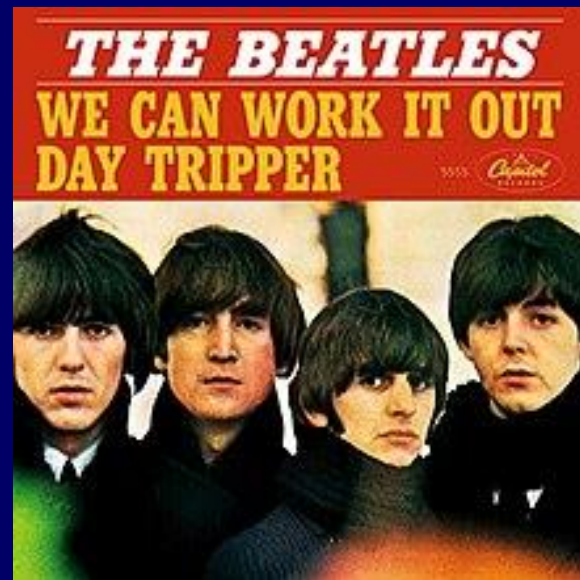
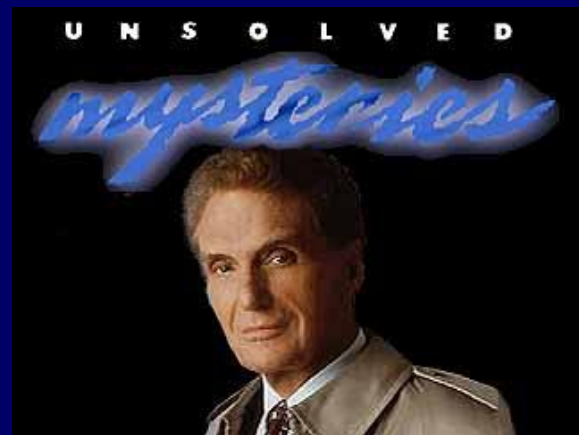


We Can Work it Out

53-year-old Male with Cellulitis, Headache, and Fever



WHAT IS IT?



Erik Munson
Marquette University
Milwaukee, Wisconsin

PRIMARY CARE PROVIDER VISIT

- Rural Kentucky resident
- Two-day history of severe headache and fever (T_{\max} 104°F)
- Symptoms developed five days following removal of numerous ticks from lower extremities
 - One was embedded (not fully removed)
 - Erythema on left ankle expanded over time to cellulitis and abscess

SIX DAYS LATER

- Patient continued to receive PO doxycycline
- Erythema extended to thigh; patient admitted

- Working diagnosis:
cellulitis and sepsis

Vancomycin
Clindamycin
PO doxycycline



You Make the Call I



LABORATORY STUDIES

- C-reactive protein 64.7 mg/L (<5 mg/L)
- Negative serology

Borrelia burgdorferi

Ehrlichia chaffeensis

Francisella tularensis

Rickettsia rickettsii

- Blood (R and N), urine cultures no growth

WOUND CULTURE (left ankle)

