Tick-Borne Infections Council of North Carolina, Inc.

2014 NEWSLETTER, Volume 1

Quote of the Season: **"***Over the last two decades, the known number and significance of tick-borne diseases have markedly increased. This tendency is likely to continue, and ticks will remain a group of interest to researchers as more species are collected from humans and consequently viewed as potential disease vectors." From the book,* ***The Hard Ticks of the World,*** *by Alberto A. Guglielmone, et al,. 2014*

Highlights…

Scroll down to see these features and more!

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State Vector-Borne Disease Task Force Meeting Schedule

August 8th
November 14th

All meetings are from **10 a.m. to 12 p.m.** and are open to the public. The meetings will be held at: Office of the Chief Medical Examiner, 4312 District Drive, Raleigh, NC, 27607

Links to Letters to Medical Providers from the State Department of Public Health on Lyme Disease and Rickettsial Diseases

These links are to the letters the state Department of Public Health issues every year to medical providers on Lyme disease and the Rickettsial diseases such as RMSF:

2014 Rickettsial Disease Memo
2014 Lyme Disease Memo

Each year the state Division of Public Health issues these updates on several vector-borne diseases. This year they have added a caveat to the Lyme disease memo having to do with the problems distinguishing between STARI (Southern Tick Associated Rash Illness) and Lyme disease since the rash and symptoms they each cause are symptomatically indistinguishable, no test is available for STARI, and tests for acute Lyme disease are not reliable. The state memo suggests that where the incidence of Lyme disease is 'low,' patients presenting with Lyme-like symptoms be observed instead of being treated since it would be likely that they have STARI rather than Lyme disease. Such a recommendation must necessarily be based on the assumption that STARI is a completely benign and self-limited disease. Unfortunately, this has never been proven in any long-term studies and there is published literature suggesting that STARI can have clinically important consequences. Therefore, we suggest that any clinician refusing to treat a patient with Lyme-like symptoms consider that 1.) STARI has never been proven to be a benign disease, 2.) it is possible to acquire Lyme disease in many parts of the state, 3.) great harm may occur if Lyme disease and possibly STARI are untreated, 4.) it is medically irresponsible to not treat a symptomatic patient with tick exposure, and, 5.) non-treatment/'observing' may violate medical ethics and put the medical provider in a legally vulnerable position.

North Carolina Data on Reportable Tick-borne Infections

Disease	Total cases by year of report 2011 FINAL (Confirmed/Probable/Suspected)	Total cases by year of report 2012 Final (Confirmed/Probable/Suspected)	Cases between 1/1/12 and 12/31/2013 (Probable + Confirmed)
Lyme disease	88 (18/70/135)	122 (27/95/80)	179 (38 confirmed)
Rickettsioses	327 (16/311/281)	591 (12/579/341)	421 (11 confirmed)
Ehrlichia	83 (27/56/102)	109 (18/91/56)	78 (23 confirmed)
Anaplasma	21 (1/20/19)	21 (0/21/21)	14(0 probable)

* illness onset may be prior to 1/1/13

Note: in 2013 Allegheny County had 2 confirmed cases of Lyme disease in persons who had not traveled out of the county for 30 days before their tick exposure. **Therefore, Allegheny County is now endemic for Lyme disease bringing the total of endemic counties in NC to 4. The other counties are Wake, Guildford, and Haywood.**

Counties with one case of locally acquired Lyme disease: Cleveland (2008), Wilkes (2009), Wilson (2009), Pitt (2009), Carteret (2009), Gates (2011), Perquimans (2011), Rowan (2013), Union (2013), Caldwell (2013).

More on the Demise of Pest Management, the State Section That Helped Protect the Public from Pests and Vector-borne Problems and Diseases

As our readers know, on July 1, 2011, the state legislature voted to abolish the Pest Management Section in the Department of Environmental and Natural Resources. The loss of the state Pest Management Section was a terrible tragedy for the people of North Carolina. Under the direction of Dr. Nolan Newton, the section had recently begun to make great advances in the understanding of the tick species as well as distribution and infection rates of various tick-borne pathogens in NC. Now, the loss of this section and the medical entomologists and environmental scientist that staffed it is being acutely felt as mosquito problems continue and tick-borne diseases continue to increase.

