

## Virginia Department of Health

### Tularemia: Overview for Healthcare Providers

<b>Organism</b>	<i>Francisella tularensis</i> : gram-negative bacteria, small, nonmotile, aerobic, nonspore-forming coccobacillus; comes in 3 subspecies
<b>Reporting to Public Health</b>	Suspected or confirmed cases require immediate notification to the local health department (LHD). See <a href="http://www.vdh.virginia.gov/LHD/index.htm">www.vdh.virginia.gov/LHD/index.htm</a> .
<b>Infectious Dose</b>	Very low: 10 bacteria when injected subcutaneously and 25 when aerosolized
<b>Occurrence</b>	Occurs throughout North America and in many parts of continental Europe, Russia, China and Japan. In North America, most cases occur from May– August. Approximately 200 cases reported annually in US and ~ 2 annually in Virginia.
<b>Natural Reservoir</b>	Small mammals (including voles, rodents, squirrels, rabbits, hares, muskrats, beavers), domestic animals (cats, dogs, hamsters), exotic animals (prairie dogs, monkeys), and various hard ticks.
<b>Route of Infection</b>	<ul style="list-style-type: none"> <li>• Inhalation of dust with infective aerosols (from contaminated soil, grain or hay), or inhalation of organisms from animal carcasses</li> <li>• Bite of infected arthropods (wood, dog and lone star ticks; less commonly in deer flies; and, in other countries, mosquitoes)</li> <li>• Ingestion of contaminated meat, water, soil or vegetation</li> <li>• Contact with contaminated water, soil, vegetation or infectious animal tissues or fluids</li> <li>• Handling sick pet animals or exotic animals</li> </ul>
<b>Communicability</b>	<ul style="list-style-type: none"> <li>• No person-to-person transmission</li> <li>• <i>F. tularensis</i> may be found in blood during first 2 weeks of disease and in lesions for a month; flies infective for 14 days and ticks throughout lifetime (2 years)</li> </ul>
<b>Risk factors</b>	Risk is higher if hunting, trapping, butchering, farming, landscaping, or handling infectious laboratory specimens
<b>Case-fatality Rate</b>	Usually <2%, but ranges up to 24% depending upon the strain
<b>Incubation Period</b>	Related to the size of the inoculum; 3 to 5 days (range 1 to 14 days)
<b>Clinical Description</b>	<ul style="list-style-type: none"> <li>• Ulceroglandular: most common syndrome; cutaneous ulcer with regional lymphadenopathy; occurs through contact with an infected animal carcass or through an arthropod bite</li> <li>• Glandular: common syndrome; regional lymphadenopathy with no ulcer; occurs through contact with an infected animal carcass or through an arthropod bite</li> <li>• Oculoglandular: uncommon syndrome; conjunctivitis with preauricular lymphadenopathy; occurs with direct contamination of eye</li> <li>• Oropharyngeal: uncommon syndrome; stomatitis, pharyngitis, tonsillitis, cervical lymphadenopathy; occurs through ingestion of contaminated food or water or inhalation of contaminated droplets</li> <li>• Intestinal: intestinal pain, vomiting and diarrhea; occurs rarely, through ingestion of contaminated food or water</li> </ul>

	<ul style="list-style-type: none"> <li>• 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</li> <li>• Pneumonic: most serious syndrome, typical after intentional aerosol release of organism; primary pleuropulmonary disease; occurs through inhalation of infectious aerosols or secondary to hematogenous spread</li> </ul>
<b>Differential Diagnosis</b>	Depends upon the clinical manifestations and route of infection
<b>Radiography</b>	<ul style="list-style-type: none"> <li>• Radiographic findings include patchy subsegmental air space opacities, hilar lymphadenopathy, and pleural effusion.</li> <li>• Earliest findings may be peribronchial infiltrates advancing to bronchopneumonia.</li> </ul>
<b>Specimen Collection and Laboratory Testing</b>	<ul style="list-style-type: none"> <li>• Appropriate specimens include swabs or scrapping of skin lesions, lymph node aspirates or biopsies, pharyngeal washings, sputum specimens, or gastric aspirates, depending on the form of illness. Paradoxically, blood cultures are often negative.</li> <li>• A presumptive diagnosis may be made through testing of specimens using direct fluorescent antibody, immunohistochemical staining, or PCR.</li> <li>• A diagnosis can also be established serologically by demonstrating a 4-fold change in specific antibody titers between acute and convalescent sera. Convalescent sera are best drawn at least 4 weeks after illness onset; hence this method is not useful for clinical management.</li> <li>• † If tularemia is suspected, notify LHD immediately to discuss the case and laboratory testing. Specimens should be sent to Division of Consolidated Laboratory Services (DCLS) <u>after</u> LHD has been consulted and testing has been approved by LHD/DCLS. The DCLS Emergency Duty Officer can be reached 24/7 at (804) 335-4617.</li> </ul>
<b>Treatment</b>	Information on choice of drugs, dosing and duration of treatment is available at: <a href="http://www.nejm.org/doi/pdf/10.1056/NEJMra1409755">http://www.nejm.org/doi/pdf/10.1056/NEJMra1409755</a> and <a href="http://www.bt.cdc.gov/Agent/Tularemia/TularemiaConsensus.pdf">http://www.bt.cdc.gov/Agent/Tularemia/TularemiaConsensus.pdf</a>
<b>Postexposure Prophylaxis</b>	Information on choice of drugs, dosing and duration of PEP is available at: <a href="http://www.bt.cdc.gov/Agent/Tularemia/TularemiaConsensus.pdf">http://www.bt.cdc.gov/Agent/Tularemia/TularemiaConsensus.pdf</a>
<b>Vaccine</b>	No vaccine available
<b>Infection Control</b>	<ul style="list-style-type: none"> <li>• Standard precautions;</li> <li>• Contact precautions also indicated for patients with open lesions</li> </ul>