- Direct Gram stain

No leukocytes seen
No organisms seen

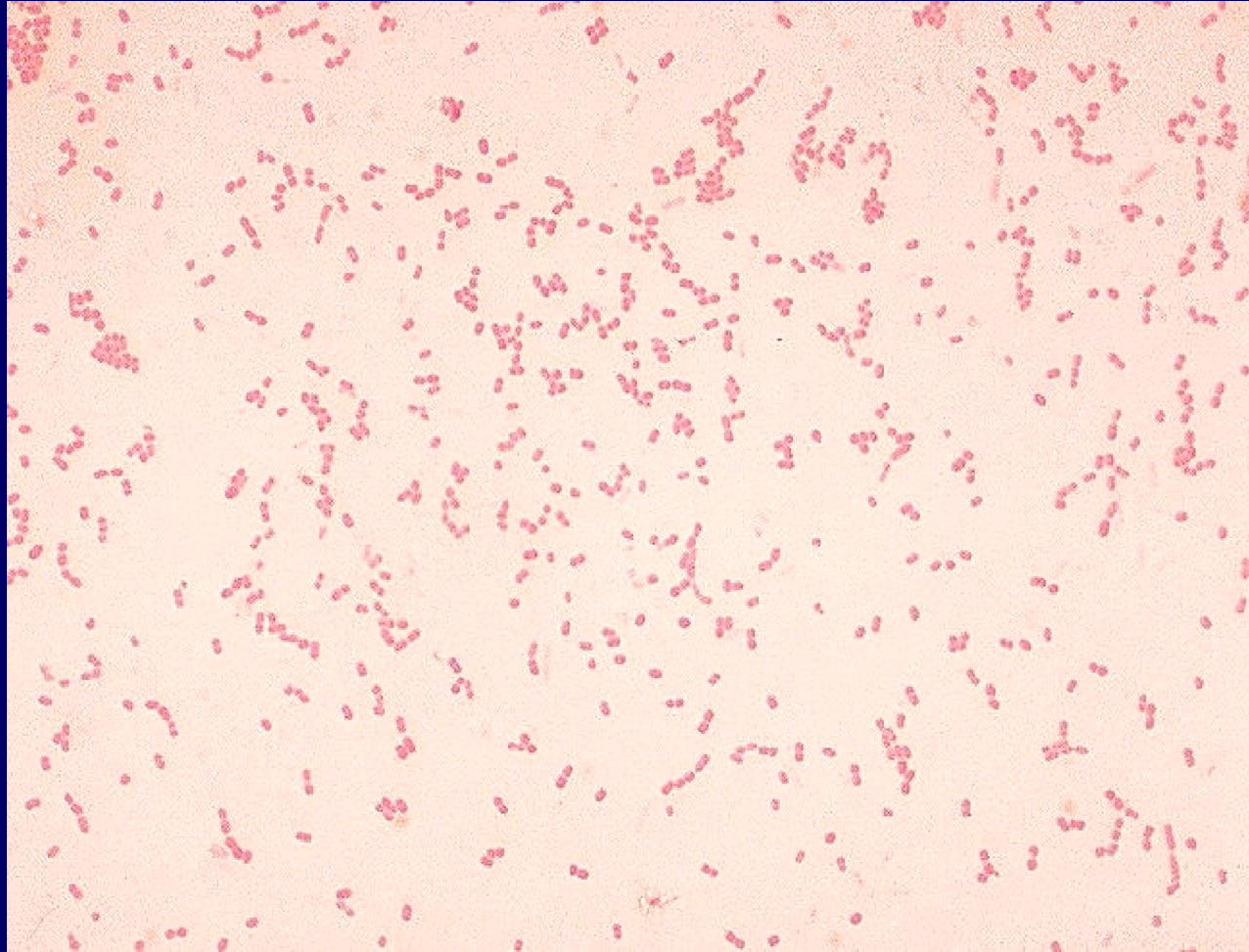
- Plates first observed at 32 hours incubation



Growth on chocolate (gray, moist colonies)
No growth on blood or MacConkey

- Overnight subculture of CA colonies (in order to set up identification panel) revealed no growth

