

# Lyme Disease

George P. Dempsey M.D.



# LYME DISEASE

- Introduction
  - History
  - Distribution/Prevalence
  - Infections
  - Ticks
  - Photos of rashes

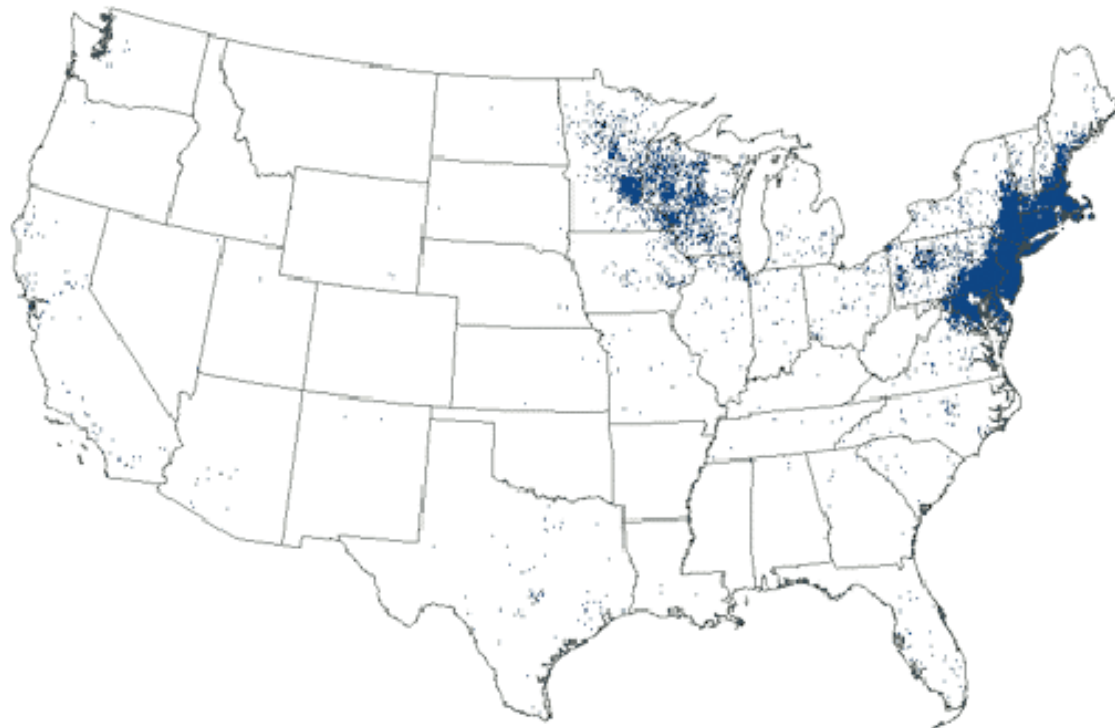


# History of lyme

- Named after Lyme, CT
  - First case diagnosed in 1975
- Ticks identified as vector in 1978
- *Borrelia* identified as the causative organism 1981
- Dr John Walker wrote about the symptoms Lyme disease off the coast of Scotland as early as 1764.
- Museum specimens

