

The background of the slide is a microscopic image of cells, showing a network of thin, dark lines representing cell membranes and thicker, more prominent structures that could be nuclei or other organelles. The overall color palette is a range of blues, from light sky blue to a deeper teal. A solid teal rectangle is positioned on the left side of the slide, serving as a backdrop for the title and author information.

# Lyme disease

Acco. Prof dr Biljana Popovska Jovičić

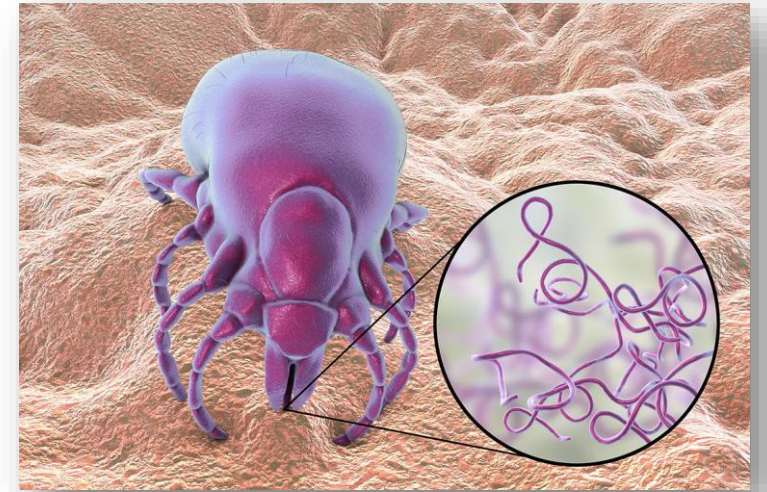
# Lyme disease

- Multisystemic inflammatory disease
- Transmitter: *Ixodes ricinus* tick
- Caused by the spirochete *Borrelia burgdorferi*
- USA, Connecticut, Lyme
- 1982, Willy Burgdorferi



# Etiology of Lyme disease

- Spirochete, a primate in the same group as leptospire and treponema
- Grows slowly on liquid BSK medium
- B. Burgdoferi is divided into 14 serotypes
- Variations in clinical manifestations are attributed to different serotypes
- Has a greater number of membrane lipoproteins, of which OspA is the most important



