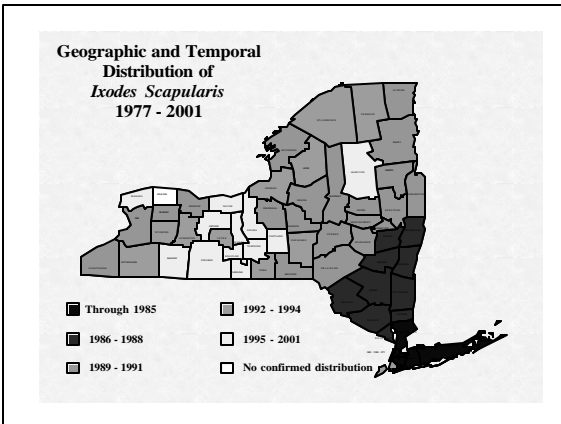
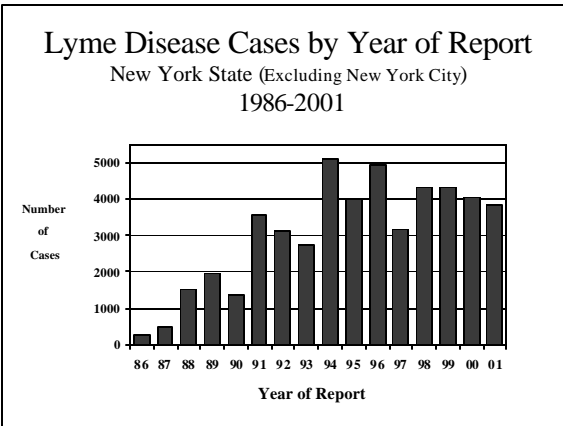
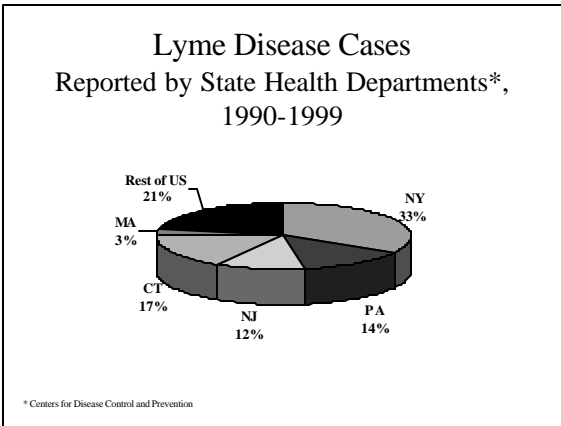




Lyme Disease

Most Common Vector - Borne Disease in U.S.A.

- Increasing geographic distribution in NYS.
- Increasing number of cases in NYS.
- Diagnosis and treatment.
- Associated with risk of other tick-borne diseases.
- Lyme disease vaccine no longer available.
- Personal protective measures very important.



Lyme Disease Incidence (per 100,000 population) 12 Selected Counties in New York State- 1990 vs. 2000

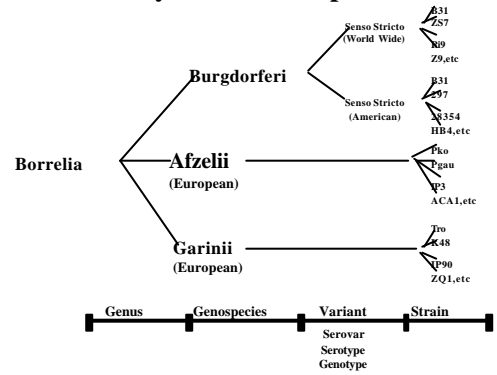
Albany 1.4 / 23.4	Rensselaer 0.6 / 44.6
Greene 26.7 / 207.5	Columbia 6.3 / 936.7
Ulster 4.8 / 112.0	Dutchess 53.1 / 376.2
Orange 11.0 / 166.1	Putnam 79.5 / 283.0
Rockland 0.4 / 20.2	Westchester 45.1 / 28.4
Nassau 6.4 / 6.4	Suffolk 40.2 / 43.2

Borrelia burgdorferi

3 separate pathogenic "species"