We are one of the few states in the U.S. without public health entomologists.
It is helpful to review some of their activities:

- provided information to the public about the biology, control, and avoidance of ticks and mosquitoes
- provided information about the diseases ticks and mosquitoes carry
- gave technical assistance to local agencies operating mosquito control programs
- made tick and mosquito collections and monitored diseases they carry
- identified tick samples from citizens and healthcare providers
- conducted workshops and training for public health workers
- created educational materials
- maintained a website
- exhibited at numerous events
- gave advice on bedbugs, lice, cockroaches, flies, fleas, and other public health pests

Now, all of these functions that helped protect the public are not available. TIC-NC is now being increasingly called upon to give presentations and to staff educational booths. Below is an article related to this by http://www.northcarolinahealthnews.org

Ticks Continue to Bite While State Loses Grip

December 10, 2013

Nonprofit agencies and businesses step up to provide a link to the public and health care providers on tick-borne illnesses in North Carolina. By Nancy Beach

State budget swallows pest-control education and services
The North Carolina legislature's 2011 budget bill dealt a significant blow to tick education and control efforts here. The Department of Environment and Natural Resources was significantly reorganized, and its Division of Environmental Health was abolished. While some of its programs were transferred to other agencies, the Public Health Pest Management Section, which had housed the state's tick control and research programs, was also eliminated. The section had provided education, insect

identification, population control and avoidance services to county health departments and the public about a number of pests besides ticks, including mosquitoes, fleas, lice, cockroaches and bedbugs.

Effective July 1, 2011, all employees of the section, which included two entomologists and three environmental scientists, were laid off. "I was shocked by that, and I am still shocked by it," said Marcia Herman-Giddens, a child and family health consultant and co-founder of the nonprofit group Tick-borne Infections Council of North Carolina (TIC-NC), based in Pittsboro. "They provided bite-prevention materials and assistance and advice with control. Members of the public could also contact that section if they needed help with identifying what had bitten them, and now they have no one to call." "This is a huge loss to our state and to research because we collaborated with them to see where research is needed on this issue," said Meagan Vaughn, a researcher who recently earned her doctorate from the epidemiology department at UNC's Gillings School of Global Public Health for work done on tick-borne illness and its prevention.
TIC-NC has been raising awareness of all diseases through their website, presentations, a newsletter and printed brochures.


A female Lone Star tick. Lone Star ticks are aggressive biters of humans and are thought to transmit at least a half dozen diseases. Photo by James Gathany/Centers for Disease Control.

One recent project, funded by a $5,000 grant from the Yahoo! Employee Foundation, enabled TIC-NC to provide education to Orange County school nurses about tick-related issues. The group is assisting in developing a standard procedure for treating any student who is found to have an attached tick.

In addition, a handout in both English and Spanish accompanied all 7,200 students' end-of-year report cards describing ticks that are a danger to North Carolinians, the proper removal of ticks, symptoms of infection and what to do if symptoms occur after tick exposure. "We're far away from making an impact at the state level, but we are making progress locally and have really gained a lot of momentum in the last year," Brownley said. "We're working with the Orange County and Wake County schools, and we hope to add Chatham soon." For the entire article see: http://www.northcarolinahealthnews.org/2013/12/10/ticks-continue-to-bite-while-state-loses-grip/

Discover Magazine: The Confounding Debate Over Lyme Disease in the South

The debilitating tick-borne disease is well-documented north of the Mason-Dixon line, but does it exist beyond that? By Wendy Orent | Friday, November 01, 2013

