

## WINTER NEWSLETTER 2010-2011

Tick-borne  
North Carolina,



Infections Council of  
Inc

### *Highlights...*

**Scroll down to see these features and more!**

- Two tick workshops held by state
- A new *Borrelia* (cousin of the Lyme disease bacteria) found in NC ticks
- Chapel Hill neighborhood developed their own bow-hunting program
- Lone star tick report by a state expert, includes map of NC lone star distribution
- Lyme disease article in Winston- Salem Journal with letter to the editor from TIC-NC (which the paper did not publish)
- More on meat allergies related to tick bites
- NC publication on using animal data to predict human tick-borne infections
- Case report from Yale: Untreated Lyme disease
- Columbia University: web link on STARI, the Lyme disease controversy, and more
- Updates in CDC surveillance criteria for RMSF and babesiosis

***Quote of the month...*** : " Lone Star Larvae Questing on Blade of Grass" Marcee Toliver



photo by Marcee Toliver, NC State Pest Management

## STATE VECTOR-BORNE DISEASE TASK FORCE MEETING SCHEDULE

July 1st 9:30-12:30PM Friday or July 25th 9:30-12:30PM Monday

November 4th 9:30-12:30PM Friday.

NOTE: **ACTUAL MEETING TIME IS 10-12** BUT ROOM IS OPEN LONGER FOR GATHERING.

These meetings, open to the public, will be in room 1A224 at 2728 Capital Blvd. Folks are not to park in the front visitors spaces if they will be in the building longer than two hours...building management will have them towed.

## DECEMBER SYMPOSIUM ON VECTOR-BORNE DISEASES HELD DECEMBER 8, 2010

A symposium on vector-borne diseases, held December 8, 2010, included talks on Lyme disease, babesia, bartonella, changing ecology, rickettsial diseases, mosquito-borne diseases and more. Attended by 350 people, it was sponsored by NC State University College of Veterinary Medicine, UNC Gillings School of Global Public Health, and the Office of Research NSCU Office of Professional Development. Two board members from TIC-NC participated as well as two of our members.

If you are interested in downloading the presentations from the Eighth Annual "One Medicine" Symposium, **Reality Bites: A One Medicine Approach to Vector-borne Diseases**, visit the [North Carolina Department of Agriculture & Consumer Services website](http://www.ncagr.gov/oep/oneMedicine/OneMedicineSymposium2010.htm). at:  
<http://www.ncagr.gov/oep/oneMedicine/OneMedicineSymposium2010.htm>

## NC TICK AND TICK-TRANSMITTED DISEASE WORKSHOP HELD IN RALEIGH, MARCH 23

Tick season is here, are you up on the latest about ticks and tick-transmitted disease? Are you familiar with *Amblyomma maculatum*, *Rickettsia parkeri*, ehrlichiosis, four-posters, and how to protect yourself and others from tick bites?

The DENR Public Health Pest Management Section, DHHS Communicable Disease Branch and NSCU Entomology Department held a one-day Ticks and Tick-borne Diseases Workshop at 2728 Capital Boulevard in Raleigh on March 23. State employees and others from all over the state attended.

## WINTER TICK STORY, SHOWS NEED TO ALWAYS BE ALERT

From a TIC-NC, Inc member: "On December 10 my husband was peacefully reading his mail about 5pm after having come in from his shop, when I saw him whip off his glasses and examine them. He said, "You are not going to believe this!" A male *I scapularis* (black-legged tick) was crawling across the lens. He had not been in the woods, and was only a few feet outside his shop that day. Seems we can't even let down our guard in the winter anymore."

## **NEW *BORRELIA* FOUND IN TICKS IN NORTH CAROLINA**

The state is sending NC collected *Ixodes scapularis* ticks for testing by the CDC to get an estimate of the prevalence of *B. miyamotoi* here. To date, one tick has tested positive. This borrelia is related to the relapsing fever types. It is not yet known if it is a human pathogen. See information from Tennessee below:

### **High-Prevalence *Borrelia miyamotoi* in Wild Turkeys (*Meleagris gallopavo*) in Tennessee**

**Authors:** Scott, M. C.; Rosen, M. E.; Hamer, S. A.; Baker, E.; Edwards, H.; Crowder, C.; Tsao, J. I.; Hickling, G. J. Journal of Medical Entomology, Volume 47, Number 6, November 2010 , pp. 1238-1242(5)