- *B. burgdorferi, sensu stricto*
- *B. garinii*
- *B. afzelii*

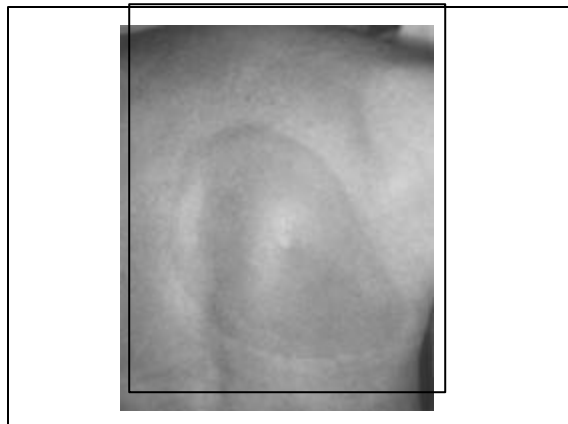
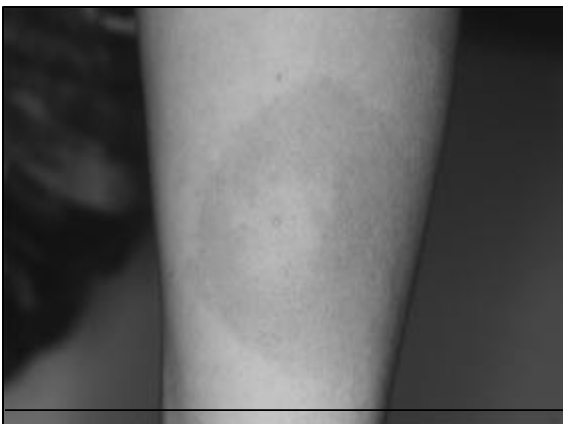
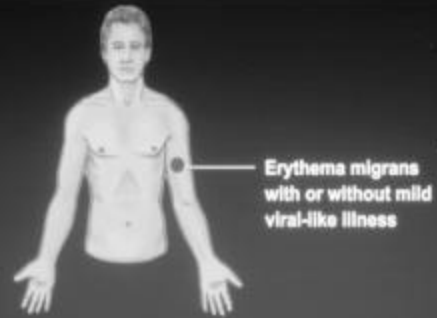
Taxonomy of Borrelia Species



Borrelia burgdorferi

- All Three pathogenic "species" are found in Europe.
- Only *B. burgdorferi, sensu stricto* is found in North America

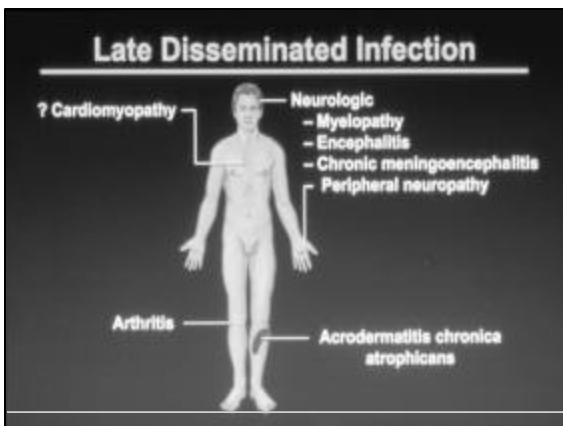
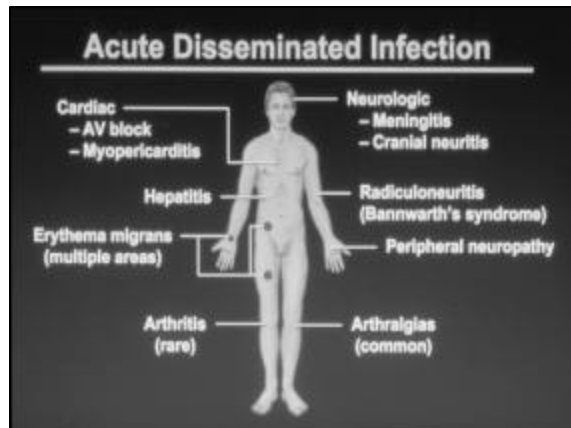
Early Local Infection





