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# Lyme Disease in Fairfield County, Connecticut: The Need to Know

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# LYME DISEASE IN FAIRFIELD COUNTY, CONNECTICUT: THE NEED TO KNOW

Jack Chen, MSIII

Family Medicine Clerkship May - June 2019

Brookfield Family Medicine | Brookfield, CT

Mentors: Dr. Cornelius Ferreira

Larner College of Medicine at University of Vermont

# PROBLEM IDENTIFICATION AND NEED

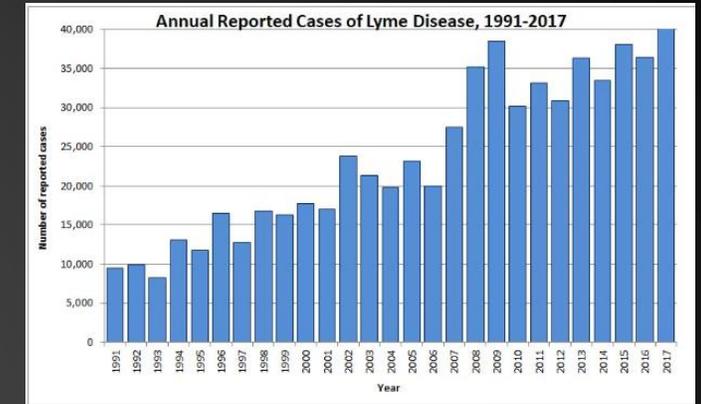
- Lyme Disease Problem
  - Lyme disease is a multisystem disease caused by spirochete *Borrelia burgdorferi*
  - *Borrelia burgdorferi* transmitted through bite of Blacklegged Ticks (aka *Ixodes scapularis* predominant in US, esp. CT)
  - Exposure spring to early fall when vector present
  - Most cases reported in northeastern, mid-Atlantic and north central regions
  - Multisystemic disease preventable if recognized early and treated with antibiotics
- Need to educate patients
  - Based on interviews
    - spring to fall → many patient's visit pertain to tick and Lyme disease
    - Patient's lack of knowledge regarding Lyme disease (what to do before and after tick bite)
  - CDC
    - Steady rise in prevalence from 12,801 confirmed cases in 1997 to 29,513 confirmed cases in 2017
  - CT DPH
    - Most number of cases of Lyme Disease in Connecticut is in Fairfield County
      - About 1/5 of the cases reported



<http://davidroblemd.blogspot.com/2015/>

# PUBLIC HEALTH COST & UNIQUE COST CONSIDERATIONS

- Steady rise in number of cases reported in past 25 years
  - Little less than 10,000 cases reported in 1991 to 40,000 cases in 2017
- Lyme disease is expanding in to more states
- Estimated over 300,000 people are diagnosed and treated each year in US
  - 7<sup>th</sup> most common reportable infectious disease in US
- Lyme disease is associated with \$2,968 higher total health care costs and 87% more outpatient visits over a 12-month period
- Total cost of Lyme disease testing alone is estimated at \$492 million.
- Total medical cost attributable to Lyme disease can be as much as \$1.3 billion a year
- Education especially awareness and prevention is crucial to decrease number of cases each year and keep the cost down



<https://www.cdc.gov/lyme/why-is-cdc-concerned-about-lyme-disease.html>

# COMMUNITY PERSPECTIVE

- Brianna Stelzel, MA Brookfield Family Medicine
  - Does not think that patients are educated about ticks and Lyme disease
  - Patient will most definitely benefit from being more educated about ticks and Lyme disease from their provider
- Donna Cople, LPN Brookfield Family Medicine
  - “Highest amount of tick-related visit I have seen is 6 in one day from one provider”
  - Believes that patients are aware of ticks and Lyme disease because of the media and public information. However, the awareness makes the patients come in demanding medication and testing
- Scott Williamson, MA Brookfield Family Medicine
  - At high of the season, 2-6 tick-related visits a day
  - Season last from April to November depending on the weather
  - Some patients are aware of ticks and Lyme disease. Some patients may even be informed but following through to protect themselves from ticks is another story.
  - Continue to further educate the patients will definitely be helpful and effective because the patient that are aware of ticks and Lyme disease (via TV and news) would call the office immediately asking for antibiotics/vaccines/testing and worry about outbreaks.
- Werhner Rojas, LPN Brookfield Family Medicine
  - “One of the provider in the office have handouts to give to patients and really sit down and spend the time to educate the patient”
  - “As one of the triage nurses, the provider’s efforts made a difference. I feel there is a slight decrease in the number of tick related visits”