GRAM STAIN OF CHOCOLATE AGAR

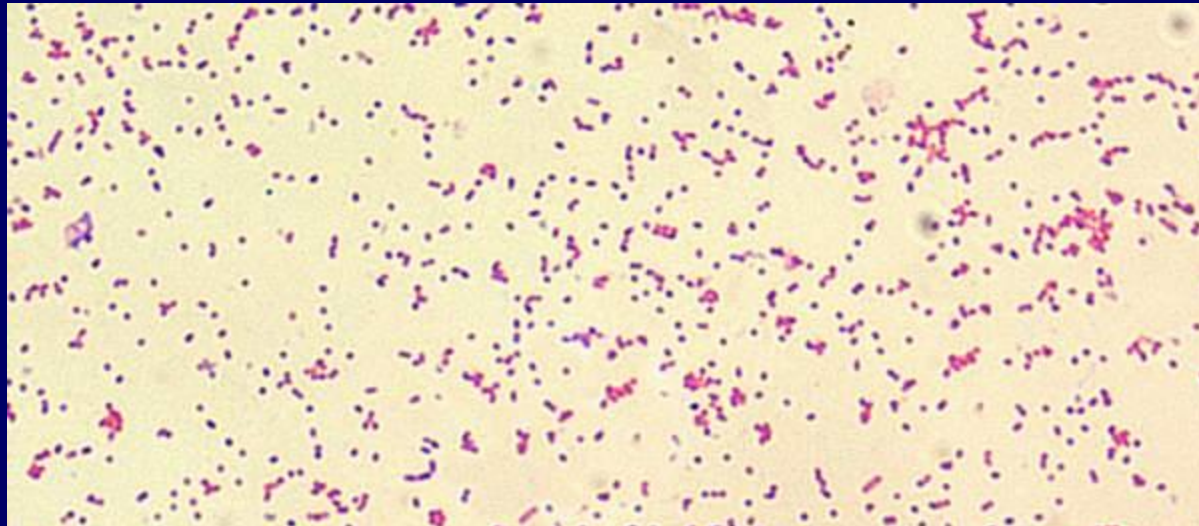


You Make the Call II



GRAM-NEGATIVE COCCOBACILLI

Genus	Oxidase	Growth rate	Blood agar	MacConkey	Urease	Catalase
<i>Haemophilus</i>	pos	1d	NG	NG	some	pos
<i>Brucella</i>	pos	2d	growth	NG	+++++	pos
<i>Francisella</i>	neg	2d	growth*	NG	neg	weak
<i>Acinetobacter</i>	neg	1d	growth	growth	some	pos
<i>Kingella</i>	pos	1d	growth	NG	neg	neg



SAFE “BENCH-LEVEL” RAPID TESTS

Catalase
Oxidase
 β -lactamase
Urease

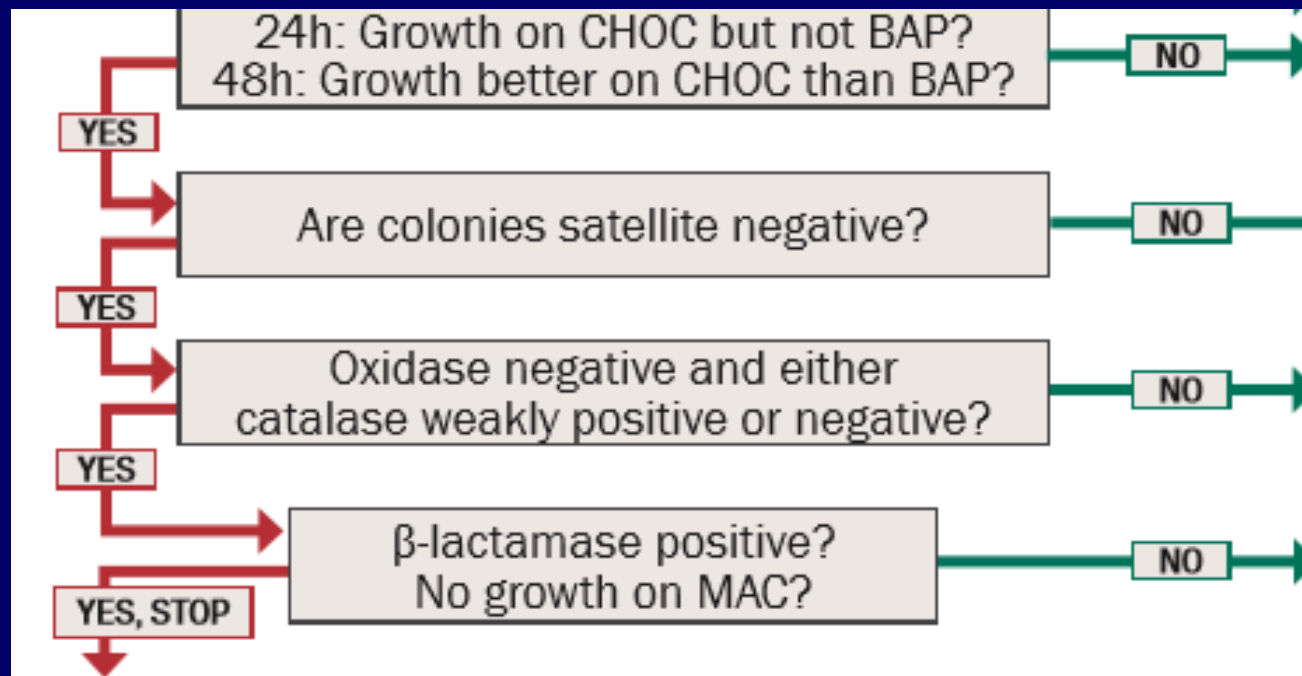
Recognize. Rule-Out. Refer.

