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Lyme Disease: Prevention, Recognition & Treatment

Kristen J. Bartlett
University of Vermont

LYME DISEASE:
PREVENTION, RECOGNITION & TREATMENT

Hinesburg Family Practice
Kristen Bartlett, MS3
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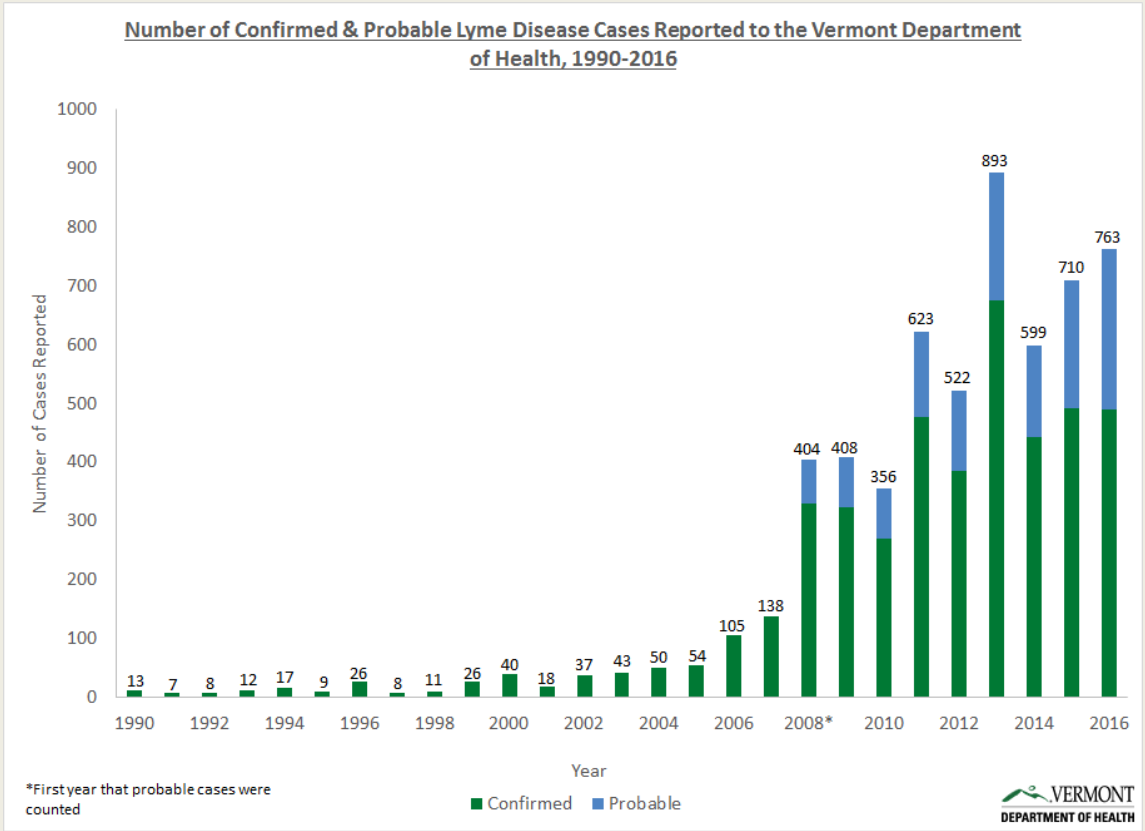
Faculty Mentors: Dr. Cangiano, Dr. Graham, Dr. Humphrey, Dr. Sirois, Dr. Ulager