# INTERVENTION AND METHODOLOGY

- Create handout with essential information regarding ticks and Lyme disease
  - general information, prevention, how to remove and kill a tick, monitor signs and symptoms and when to seek a healthcare professional
- Distribute handout to every patient that comes to the office
- Have the handout at the receptionist desk
- Have the handout posted on the bulletin board in the waiting room and the Doctor's office
- The goal is provide the basic knowledge to:
  - Have healthier patient population – without ticks & Lyme disease
  - Decrease number of tick bite related office visits at Brookfield Family Medicine
  - Reduce medical cost relating to Lyme disease (office visit, ER visits, Lyme disease testing, medications)
  - Decrease the incidence of Lyme disease in Fairfield County

# RESULTS/RESPONSE

- Handout with essential basic information is to be distributed as stated in “Intervention and Methodology” section
- Handout contains general information, prevention, how to remove and kill a tick, monitor signs and symptoms and when to seek a healthcare professional

### Things You Need to Know About Ticks and Lyme Disease to Keep Your Family Safe

**General Information**



- Lyme disease is a multisystem disease
- Caused by bacterium *Borrelia burgdorferi*, which is transmitted through bite of the vector Blacklegged Deer Ticks (aka *Ixodes scapularis* which is predominant in US, esp. CT)
- Most exposure spring to early fall when vector is most prevalent
- **Tick must be attached for a day or more to spread bacteria to blood**
- **Many people that get Lyme disease never knew they were bitten by a tick**
- **Most people bitten by ticks do not get Lyme disease**
- Most cases reported in northeastern, mid-Atlantic and north central regions of US
- **Multisystemic disease preventable if recognized early and treated with antibiotics**

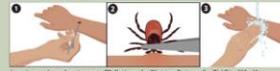
**Prevention**

- Know where to expect ticks
  - Ticks live in grassy, wooded and brushy areas
  - Can be on animals, including pets like dogs
  - Try to avoid ticks by walking in center of trails
- Treat clothing and gear with 0.5% permethrin
- Use insect repellants containing DEET, picaridin, IR3535, Oil of Lemon Eucalyptus (OLE), para-menthane-diol (PMD) or 2-undecanone on exposed skin
  - Babies younger than 2 months of age should not use insect repellants
  - Children under 3 years old should not come in contact with OLE or PMD
- **Check frequently for tick bites!**
  - Full body check before going inside
  - Check clothing, gear, pets for ticks before going inside
  - Shower within 2 hours of going inside

This handout was compiled using CDC [Center for Disease Control and Prevention] and Dr. David Robles, M.D. as a reference. <https://www.cdc.gov/lyme/index.html> | <http://davidroblesmd.blogspot.com/2015/>

### How to Remove and Kill a Tick

1. Using a fine-tipped tweezers, grasp the tick as close to skin's surface as possible
2. Pull the tick upward with a steady and even pressure. Do not twist or jerk as you pull.
3. Once the tick is removed, thoroughly clean the bite area and your hands with soap and water or rubbing alcohol.
4. Put rubbing alcohol on the tick to kill it OR put the live tick in a sealed bag
5. Save the tick for identification and degree of engorgement



<https://www.cdc.gov/lyme/images/P3-Guide-for-Clinicians-Patient-After-TickBite-010.pdf>

### Monitor Signs and Symptoms (even without finding a tick)

\*Course of infection without treatment\*

- Stage 1: **Early-Localized**. Infection has not yet spread throughout body
  - Begin days or weeks after infection
  - Flu-like symptoms e.g. fatigue, malaise, fever chills, headache, malaise, joint pain (arthralgias), muscle pain (myalgias) and stiff neck
  - Classic rash → erythema migrans aka “bull’s eye” rash seen in 50-70% of cases
- Stage 2: **Early-disseminated**. Bacteria has begun to spread throughout body.
  - Weeks to months after tick bite
  - Can spread to brain, heart, joints
  - Meningitis, fever and chills, facial palsy (50% of cases), nerve pain, rapid or slow heart rate, chest pain
- Stage 3: **Late-disseminated**. Bacteria have spread throughout body
  - Months or years after infection
  - Neurological disorders (e.g. memory loss, disorientation, confusion, dizziness), paralysis of facial muscle, sleep and vision problems



