



Dirt Car Racing Fever

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IDAC Fascinating Cases
Winter Symposium
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No Disclosures

HPI

- 46-year-old man referred to ID clinic
- 14 months of joint pain (knees, ankles, hands, wrists, elbows, shoulders) with recurrent fever every 6 to 8 weeks.
- Associated with:
 - Fatigue and brain fog
 - Nausea and vomiting
 - Weight loss 35 lbs. due to low appetite

Medical History

- Celiac disease per patient (negative TTG IgA IgG)
- Old cocci
- S/P Cholecystectomy
- Allergies
 - Gluten
 - Ibuprofen
- Medications
 - None

Social History

- Tobacco: Denies
- ETOH: 4 vodka shots per week
- Drugs: denies
- Exposed to bird droppings
- Insects: denies
- Jail: denies
- Homelessness: denies
- Occupation
 - Construction
 - Breeds livestock in Texas
- Hobbies:
 - Dirt Car Racing
 - Baseball coach
- Travel:
 - Dirt car racing >20 US states
 - Missouri prior to initial symptom onset
- Sick Contacts:
 - 2 other farmworkers on a Texas farm had similar symptoms

Tmax: 39.1C, HR 120

- General: Appears comfortable but tired and in no acute distress **until he moves and has pain from stiffness.**
- Neck: **Stiff/pain on extension but not flexion.**
- Abdominal: **soft but is tender to moderate palpation over entire mid-abdomen and epigastric regions with milder tenderness generalized throughout the rest of his abdomen,** no peritoneal signs
- Skin: **Extremely dry skin worse over particular areas such as the dorsal aspect of both hands.**
- Neuro:
 - **Patient sat up at the edge of the bed but required assistance when attempting to stand as he is said he felt exhausted and also pain with movement so he requested to rest and be moved.**

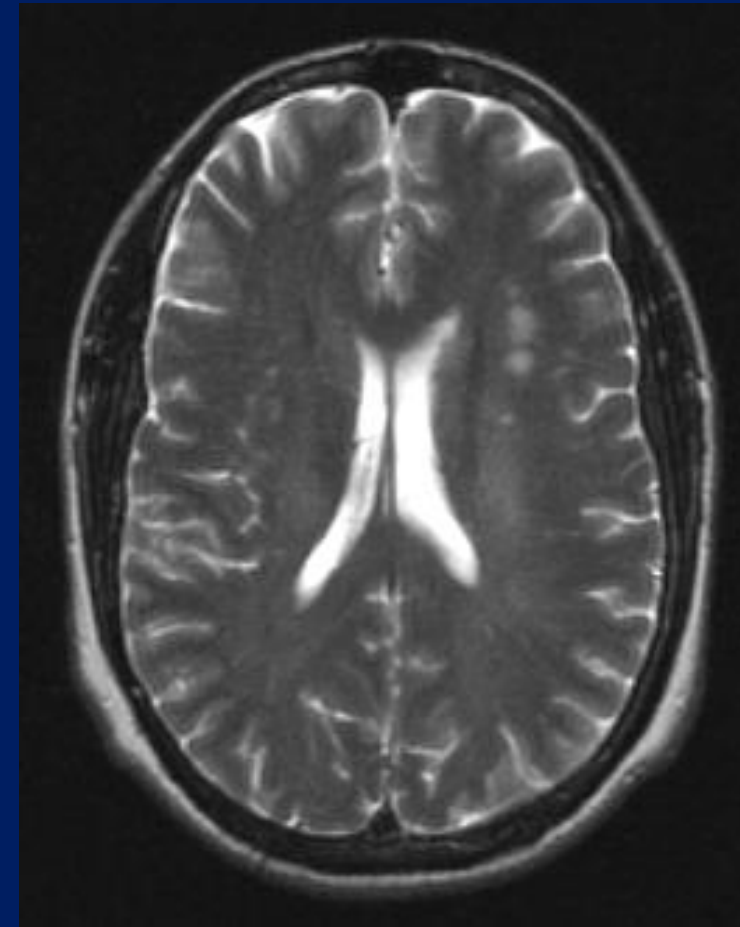
Previous Work up

- CBC: 5.1/**13.1**/**36.8**/225
 - ANC 3800, ALC 800, AEC 0, AMC 500
- BMP: 135/3.8/101/26/14/0.98/100
- LFT: 1.3/0.4/**58**/**90**/110/ /7.7/3.5
- ESR **79**, CRP **14.3**, Lactic 1.3