**Abstract:** During spring and fall 2009, 60 wild turkeys (*Meleagris gallopavo*) harvested by Tennessee hunters were surveyed for *Borrelia* spp. by sampling their blood, tissue, and attached ticks. In both seasons, 70% of turkeys were infested with juvenile *Amblyomma americanum*; one spring turkey hosted an adult female *Ixodes brunneus*. Polymerase chain reaction assays followed by DNA sequencing indicated that 58% of the turkeys were positive for the spirochete *Borrelia miyamotoi*, with tissue testing positive more frequently than blood ( $P = 0.015$ ). Sequencing of the 16S-23S rRNA intergenic spacer indicated =99% similarity to previously published sequences of the North American strain of this spirochete. Positive turkeys were present in both seasons and from all seven middle Tennessee counties sampled. No ticks from the turkeys tested positive for any *Borrelia* spp. This is the first report of *B. miyamotoi* in birds; the transmission pathways and epidemiological significance of this high-prevalence spirochetal infection remain uncertain.

## **CHAPEL HILL NEIGHBORHOODS DEVELOP THEIR OWN DEER CULLING PROGRAM AND PETITION THE TOWN COUNCIL FOR A CITY-WIDE PROGRAM**

**Chapel Hill, Fall 2010.** Mt Bolus Rd. and another neighborhood petitioned the Town Council in early 2009 to address the increasing urban deer population along with the Chapel Hill Sustainability Committee. The Town applied to the North Carolina Wildlife Resources Commission for the Urban Archery 2011 season permit and the Council held a public forum in April 2010 to hear from experts and citizens. At that forum, it was learned that it was legal to bowhunt within town limits. Since the forum, little has been done by the town staff to organize a program to cull the deer herd because of resistance from a minority of the Council members. In mid 2010, a memo from the town Manager to the Council reported that NCWRC now estimates

the Orange County deer population at 25 to 35 per square mile, which means that there may be up to 1200 deer within Chapel Hill. Cases of Lyme disease and other tick-borne infections are increasingly being contracted.

In response to this new information, concerned citizens surveyed their Mt. Bolus Rd, neighborhood to determine how many property owners would permit bowhunting (2 to 1 in favor, the rest want deer removed from their property if wounded or dead), and got information from the town Manager about the legal "do's and don'ts" for urban hunting. Voluntary guidelines for deer hunting were drawn up and circulated throughout the neighborhood for comments and final acceptance. Several hunters have already begun the hunting which continued through the end of February. To date there have been no complaints.

Another resolution is being prepared from the Sustainability Committee to ask the Town Council to organize a deer culling program instead of relying on individual neighborhoods taking matters into their own hands.

## **REPORT ON LONE STAR TICKS IN NC BY A STATE TICK EXPERT**

### **Lone Star Ticks in North Carolina**

by Marcée Toliver, Public Health Pest Management, State of North Carolina

As reported in the spring 2009 NC Mosquito and Vector Control Association newsletter, Public Health Pest Management (PHPM) is currently involved in intensive work with ticks and tick borne disease in North Carolina. One facet of this work involves collecting data on the tick species frequently attaching or crawling on people.

This work was begun in February of 2009 and is dominated by the presence of the Lone Star tick, especially throughout the coastal plain and piedmont counties. The lone star tick, *Amblyomma americanum*, makes up about 90% of the submissions received from 61 counties found on either people or their pets.

The adult female is easily recognized by the single white dot in the center of the back, hence the name 'lone star' tick. The male is slightly smaller and has white markings or streaks around the margins of the body which are not easily seen without magnification. The life cycle consists of four stages: egg; six-legged larva or "seed ticks"; an eight-legged nymph; and the adult male or female. This species is referred to as a three-host tick since it feeds on different animals for each feeding stage.

Adult lone star ticks mate on the host and the female drops to the ground to lay her eggs and then dies. The male dies soon after mating with one or more females. Each female can lay a cluster of thousands of eggs on the ground or in leaf litter –unlucky for the person who happens to stand close by soon after the eggs have hatched! I've heard many stories from people describing the effect of the seed ticks crawling up their pants leg like a wave!

Lone star mouthparts, like other ticks, are exquisitely designed for piercing the skin and sucking fluid. A small incision is made in the skin with barbed, piercing mouthparts, the chelicerae, in a sawing motion. The central structure, the hypostome contains barbed teeth much like a fish hook. After being inserted, fluid is secreted that will cement the mouthpart to the surrounding skin, making removal more difficult. Feeding is definitely a commitment and lengthy process for ticks.

