

# The Impact of Tick Borne Disease on Domestic Pets

And How to Prevent It



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# Affected Animals

- Discussion limited to domestic dogs and cats
- Horses
- Others?



# Tick Borne Diseases

## Northeast

Lyme

Anaplasma

Ehrlichia

RMSF

Tick paralysis

## South

Babesia

Cytauxzoonosis

Tularemia

Feline Infectious

Anemia

(Hembartonellosis)

## Europe

Mediterranean  
Spotted Fever

Tick Borne  
Encephalitis

# Why?

TBDs are a result of complex interplay of factors

- Increase pet ownership
- Increased # of pets inside/access to human sleeping areas
- Increase pet travel
  - Transports/rescues
  - Movement of ticks to new geographic areas
- Increased travel to countries with endemic vector borne disease



# Why?

- Changes in urban planning
  - Increase tick friendly green spaces to urban areas
- Wildlife protection efforts
  - Increases # of alternate hosts for ticks (ie foxes)
- Climate Change
  - Allows disease to travel North to now warmer climates



# How Do I Know My Pet Has TBD?

- Challenging
- Vague/Intermittent symptoms



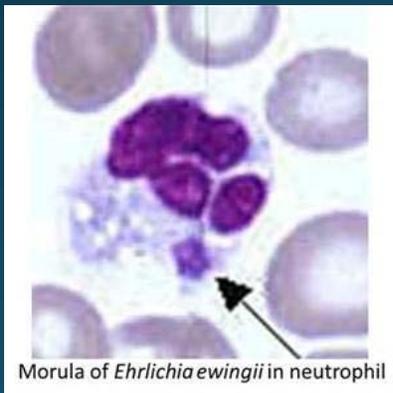
# Clinical Signs

- Lethargy
- Fever
- Lameness
- Malaise
- Pale mm
- Lymphadenopathy
- Chorioretinitis, retinal detachment, uveitis
- Neurologic
- Petechia/ecchymotic hemorrhages secondary to thrombocytopenia
- Vomiting
- ~~Bulls-eye rash~~
  - RMSF – only some get spotty rash

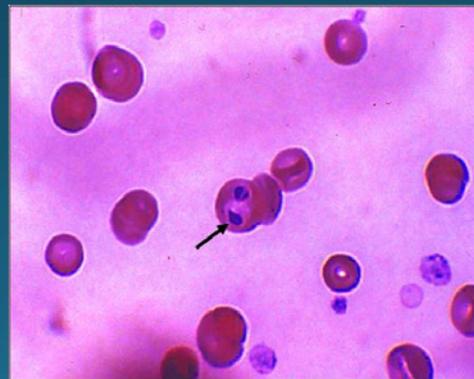
WIDE RANGE OF SYMPTOMS

# Diagnostics

- 4DX-Idexx Laboratories
- Vet Scan Lyme and Ehrlichia Rapid Test – Abaxis
- Send out RMSF – Indirect Fluorescent Antibody Titer (IFA)
- Babesiosis, Ehrlichia, Anaplasma – blood smear



Morula of *Ehrlichia ewingii* in neutrophil



*Babesia canis* (arrow) within a red blood cell



# What does a Positive TBD Test Mean?

- Exposure vs actual infection
  - Lyme Quant C6
- Yearly screening - Controversial
  - Most positives don't recall ever seeing a tick
- Indicator of need for better tick prevention



# Positive Test – Now What?

- No definitive study showing treatment of non-clinical, Lyme positive dogs prevents future disease
- However:
  - Treatment decreases circulating C6 antibodies
  - Decreases circulating immune complexes
- Increase in cases of AV Heartblock in dogs with previous Lyme history(asymptomatic) but never treated



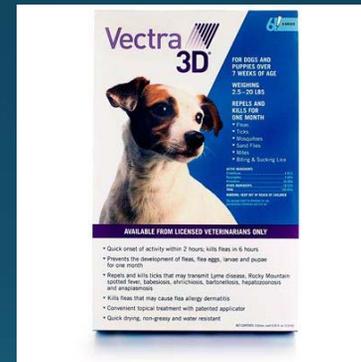
# Treatment

- Appropriate Abs
  - Doxycycline/Minocycline
  - Amoxicillin
  - Others
- Pain management for polyarthritis
- Lyme nephritis
- Blood transfusions
  - Severe anemias



# Prevention

- Most effective
  - Remember transmission can occur in 3-5 hrs
- Topical spot ons
- New oral meds
- New collars



