

Lyme Disease Advisory Committee Meeting
March 13, 2014
Sacramento, California

Committee members in attendance

Barbara Barsocchini, California Lyme Disease Association (LymeDisease.org)
Karen Chew, Lyme Disease Support Network (via phone)
Anne Kjemtrup, D.V.M., M.P.V.M., Ph.D. (for Vicki Kramer, Ph.D.), California Department of Public Health (CDPH)
Robert Lane, Ph.D., University of California, Berkeley
James Miller, Ph.D., University of California, Los Angeles (via phone)
Chindi Peavey, Ph.D., Mosquito and Vector Control Association of California (MVCAC)
Raphael Stricker, M.D., California Medical Association (CMA) (via phone)
Lisa Messner, CPhT, Lyme Disease Support Network (via phone)

Other attendees

Denise Bonilla, M.S., M.S., CDPH, Committee Coordinator
Mark Novak, Ph.D., CDPH, Supervising Public Health Biologist

Approximately 15 individuals representing CDPH, Vector-Borne Disease Section (VBDS) and the interested public

1. Roll Call and Opening Comments

The meeting was brought to order by Dr. Lane at 10:03 a.m.

2. Committee Member Updates

Dr. Miller highlighted three recent publications in the literature.

- A gene in the *Borrelia burgdorferi* genome (HrpA) influences important metabolic functions of the bacteria essential for mammalian infectivity by syringe inoculation and tick transmission. This has implications for understanding the spirochete's enzootic cycle. (Salman-Dilgimen A, Hardy PO, Radolf JD, Caimano MJ, Chaconas G. PLoS Pathog. 2013 Dec;9(12):e1003841. doi: 10.1371/journal.ppat.1003841. Epub 2013 Dec 19.)
- A study was performed whereby larval *Ixodes scapularis* ticks were fed on patients with evidence of Lyme disease to assess the safety of using *I. scapularis* larvae for the xenodiagnosis of *B. burgdorferi* in humans. The methodology was well tolerated and *B. burgdorferi* DNA (not viable spirochetes) was recovered from ticks that fed on 2/36 patients; one patient with an erythema migrans rash, the other with post-treatment Lyme disease. (Marques A, Telford SR 3rd, Turk SP, Chung E, Williams C, Dardick K, Krause PJ, Brandenburg C, Crowder CD, Carolan HE, Eshoo MW, Shaw PA, Hu LT. Clin Infect Dis. 2014 Apr;58(7):937-45. doi: 10.1093/cid/cit939. Epub 2014 Feb 11.)
- Recent tests offered by Advanced Laboratories are still being examined by two independent labs.

Dr. Stricker reported on research he participated in whereby live *B. burgdorferi* spirochetes were recovered from semen samples or vaginal secretions from patients with positive Lyme disease tests; couples having unprotected sex had the same strain. This study is in progress and is not published.

Ms. Barsocchini reported that Lymedisease.org had 37 medical professionals (12 from southern California) apply for funds this year. The annual Lyme walk will be in Santa Monica in May.

Dr. Lane summarized a study that his lab and Alameda County Vector Control District conducted from 2009 to 2013 that has just been submitted for publication. Six different *B. burgdorferi* sensu lato strains and two relapsing group spirochete strains were identified in ticks or small mammals from multiple sites in Alameda County. Two of these spirochete strains are novel to North America. Gabi Margos at the German National Reference Centre for *Borrelia* and Natalia Federova have been working to further characterize the novel strains; he acknowledged Lucia Hui of Alameda VCD who has helped to support this study. Dr. Lane also reported on recent meetings he attended, including a tick working group meeting sponsored by the California Department of Public Health and a Kaiser-sponsored physician tick-borne disease workshop with over 80 health care providers in attendance.

Committee Comments: Dr. Stricker added that a recent study by Salkeld et. al in the San Francisco Bay Area found *Borrelia burgdorferi*, *Borrelia miyamotoi*, and other uncharacterized *Borrelia* sp. in *Ixodes pacificus* ticks. Infection prevalence ranged from 0-6%. In response to a question, Dr. Lane noted that *B. miyamotoi* has been shown to be transmitted transovarially in *I. pacificus* ticks and Dr. Padgett (CDPH, via phone) noted that most studies show the proportion of transovarial transmission is approximately 5%.