Lone star ticks seem particularly well suited to life in North Carolina and are pervasive! They can be found in wooded areas, along paths and trails and grassy areas. They appear to tolerate a wide range of environmental conditions, temperatures and soils – with submissions starting rather abruptly in February, soon after the first week of unseasonably warm weather. Adults and nymphs appeared almost simultaneously and have continued to keep pace throughout the spring and early summer. Collectors in the field are just now starting to report encounters with the larval stage but submissions of larval ticks have not been received as of this writing. Larval lone stars usually appear in late summer, from August to October.

It is interesting to note that of the 526 lone star ticks submitted, 40% have been attached and 60% were found before becoming attached to feed. Nymphs appear to be equally likely to go undetected – 50% were attached. Females and males are slightly more likely to be found and pulled off before attaching (70% and 60% respectively), probably due to their larger size. Anecdotally, many people report that they can feel the adults crawling and usually have an itching or burning sensation as soon as the adults start to attach.

Lone star ticks are recognized as the primary vector of human monocytic ehrlichiosis, tularemia and are being studied for their role in transmitting Southern tick associated rash illness (STARI), described as a lyme-like illness which is not yet fully understood.



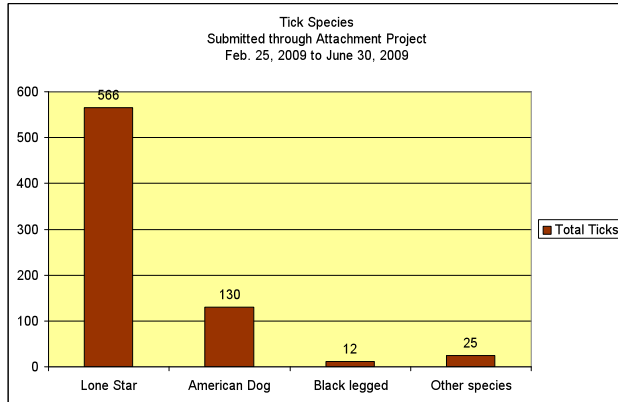
*Female lone star tick*



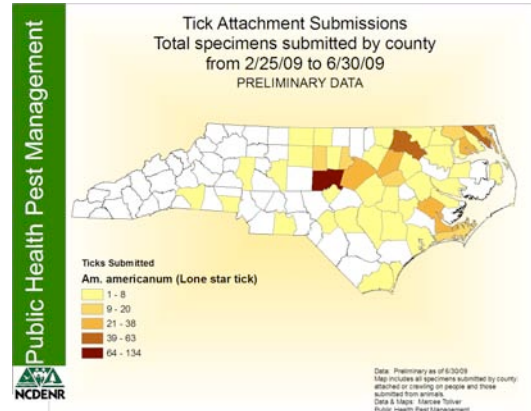
*Lone star male*



*Lone star nymph attached to skin*



*Species submitted to date*



*Map of Lone star ticks submitted*

## **MORE ON THE TICK-RELATED ALLERGIC REACTION FROM BEEF, PORK, AND LAMB**

Lone star larvae are also being studied for their possible role in a delayed allergic reaction to beef, pork or lamb. Some people may have severe anaphylactic reactions. There are many more links on the internet.

A study from Australia: <http://ama.com.au/node/4606>

Virginia: <http://www.gettheskinney.com/2009/10/27/tick-bites-red-meat-and-hives/>  
<http://www.jacionline.org/article/S0091-6749%2809%2901268-8/abstract>

