water, soil, or vegetation • Contact with contaminated water, soil, vegetation, or infected animals
Communicability	• Person-to-person transmission is extremely rare (documented only twice) • *F. tularensis* can be found in blood during first 2 weeks of disease and in lesions for a month or more • Flies are infective for 14 days and ticks are infective throughout their lifetime (approximately 2 years)
Risk Factors	• Hunting, trapping, butchering, farming, or landscaping • Handling infectious laboratory specimens
Case-fatality Rate	Range <2%–24%, depending upon the strain
Incubation Period	Related to the size of the inoculum; average is 3–5 days (range 1–14 days)
Clinical Description	• There are multiple clinical forms that depend on the transmission route. All forms are accompanied by fever, which can be as high as 104°F. • Ulceroglandular: most common syndrome; cutaneous ulcer with regional lymphadenopathy; occurs through contact with an infected animal carcass or through an arthropod bite • Glandular: common syndrome; regional lymphadenopathy with no ulcer; occurs through contact with an infected animal carcass or through an arthropod bite • Oculoglandular: uncommon syndrome; conjunctivitis with preauricular lymphadenopathy, palpebral ulcers, submandibular and cervical lymphadenopathy, photophobia, excess lacrimation; occurs with direct contamination of eye • Oropharyngeal: uncommon syndrome; severe throat pain, stomatitis, exudative pharyngitis, tonsillitis, cervical and preparotid lymphadenopathy; occurs through ingestion of contaminated food or water or inhalation of contaminated droplets

	• Intestinal: abdominal pain, vomiting and diarrhea; occurs rarely, through ingestion of contaminated food or water • Typhoidal: uncommon syndrome; febrile illness without early localizing signs and symptoms; used to describe illness in patients with systemic infections without cutaneous or mucosal membrane lesions • Pneumonic: most serious syndrome, typical after intentional aerosol release of organism; primary pleuropulmonary disease; occurs through inhalation of infectious aerosols or secondary to spread in the blood; cough (dry or productive), pleuritic chest pain, substernal tightness
Differential Diagnosis	Depends upon the clinical manifestations and transmission route
Radiography	• Radiographic findings include patchy subsegmental air space opacities, hilar lymphadenopathy, and pleural effusion • Earliest finding might be peribronchial infiltrates advancing to bronchopneumonia
Specimen Collection and Laboratory Testing	• A diagnosis is often established serologically by demonstrating a fourfold or greater change in serum antibody titer between acute and convalescent specimens using tube or microagglutination • Culture can also yield a definitive diagnosis. Appropriate specimens include swabs or scraping of skin lesions, lymph node aspirates or biopsies, pharyngeal washings, sputum specimens, or gastric aspirates, depending on the form of illness. Blood cultures should be collected, although yield might be low. • A presumptive diagnosis can also be made by direct fluorescent antibody, immunohistochemical staining, sequence-based technologies, or polymerase chain reaction (PCR). • Because of laboratory safety concerns, if tularemia is suspected, notify the LHD immediately to discuss the case and laboratory testing. Specimens may be sent to the Division of Consolidated Laboratory Services (DCLS) after VDH has approved testing. For questions about specimen collection, the DCLS Emergency Officer can be reached 24/7 at 804-335-4617.
Treatment	• Treatment usually lasts 10–21 days, depending on the medication used • Gentamicin, ciprofloxacin, or doxycycline are treatment options • During a mass casualty situation (i.e., when intramuscular or intravenous treatment is not available), oral doxycycline or ciprofloxacin are the preferred choices • Additional information on choice of drugs, dosing and duration of treatment is available on CDC's Tularemia Information for Clinicians webpage: https://www.cdc.gov/tularemia/clinicians/ and in the American Academy of Pediatrics Red Book: 2021–2024 Report of the Committee on Infectious Diseases
Postexposure Prophylaxis	• Doxycycline or ciprofloxacin are the preferred choices for postexposure prophylaxis during a mass casualty situation • Additional information on choice of drugs, dosing and duration of prophylaxis is available at CDC's Tularemia Information for Clinicians webpage: https://www.cdc.gov/tularemia/clinicians/
Vaccine	No vaccine available
Infection Control	• Standard Precautions should be used when caring for patients • Laboratory personnel should be alerted when tularemia is suspected • Bodies of patients who die of tularemia should be handled using Standard Precautions; autopsy procedures that produce aerosols or droplets should be avoided