- LP: OP 21.5 cmH2O, WBC 1, RBC 1, Glu 50, Protein 50

Neuroimaging

- CT head w/o contrast negative for bleed
- CT head neck angiography:
 - Congenital absence versus hypoplasia of the left posterior communicating artery
 - 1.4 cm left thyroid gland nodule
- MRI brain w/wo contrast:
 - Mild chronic microvascular disease



Imaging

- CT abd/pelvis with contrast
 - Increased fluid in small bowel loops suggestive of enteritis
 - Bilateral nephrolithiasis without hydronephrosis
 - Hepatosplenomegaly with liver steatosis
 - RLL noncalcified nodule
- US liver
 - No intrahepatic or extrahepatic biliary ductal dilation s/p Cholecystectomy
- TTE negative



Labs

- RF <10
- CCP IgG <16
- SCL-70 <1
- Sjogren's SS-A SS-B negative
- SM/SM-RNP negative
- B2 glycoprotein IgA IgG IgM <2
- Cardiolipin IgA IgG IgM <2
- C3 160
- C4 14
- dsDNA ab <1
- Lupus anticoagulant
 - **PTT-LA 46 (positive)**
 - DRVVT 45 (negative)
- Lyme IgG <0.90
- T3 total 138

Labs

- Ethanol <3
- Ammonia 47
- LDH 332
- Procalcitonin 0.55
- TSH 0.458
- A1c 4.8%
- B12 640
- Folate RBC 439
- Stool culture negative
- Stool O&P negative
- Blood culture negative
- CSF culture negative
- Acute hepatitis panel negative
- ANA negative
- Calprotectin <5
- Lactoferrin stool negative
- C3 224
- C4 36
- CH50 >60
- dsDNA Crithidia negative
- Gliadin IgG negative
- IgA 310
- IgG 1033
- IgM 109
- TTG IgA <1
- TTG IgG 2
- RPR negative
- TB IGRA negative
- **Cocci** IgM NR **IgG VWR** CF <1:2

Summary so far

- 46-year-old man with old cocci
- Recurrent fever 101-103F every 6 to 8 weeks
- Fatigue unrelieved by sleep or rest
- Joint pain and stiffness
 - Bilateral ankles, knees, elbows, shoulders
 - Worse with rest and in the morning
- Blurry vision and dizziness associated with position
- Mild transaminitis
- Inflammatory markers CRP ESR elevated
- Autoimmune and Lyme negative
- ETOH+, bird droppings, construction, Texas livestock breeder, dirt car racer, exposed to dust from >20 states

Pause

FUO with arthralgia's in a USA traveller

- **Histoplasmosis**
- ***Francisella tularensis***
- ***Chikungunya***
- ***Brucella***
- ***Ehrlichia chaffeensis***
- **Rickettsial: RMSF, Typhus**
- ***Anaplasma phagocytophilum***
- ***Blastomyces***
- ***Babesia microti***
- ***Bartonella* (*B. henselae*, *B. quintana*)**
- **Q Fever (*Coxiella burnetii*)**
- **Colorado Tick Fever**
- **Lyme**

ID Work up

- Histoplasmosis Ag negative
- *Francisella tularensis* Antibody Negative
- *Chikungunya* Antibodies negative
- Brucella Antibodies negative
- *Ehrlichia chaffeensis* negative
- Rickettsial Disease Panel
 - RMSF negative
 - Typhus Fever negative
- *Anaplasma phagocytophilum* Antibodies negative
- *Blastomyces* Antigen negative
- *Babesia microti* Antibodies negative
- Bartonella Species Antibodies negative
- Colorado Tick Fever Antibody negative
- Lyme Disease Ab negative
- Q Fever (*Coxiella burnetii*) Antibodies (IgG, IgM), with Reflex to Titers
 - **IgM phase I positive CF 1:256**
 - **IgG phase I positive CF 1:256**
 - **IgM phase II positive CF 1:512**
 - **IgG phase II positive CF 1:1024**