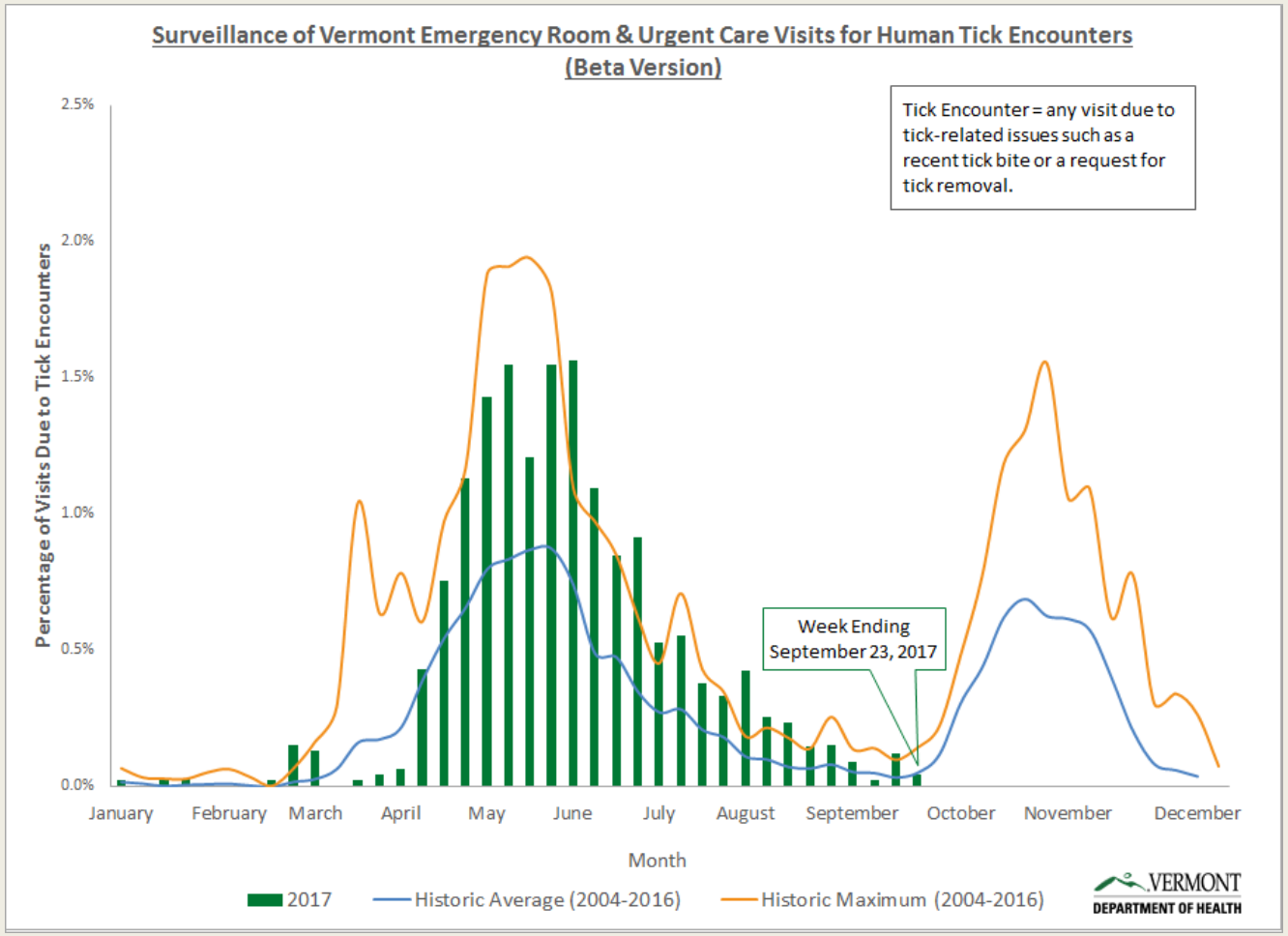
Problem Identification & Need

- Lyme disease is the most commonly reported vector-borne illness in the US
- The incidence of tick-borne illnesses have risen steadily in Vermont over the past ten years
  - Lyme disease is carried by bacteria *Borrelia burgdorferi*, carried by the black-legged tick (*Ixodes scapularis*)
  - Over 99% of tick-borne illnesses reported to VDH are transmitted by the black-legged tick
  - Over half of the black-legged ticks in Vermont carry *B. burgdorferi* (52.9% ticks collected between 2013-2016)
  - Vermont had the highest rate of Lyme disease cases reported in the US in 2015
  - Black-legged tick activity is highest during May and June in the nymphal form, with a second increase in activity in October and November as adult ticks
- Hinesburg Family Practice is located near the border of Chittenden and Addison counties, which had confirmed Lyme Disease cases between 11-50 and 51-100, respectively, in 2015
- Many patients present to the clinic with complaints of rash that is then identified as erythema migrans rash indicative of recent Lyme infection
- Conversely, patients may complain of nonspecific symptoms such as fatigue and joint pains and are convinced they have Lyme disease, even in absence of confirmed tick bite



