Outline

- Review tularemia basics
- Discuss clinical signs in animals and people
- Review epidemiology of tularemia in Minnesota animals and people
- Consider veterinarians and public health role in tularemia
- Tularemia success stories
Tularemia: *Francisella tularensis*

- Intracellular, Gram negative, coccobacillus
- Two defined subspecies
  - Type A, *F. tularensis tularensis*
  - Type B, *F. tularensis holarctica*
- Infects >200 species of mammals, including humans
Tularemia Background

- Transmission:
  - Inhalation
  - Ingestion
  - Direct contact with infected animals
  - Arthropod vectors
Figure 15. Humans can acquire tularemia by many routes and from numerous sources. (Mouse and tick photographs courtesy of the Center for Disease Control, microscope photograph by James Runningen, other photographs by Milton Friend.)
Tularemia: *Francisella tularensis*

- Persistent in the environment and highly resistant to freezing

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*Figure 11. Rodents and tularemia in North America: general pathways for infection.*

*Illustration by John M. Evans*

Clinical Signs in Humans

- Clinical signs are dependent on route of exposure
- Six defined clinical forms, all including fever
  - Ulceroglandular
  - Glandular
  - Oculoglandular
  - Oropharyngeal
  - Pneumonic
  - Typhoidal
- Other non-specific signs include chills, joint pains and headache
Clinical Signs in Animals

Domestic and Wild Animals

- Infected animals exhibit non-specific signs including
  - Profound fever
  - Lethargy
  - Poor appetite
  - Weight loss
  - Oral ulcers
  - Lymphadenopathy
Tularemia in Minnesota

- Reportable in humans and animals
- MDH conducts blended surveillance for humans and animals
- Rare in Minnesota
  - 21 cases in animals from 2004-2015
    - Median = 1 case/year (range 0-5)
  - 12 cases in humans from 1994-2015
    - 0-3 cases/year
    - 1 case acquired from his cat with confirmed tularemia
Tularemia Cases by Minnesota County* of Residence, 1994-2015 (n=32)

*Placement of symbol in county does not represent exact geographical location of the case
Tularemia in Minnesota, 2015 – 2016

2015: 4 animal cases
- 3 cats
  - 1 from Ramsey County
  - 1 from Dakota County
  - 1 from Hennepin County (survived!)
- 1 rabbit
  - From Ramsey County (same neighborhood as cat)

2016 (to-date): 12 animal cases
- 11 cats
- 1 rabbit from Hennepin County
Tularemia in Minnesota, 2016

- 11 animal cases in 2016
  - 1 rabbit
    - Hennepin County
  - 11 cats
    - 6 Hennepin County
    - 2 Washington County
    - 1 Ramsey County
    - 1 Swift County
    - 1 Dakota County
Tularemia in Minnesota, 2016

- 3 human cases in 2016
  - Sherburne County
    - Fish hook puncture in South Dakota
  - Hennepin County
    - Tick bite in Twin Cities Metro
  - St. Louis County
    - Bug bite in Itasca Co.
Tularemia Cases by Minnesota County of Residence, 2016 (n=15)

Species No.

- Cat 11
- Rabbit 1
- Human 3

Francisella tularensis Subtype

- *tularensis* (type A)
- *holarctica* (type B)
- Not available

*exposed in Anoka County
**exposed in South Dakota
***exposed in Itasca County
Veterinarian’s Role

- Detection and appropriate treatment
  - Outdoor cat
  - High fever – consider tularemia
  - Oral ulcers

- Use of personal protective equipment can protect you and your staff
  - Gloves
  - N95 respirator for necropsy or aerosol-generating procedures

- Report confirmed and suspect cases immediately
**Hospitalization / Treatment Form**

**Gown, gloves, protective Eyeware**

**Fever**

**Condition:** Tularemia Suspect 8-13-16

**Doctor:** Mikel

**Technician:** Courtney

**Alerts:** poss. Zoonotic

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<table>
<thead>
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<th>Weight: 7.1 kg</th>
<th>Temp: 100.8°F</th>
<th>Pulse: 180</th>
<th>Resp: 52</th>
<th>MM/CRT: 12</th>
<th>Catheter IN/OUT: 22 gage</th>
<th>Fluids: 2412 mL/hr LRS+ KCl</th>
</tr>
</thead>
</table>

**TREATMENTS**

- Cervena 200mg 1.5 mL IV slowly
- Morphine 0.55 mL 0.5mg
- Hydrocortisone 60 mg PO bid 70
- NG tube placement

**Free Choice H2O:** +1+1+1+1+1+1 spill

**Diet:** Y

**Urine:** 1/4 on towel

**Feces:**

- Exercise:
- Call w/ Update:

**Charges Invoiced:**

**Charges Updated Before Discharge:**

**Day:** Saturday
Treatment

- The recommended early treatment for animals includes antibiotic therapy with fluoroquinolones, tetracycline, doxycycline or gentamicin.
- This bacteria is UNRESPONSIVE to beta-lactam antibiotics.