Q Fever – “Query”

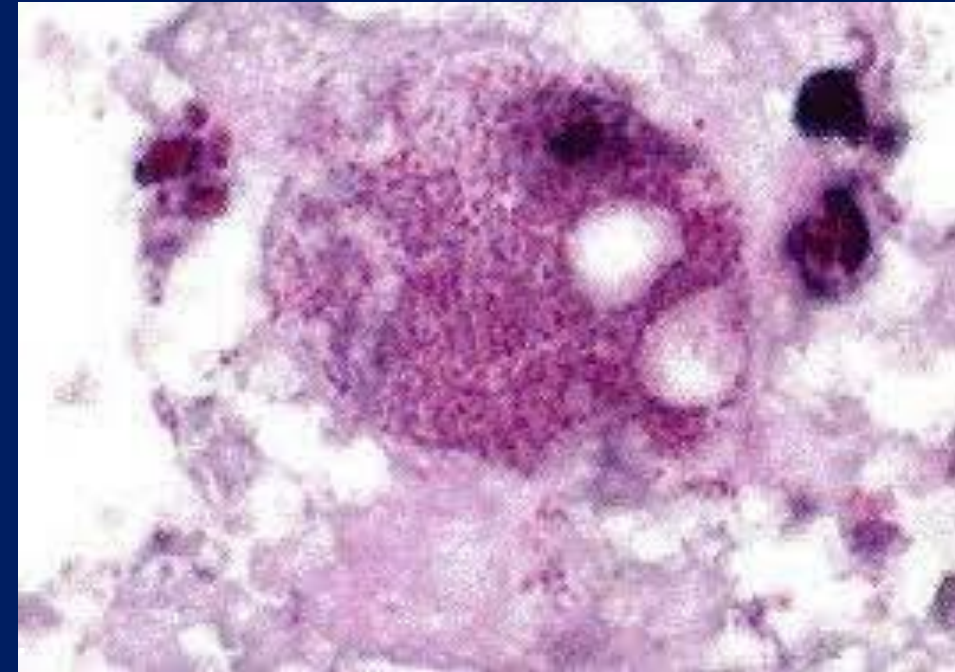
- 1935 Queensland, Australia
 - Febrile illness 20/800 workers in Brisbane meatworks
 - “Query” fever – Q fever – unknown disease
 - Burnet and Freeman isolated *Rickettsia burnetii* from blood and urine
- *Rickettsia diaporica* found in ticks in Nine Mile Creek, Montana
- Found to be same organism: *Coxiella burnetti*

Q Fever – “Query”

- Self-limited febrile illness
- Pneumonia
- Endocarditis
- Hepatitis
 - Less common meningitis, encephalitis, osteomyelitis
- Acute and chronic (persistent) focalised forms