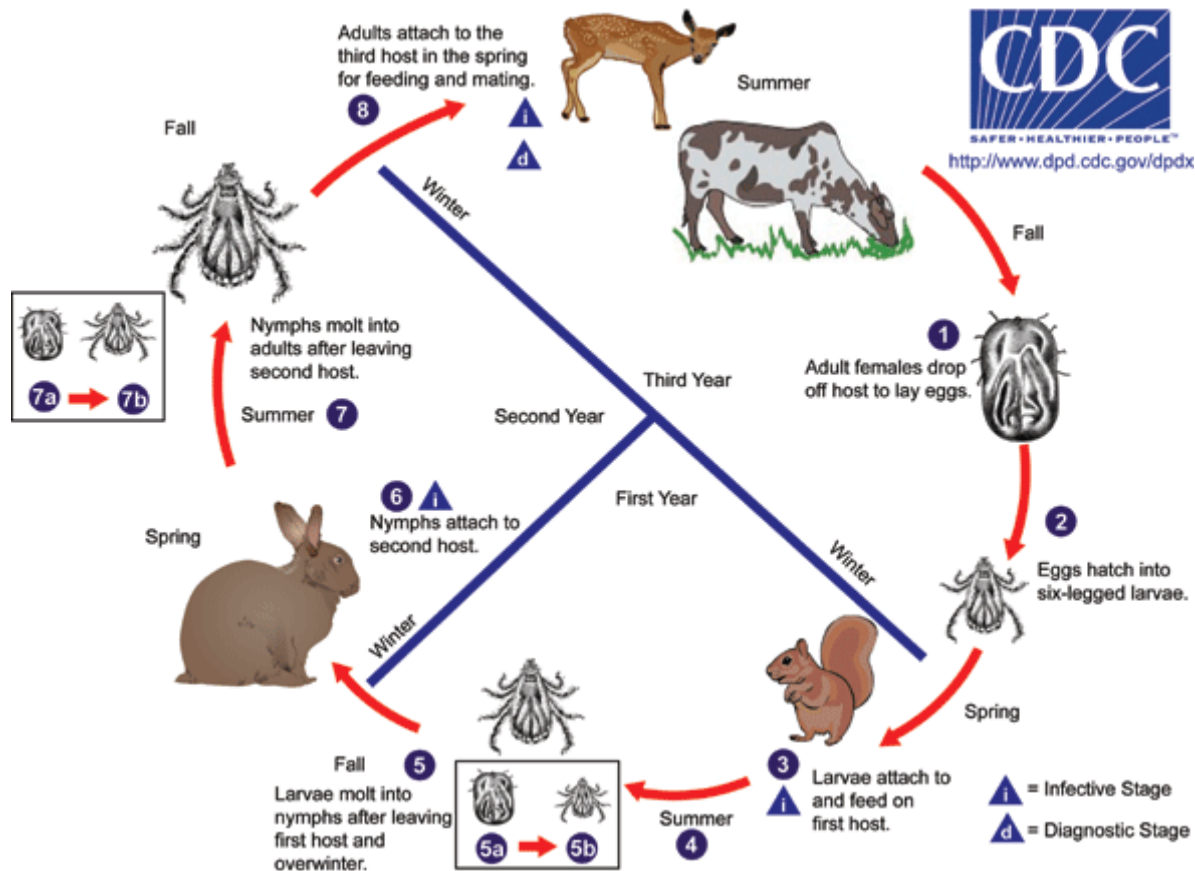
[J Allergy Clin Immunol.](#) 2011 May;127(5):1286-1293.e6. Epub 2011 Mar 31.

May 2011. The relevance of tick bites to the production of IgE antibodies to the mammalian oligosaccharide galactose- $\alpha$ -1,3-galactose. Commins SP, James HR, Kelly LA et al. Asthma and Allergic Diseases Center, University of Virginia Health System, Charlottesville, Va.  
<http://www.ncbi.nlm.nih.gov/pubmed/21453959>

## **TICK LIFE CYCLE-DISEASE FIGURE FROM THE CDC**

Life cycle of three-host ixodid (hard) ticks. The adult is considered the diagnostic stage, as identification to the species level is best achieved with adults. Most ticks of public health importance follow this pattern, including members of the genera *Ixodes* (Lyme borreliosis, babesiosis, human granulocytic ehrlichiosis), *Amblyomma* (tularemia, ehrlichiosis, Lyme borreliosis, Rocky Mountain spotted fever), *Dermacentor* (Rocky Mountain spotted fever, Colorado tick fever, tularemia, tick paralysis), and *Rhipicephalus* (Rocky Mountain spotted fever, boutonneuse fever).

Three-host ixodid ticks have a life cycle that usually spans three years, although some species can complete the cycle in only two years. Adult females drop off the third host to lay eggs after feeding, usually in the fall. Eggs hatch into six-legged larvae and overwinter



in the larval stage. In the spring, the larvae seek out and attach to the first host, usually a small rodent. Later in the summer, engorged larvae leave the first host and molt into nymphs, usually in the fall. The ticks overwinter in this stage. During the following spring, the nymphs seek out and attach to the second host, usually another rodent or lagomorph. The nymphs feed on the second host and drop off later in the summer. Nymphs molt into adults - off the host in the late summer or fall, and overwinter in this stage. The next spring, adults seek out and attach to a third host, which is usually a larger herbivore (including cervids and bovids), carnivore, or human. The adults feed and mate on the third host during the summer. Females drop off the host in the fall to continue the cycle. Females may reattach and feed multiple times. The three hosts do not necessarily have to be different species, or even different individuals. Also, humans may serve as first, second or third hosts. <http://www.dpd.cdc.gov/dpdx/HTML/Ticks.htm> Accessed October 24, 2010  
 When accessed May 13, 2011, the information listed for lone star ticks (*Amblyomma*) is tularemia, ehrlichiosis, Rocky Mountain spotted fever (RMSF), and boutonneuse fever.