…So if there is Lyme — or Lyme-like illness — in the South, what could be spreading it? The aggressive lone star tick, *Amblyomma americanum*, which frequently bites people as well as other animals, is a prime suspect. In the early 1990s, researchers realized its bite could cause a roundish, gradually spreading mottled red rash that was a virtual ringer for the erythema migrans (EM) rash, the classic signature of Lyme disease in the Northeast. But since few Lyme experts believe that the lone star can harbor and transmit Lyme *Borrelia*, the rash the tick leaves upon biting is never attributed to Lyme disease. Instead, in the South, the illness is called STARI, for Southern Tick-Associated Rash Illness. According to microbiologist Barbara Johnson, one of the top Lyme disease experts at the

CDC's Division of Vector-Borne Diseases in Fort Collins, Colo., STARI is relatively benign, presenting only with the rash and flulike symptoms of early Lyme. Its cause remains unknown… For entire story see: http://discovermagazine.com/2013/dec/14-southern-gothic#.UnqU0-K2JR0

Bald Head Association: NC Island is Trying Deer Contraception

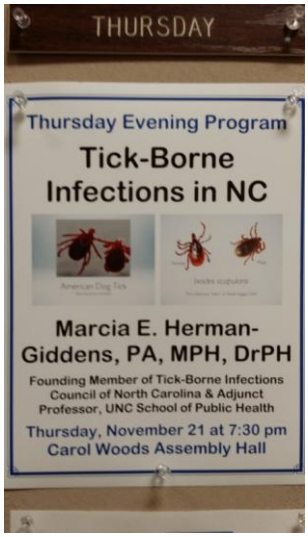
December 2013 Island Report: Deer Management Immuno-Contraception Moves to the Field ~Patrick Amico, Conservation Biologist

After a successful and impressive fundraising campaign by the Friends of Bald Head Island Deer, the whitetailed deer immuno-contraception program began field operations on January 6, 2014. This January, 30 female deer will be vaccinated with a tested and EPA-approved pharmaceutical drug called GonaCon, which is produced by the USDA Wildlife Services. The drug will be administered at dusk and into the night. Partners, including BHI Conservancy staff, will tranquilize deer along roadsides and at bait stations using anesthesia administered by a quiet, CO2-powered dart gun. For complete details see: http://bhinews.com/index.php?function=story_view&id=668

Fundraiser Held for Pittsboro Woman with Lyme Disease to Help With Treatment Costs

It was a cold day and rain was pouring so hard one couldn't even see the sign clearly outside the Kiwanis Building where the event was held. The Community Against Lyme: A Fight For Treatment auction/dinner fundraiser was held on December 14th from 2-6pm at the Pittsboro Kiwanis Club. All proceeds went towards helping pay for medical treatments. The young woman was sick since 2007 before being diagnosed with Lyme disease (LD). She had sought help at Duke, the Mayo Clinic, and Johns Hopkins. All said she did not have Lyme disease, but were not sure what she had. After treatment for LD began recently, she has gone from being in a wheel chair to being able to walk again with the help of a cane.

TIC-NC Gave a Presentation to Residents of Carol Woods Continuing Care Community in Chapel Hill



University of North Carolina Grand Rounds in Pediatrics on Lyme Disease, Jan 9, 2014

Paul Lantos, MD, from Duke University presented "Lyme Disease in the South" to the Pediatric Department at UNC. The full presentation may be viewed at:
http://echo2.med.unc.edu:8080/ess/echo/presentation/accf728c-d1bf-4a69-9f5e-c626b1ed1d9e

Study Finds Possible Evidence of Other Species of the Lyme Disease Bacteria That May Cause Disease in the South

Geographic and genospecies distribution of *Borrelia burgdorferi* sensu lato DNA detected in humans in the United States. Kerry L Clark, Brian F Leydet and Clifford Threlkeld
Abstract

