

## **Public Tick IPM Working Group**

**November 18, 2020**

Please send additions, omissions or other corrections to [lmcsherry@ipminstitute.org](mailto:lmcsherry@ipminstitute.org)

The Working Group meets via conference call on the second Wednesday of each month at 1:00PM CT (2:00PM EST). The following notes are for November 18, 2020.

### **Roll**

1. Allegra Lowit, Thermacell
2. Bob Maurais, Mainely Ticks
3. Chris Przybyszewski, US BIOLOGIC
4. Dawn Gouge, Arizona State University
5. Deborah Thomson, One Health Lessons
6. Dr. Eboni Cornish, International Lyme and Associated Diseases Society Educational Foundation
7. Heather Szerlong, Ticknology
8. Jean Tsao, Michigan State University
9. Jill Auerbach, Hudson Valley Lyme Disease Association
10. Jody Gangloff-Kaufmann, Cornell University
11. Joellen Lampman, New York State IPM Cornell University
12. Larry Scrapper, Inter-Tribal Environmental Council
13. Leah McSherry, IPM Institute of North America
14. Lynne Jess, North Central IPM Center
15. Marco Notarangelo, Department of Health and Human Services
16. Mason Kauffman, US BIOLOGIC
17. Monica White, Colorado Tick-Borne Disease Awareness Association
18. Peter Werts, IPM Institute of North America
19. Roberto Cortinas, University of Nebraska
20. Scott Larson, Metropolitan Mosquito Control District
21. Thomas Mather, University of Rhode Island
22. Tim Fox, Madison Area Lyme Disease Support Group

### **Agenda**

1. Dr. Eboni Cornish, International Lyme and Associated Diseases Society Educational Foundation, Clinical assessment and management of tick-borne disease
2. NCIPMC grant application review
3. Tick IPM Special Session details
4. Updates, comments and announcements from the working group members

**A recording of this call and presentation is available by visiting this link:**

<https://transcripts.gotomeeting.com/#/s/350b18da35ba92b2a5275b4d001c6c656794552b913886f34815e5dedbecdd80>

Dr. Eboni Cornish, International Lyme and Associated Diseases Society Educational Foundation, Clinical assessment and management of tick-borne disease, [doccornish@amenclinic.com](mailto:doccornish@amenclinic.com)

**1. Presentation: Clinical assessment and management of tick-borne disease, Dr. Eboni Cornish, International Lyme and Associated Diseases Society Educational Foundation**

- History/Background
  - Does Lyme disease exist?
    - Lyme disease is controversial
    - Some doctors don't believe in Lyme disease
  - Lyme disease has been around since the ice age
    - First discovered in mummies
      - 5,300-year-old ice mummy discovered in Eastern Alps about 20 years ago
    - Gene evidence of *Borrelia* and clinical evidence of arthritis
  - Reservoir host
    - After hatching from the egg, the larva (stage 1) latches onto and feeds off the blood of the white-footed mouse (reservoir)
    - Next (stage 2), during late spring, the fed larva falls off the mouse reservoir and transforms into a dormant nymph
    - Stage 3 nymphal activity begins. The tick attaches to a new host, possibly a human. This stage is responsible for most cases of Lyme
  - Only the deer tick has consistently been identified as being a vector of Lyme disease
  - Epidemiology of Lyme
    - Increasing incidence
    - Increasing numbers of cases and importance
    - Under reporting: 7-10 fold
    - CDC – 2013 increased estimate of new cases per year from 30,000 to 300,000
    - Geographic disease
      - 2 major foci in the United States
      - Upper Midwest/Mid-Atlantic
      - Lyme disease has been reported in every state
    - With over 300,000 new cases each year, Lyme disease is the fastest growing infectious disease in the United States
  - Infections Disease Society of America (ISDA)
    - A medical association representing physicians, scientists and other health care professionals who specialize in infectious disease
    - To improve the health of individuals, communities and society by promoting excellence in patient care, education, research, public health and prevention relating to infectious disease
  - International Lyme and Associated Diseases Society (ILADS)

- An international multidisciplinary medical society dedicated to the diagnosis and appropriate treatment of Lyme and its associated diseases.
- Promotes the understanding of Lyme and its associated diseases through research and education and strongly supports physicians and other health care professionals dedicated to advancing the standard of care for Lyme and its associated diseases.
- Study from Brown University
  - Clinical Antibiotic Retreatment of Lyme disease in patients with persistent symptoms
    - Presented at hearing of the IDSA Review Panel 2009 and published 2012
    - Concluded that the IDSA guidelines should be held in question
    - Reviewed four NIH – funded studies and examined retreatment of patients with Chronic Lyme
      - Klempner 2001
        - Inadequate statistical analysis
      - Krupp 2003
        - Worsening fatigue post treatment
      - Fallon 2008
        - Worsening function and severe pain post treatment
      - Fallon and Krupp findings indicate that re-treatment of Lyme disease in patients with persistent symptoms a bio-statistical review by contemporary clinical trails 2012
- An alternate interpretation of the literature