## LYME DISEASE STORY IN WINSTON-SALEM JOURNAL, December 29, 2010

*Lyme disease uptick in Virginia hasn't reached N.C. so far*

By Wesley Young, Winston-Salem Journal, Winston-Salem, North Carolina

December 29, 2010

<http://www2.journalnow.com/news/2010/dec/29/wsmet01-lyme-disease-uptick-in-virginia-hasnt-reac-ar-651518/> or <http://tinyurl.com/25cwduh>

Lyme disease has been on the upsurge in Virginia in recent years, but authorities aren't sure whether its southward march means future trouble for North Carolina. North Carolina saw Lyme disease rise from 2002 to 2004, although nothing close to what people in such Northern states as Connecticut and New Hampshire routinely experience. In most years, North Carolina has fewer than 50 confirmed cases per year.

**Letter to the editor in response as submitted, 2 January 2011, from TIC-NC- not published:**

It is unfortunate that the December 29 article on Lyme disease in Virginia and North Carolina did not mention that Wake County was declared endemic for Lyme disease last years ago according to very strict criteria. (See <http://www.newsobserver.com/2010/03/18/394678/lyme-disease-found-in-wake.html>.)

A number of other North Carolina counties have had local cases reported.

Comparing data among states can be misleading as reporting practices and requirements can differ from state to state and even within the same state over time which has happened in NC. Cases 'reported' and sent to the CDC for data compilation means the cases were accepted. An unknown number of cases are screened out for various reasons and not all medical practitioners report even though they are supposed to do so. Therefore, the official number of cases of any reportable disease according the accepted reports do not indicate the actual number of cases.

I must disagree that "prevention of all tick diseases can usually be accomplished by quickly removing any tick found on the body." If it were this easy to find the ticks, some of which are the size of poppy seeds, we would not see the CDC reporting over 20,000 cases of Lyme disease a year and thousands of other tick-borne diseases. Prevention includes staying out of tick-infested areas and applying the appropriate tick repellent

**NC PAPER ON USING ANIMAL AND HUMAN DATA SOURCES TO DETECT INCREASE IN HUMAN TBIs**

**Evaluation of Routinely Collected Veterinary and Human Health Data for Surveillance of Human Tick-Borne Diseases in North Carolina**

Sarah K. Rhea, Seth W. Glickman, Anna Waller, Amy Ising, Jean-Marie Maillard, Elizabeth M. Lund, Larry T. Glickman. *Vector-Borne and Zoonotic Diseases*. January 2011, 11(1): 9-14. doi:10.1089/vbz.2009.0255.

**Abstract** Tick-borne diseases are an important cause of human morbidity in North Carolina. This study evaluated the use of routinely collected veterinary hospital and human hospital emergency department (ED) data for earlier signal detection compared with routine reporting of tick-borne diseases to the North Carolina Division of Public Health in 2006 and 2007. The Early Aberration Reporting System was used to detect the earliest indication of an increase in number



of dogs infested with ticks that were brought to veterinary hospitals and in number of people presenting to EDs with a tick-related chief complaint or who had an ED International Classification of Diseases diagnosis code of tick-borne disease. Results indicate that systematic monitoring of veterinary hospital and human ED data can detect increases in tick activity 4 weeks earlier than the current surveillance method, which would facilitate timely initiation of tick prevention and increased clinical awareness among veterinarians and physicians.

## **A CASE OF UNTREATED LYME DISEASE FROM YALE**

*A case revealing the natural history of untreated Lyme disease.* Schoen RT.  
Section of Rheumatology, Yale University School of Medicine, Suite 6A, 60 Temple Street, New Haven, CT 06510, USA.