**Biothreat Agent Bench Cards
for the Sentinel Laboratory**



SAFE “BENCH-LEVEL” RAPID TESTS

Catalase
Oxidase
 β -lactamase
Urease



LRN REFERENCE LABORATORY

Francisella tularensis not ruled-out. Do not attempt further identification and contact your LRN Reference Level Laboratory to refer the isolate. **Suggested Reporting Language:** Possible *F. tularensis* submitted to LRN Reference Level Laboratory for confirmatory testing.

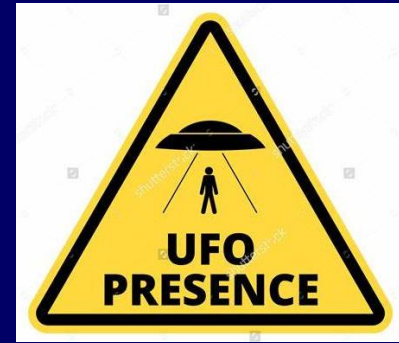
LRN REFERENCE LABORATORY

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***Francisella tularensis* by PCR**

IMPORTANCE OF REFERRAL



- Prophylactic doxycycline or ciprofloxacin for exposed laboratory workers (watch out for plate opening)
- May identify as *H. influenzae*, *Oligella* spp., *Psychrobacter* spp., *A. actinomycetemcomitans* via automated identification systems [or be missed all together]

REMINDER

Bacillus anthracis

Brucella spp.