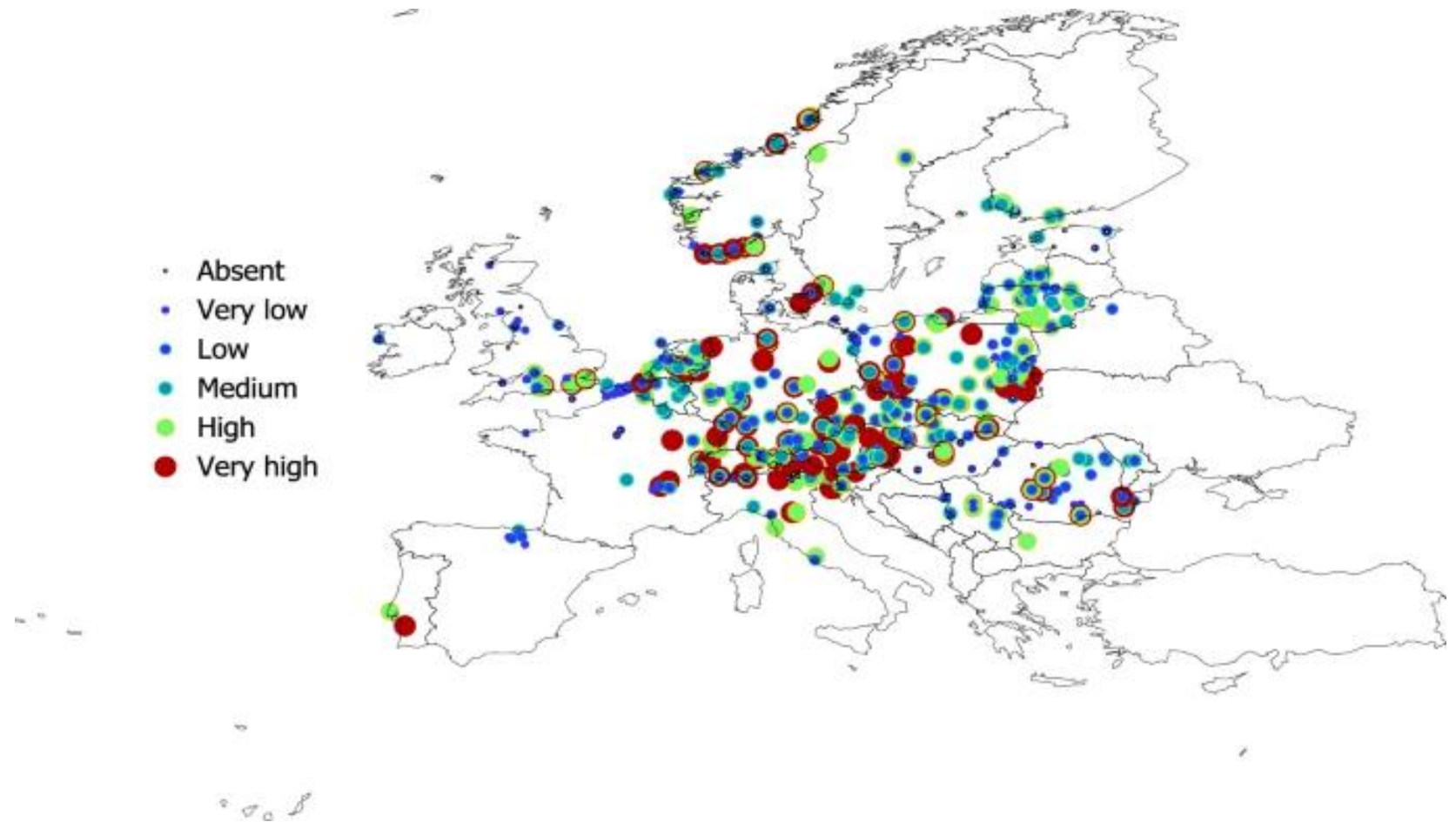
# Epidemiology of Lyme disease

- The disease is transmitted by tick bites
- The main reservoirs are mice and larger mammals
- Global distribution, especially limited to temperate climates (Europe and the USA)
- The disease is transmitted most often in the nymph stage
- Spring-summer
- Hikers