# Lyme Disease Distribution

Reported cases of Lyme disease—United States, 2005



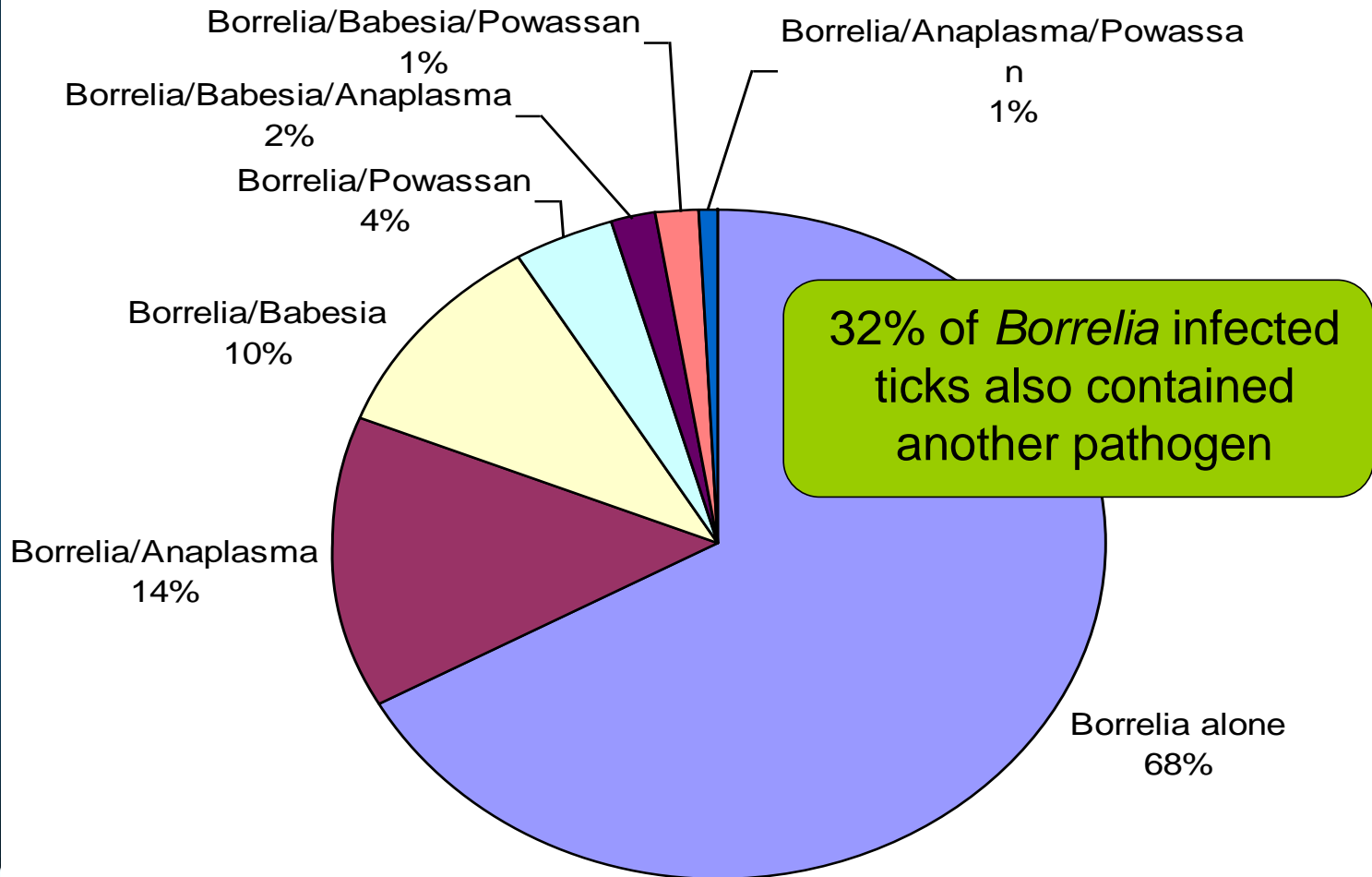
1 dot placed randomly within county of residence for each reported case



# Tick Borne Pathogens

- Lyme
- Anaplasmosis
- Ehrlichiosis
- Babesiosis
- Powassan virus
- Tick Fever
- STARI
- Rickettsia (Rocky Mountain Spotted Fever)
- Tularemia
- Tick Paralysis
- Other viruses

# Co-Infections







# Future Research

- Research Technique is being used that does not require culturing and does not require prior knowledge of what the infection or infections may be
- Regular tests require you to guess what could be the infection and gives a YES or NO answer for just that infection.



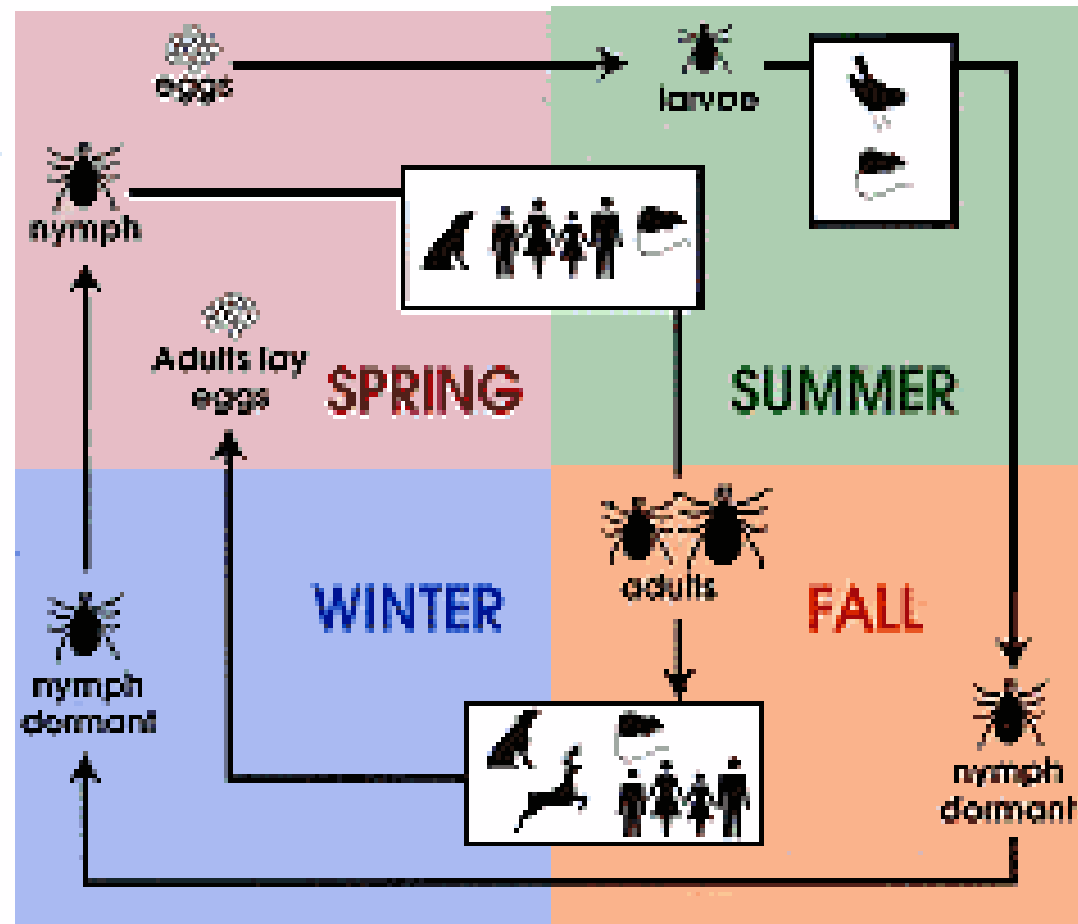
# TICKS-KNOW THINE ENEMY!