A 71-year-old woman presented to a rheumatologist with what she believed to be a 2-year history of Lyme disease, progressing from erythema migrans to Lyme arthritis. Investigations, history, physical examination, and serologic testing confirmed the diagnosis of Lyme disease. The patient refused antibiotic therapy during the first 2 years of her illness. During the next 2 years, she consulted a rheumatologist, but declined antibiotic therapy. She continued to have recurrent episodes of arthritis, following which she was successfully treated with doxycycline, given initially for 2 weeks, with a second, 4-week cycle administered 2 months later. This case illustrates the natural history of untreated Lyme disease, which is rarely observed in most patients since diagnosis almost always leads to successful antibiotic treatment. Furthermore, this case also demonstrates that infection with *Borrelia burgdorferi* can persist for years in untreated patients; however, antibiotic therapy is still likely to be effective, despite long-term infection.

<http://eutils.ncbi.nlm.nih.gov/entrez/eutils/elink.fcgi?dbfrom=pubmed&id=21173795&retmode=ref&cmd=prlinks>

## **WEBLINK FOR COLUMBIA UNIVERSITY MEDICAL CENTER ON THE LYME DISEASE CONTROVERSY**

The Columbia University Medical Center site presents materials on the Lyme related medical controversy issues as well as general tick issues and diseases. There is an excellent discussion of STARI or Master's Disease, the Lyme-like infection from lone star ticks. <http://www.columbia-lyme.org/patients/controversies.html>

## **ARTICLE IN ARCHIVES OF INTERNAL MEDICINE ON PRACTICE GUIDELINES**

Many Recommendations Within Practice Guidelines Not Supported by High-Quality Evidence, Study Finds

*ScienceDaily* (Jan. 10, 2011) — More than half of the recommendations in current practice guidelines for infectious disease specialists are based on opinions from experts rather than on evidence from clinical trials, according to a report in the January 10 issue of *Archives of Internal Medicine*, one of the JAMA/Archives journals.

"During the past half century, a deluge of publications addressing nearly every aspect of patient care has both enhanced clinical decision making and encumbered it owing to the tremendous volume of new information," the authors write as background information in the article. "Clinical practice guidelines were developed to aid clinicians in improving patient outcomes and streamlining health care delivery by analyzing and summarizing data from all relevant publications. Lately, these guidelines have also been used as tools for educational purposes, performance measures and policy making."

Interest has been growing in critically appraising not only individual guidelines but also the entire sets of guidelines for specialists and subspecialists, the authors note. Dong Heun Lee, M.D., and Ole Vielemeyer, M.D., of Drexel University College of Medicine, Philadelphia, analyzed the strength of recommendations and overall quality of evidence behind 41 guidelines released by the Infectious Diseases Society of America (IDSA) between January 1994 and May 2010.

Recommendations within the guidelines were classified in two ways. The strength of recommendation was classified in levels A through C, with A indicating good evidence to support the recommendation, B indicating moderate evidence and C indicating poor evidence; some guidelines also included levels D and E. The quality of evidence was classified in levels I through III, with level I signifying evidence from at least one randomized controlled trial, level II indicating evidence from at least one well designed clinical trial that was not randomized and level III indicating evidence was based on opinions of respected authorities based on clinical experience, descriptive studies or reports of expert committees.

The 41 analyzed guidelines included 4,218 individual recommendations. Of these, 14 percent were classified as backed by level I evidence, 31 percent as level II and 55 percent as level III. Among class A recommendations, 23 percent were level I and 37 percent were level III.

In addition, the researchers selected five recently updated guidelines and compared them to their previous versions. In all but one case, the new versions cited an increased number of articles, and in every case the number of recommendations increased. However, most of these additional recommendations were supported only by level II or III quality of evidence. Only two updated guidelines had a significant increase in the number of level-I recommendations.

There are several possible explanations for these findings, the authors note. In comparison to other specialties, relatively few large multicenter randomized controlled trials have been conducted in the field of infectious diseases. "Many infectious diseases occur infrequently, present in a heterogeneous manner or are difficult to diagnose with certainty," the authors write. "For others, a randomized controlled trial would be impractical or wasteful or might be deemed unethical." In addition, some of the recommendations address questions about diagnosis or

prognosis, neither of which could be studied in a randomized controlled trial and thus could never receive the highest quality rating.

"Guidelines can only summarize the best available evidence, which often may be weak," the authors conclude. "Thus, even more than 50 years since the inception of evidence-based medicine, following guidelines cannot always be equated with practicing medicine that is founded on robust data. To improve patient outcomes and minimize harm, future research efforts should focus on areas where only low-level quality of evidence is available. Until more data from such research in the form of well-designed and controlled clinical trials emerge, physicians and policy makers should remain cautious when using current guidelines as the sole source guiding decisions in patient care."