The present study investigated the cause of illness in human patients primarily in the southern United States with suspected Lyme disease based upon erythema migrans (EM)-like skin lesions and/or symptoms consistent with early localized or late disseminated Lyme borreliosis. The study also included some patients from other states throughout the USA. Several polymerase chain reaction (PCR) assays specific for either the Borrelia genus or only for Lyme group Borrelia spp. (B. burgdorferi sensu lato), and DNA sequence analysis, were used to identify Borrelia spp. DNA in blood and skin biopsy samples from human patients. Borrelia burgdorferi sensu lato DNA was found in both blood and skin biopsy samples from patients residing in southern states and elsewhere in the U.S., but no evidence of DNA from other Borrelia spp. was detected. Based on phylogenetic analysis of partial flagellin (flaB) gene sequences, strains that clustered separately with B. burgdorferi sensu stricto, B. americana, or B. andersonii were associated with Lyme disease-like signs and symptoms in patients from southern states, as well as some other areas of the country.

Strains most similar to B. burgdorferi sensu stricto and B. americana were found most commonly, and appeared to be widely distributed among patients residing throughout the U.S. The study findings suggest that human cases of Lyme disease in the southern U.S. may be more common than previously recognized, and may also be caused by more than one species of B. burgdorferi sensu lato. This study provides further evidence that B. burgdorferi sensu stricto is not the only species associated with signs and/or symptoms consistent with Lyme borreliosis in the USA.

Lyme Disease Community Blows the Whistle on Corruption Within the CDC

Saturday, 16 November 2013 10:05 By Jessica Bernstein, Truthout | Op-Ed

The Centers for Disease Control and Prevention (CDC) recently announced that rather than 30,000 new cases of Lyme disease each year in the United States, there are likely 300,000. This article presents a point of view about why it's taken the CDC so long to acknowledge that Lyme disease has reached epidemic proportions.
http://truth-out.org/opinion/item/20053-lyme-disease-community-blows-the-whistle-on-corruption-within-the-cdc

More Than You Might Want to Know About How Ticks Get Their Mouthparts Into You

How ticks get under your skin: insertion mechanics of the feeding apparatus of *Ixodes ricinus* ticks, Richter D, et al. October 2013 online, *Proc. R. Soc. B 22 December 2013 vol. 280 no. 1773 20131758*

Abstract. The tick *Ixodes ricinus* uses its mouthparts to penetrate the skin of its host and to remain attached for about a week, during which time Lyme disease spirochaetes may pass from the tick to the host. To understand how the tick achieves both tasks, penetration and attachment, with the same set of implements, we recorded the insertion events by cinematography, interpreted the mouthparts' function by scanning electron microscopy and identified their points of articulation by confocal microscopy. Our structural dynamic observations suggest that the process of insertion and attachment occurs via a ratchet-like mechanism with two distinct stages. Initially, the two telescoping chelicerae pierce the skin and, by moving alternately, generate a toehold. Subsequently, a breaststroke-like motion, affected by simultaneous flexure and retraction of both chelicerae, pulls in the barbed hypostome. This combination of a flexible, dynamic mechanical ratchet and a static holdfast thus allows the tick to solve the problem of how to penetrate skin and also remain stuck for long periods of time.
The entire paper is available at no charge. The photographs are amazing.
http://rspb.royalsocietypublishing.org/content/280/1773/20131758.short

Anaplasma May Be Transmitted to the Fetus

Demonstration of Transplacental Transmission of a Human Isolate of *Anaplasma phagocytophilum* in an Experimentally Infected Sheep by E. Reppert, et al.

Anaplasma phagocytophilum, first identified as a pathogen of sheep in Europe, more recently has been recognized as an emerging tick-borne pathogen of humans in the U.S. and Europe. Transmission of *A. phagocytophilum* is reported to be by ticks, primarily of the genus *Ixodes*. While mechanical and transplacental transmission of the type genus organism, *A. marginale*, occur in addition to tick transmission, these modes of transmission have not been considered for *A. phagocytophilum*.