Burkholderia mallei

Burkholderia pseudomallei

Francisella tularensis

Yersinia pestis

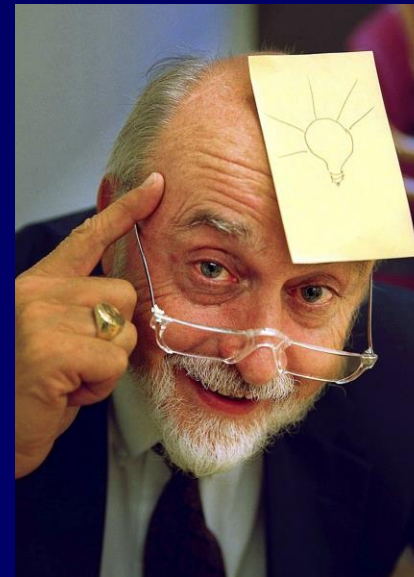
DON'T TRY

Clostridium botulinum

Coxiella burnettii

Smallpox

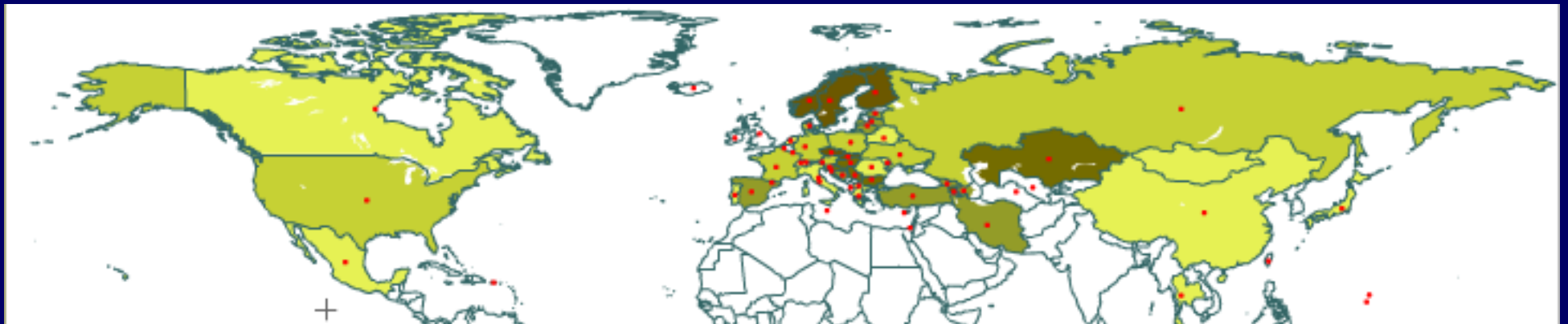
Viral hemorrhagic fever



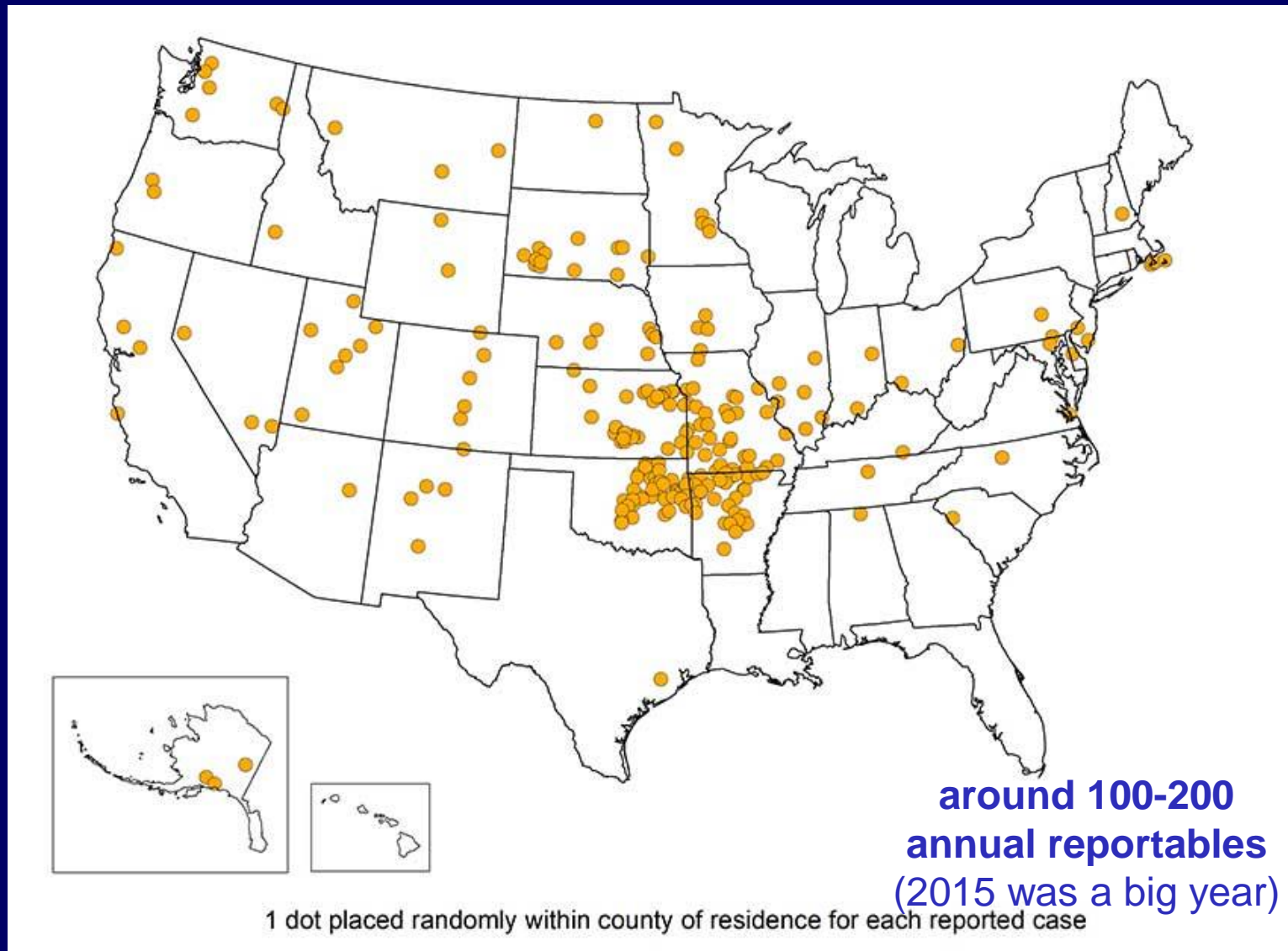
TULAREMIA EPIDEMIOLOGY

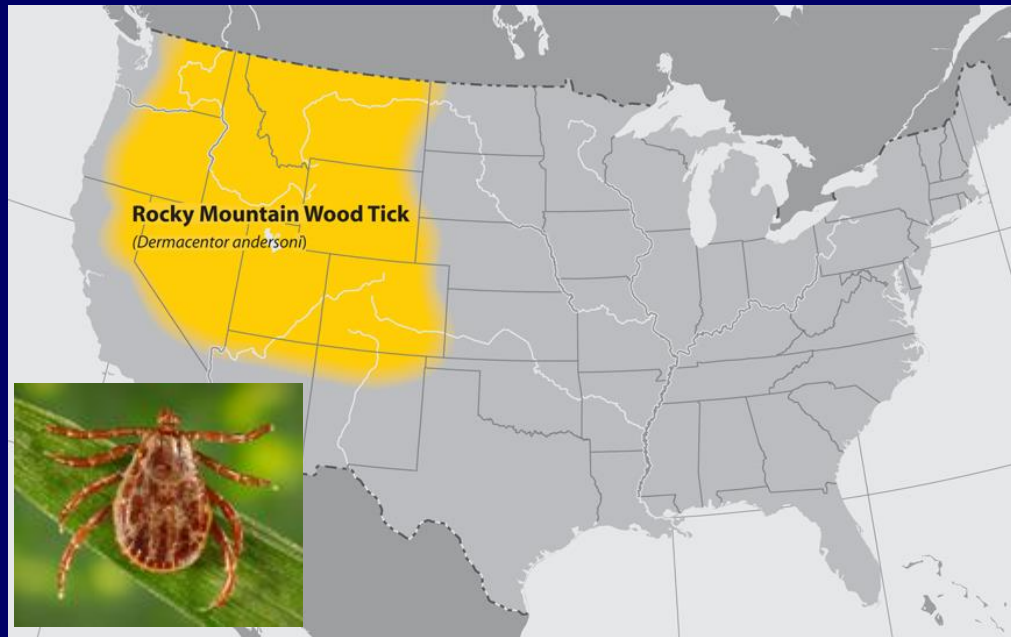
- Disease onset 3-5 days
- All presentations accompanied by fever
- Acquisition

Handling infected animals (rabbits, muskrats, *etc.*)
Tick or deer fly bites
Landscaping or farming activities



TULAREMIA DISTRIBUTION--2017





TULAREMIA CLINICAL

- Ulceroglandular

Most common form (45-80%)

Following tick bite or handling animal

Regional lymphadenopathy (axilla, inguinal)



- Glandular

No ulcerated site of infection

Following tick bite or handling animal



- Oropharyngeal/intestinal

Eating/drinking contaminated food/water

Mouth ulcers, pharyngitis, tonsillitis

Cervical lymphadenopathy