### **Editorial: Guidelines No Substitute for Critical Thinking**

"What are providers to make of recommendations in guidelines if most of these recommendations are based on opinion? First, these data reinforce that absolute certainty in science or medicine is an illusion. Rather, evaluating evidence is about assessing probability," writes John H. Powers, M.D., of Scientific Applications International Corporation, Bethesda, Md., in an accompanying editorial.

"Perhaps the main point we should take from the studies on quality of evidence is to be wary of falling into the trap of 'cookbook medicine,'" Dr. Powers writes. "Although the evidence and recommendations in guidelines may change across time, providers will always have a need to know how to think about clinical problems, not just what to think."

"As with individual research studies, providers should critically evaluate guidelines and the evidence on which they are based and how relevant recommendations are locally at their institutions and in their patients," Dr. Powers concludes. "Especially for subspecialists, guidelines may provide a starting point for searching for information, but they are not the finish line. The fact that many recommendations are based on opinion should also serve as a call to future researchers to critically evaluate and study the questions that need better answers."

**Analysis of Overall Level of Evidence Behind Infectious Diseases Society of America Practice Guidelines** Dong Heun Lee, MD; Ole Vielemeyer, MD.  
Arch Intern Med. 2011;171(1):18-22. doi:10.1001/archinternmed.2010.482

## ***BORRELIA* AND LYME ARTHRITIS**

**Relationship between immunity to *Borrelia burgdorferi* outer-surface protein A (OspA) and Lyme arthritis.** Steere AC, Drouin EE, Glickstein LJ.

Center for Immunology and Inflammatory Diseases, Massachusetts General Hospital, Harvard Medical School, Boston, [USA.asteere@partners.org](mailto:USA.asteere@partners.org)

Antibiotic-refractory Lyme arthritis may result from *Borrelia burgdorferi*-induced autoimmunity

in affected joints. Such patients usually have certain HLA-DRB1 molecules that bind an epitope of *B. burgdorferi* outer-surface protein A (OspA), and cellular and humoral immune responses to OspA are greater in patients with antibiotic-refractory arthritis than in those with antibiotic-responsive arthritis. Recent work in a mouse model suggests that, during *B. burgdorferi* infection, OspA in genetically susceptible individuals stimulates a particularly strong T(H)1 response, which may be one of several factors that can help set the stage for a putative autoimmune response in affected joints. However, vaccination with OspA did not induce arthritis in this mouse model, and case and control comparisons in human vaccine trials did not show an increased frequency of arthritis among OspA-vaccinated individuals. Thus, a vaccine-induced immune response to OspA does not replicate the sequence of events needed in the natural infection to induce antibiotic-refractory Lyme arthritis.

**Eds note:** This study suggests that persistent arthritis after LD is NOT autoimmunity, but the ongoing presence of Bb antigens. These antigens may trigger the immune response in which similar self-antigens are involved with inflammation. If the arthritis were true autoimmunity, the vaccine-immunized hosts would have a persistent and obvious rheumatoid-like inflammatory polyarthritis (as opposed to the monoarthritis or pauciarthritis seen in Lyme).

## **18 TYPES OF LYME DISEASE BACTERIA FOUND WORLD-WIDE TO DATE**

### **The expanding Lyme Borrelia complex-clinical significance of genomic species?**

Stanek, G. and Reiter, M. (2011), *Clinical Microbiology and Infection*, 17: 487-493.

Article first published online: March 17, 2011 <http://dx.doi.org/10.1111/j.1469-0691.2011.03492.x>

### **Abstract**

Ten years after the discovery of spirochaetes as agents of Lyme disease in 1982 in the USA, three genomic species had diverged from the phenotypically heterogeneous strains of *Borrelia burgdorferi* isolated in North America and Europe: *Borrelia afzelii*, *B. burgdorferi sensu stricto* (further *B. burgdorferi*), and *Borrelia garinii*. Whereas *B. burgdorferi* remained the only human pathogen in North America, all three species are aetiological agents of Lyme borreliosis in Europe.