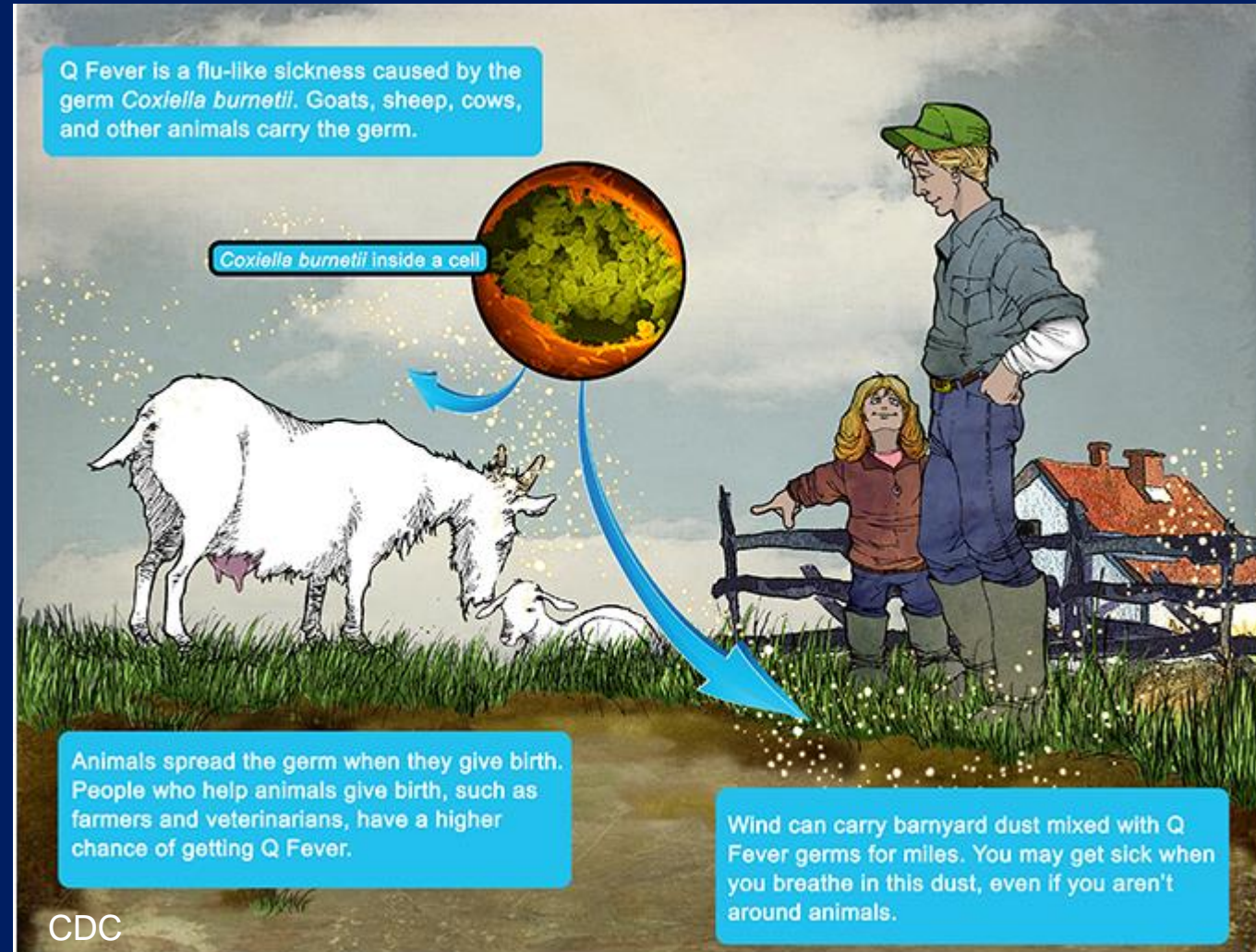
Coxiella burnetii

- Pleomorphic gram negative (does not stain with Gram stain) coccobacillus
- Intracellular
- Spore stage
- Phase variation
 - Acute infection: phase II ab
 - Persistent infection (endocarditis): IgG phase I ab