Recently, we developed a sheep model for studying host–tick–pathogen interactions of the human NY-18 *A. phagocytophilum* isolate. Sheep were susceptible to infection with this human isolate and served as a source of infection for *I. scapularis* ticks, but they did not display clinical signs of disease, and the pathogen was not apparent in stained blood smears. In the course of these experiments, one sheep unexpectedly gave birth to a lamb 5 weeks after being experimentally infected by inoculation with the pathogen propagated in HL-60 cells. The lamb was depressed and not feeding and was subsequently euthanized 18 h after birth. Tissues were collected at necropsy for microscopic examination and PCR to confirm *A. phagocytophilum* infection. At necropsy, the stomach contained colostrum, the spleen was moderately enlarged and thickened with conspicuous lymphoid follicles, and mesenteric lymph nodes were mildly enlarged and contained moderate infiltrates of eosinophils and neutrophils. Blood, spleen, heart, skin and cervical and mesenteric lymph nodes tested positive for *A. phagocytophilum* by PCR, and sequence analysis confirmed that the lamb was infected with the NY-18 isolate. Transplacental transmission should therefore be considered as a means of *A. phagocytophilum* transmission and may likely contribute to the epidemiology of tick-borne fever in sheep and other mammals, including humans.
http://onlinelibrary.wiley.com/doi/10.1111/tbed.12120/full. *Transboundary and Emerging Diseases.* Special Issue: Emerging and Re-emerging Epidemics Affecting Global Health. Volume 60, Issue Supplement s2, pages 93–96, November 2013

Lyme Disease is Increasing in the United Kingdom

Lyme disease in the United Kingdom, by Simon W Dubrey, et al.

Lyme disease, while still an uncommon disease in the UK, is on the increase. Case numbers have increased by 3.6-fold since 2001, with over 950 cases reported by the Health Protection Agency (HPA) in 2011, compared with less than 500 cases annually pre-2004. HPA indications of the true incidence are suggested to be closer to 3000 cases/year, of which around 82% of cases are indigenously acquired. Three genospecies, *Borrelia burgdorferi sensu stricto*, *Borrelia afzelli* and *Borrelia garinii*, represent the predominant pathogenic variants in the UK. Erythema migrans is the commonest manifestation, occurring in 60%–91% of cases. In the UK, neuroborelliosis is the most common complication, while myocarditis is unusual, and death from either conduction disease or carditis is extremely rare. The role of Borrelia infection in chronic dilated cardiomyopathy in the UK remains unproven. Controversy over the existence of either 'chronic Lyme disease' and/or 'post-Lyme disease syndrome' continues unabated. National medical societies, patient advocacy groups, insurance companies, lawyers, doctors, the private health medical sector and scientific journals have all become embroiled in this bitter controversy. New developments include diagnostic tests able to detect Lyme disease at an earlier stage, shorter durations of antibiotic therapy and potential advances in vaccines against Borrelia.
Postgrad Med J doi:10.1136/postgradmedj-2012-131522

Poland Study Found Five Genospeicies of Lyme Disease and the New Disease, Borellia Miyamotoi

Journal of Vector Ecology 38(2):345-352. 2013
doi: http://dx.doi.org/10.1111/j.1948-7134.2013.12050.x

Relationship between Temporal Abundance of Ticks and Incidence of Lyme Borreliosis in Lower Silesia Regions of Poland by D. Kiewra and G. Zaleśny[2]

The aim of this study was to identify the factors determining the incidence of Lyme borreliosis (LB) in southwestern Poland by estimating the prevalence of *B. burgdorferi* s. 1. in *I. ricinus,* and to analyze the temporal abundance of ticks in relation to epidemiological data on LB incidence. Host-seeking ticks collected in 2011 in four districts in southwestern Poland were examined by nested PCR for the presence of *B. burgdorferi* s.l. In total, 2,507 host-seeking *I. ricinus* were collected. The temporal abundance of ticks varied between districts. The minimal infection rates with *B. burgdorferi* s.l. were 11.5% for nymphs and 37.7% for adults. There were no statistical differences in the level of infection between districts either for nymphs or for adults. Five different genospecies were identified within the *B. burgdorferi* s.l. complex: *B. garinii, B. afzelii, B. lusitaniae, B. valasiana,* and *B. burgdorferi* s.s., and additionally *B. miyamotoi.* Our results point to a relationship between tick temporal abundance and LB incidence both for adults and nymphs. The high abundance of ticks is positively correlated with the number of LB cases in humans. The tick's abundance may be considered as a major factor in determining the LB risk in southwestern Poland.
Note: In Europe any species of the Borrelia burgdorferi complex that causes human illness is called Lyme disease.