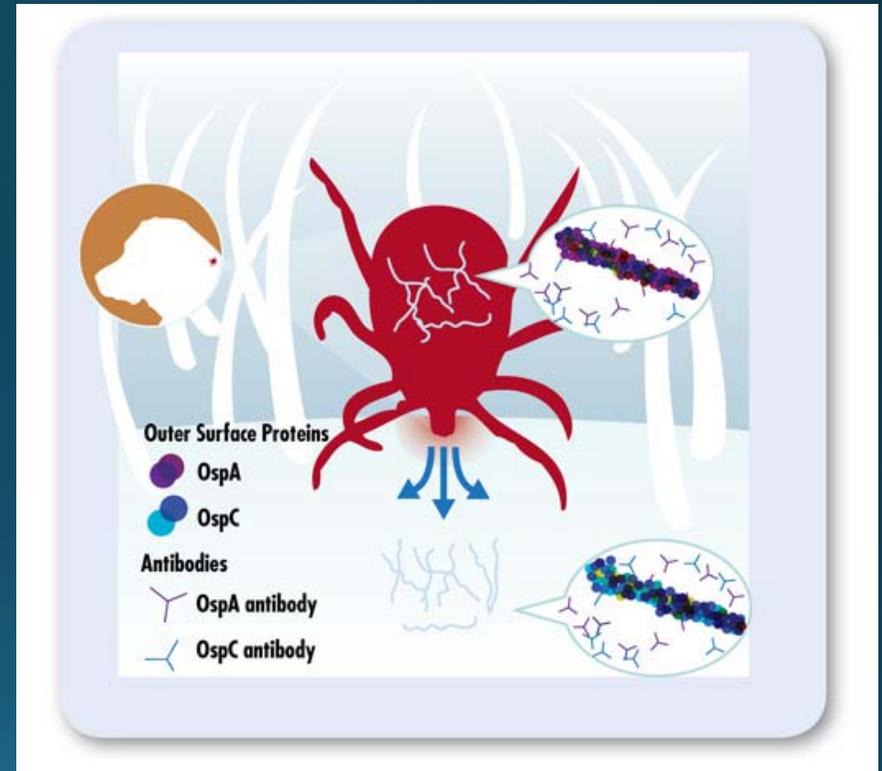
# Prevention

- Lyme vaccination
- No natural/organic methods
- Tick check daily
  - In between toes, ear flaps, base of tail, axillary/inguinal areas



# Lyme Vaccine

- Outer Surface Protein A (OspA)
  - Works in tick's gut
  - Binds bacteria during blood meal
  - Sterilizes the gut and prevents transmission of Bb
- OspC
  - Main immunogenic protein exhibited in tick's salivary glands



# Lyme Vaccine

- All Lyme vaccines produce antibodies in dog to Outer Surface Protein A (OspA)
  - Some vaccines also produce antibodies to OspC
- OspA is the important antibody to prevent Bb transmission
  - Other Osps are not relevant in prevention of infection
- Very safe
- Highly efficacious
- Does not cause a positive test

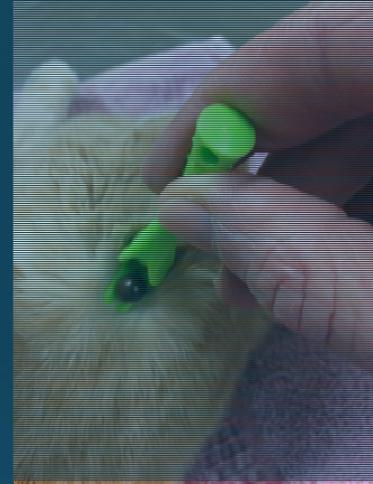


# Tick Removal

- Do NOT use:
  - Vaseline
  - Mouthwash
  - An extinguished match
  - Your hands
  - Liquid soap
  - Nail polish
  - Apple cider vinegar
  - Tweezers



# Tick Removal



# What About Cats?

- Highly resistant to *B. burgdorferi*
  - Rarely show signs of disease
- Hemobartonellosis (Feline Infectious Anemia)
  - Tick vector
- Cytauxzoonosis
  - Protozoal
  - Reservoir host is bobcat
  - Big cats in captivity
- Tularemia
  - Also transmitted by fleas
  - Rabbit fever
- No vax in cats
  - Topical prevention
  - Tick check



Cats bring ticks closer to people

# Environmental Exposure

- Avoid tick infested areas
  - Keep out of high grass and woods
  - Stay on well groomed trails and paths



# Pet TBD Relates to People

- TBD direct transmission only
- Pets are sentinels for TBD infections in people
- Dogs (and cats) increase contact between species
  - Pets sleeping in human beds
  - Pets on furniture
  - Pets have higher exposure and bring ticks in to us
  - Exposure when removing tick?



# TBD Impact on Pets (and People)

- Canaries in the coal mine
- Effect on human counterparts
- Prevention is the key