3. CDPH Progress Report (Denise Bonilla)

Ms. Bonilla reviewed the tick-borne disease prevention activities of CDPH. For the general public, CDPH tweets and Facebook postings resulted in messages being spread through other health agencies' social media efforts. Ms. Bonilla reviewed the VBDS outreach activities to the medical community; this included lectures to medical staff and supplying materials per requests. VBDS continues to provide presentations and educational materials on tick-borne diseases to local vector control agencies and other partners.

Committee comment:

Dr. Lane remarked that keeping a database on tick records is important. Single tick testing provides the best estimates for pathogen prevalence; at least 100-150 adult ticks per site should be tested for meaningful data. Testing pools of ticks is indicated when prevalence is anticipated to be very low and if the goal is primarily to detect the presence of the agent.

4. Comparative sampling of substrates for *Ixodes pacificus* nymphs at three Sierra foothill sites (Mark Novak)

Dr. Novak reported that sampling of *Ixodes pacificus* nymphs was conducted during the spring months of 2012 and 2013 to compare relative substrate (leaf litter, downed tree or limb, and standing tree) utilization by *I. pacificus* nymphs within similar habitats in Sacramento, El Dorado, and Placer Counties. Additionally, the project compared nymphal *Borrelia burgdorferi* s.s. infection prevalence from the different questing substrates at these locations. For both years,

nymphs were most commonly collected on downed wood, followed by tree trunks and leaf litter. In Sacramento and El Dorado Counties, where the most infected ticks were collected, nymphs from leaf litter had the highest *B. burgdorferi* infection prevalence (26%) in comparison to those collected from logs (18%) and tree trunks (12%).

Committee comment:

- Dr. Lane provided results from a study he previously published where a higher prevalence of *B. burgdorferi* was found in nymphal ticks on wood products. Most nymphal ticks are found in the substrate where they drop from their host. Comparing infection prevalence of nymphal ticks on different substrates should be done in a variety of areas of the state to estimate what might be the most risky area for the acquisition of infected immature ticks. He noted that flagging the leaf litter only collected around 6% of nymphal ticks present at that time.
- Dr. Kjemtrup remarked that this was an important study that expanded our knowledge of the ecology of Lyme disease. She requested the committee's suggestions on how this information could be incorporated into public health messaging.
 - Ms. Chew answered that it would be good to have a press release when studies like this are done to aid public and medical knowledge on this subject.
 - Dr. Kjemtrup noted that CDPH tweets and Facebook messages might be a good way to highlight this information.
 - Ms. Messner remarked that it would be better to have press releases to primary care providers rather than social media. She suggested that CDPH could send releases to the local health departments.
 - Dr. Lane commented that the use of the [interactive tick map](http://cdphgis.maps.arcgis.com/apps/SocialMedia/index.html?appid=8d99fb1135d1424f9d8a8711acb7d459) (<http://cdphgis.maps.arcgis.com/apps/SocialMedia/index.html?appid=8d99fb1135d1424f9d8a8711acb7d459>) helps to alert the public about endemic areas and can be helpful to clinicians.

5. Tick identification card update (Given by Anne Kjemtrup for Claudia Erickson)

A review was done of the existing CDPH tick identification card to see what changes should be made in the future. A reprint with better quality photos is in the works. The possibility of adding the brown dog tick to the card was discussed.

Committee suggestions:

- General agreement to remove the engorged tick pictures and add the brown dog tick, although retaining one engorged tick picture might still be useful to show people what they look like.
- Possibly change the text on where ticks are found to make space.
 - Habitat areas could be changed to read “natural areas”
 - Add logs, wood, and possibly grass and brush.
- Change Rocky Mountain spotted fever to *Rickettsia* or “spotted fever group.”
- Add *B. miyamotoi* to the list of diseases and possibly change the title of the card to “Commonly encountered ticks in California.”
- The scale is not noticeable and possibly redundant except when viewed online. Be sure life

stages are labeled.

- Refer to the Rhode Island Tick Encounter site for possible template pictures rather than silhouettes of the stages.