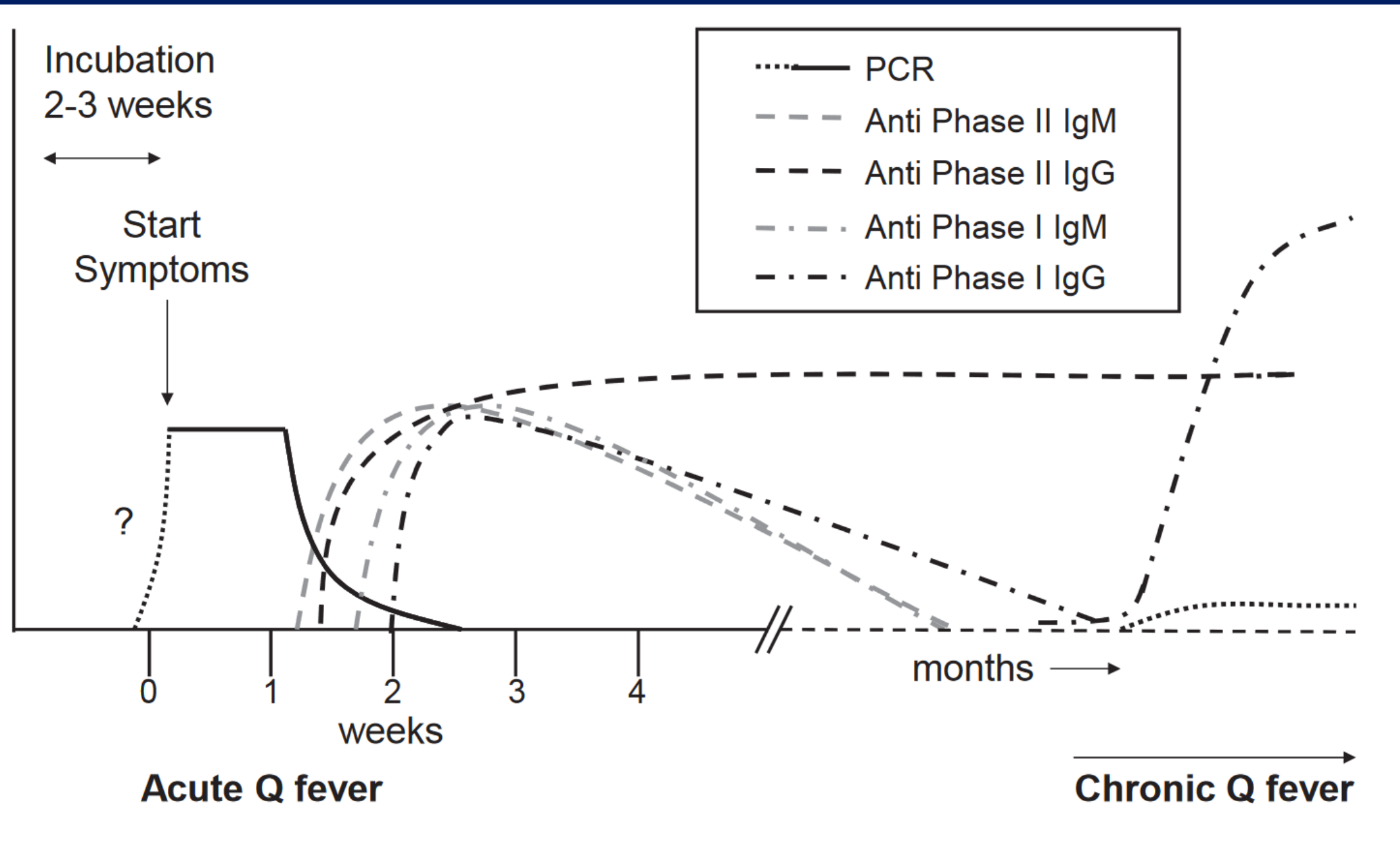
Epidemiology

- Zoonosis
 - Inhalation
 - Ingesting unpasteurized milk
- Reservoirs
 - Cattle, sheep, goats
 - Infected parturient cats
 - Extensive wildlife reservoirs (ticks)
 - Parturition infects environment
- Windborne spread (10 km)
- Worldwide except New Zealand, Polynesia, Antarctica, Arctic



Diagnosis

- Indirect immunofluorescent serology
- Acute disease
 - Fourfold rise in IgM titer
- Persistent disease
 - Lesion: endocarditis, osteomyelitis, vascular infection
 - IgG Phase I titer at least 1:800, PCR blood, or biopsy
 - Usually IgG phase I > phase II, but not always
 - FISH stain can ID organisms in tissue