Diagnosis of *Borellia burgdorferi* Infection

Observation of Erythema Migrans is Diagnostic



Serodiagnosis of Lyme Disease

- IFA
- Elisa
 - Whole organism (most common)
 - Specific fraction
 - Recombinant proteins
- Western blot

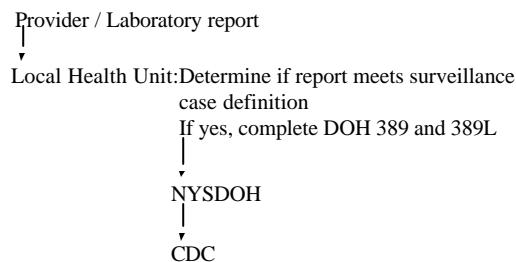
**IgM Western Blot Criteria
ONLY VALID EARLY IN THE DISEASE**

- Bands:
 - 41
 - 39 2 specific bands must be present to be positive
 - 23 (Osp C)

IgG Western Blot Criteria

- Bands
 - 93 - 30 (not Osp A)
 - 66 - 28
 - 60 - 23 (Osp C)
 - 41 - 20
 - 30 - 18
- 5 of 10 bands must be present to be positive

Lyme Disease Surveillance



Treatment of Lyme Disease

**Early local infection
21 Days of Oral Therapy**

- Doxycycline
- Amoxicillin
- Cefuroxime

Treatment of Lyme Disease

**Acute disseminated infection
(with meningitis)**

- 14- 21 Days of IV Therapy**
- Ceftriaxone
 - Cefotaxime

Treatment of Lyme Disease

**Acute disseminated infection
(without meningitis)**

21 Days of Oral Therapy

- Doxycycline
- Amoxicillin

Treatment of Lyme Disease

Late disseminated infection Non-Neurologic

21-30 Days of Oral Therapy

- Doxycycline
- Amoxicillin

Treatment of Lyme Disease

Late disseminated infection Neurologic

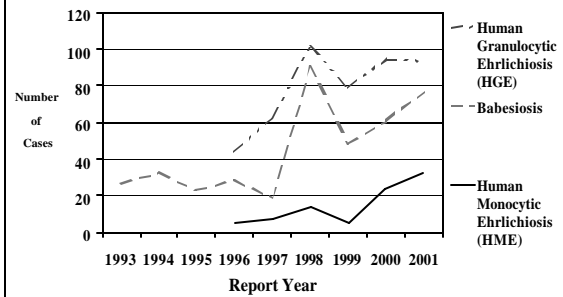
21-30 Days of IV Therapy

- Ceftriaxone
- Cefotaxime

Tick-borne Diseases in NYS

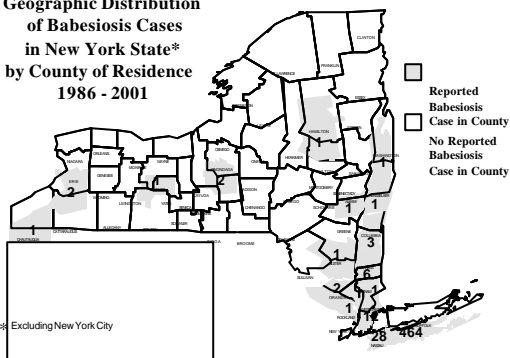
Disease	Vector
Lyme disease	<i>Ixodes scapularis</i> (deer tick)
Babesiosis	<i>I. scapularis</i>
Human granulocytic ehrlichiosis (HGE)	<i>I. scapularis</i>
Human monocytic ehrlichiosis (HME)	<i>Amblyomma americanum</i> (lone star tick)
Rocky mountain spotted fever	<i>Dermacentor variabilis</i> (dog tick)
Powassan Encephalitis	<i>Ixodes cookei</i> (woodchuck tick)

Babesiosis and Ehrlichiosis*, 1993 - 2001 New York State (Excluding New York City)