- Treatment for humans also includes aminoglycosides, ciprofloxacin, or tetracyclines for 10-21 days.
MDH/Public Health Role

- Surveillance
  - Identify risk factors and increased-risk areas
    - Site visit, collect environmental data
- Assess exposure risk
  - Veterinary staff
  - Pet owners
  - Gross pathology and microbiology laboratory staff
- Monitor exposed people
- Facilitate prophylaxis, testing, and treatment for those who need it
### Tularemia Site Investigation Form

### Minnesota Department of Health

**CASE ID:**

**CASE/ANIMAL OWNER NAME:**

**ANIMAL CASE ID:**

**ANIMAL NAME:**

<table>
<thead>
<tr>
<th>Illness Onset Date:</th>
<th>Site Investigation Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Site Investigation Time:</td>
</tr>
</tbody>
</table>

| Biovar: □ Type A  
□ Type B  
□ Unknown |
|-----------|

| Form: □ Pneumonic  
□ Oropharyngeal  
□ Glandular  
□ Ulceroglandular  
□ Oculoglandular  
□ Typhoidal |
|-----------|

**Possible Exposure Sources (check all that apply):**

- □ Ticks/Wooded Habitat
- □ Other vectors (biting flies)
- □ Contact with sick or dead animals
- □ Hunting
- □ Lawn mowing or landscaping
- □ Contact or ingestion of uncooked meat
- □ Contact or ingestion of soil / untreated water
- □ Unknown
- □ Other: ____________________________

**Other Pertinent History:**

**SITE CHARACTERISTICS**

| Neighborhood: □ Urban  
□ Suburban  
□ Small Town  
□ Rural (wooded)  
□ Rural (farmland)  
□ Other: ____________________________ |

| Dominant Land Use of Property: □ Lawn  
□ Grassland  
□ Woods  
□ Waterfront  
□ Cropland  
□ Pasture  
□ Other: ____________________________ |

| Age of Property/Development: □ < 1 year  
□ 1-5 years  
□ 5-10 years  
□ 10-20 years  
□ > 20 years |

| Property Size: □ < ½ acre  
□ ½ - 2 acres  
□ 2-20 acres  
□ > 20 acres |

| Property Enclosed with fence? □ Yes  
□ No  
□ Partial (Describe): ____________________________  
□ if yes, what type of fence? ____________________________ |

| Nearby Body of Water: □ None  
□ Wetland  
□ Pond  
□ Lake  
□ River  
□ Stream |

** Nearby Wooded Area: □ Yes  
□ No |

| if yes, how far away? □ < 100 ft  
□ 100-300 ft  
□ 300 ft-1 mile  
□ > 1 mile |

| if yes, what size? □ < ½ acre  
□ ½ - 2 acres  
□ 2-20 acres  
□ > 20 acres |

| if yes, what type? □ Deciduous  
□ Coniferous  
□ Mixed |

**MDH Investigators:** ____________________________

**Current Weather Conditions:**

| Temperature (°F): | Precipitation: □ none  
□ light  
□ medium  
□ heavy |

| Clouds: □ < 50%  
□ 50-99% |

| Wind: □ none  
□ light  
□ medium  
□ strong |

| Preceding (4 wks prior) Weather: ____________________________ |

**Dead Animals Present: □ Yes  
□ No |

| if yes, describe (number, species, lesions, location): ____________________________ |

**Wildlife or Signs of Wildlife Present: □ Yes  
□ No |

| if yes, describe (number, species, tracks/feces/plant damage, location): ____________________________ |

**Birdfeeders/Wildlife Attractants or Repellents Present: □ Yes  
□ No |

| if yes, describe (number, type, location): ____________________________ |

**Vectors Present: □ Yes  
□ No |

| if yes, describe (number, species, location): ____________________________ |

**SPECIMEN COLLECTION**

**Vectors:**

**Dead Animals:**

**Live Animals:**

**Water:**

**Other:**

**SITE MAP**

**SUSPECTED SOURCE OF EXPOSURE**

*Most Likely Source: ____________________________

*Other Possible Sources: ____________________________
Success Stories
Sir Rupert Kensington IV
Questions?
Thank you!

Acknowledgements

- Tularemia Team at MDH
- MDH Public Health Lab
- Veterinary Diagnostic Lab, Necropsy and Bacteriology
- UMN Veterinary Medical Center
- Board of Animal Health
- Reporting veterinarians and physicians!