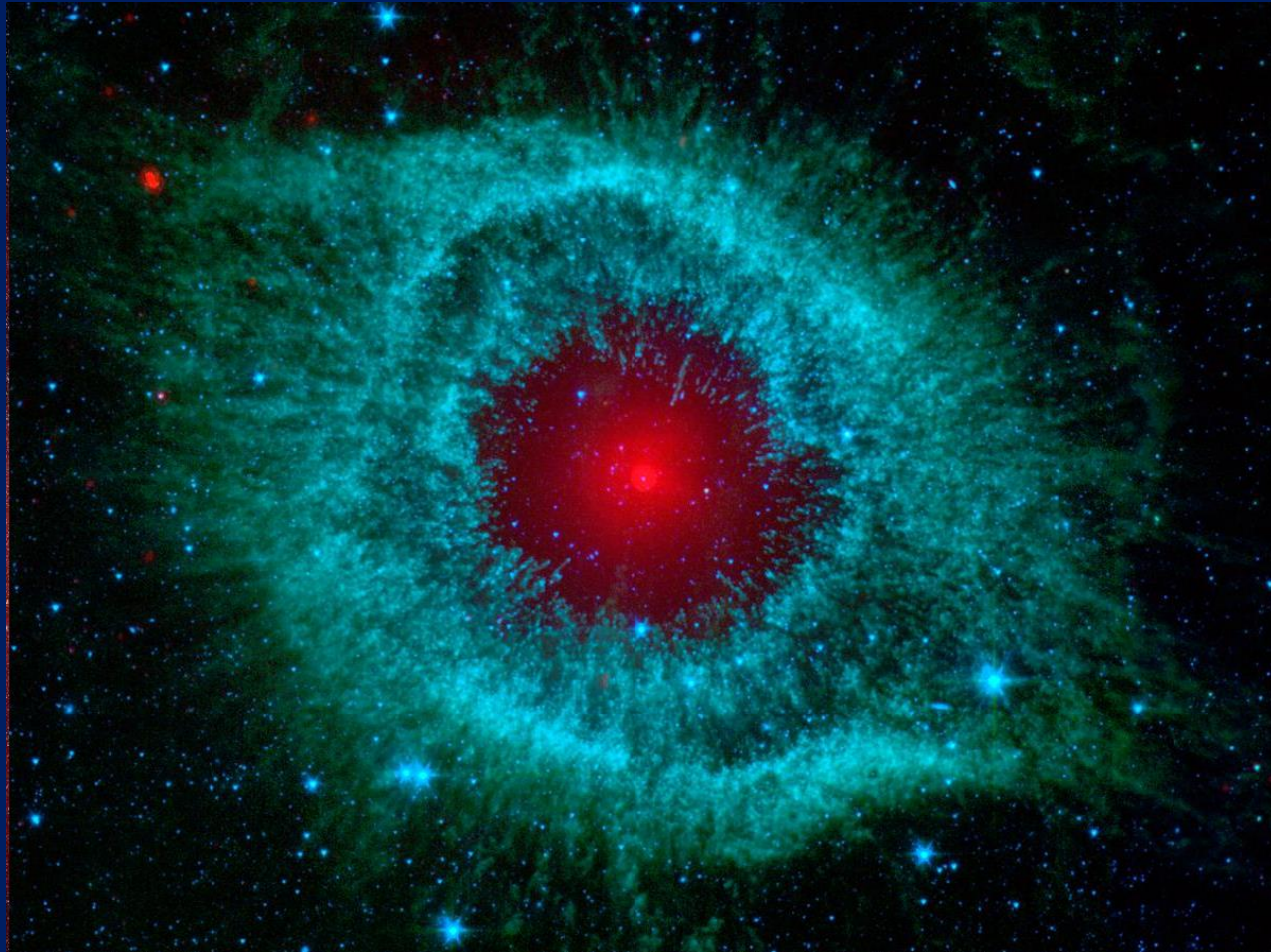
Therapy

- Acute Q fever
 - Doxycycline 100mg BID for 14 days
- Q fever endocarditis
 - Native valve: Doxycycline plus hydroxychloroquine for 1.5 years
 - Chloroquine alkalinizes the phagolysosome, enhancing doxy's bactericidal effect
 - Hydroxychloroquine contraindicated in G6PD deficiency, retinal or visual field defects
 - Prosthetic valve: 2 years
 - Ophthalmology baseline and every 6 months
 - ESR, Anemia, hyperglobulinemia
 - Valve replacement if necessary
 - Serologies every 3 months (decrease four fold at 2 years)