Another seven genospecies were described in the 1990s, including species from Asia (*Borrelia japonica*, *Borrelia turdi*, and *B. tanukii*), North America (*Borrelia andersonii*), Europe (*Borrelia lusitaniae* and *Borrelia valaisiana*), and from Europe and Asia (*Borrelia bissettii*). Another eight species were delineated in the years up to 2010: *Borrelia sinica* (Asia), *Borrelia spielmanii* (Europe), *Borrelia yangtze* (Asia), *Borrelia californiensis*, *Borrelia americana*, *Borrelia carolinensis* (North America), *Borrelia bavariensis* (Europe), and *Borrelia kurtenbachii* (North America).

Of these 18 genomic species *B. afzelii*, *B. burgdorferi* and *B. garinii* are the confirmed agents of localized, disseminated and chronic manifestations of Lyme borreliosis, whereas *B. spielmanii* has been detected in early skin disease, and *B. bissettii* and *B. valaisiana* have been detected in specimens from single cases of Lyme borreliosis. The clinical role of *B. lusitaniae* remains to be substantiated.

## RECENT CDC SURVEILLANCE CRITERIA CHANGES

### Recent CDC changes for tick-borne infections.

The CDC announced in Jan 2011 that their re-designed and updated website pertaining to **Rocky Mountain Spotted Fever** was up: <http://www.cdc.gov/rmsf/index.html>

Changes to CDC nationally **notifiable infectious diseases**.

[http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6001a7.htm?s\\_cid=mm6001a7\\_e&source=govdelivery](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6001a7.htm?s_cid=mm6001a7_e&source=govdelivery)

**Modifications to Table I and Table II** Two new conditions have been added to the list of nationally notifiable infectious diseases: **babesiosis** and coccidioidomycosis. Incidence data for babesiosis will appear in Table I, and incidence data for coccidioidomycosis will appear in Table II.

## NEW CDC WEBSITES FOR EHRLICHIOSIS AND ANAPLASMOSIS

The newly revised and updated websites for ehrlichiosis and anaplasmosis are now available from the CDC website. The pages contain a lot of good information as well as the most recently available national statistics.

<http://www.cdc.gov/ehrlichiosis/>

<http://www.cdc.gov/anaplasmosis/>

**NORTH CAROLINA** For state disease data by county:

<http://www.epi.state.nc.us/epi/gcdc/pdf/CDbyCountybyYear2000-2005.pdf>

- The tick occurrence and attachment maps have been updated on the PH Pest Management website. Please see: [http://www.deh.enr.state.nc.us/phpm/ticks\\_projects.htm](http://www.deh.enr.state.nc.us/phpm/ticks_projects.htm)

### *Advertisement*

The advertiser below has supported the efforts of TIC-NC through financial donations.



## INSECT SHIELD INFORMATION AND FORM FOR GETTING CLOTHES TREATED

**What is Insect Shield? - from their website [www.insectshield.com](http://www.insectshield.com)**

Insect Shield Repellent Apparel and Insect Shield Repellent Gear are revolutionary products designed to provide long-lasting, effective and convenient personal insect protection... Recently, EPA has granted Insect Shield extended durability claims for its apparel registration, through 70 washings... (The) proprietary formulation of the insect repellent permethrin results in effective, odorless insect protection that lasts the expected lifetime of a garment.

**Which insects does Insect Shield repel?**

Insect Shield Repellent Apparel has been proven and registered to repel mosquitoes, ticks, ants, flies, chiggers, and midges (no-see-ums).

**To purchase Insect Shield clothing:**

[www.insectshield.com/work](http://www.insectshield.com/work)  
[www.insectshield.com/camp](http://www.insectshield.com/camp)

**Get a free treated bandana** if you become a Facebook fan. Simply go to:

[www.facebook.com/insectshield](http://www.facebook.com/insectshield)

And click on the “Like” button then email their mailing address to [marketing@insectshield.com](mailto:marketing@insectshield.com)

**Send off your own clothes for treatment:**

The form is available from TIC-NC or the Insect Shield website. Pricing: 1 Item of Clothing -- \$9.95/piece 3-19 Items -- \$8.33/piece 20 or More Items -- \$7.95/piece plus shipping. (current prices)

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*TIC-NC is grateful for the financial contributions of Insta-Shield, Inc.*

*Tick-Borne Infections Council of North Carolina is a non-profit organization formed to improve the recognition, treatment, control, and understanding of tick-borne diseases in North Carolina. We are all-volunteer and appreciate donations.*

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Any contact information is provided for you to learn about tick borne illnesses and related issues. Our organization is not responsible for the content of other material or for actions as a result of opinions or information expressed which may appear from time to time.

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