TULAREMIA CLINICAL

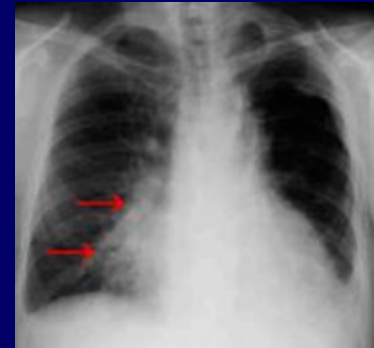
- Oculoglandular

- Touching eyes while butchering
 - Ocular irritation, inflammation
 - Lymphadenopathy near ear



- Pneumonic

- Most severe form
 - Cough, chest pain, dyspnea
 - Inhalation (carcasses) or seeding of lungs



- Typhoid

- Any combination of general symptoms
 - Localized signs are absent; most difficult to recognize

Photo Quiz

(For answer and discussion, see page 2387 in this issue [doi:10.1128/JCM.r00075-11])

Cellulitis, Headache, and Fever following Tick Bites



FIG. 1. Gram stain of colonies from chocolate agar plate.

A 53-year-old male resident of rural Kentucky presented to his primary care physician with a 2-day history of severe headache and fever to 104°F. Symptoms had developed 5 days

in the laboratory late in the evening, culture plates were not examined until after 32 h of incubation. At that time, small, gray, moist colonies were present on the chocolate agar plate,