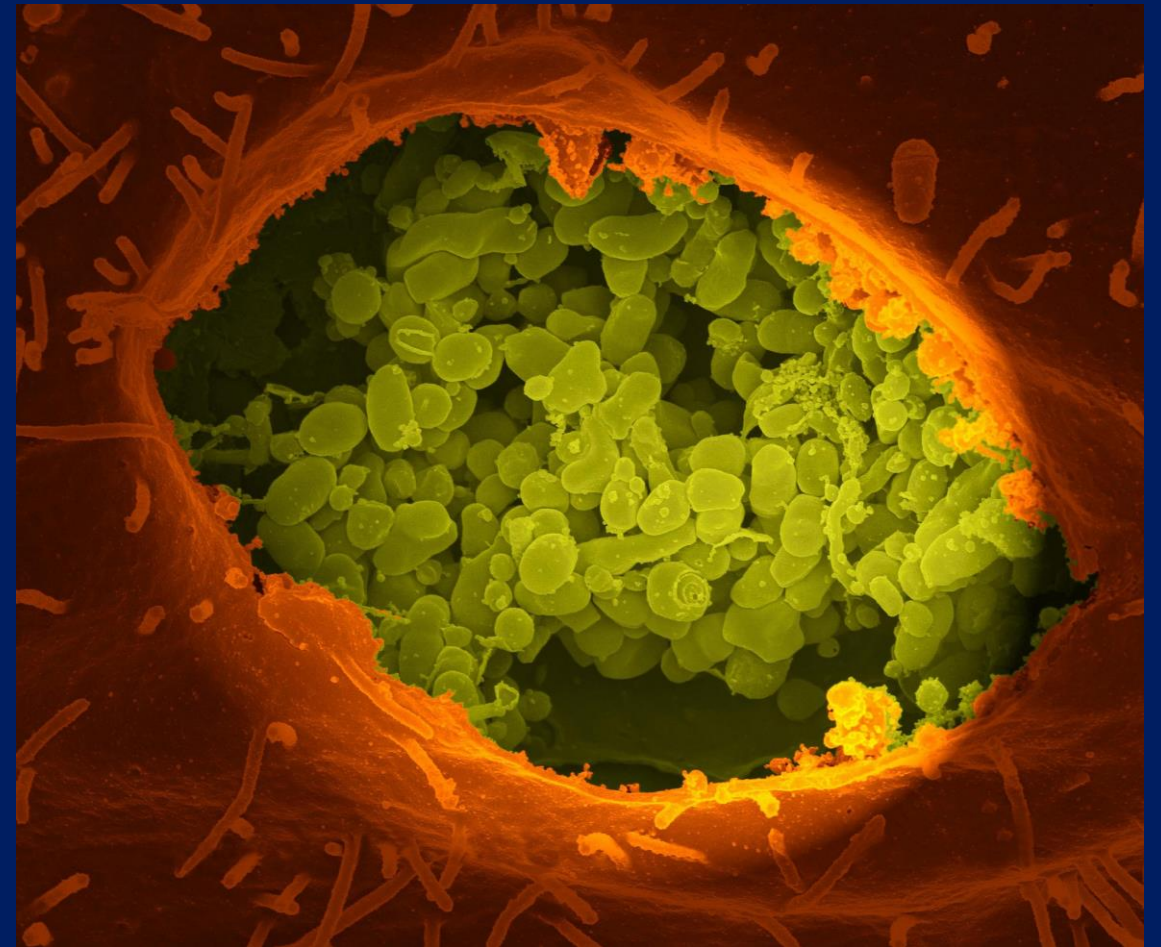
Back to the case

- Persistent Q fever
 - TEE negative
 - PET-CT pending
- Completed 14 days of doxycycline 100mg BID





Helix Nebula from Spitzer (NASA)



Coxiella burnetii inside a vacuole of vera cell (NIH)