- Ecology
- Lifecycle
- Identification
- Anatomy
- Mechanism of feeding



# Tick Life Cycle

## 2-Year Life Cycle of the Deer Tick



# Tick Stages

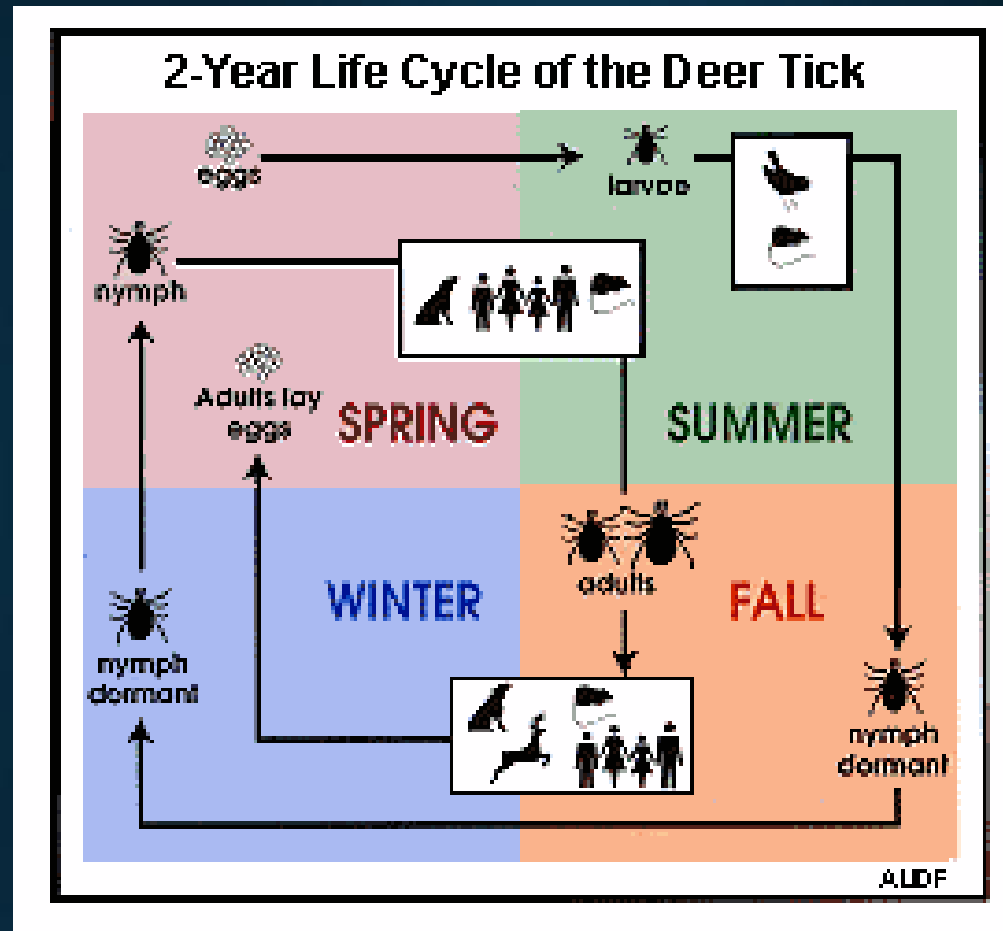


# Common Ticks



# Where They Live

- High grass
  - Adults
- Moist habitats
  - Forests
  - Under leaves
- Animal trails
  - They can smell you!