Public Health Costs

- Tick bites and other tick-related complaints result in an increase in utilization of emergency department and urgent care clinics
  - ER and Urgent Care visits in VT in 2017 (green bars) have been consistently higher than historical averages (blue line)
- Studies comparing patients with Lyme disease to matched controls with no known exposure have found the former to be associated with a $2,968 increase in health care cost, 87% more outpatient visits, and 71% more emergency department visits per year
  - Using these figures, estimates of increased costs due to Lyme disease and complications are as high as $712 million to $1.3 billion annually
- The cost of testing for Lyme is $230, not including associated appointments
- Proper utilization of screening and treatment are essential to reducing both costs associated with tests and overuse of antibiotics contributing to antibiotic resistance
  - This requires both patient and provider education



Community Perspective

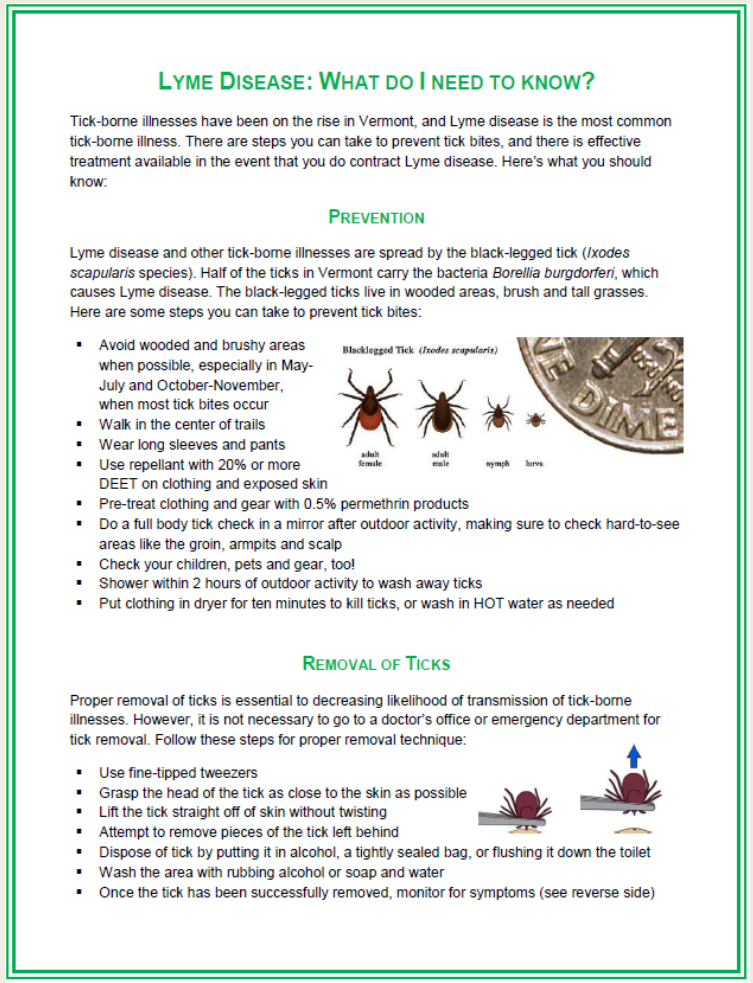
- Community Interviewees:
  - Bradley Tompkins, Infectious Disease Epidemiologist & Program Chief, Vermont Department of Health
  - Laura Campo, RN, Hinesburg Family Practice Triage Nurse
- General themes:
  - The level of public awareness regarding Lyme Disease has greatly increased over the past few years
  - There is still a great deal of misinformation about prevention, treatment, and course of disease on the internet and on social media
  - There is a general sense of fear surrounding Lyme Disease and other tick-borne illnesses, particularly concerning “chronic Lyme”
  - Patients are unaware of the appearance of black-legged ticks
  - Patient education is needed to provide accurate information and we should take opportunities to provide patients with reputable information and resource whenever possible
  - Vermont is a health-conscious state and its residents enjoy spending time outdoors making prevention education is hugely important