	<b>IDSA</b>	<b>ILADS</b>
<b>Rash</b>	Majority >70%	In minority <50%
<b>Chronic</b>	Does not exist	Common
<b>Two-tier</b>	Sensitive	Poor sensitivity
<b>Seronegative</b>	No	Yes
<b>IgM positivity</b>	>1 month false positive	Often present in chronic disease
<b>Use of antibiotics &gt;4 weeks</b>	Not recommended	May be appropriate on a case-by-case basis
<b>Single dose Doxycycline prophylaxis</b>	Effective	Likely ineffective

- Lyme disease typical acute presentation
  - Feder advises that “...patients from Lyme disease endemic areas who have fever and fatigue, especially within a month following a deer tick bite, should be considered for empiric antibiotic therapy for early localized Lyme disease i.e. don’t delay treatment for tests, even without a rash

- Diagnosis
  - 25%-<50% develop Erythema Migrans (EM) rash from Lyme disease
    - Rash may not occur at all
    - If it does occur, it may not be recognized
      - May be atypical
      - May be in “hidden” location
  - Acrodermatitis chronica atrophicans rash
    - Usually found in European strains of *Borrelia*
    - Inflammatory stage with blue or reddish discoloration
    - As it progresses, the tissue begins to wrinkle
    - Can become atrophic
    - Non-healing ulcers can occur
  - Lyme disease typical acute presentation
    - Usually within weeks of exposure:
      - Fever
      - Headache
      - Joint pain
      - Fatigue
    - Consider Lyme or other TBD if otherwise viral illness, occurs in an endemic area and occurs during late spring/summer
  - Left facial palsy
  - Arthritis
    - Often different joints (migratory)
    - Latency weeks to years
  - Lyme disease clinical presentation
    - If left untreated:
      - Chronic Lyme Disease
      - Chronic fatigue (CFS like)
      - Nervous system
        - Pain
          - Peripheral neuropathies
          - Headaches
        - Facial or Bell’s palsy
        - Autonomic dysfunction
        - Fractured sleep
        - Neuropsychiatric-bipolar, depression, panic
        - Cognitive impairment
        - Potentially Parkinson’s, ALS and MS “like”
      - Arthritis/arthralgias
        - Often in different joints and “migratory”
      - 5% may develop carditis (e.g. heart block)

- 10% neurologic manifestations
  - Meningitis
  - Cranial Nerve Palsis or radiculopathy
- 60% arthritis
- What makes Lyme resistant impaired immune function
  - Decreased CD57 subset of natural killer (NK) cells
  - Produce chemicals to disable antibodies
  - CYST form
    - Relatively dormant form of the bacteria
    - Cell wall deficient, decreasing ability for host immune system response
    - Can convert back to spirochetal form
- Co-infections
  - Babesia
    - Air hunger
    - Cough
    - Fatigue
    - Headache
    - Shaking chills
    - Sweats
  - Bartonella (also known as Cat Scratch Fever)
    - Lymph node enlargement
    - Striae
    - Red popular lesions
    - Subcutaneous nodules
    - Neuropathy
    - Pains in the soles of feet
    - Brain fog
  - Ehrlichia
    - Elevated liver enzymes
    - Fever
    - Fatigue
    - Muscle aces
  - RMSF
    - Sudden fever
    - Rash
    - Joint pain
  - Mycoplasma
    - Fatigue
    - Musculoskeletal symptoms

- Cognitive problems
      - Can have more than one co-infection at a time
  - Chronic Lyme Disease
    - Chronically ill for at least 6 months, signs and symptoms at least in part caused by an active infection by the organism *Borrelia burgdorferi* or related strains
    - Cognitive impairment
    - Postural orthostatic tachycardia syndrome (POTS)
      - Sever change in blood pressure from lying to standing
    - Neuropsychiatric illness
      - Paranoia, dementia, schizophrenia, bipolar disorder, panic attacks, major depression, anorexia nervosa and obsessive-compulsive disorder
    - Parkinson's
    - ALS-Motor neuron disease
  - Seronegativity
    - Contributing factors
      - Multiple strains
      - Bb evading immune detection
        - Intracellular
        - Change in physical characteristics
        - Biofilm
        - Immune dysfunction
- Management
  - To date, there are no convincing published data that repeated or prolonged courses of either oral or IV antimicrobial therapy are effective for such patients
  - The consensus of the Infectious Diseases Society of America expert-panel members is that there is insufficient evidence to regard "chronic Lyme disease" as a separate diagnostic entity
  - Doxycycline prophylaxis
    - IDSA-recommendation for post tick bite prophylaxis: single stat dose of doxycycline 200mg if within 72 hours of a tick bite
    - Design flaws
      - Duration of follow up was inadequate
      - Patients may be asymptomatic early in the infection only to develop symptoms of late disease after a latent period lasting months to years
      - In essence, validation of efficacy was not adequately employed
  - Preferred regimen for post exposure to a tick bite:
    - Doxycycline 100mg twice daily for 20 days