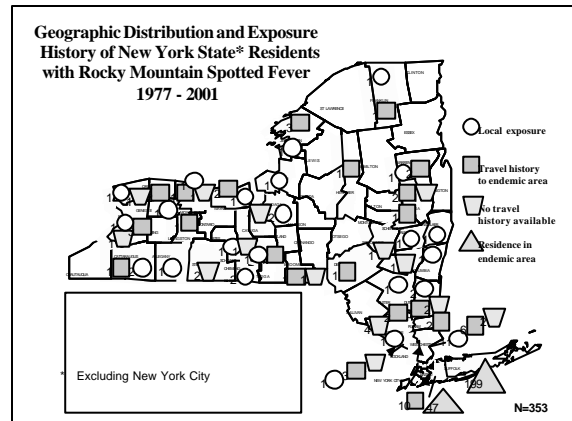
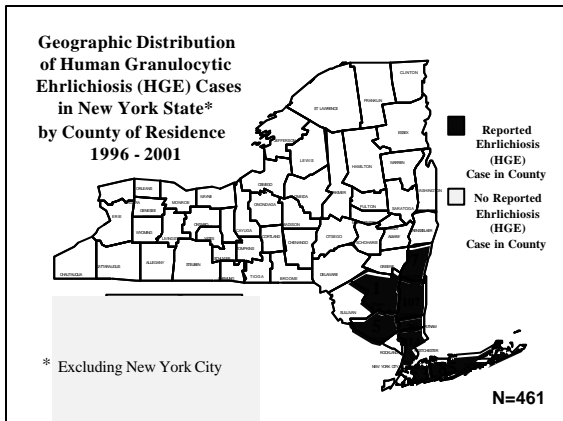
* Reportable Since 1996

Geographic Distribution of Babesiosis Cases in New York State* by County of Residence 1986 - 2001



Locally Acquired Babesiosis Cases* in New York State (Excluding New York City) 2001





Tick Habitat

- Ticks live in grassy, wooded and brushy areas.
- They quest on the ends of vegetation up to 18" high.
- Lawns and gardens.
- Stone walls.
- Woodpiles, leafpiles .

Personal Protective Measures

- Avoid tick habitat/habitat management
 - Wooded, brushy or over-grown grassy areas
 - Keep grass cut. Clear brush, leaf litter.
- Wear light colored clothing (to see ticks)
- Tuck pants into socks and shirt into pants
- Repellents - Follow label directions

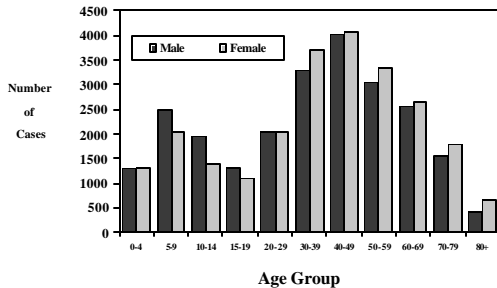
Personal Protective Measures

- Body check for ticks
- Prompt removal of attached tick
 - Transmission is unlikely if tick is attached < 36 hours

Landscape Maintenance

- Keep grass cut short.
- Clear brush and leaf litter out of gardens and away from the house.
- Stack woodpiles away from the house.
- Keep the ground under birdfeeders clean.
- Choose landscape plants not favored by deer.

**Lyme Disease Cases by Sex and Age Group
New York State (Excluding New York City)
1986 - 2001**



Lyme Disease Vaccine

- Vaccine no longer manufactured and distributed by GlaxoSmithKline (GSK).
- GSK recommending no additional doses be administered.
- GSK requesting all vaccine be returned.
- Personal protective measures even more important.

Summary

- Increasing geographic distribution in NYS.
- Increasing number of cases in NYS.
- Diagnosis and treatment.
- Associated with risk of other tick-borne diseases.
- Lyme disease vaccine no longer available.
- Personal protective measures very important.

Additional Resources

- Centers for Disease Control
www.cdc.gov/ncidod/dvbid/lyme
- Infectious Disease Society of America
published Lyme disease guidelines
www.idsociety.org/PG/toc.htm
- MMWR Recommendations and Reports
May 2, 1997/Vol. 46/No. RR-10