6. Lyme Disease case reporting (Anne Kjemtrup)

Dr. Kjemtrup reviewed the process of Lyme disease case surveillance in California. As a surveillance system, it is designed to capture as many cases as possible that fit the national surveillance case definition. This provides epidemiologically useful (who, what, where, why) information. She commented on recent studies from the U.S. Centers for Disease Control and Prevention (CDC) that suggested that Lyme disease is under-reported by a factor of 10. She noted that under-reporting is typical of most reportable diseases and that the CDC has long estimated under-reporting of Lyme to be by a factor of 10—the recent studies simply have quantified the estimate. This knowledge does not impact what we know about the ecology and epidemiology of the disease but may impact, for instance, resource allocation.

Dr. Kjemtrup's responses to committee comments included:

- Electronic reporting has facilitated case reporting and is implemented now throughout most of California; just a few counties remain in transition to the new system.
- Diagnostic images such as PET scans are usually not included in the electronic reports since that information is not used to assess case status; however, such information can be included for the record.
- An electronic reporting system cannot change the information flow (from health care practitioner to local health department to state to CDC) to bypass the counties. Some counties include cases that do not fit surveillance case definitions in the records passed to the state; others do not include these cases.
- About a third of Lyme disease cases are acquired outside of the county of residence, and of those, half are acquired out of state. We don't know if the under-reporting factor of 10 applies to California since the CDC studies were done in the eastern United States.

7. General Public Comment Period

- A member of the public highlighted the need for the state to be more involved in holding meetings for health practitioners and offer CME credit if possible.
 - Dr. Kjemtrup noted that CDPH currently does not have resources to offer CME credit and that educational material and presentations on Lyme disease are made available to physicians throughout the state.
- A member of the public noted that they are aware of years when there were 1200 *B. burgdorferi* positive lab results from one lab. The speaker wondered why so many positive tests do not turn out to be Lyme disease cases. The speaker was interested in knowing how many lab reports from IgeneX actually get reported from the state to the CDC. It was added that people are still told by their doctors that they cannot get Lyme disease in California and we need to work to rectify this misinformation.
- Has there been tick testing in Riverside and San Bernardino counties for Lyme disease? Ms. Bonilla answered that there have been many adult ticks tested but few testing positive; there is an effort to find and test nymphal ticks from those areas.

- Lyme disease changed the quality of life for the next speaker. It is an important disease that needs to be brought to the attention of health care providers, the public, and the military in California. The speaker wondered if CDPH had the intention of creating guidelines for control of tick-borne diseases on public lands, including plans to use oral bait vaccine with mice. The cost of this project is much less than the cost of dealing with chronic Lyme. Dr. Kjemtrup noted that providing prevention information and approaches on public lands is part of CDPH's tick-borne disease education program. A baited vaccine approach for small mammals would be effective in small areas around rural homes, but not on large areas of land.
- Is there a test for *Borrelia miyamotoi* in development? Dr. Kjemtrup noted that several groups are working on test development.
- Is there going to be follow-up in Bay Area parks regarding *B. miyamotoi* infection prevalence in ticks? Dr. Peavey and Ms. Bonilla both noted that local vector control agencies and CDPH will continue work in that region and post trails with tick warning signs.
- The speaker requested that CDPH literature contain information about possible tick exposure from dogs. Dr. Kjemtrup noted that CDPH literature includes a statement to check for ticks on pets.
- A speaker stated that a CDC employee, while attending a California Kaiser symposium in February, recommended that when a patient has a tick bite, that doctors shouldn't give prophylactic treatment because the infection rate is only 1 to 2 %. She remarked that this is a misconception.
- Phone service cut off the last public speaker who had the following comment/question summarized below from email follow up:
 - The caller asked if test results from IgeneX were specifically ignored in surveillance testing, either by state or local directive.
 - Dr. Kjemtrup replied that CDPH does not tell local health departments to ignore IgeneX laboratory reports. Laboratory reports for Lyme disease may not be included in the surveillance case count for many reasons including:
 - Test not complete and no information forthcoming (for example ELISA only).
 - Test not appropriate in relation to time of disease onset.
 - Test run as a screening with no suspicion of current disease or case previously reported.
 - There are cases that fit surveillance criteria with laboratory results from IgeneX in the system.

Meeting adjourned at 1:46 p.m. by Dr. Lane