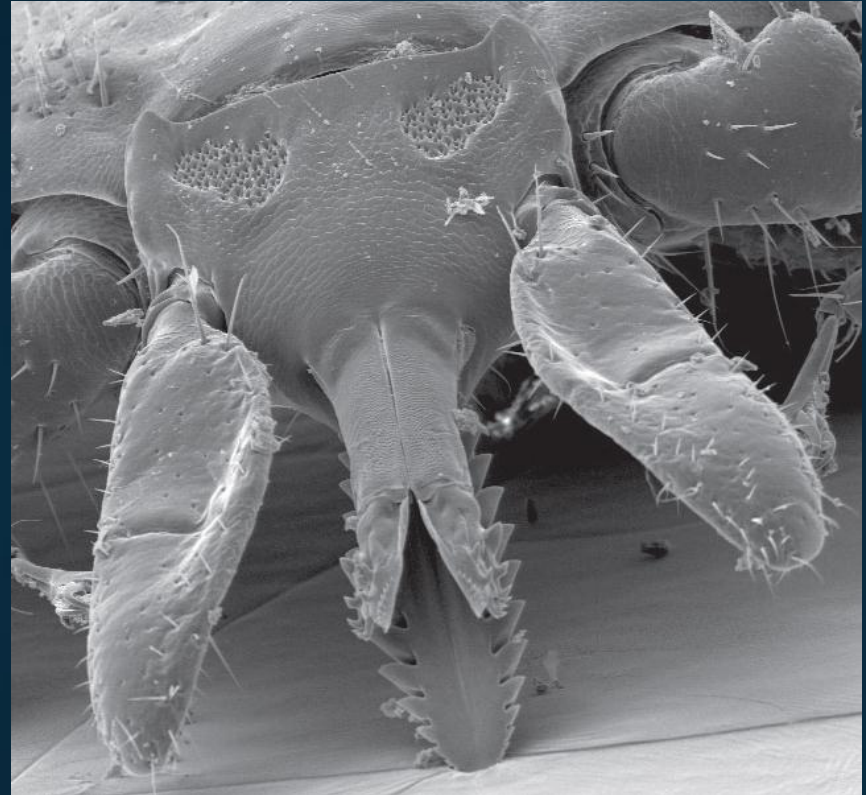
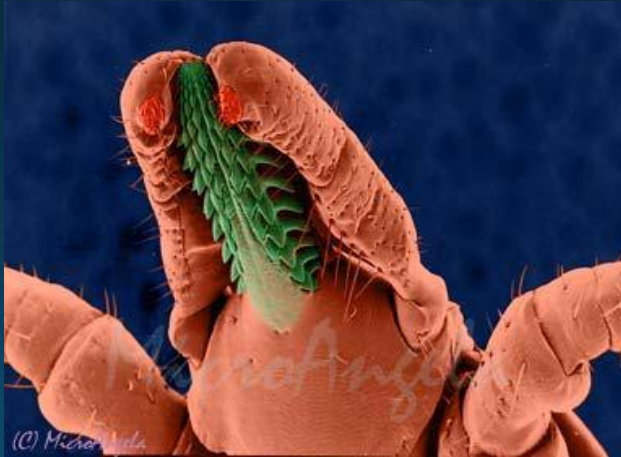


# Where they do not live

- Dry environments
- Windy
- Pine forest floors
- Beaches
- Rocks and pebbles

# KNOW THINE ENEMY!

## Electron Microscopy of tick anatomy



Ticks: the foulest and nastiest creatures that be.  
Pliny the Elder, 23-79 A.D.





# The Mechanism of Feeding

- Complex Salivary Glands
- Many different chemical secreted in to the feeding pool created
- Creates a cement around the entry point
- Resists inflammation and body's natural rejection of a foreign substance (e.g., splinter)
- Suppress immune response to infection
- Feeds on last day before detaching
- Feeds once before each molt

# Salivary Glands





# Bites and Rashes

- Insect bites
- Tick bites
- Lyme rashes (ECM)
- Criteria
  - >5cm
    - Enlarging
    - Not Painful
    - Not that itchy
    - Not a bruise
    - Last more than 2-3 days

# Not Lyme





# Bruised and abused tick bite



# Bruising





# Excoriated tick bite



# Tick bite





# Tick Bite



# ECM

EARLY



DISSEMINATED



# ECM





# ECM





# ECM



# ECM



# ECM





# Chiggers



# Insect bites



# Spider bite





- For more information about our research and to see more rashes
- <http://www.georgedempseymd.com/>