Developmental stages of the multi-year cycle



# Prevalence of Lyme disease in Europe

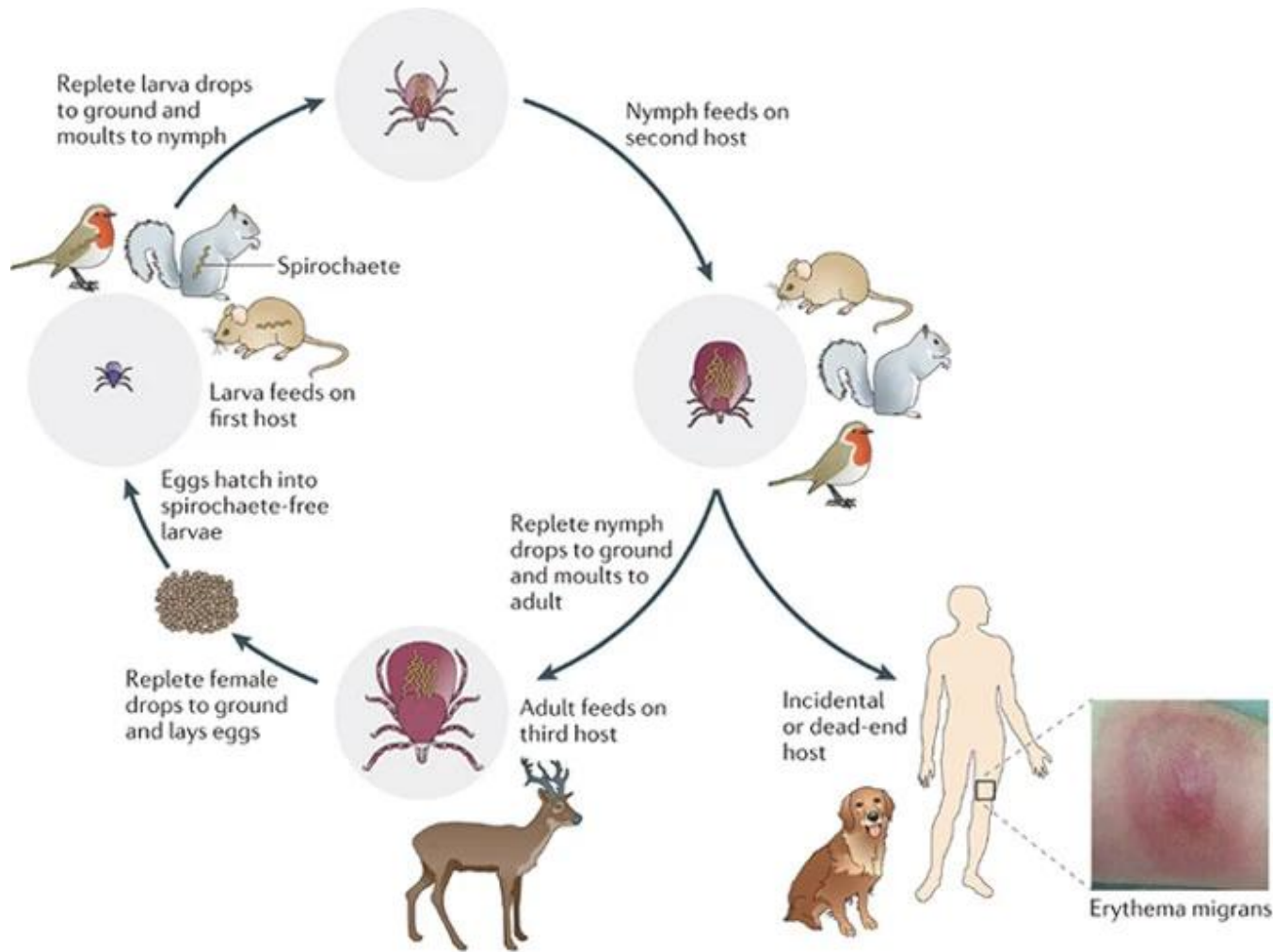


- Distribution and prevalence of *B. burgdorferi* in *I. ricinus* (data for the years 2000–2017)

Estrada-Peña et al. Int J Health Geogr (2018)  
17:41 <https://doi.org/10.1186/s12942-018-0163-7>



## Pathogenetic manifestations of Lyme disease



- After a tick bite into the skin, it takes 48 hours for safe inoculation to occur
- Incubation is 3 to 32 days
- After inoculation, it spreads through the lymphatic and blood vessels, as well as peripheral nerves
- Dissemination is facilitated by binding to plasminogen
- Upon entering the bloodstream, it binds to tissues for which it has affinity

# Clinical manifestations of Lyme disease

| 1.Stage  | Early infection                | Erythema migrans  |
|----------|--------------------------------|---|
| 2. Stage | Disseminated infection         | Meningitis,<br>migratory arthralgias,<br>radiculoneuritis,<br>erythema multiforme,<br>cranial neuritis<br>carditis (AV block,<br>myopericarditis) |
| 3. Stage | Late (persistent)<br>infection | Encephalomyelitis,<br>arthritis, peripheral<br>neuropathy,<br>chronic<br>polyradiculoneuropathy   |

# Early infection

## Erythema migrans

- Incubation period 3-32 days
- Redness that spreads concentrically around the puncture, centrifugal
- Clearly demarcated from the rest of the skin
- Maximum diameter 40cm, usually 15 cm
- Fades spontaneously after 6-8 days







# Diagnosis of Lyme disease

- Epidemiological data
- Clinical picture
- Serological tests in blood and possibly cerebrospinal fluid
- Immunofluorescence (IFA)
- Immunoenzyme-linked immunosorbent assay (ELISA)
- Western-Blot (WB)
- Polymerase chain reaction (PCR)
- Cultivation

# Treatment of Lyme disease

- Early infection
- (Erythema migrans)
- Doxycycline orally 100mg 2x1 (14-21 days)
- Amoxicillin orally 500mg 3x dn. (14-21 days)
- In case of allergy, can be included:
- Cefuroxime axetil orally 500mg 2x1 (14-21 days)
- Azithromycin, orally 1gr on day 1, then 500mg 1x1 on day 4
- In children up to 8 years of age, prescribe:
- Amoxicillin, orally 20mg/kg/day (14-21 days)
- In case of penicillin allergy:
- Azithromycin, orally 20mg/kg/day 3 to 5 days
- Cefuroxime acetyl orally 125mg 2xdn (14-21 days)

# Lyme disease treatment

## Neurological manifestations(neuroborreliosis)

- Ceftriaxon 2gr/24h, Penicilin G (20ml/24h) during 14-28 days
- Penicillin allergy-Dovicin, oral, 100mg 2x1 28 days

## Cardiological manifestations

- 1st degree AV block- treatment with oral therapy as for wound infection
- 2nd and 3rd degree AV block- Ceftriaxone, 2gr/24h 14-28 days or Penicillin G 28 days\*

## Rheumatological complications(Arthritis)

- Doksiciklin oralno 100mg 2x1 30-60 dana
- Amoksicilin 500mg 4x dn 30-60 dana ili
- Ceftriaxon 2gr/24h, Penicilin G (20ml/24h) tokom 14-28 dana

Therapy may last longer or may be repeated

THANKYOU!