New Book on Lyme Disease for Patients, Caregivers, and Medical Professionals

Dr. Kathy Spree has written a new book: *"Compendium of Tick-borne Disease: A Thousand Pearls."* It is an 850 page text book written for physicians, health care providers, patients and families. Dr. Kathy Spreen is a Lyme patient, physician, and parent. She was inspired to write her book when her son became so sick that she didn't believe he would survive and she couldn't find any doctors who knew how to help him. She wrote the book she wishes she had when her child first got sick. With board certifications in preventive medicine and family medicine, as well as a master's degree in biochemistry and an MPH, Dr. Spreen spent many years conducting clinical research studies, analyzing data, and writing technical reports to submit to regulatory bodies around world. Unfortunately, the book is $120. www.thousandpearls.com
www.amazon.com/K.-Spreen/e/B00GQYPQWQ/ref=ntt_athr_dp_pel_pop_1

CDC Helps Investigate Three Sudden Heart Inflammation Deaths in Persons Not Known to Have Lyme Disease

Three deaths reported from heart inflammation caused by Lyme disease- Boston, 12/12/2013

Three young adults in the Northeast who abruptly died in the past 13 months had an undetected heart inflammation caused by Lyme disease, according to a federal study that suggests death from the tick-borne bacteria is more common than previously thought. The deaths occurred between November 2012 and July 2013, and health officials did not identify the victims. The investigation began after the Massachusetts man was found unresponsive in a car after it went off the road. There was no sign of trauma and he was pronounced dead at a nearby hospital. He was an organ donor, so his heart was recovered by the New England Organ Bank and sent to Cryolife, Inc., in Georgia, a tissue processing and medical device company that provides heart valves and patches for cardiac surgery. For entire story see:
http://www.boston.com/lifestyle/health/blogs/daily-dose/2013/12/12/three-deaths-reported-from-heart-inflammation-caused-lyme-disease/P76VcyTQJBBwifaYcRlaNK/blog.html

Virginia House Delegate Ramadan Announces $250,000 in Budget for Lyme Testing at George Mason University

Governor McDonnell included this budget item based on Delegate Ramadan's request ~ Dulles, VA | December 18, 2013 — Delegate David Ramadan (87th) announced today that funding he requested for a groundbreaking new Lyme disease test developed by George Mason University has been included in Virginia Governor Bob McDonnell's proposed 2015-2016 budget.

George Mason University's Center for Applied Proteomics and Molecular Medicine (CAPMM) would receive $250,000 to accelerate the rollout of the Nanotrap® based Lyme Antigen Test, which was developed jointly with Ceres Nanosciences.

"I would like to thank Delegate Ramadan for his leadership and efforts to address the Lyme Disease issue, and specifically for his request that I provide funding for George Mason University's efforts to expedite testing kits for this serious disease," said Governor Bob McDonnell.

Delegate David Ramadan represents the 87th House of Delegates District. He currently serves on: Privileges & Elections (P&E) and Science & Technology (S&T) committees.

For Fun: Website for All Things North Carolina

http://nc-culture.com/
https://www.facebook.com/ncculture?ref=hl

Treat your own clothes: http://www.insectshield.com/PDF/IS%20Your%20Own%20Clothes%20-%20U.S.%20form.pdf

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

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

Disclaimer

TIC-NC's newsletter content, including text, graphics, images and information is for general informational purposes only. The contents are not intended to be a substitute for professional medical advice, diagnosis or treatment.

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 that may appear from time to time.

It is the responsibility of you as an individual to evaluate the usefulness, completeness or accuracy of any information you read and to seek the services of a competent medical professional of your choosing if you need medical care.

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