Intervention & Methodology

- Create patient educational materials that contain information regarding:
  - Prevention of tick bites
  - Recognition of black-legged ticks
  - Tick removal technique
  - Signs and symptoms of Lyme disease
  - Recognition and screening practices
  - Treatment overview
  - Resources for more information regarding Lyme and other tick-borne illnesses
- Distribute handouts in waiting room for patients to review prior to appointments
- Post copies in exam rooms for staff and providers to offer to patients with questions
- Make additional copies available for patients who would like to take information home

Results

- Two-sided handout with patient-directed education regarding Lyme disease created and shared with practice to distribute/post throughout patient care areas
- Staff and providers made aware of presence of materials for inquiring patients



Lyme Disease: What do I need to know?

Tick-borne illnesses have been on the rise in Vermont, and Lyme disease is the most common tick-borne illness. There are steps you can take to prevent tick bites, and there is effective treatment available in the event that you do contract Lyme disease. Here's what you should know:

Prevention

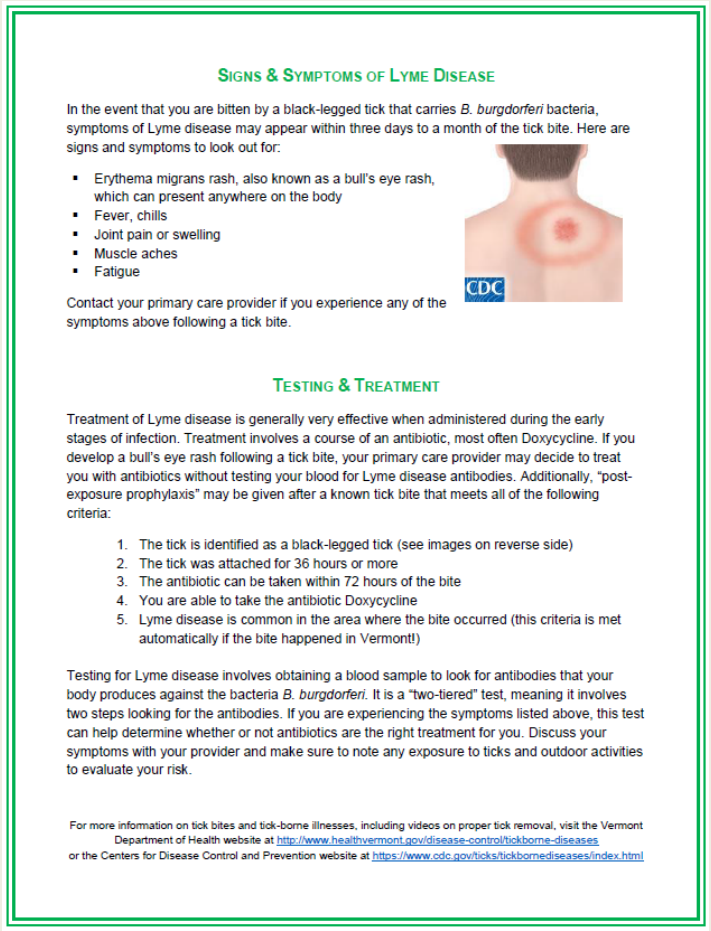
Lyme disease and other tick-borne illnesses are spread by the black-legged tick (*Ixodes scapularis* species). Half of the ticks in Vermont carry the bacteria *Borellia burgdorferi*, which causes Lyme disease. The black-legged ticks live in wooded areas, brush and tall grasses. Here are some steps you can take to prevent tick bites:

- Avoid wooded and brushy areas when possible, especially in May-July and October-November, when most tick bites occur
- Walk in the center of trails
- Wear long sleeves and pants
- Use repellant with 20% or more DEET on clothing and exposed skin
- Pre-treat clothing and gear with 0.5% permethrin products
- Do a full body tick check in a mirror after outdoor activity, making sure to check hard-to-see areas like the groin, armpits and scalp
- Check your children, pets and gear, too!
- Shower within 2 hours of outdoor activity to wash away ticks
- Put clothing in dryer for ten minutes to kill ticks, or wash in HOT water as needed