- 100% efficacy in preventing Bb infection using a sustained release formulation of minocycline lasting 19 days
- Outlook
  - Assimilate the literature and provide a balanced assessment of guidelines
  - If we don't, Lyme disease will become worse
- Questions
  - Tim Fox
    - What are the doctors told as far as guidelines to follow?
      - Most doctors are told to follow the IDSA recommendations
        - One day of doxy
      - There isn't consistency with recommendations
        - Dr. Cornish recommends treating patients until they get better – need a minimum of 20 days
        - Co-infections require different forms of treatment depending on what the serology shows
        - Antibiotics + immune system boosters + dietary changes
    - Does the CDC endorse one of these recommendations?
      - CDC recommends the same as IDSA – one day of doxy
  - Tom Mather
    - There are a lot of non-pathogenic Rocky Mountain spotted fever *Rickettsias* out there that are transmitted and they all don't cause RMSF - they cause either no or lesser pathology. A good example is *Rickettsia parkeri* in Gulf Coast ticks. Might be good to look at the spotted fever group *Rickettsias* in a slightly different light. In pets, they may test positive for RMSF and be aggressively treated but it's probably a lesser pathogenic than *Rickettsia*. In ticks, it's hard to find the *Rickettsia* germ but there are other spotted fever germs. This comes up in particular when people say their serology shows they had RMSV but was bitten by a lone star tick and we all know that lone star ticks have *Rickettsia amblyommii*, which can cause a positive serology but doesn't really cause the disease yet people will swear that they've had RMSF from a non-vector tick
      - You're absolutely right – just like with *Borrelia*, there are definitely different strains of these organisms and should be keeping that in mind during diagnosis
  - Dr. Cornish closing remarks:
    - Please reach out with any questions or to go into more in-depth about co-infections.
    - Check out the [ILADS website](#) – ILADS is the largest tick-borne disease organization in the world

## 2. NCIPMC grant application review

- Introduce Peter Werts and Scott Larson as the co-project directors
  - o Peter Werts
    - Peter is a fellow IPM Institute employee and may have met some of the working group members at the Tick Academy – he gave a presentation on sprayer collaboration on the UW-Campus
    - Peter has been with the IPM Institute since 2009 and most of his work is managing projects with farmers and food companies
    - He’s coordinated and directed several working groups funded by the NCIPMC
    - His role will mostly be in the background to provide the necessary leadership support for Leah as she executes the objectives
  - o Scott Larson
    - Will serve as a co-project director with Peter
    - Main support will be given towards organizing and planning the second Tick Academy in the Twin Cities
- Reviewed the survey that was sent to working group members.
  - o [Click here](#) to complete a survey (will take approx. 2 minutes) on what IPM practices are being implemented as a result in participating in the working group.
  - o Four working group members have taken the survey so far.
  - o Although we have since turned in our application for renewed funding where we included the results we have so far, please still consider taking the survey to elevate our demonstration of how the working group has met its objectives. It’s an important aspect of the working group’s grant application to show that these monthly calls have a positive impact on those that attend. Further responses will be included in next year’s grant application. Thanks to everyone who has already taken the survey!
- Working group members were asked to share what accomplishments they have had as a result of participating in the working group to include in the working group’s grant application for renewed funding.
  - o No accomplishments were shared.
  - o Feel free to email [Leah McSherry](#) if you would like to share any accomplishments.
- Reviewed working group objectives:
  - o Increase awareness about Tick IPM strategies among working group members and public health professionals.
  - o Host the second annual Tick Academy in Minneapolis-St. Paul in 2021.
  - o Develop continuing education opportunities for public health professional organization members and working group members.
  - o Increase awareness among working group members and public health professional about the Asian longhorned tick and potential public health impacts by publishing a National Pest Alert.
- Call out for additional letters of support.
  - o The working group has nine letters of support so far. Thanks to everyone who has already provided their support!
  - o Please [email Leah](#) if you’d like to provide a letter of support.

### 3. Tick IPM Special Session details

- The working group is hosting a Tick IPM Special Session on December 10th from 1-2:30pm, which is the day after the December Tick IPM WG call
- This event will feature two presentations, the first by Dr. Thomas Mather and Megan Dyer from the University of Rhode Island Center for Vector-borne Disease
  - o Their presentation will be about green, or natural, products for tick control and assessing their effectiveness
- The second presentation will be by Dr. Deborah Thomson
  - o Her presentation will be about an ever-growing Global One Health Education Movement that is changing lives around the world for both children and adults.
  - o She'd like all of you to join in on this event to learn more about how this global movement got started, where it is going, how tick-borne disease education fits into it, and how you can contribute to it while positively impacting your community during these challenging times.
- Although early bird registration is over, the current registration fee is a very reasonable at \$20
- We're proud to have this event sponsored by the North Central IPM Center, Tick Box and US BIOLOIC
- Please [visit the working group's website](#) for more information and to access the registration form or feel free to [email Leah](#) with any questions

### 4. Updates, comments and announcements from the working group members

- None

These notes are for a Working Group call on November 18, 2020. Future calls will continue to fall on the second Wednesday of the month at 1 PM Central time.

**The Public Tick IPM Working Group is funded by the USDA National Institute of Food and Agriculture, Crop Protection and Pest Management Program through the North Central IPM Center.**