<http://the-roblesmd.blogspot.com/2015/>

### When to seek a healthcare professional

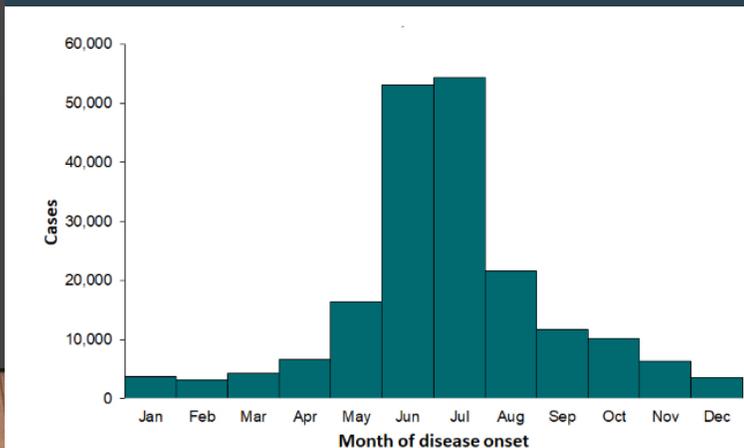
- If a tick could have been attached on exposed skin longer than 24 hours
- If experiencing the signs and symptoms consistent of Lyme Disease (even without finding a tick)

This handout was compiled using CDC [Center for Disease Control and Prevention] and Dr. David Robles, M.D. as a reference. <https://www.cdc.gov/lyme/index.html> | <http://davidroblesmd.blogspot.com/2015/>

# EVALUATION OF EFFECTIVENESS & LIMITATIONS

- Keep track of the number of tick related visits at Brookfield Family Medicine to see if there is a decrease
  - Since Lyme disease is seasonal (most prevalence from spring to early fall), it would make more sense to compare overall number of tick related visits one year to the next
  - Compare the same months across number of years
    - E.g. based on CDC historical data, the top four months of Lyme disease cases reported are May to August
- Patient fill out a survey at the end of the office visit after reading the handout
  - Rating the effectiveness of the handout
  - Evaluating how much the patient knew about ticks and Lyme disease before reading the handout
- Provide a pretest and posttest questionnaire to assess understanding of the handout and address any misunderstanding
- Patients can self-report or doctor can ask the patient about the effectiveness of the handout and discuss
- Limitations
  - Difficult to track every tick related visit at the office
  - Handout only given to Brookfield Family Medicine patients
  - Time consuming to assess patient's understanding of the handouts
  - Difficult to assess reliably the handout's impact

Lyme disease—Confirmed cases by month of disease onset, United States, 2001-2017



<https://www.cdc.gov/lyme/stats/graphs.html>

# RECOMMENDATIONS FOR FUTURE INTERVENTIONS/PROJECTS

- Distribute handout to:
  - Hospitals
  - Other doctor's offices (all specialties)
  - Schools
  - Daycares
  - Parks
  - Camp sites
- Spend some time during annual physicals to educate on the dangers of ticks and Lyme disease
- Go to schools and town hall meetings to further educate the public
- Encourage other doctor's offices to educate their patients
- Handouts containing other tick-borne illness focusing on general information, prevention, how to remove and kill a tick, monitor signs and symptoms and when to seek a healthcare professional

# REFERENCES

- Adrian, Emily R., et al. “Health Care Costs, Utilization and Patterns of Care following Lyme Disease” *PLoS One*, (2015) Apr;10(2)
- Centers for Disease Control and Prevention. “Lyme Disease.” CDC, <https://www.cdc.gov/lyme/index.html>. Accessed 5 June 2019
- CT Department of Public Health. “Lyme Disease Statistics.” CT DPH, <https://portal.ct.gov/DPH/Epidemiology-and-Emerging-Infections/Lyme-Disease-Statistics>. Accessed 5 June 2019
- Robles, David. “Lyme Disease.” David Robles, MD, PhD- Dermatologist, <http://davidroblesmd.blogspot.com/2015>. Accessed 5 June 2019

# INTERVIEW CONSENT FORM

- Thank you for agreeing to be interviewed. This project is a requirement for the Family Medicine clerkship. It will be stored on the Dana Library ScholarWorks website. Your name will be attached to your interview and you may be cited directly or indirectly in subsequent unpublished or published work. The interviewer affirms that he/she has explained the nature and purpose of this project. The interviewee affirms that he/she has consented to this interview.
- Consented    
Name: Scott Williamson  
Name: Brianna Stelzel  
Name: Donna Cople  
Name: Werhner Rojas
- Did NOT Consent    
Name: \_\_\_\_\_  
Name: \_\_\_\_\_