Removal of Ticks

Proper removal of ticks is essential to decreasing likelihood of transmission of tick-borne illnesses. However, it is not necessary to go to a doctor's office or emergency department for tick removal. Follow these steps for proper removal technique:

- Use fine-tipped tweezers
- Grasp the head of the tick as close to the skin as possible
- Lift the tick straight off of skin without twisting
- Attempt to remove pieces of the tick left behind
- Dispose of tick by putting it in alcohol, a tightly sealed bag, or flushing it down the toilet
- Wash the area with rubbing alcohol or soap and water
- Once the tick has been successfully removed, monitor for symptoms (see reverse side)



Signs & Symptoms of Lyme Disease

In the event that you are bitten by a black-legged tick that carries *B. burgdorferi* bacteria, symptoms of Lyme disease may appear within three days to a month of the tick bite. Here are signs and symptoms to look out for:

- Erythema migrans rash, also known as a bull's eye rash, which can present anywhere on the body
- Fever, chills
- Joint pain or swelling
- Muscle aches
- Fatigue

Contact your primary care provider if you experience any of the symptoms above following a tick bite.

Testing & Treatment

Treatment of Lyme disease is generally very effective when administered during the early stages of infection. Treatment involves a course of an antibiotic, most often Doxycycline. If you develop a bull's eye rash following a tick bite, your primary care provider may decide to treat you with antibiotics without testing your blood for Lyme disease antibodies. Additionally, "post-exposure prophylaxis" may be given after a known tick bite that meets all of the following criteria:

1. The tick is identified as a black-legged tick (see images on reverse side)
2. The tick was attached for 36 hours or more
3. The antibiotic can be taken within 72 hours of the bite
4. You are able to take the antibiotic Doxycycline
5. Lyme disease is common in the area where the bite occurred (this criteria is met automatically if the bite happened in Vermont!)

Testing for Lyme disease involves obtaining a blood sample to look for antibodies that your body produces against the bacteria *B. burgdorferi*. It is a "two-tiered" test, meaning it involves two steps looking for the antibodies. If you are experiencing the symptoms listed above, this test can help determine whether or not antibiotics are the right treatment for you. Discuss your symptoms with your provider and make sure to note any exposure to ticks and outdoor activities to evaluate your risk.

For more information on tick bites and tick-borne illnesses, including videos on proper tick removal, visit the Vermont Department of Health website at http://www.healthvermont.gov/disease-control/tickborne-diseases
or the Centers for Disease Control and Prevention website at https://www.cdc.gov/ticks/tickbornediseases/index.html

Effectiveness & Limitations

- Effectiveness:
  - Effectiveness of this intervention will need to be evaluated over time
  - Patient data can be collected from clinic to review and compare rates of patients tested for Lyme disease and those diagnosed and treated
  - Feedback from triage nurses and providers can be obtained regarding patients' general knowledge and any improvements noted, specifically via survey
  - Survey patients who have reviewed the educational handout to evaluate their level of knowledge before and after reading the materials and their likelihood to utilize information gained
- Limitations:
  - Small practice size making it hard to reach a large group of patients
  - Intervention relies on patients picking up reading materials and reviewing information contained
  - May be challenging to systematically evaluate efficacy without directly tracking patients who have reviewed handout
  - Impossible to eliminate risks with rising rates of infection occurring throughout the state, regardless of patient prevention practices

Recommendations

Recommendations for future research or expansion of this initiative include:

- Share patient educational materials with other UVMMC primary care practices
- Hosting classes in the community for tick prevention strategies, tick identification and removal, and overview of signs and symptoms of disease
- Expand patient education materials to include other tick-borne illnesses
- Develop provider training in recognition of tick-borne illnesses, screening protocols and treatment guidelines
- Continue research regarding development of Lyme disease vaccine and evaluate its efficacy and its role in communities with increasing rates of disease or among particular populations at higher risk for contracting Lyme
- Further research into Post-treatment Lyme Disease Syndrome and its course, as well as patient and provider education around the use of long-term antibiotics in the absence of ongoing bacterial infection with *B. burgdorferi*
- Efforts to encourage patients to contact primary care offices in lieu of emergency departments and urgent care to decrease costs of services related to tick bites

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Images:

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Consent

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. Yes __X__ / No _____