Tick Borne Diseases

Anna-Marie Wellins DNP, ANP-C







About the Healthy Libraries Program

- Stony Brook Medicine's Healthy Libraries Program (HeLP) is a partnership with the Public Libraries of Suffolk County, the Suffolk Cooperative Library System Outreach Services Department, and is supported in part by the American Heart Association of Long Island.
- The program is an interdisciplinary team of public health, nursing, and social work students whose aim is to:
 - Provide evidence-based health information, screening, and case management to a diverse community of patrons in the public library setting.
 - Refer patrons to promote access to appropriate health and social services programs locally that will address their health and social support needs.
 - For students to experience an interprofessional team and demonstrate the core competencies based on the Interprofessional Education Collaborative (IPEC).

Stony Brook Medicine

About the Content Expert: Dr. Anna Marie Wellins



Dr. Wellins is a Clinical Assistant Professor at Stony Brook University's Advanced Graduate Nursing Education Program. She completed her Doctor of Nursing Practice degree in 2015 at Stony Brook University. Prior to joining the Stony Brook faculty she worked as a Nurse Practitioner in Sag Harbor, New York. She frequently saw tick-borne disease during her clinical practice due to the high prevalence of ticks on the East End of Long Island. She is a member of the East End Tick Advisory Council which focuses on tick-borne disease education, treatment and prevention for the community, and as a resource to local health care professionals. She is currently a co-investigator in a NIH funded study on Lyme disease in collaboration with Rutgers University.

About the Regional Tick-Borne Disease Resource Center

The Regional Tick-Borne Disease Resource Center at Stony Brook Southampton Hospital educates the public, promotes collaboration and educational opportunities within the medical community, and facilitates access to the diagnosis and treatment of tick-borne diseases.

Dr. Wellins is on the advisory panel for the center.

The center offers a "Help Line" where callers can receive expert advice on tick removal, help understanding laboratory results, and when appropriate referrals to physicians and other medical professionals. You can call at (631) 726-TICK

Their website offers educational materials that you can view or print, articles and even tick tips on YouTube. <u>https://southampton.stonybrookmedicine.edu/services/tick-borne-disease-resource-center</u>

PUBLIC HEALTH CRISIS **Education** is key! Knowledge is power!

- PROGRAM OBJECTIVES:
- Identify the definition of a vector.
- Identify environmental/habitat disruptions that increase tick populations.
- Identify common signs and symptoms of Lyme disease.
- Identify common treatments for tick-borne diseases.
- Identify things you can do to reduce your risk of getting a tick bite.

Thank you for attending this webinar!

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Life Cycle Same for all hard-bodied ticks



Blacklegged ticks

TickEncounter Resource Center **Ixodes scapularis (Blacklegged ticks or Deer ticks)**



Lone Star Ticks

Dog Tick

TICKS

Engorgement with feeding

Tick bites especially nymphal ticks are usually painless, the ticks are tiny, and consequently many people are unaware that they have been bitten.

Environmental Factors/habitat

Predators are Reduced

Vector

• An organism, typically a biting insect or tick, that transmits a disease or parasite from one animal to another

Reservoir

- Animals such as rodents where an infectious agent normally lives and multiplies.
- The reservoir typically harbors the infectious agent without injury to itself.

Host

• An animal in which a parasite, bacteria or virus lives.

Tick-Borne Illness

Black Legged Deer Ticks

- Lyme Disease (most common)
- Babesiosis
- Anaplasmosis

Lone Star Ticks

- Ehrlichiosis
- STARI
- Alpha-Gal Meat Allergy
- Rickettsia
- Tularemia

Dog Ticks

- Rocky Mounted Spotted Fever
- Tularemia

History

- Tick exposure?
- Rash?
- Symptoms? Flu like symptoms?
- Facial Palsy?
- Lab/diagnostics –Tick panel, PCR, blood count, chemistry panel...

Parasite smear

- Treatment
- Prevent/reduce future exposure

Lyme Disease

- Most common tick vector disease causes by the Black legged tick (deer tick)
- 300,000 cases in US/year
- Estimated 40-60% adult ticks infected, 20% nymphs infected
- Nymphs active Spring/Summer, Adults continue to be active from Fall- Spring if temperatures above freezing
- Ticks require humid conditions to live/thrive

Lyme Disease

- Ticks feeding for >24 hours higher likelihood in disease transmission
- Tick mouthpart barbed anchor cements into skin, tick saliva irritant, spirochete in gut back washes into tick mouth -enters into animal/person
- Bull's eye rash (<50%), flu like symptoms, joint/muscle aches, fever/chills, headache, neck pain, fatigue, mental cloudiness "brain fog", Facial palsy, visual changes....

LYME DISEASE

- Diagnostic tests: 2 tier Antibody test
- 1 month after exposure if no antibiotics)
- Doxycycline x 14-28 days (avoid sun exposure, take with food, probiotics) Long courses not for children <8 years
- Other antibiotics-amoxicillin
- Chronic Lyme : Neurological symptoms-intravenous antibiotics

Two-Tiered Testing for Lyme Disease

First Test

Second Test

Division of Vector Borne Diseases | Bacterial Diseases Branch

Not all rashes are alike!

Lyme Disease

Stage 1-local early infection (3-30 days after exposure)

• Rash, flu like symptoms

Stage 2- (weeks to months after exposure)

- Joint pain, arthritis, headache, fatigue
- 10-20% neurological s/s, <10 % cardiac involvement

Stage 3- late persistent infection (months to years later)

- Fibromyalgia (muscle pain)
- Arthritis of large joints,
- Memory changes
- Depression

Post Treatment Lyme Disease Syndrome (PTLDS)

- May result from autoimmune activation
- Dependent on individual immune system
- Joint swelling similar to arthritis
- Chronic neurologic symptomsmay require spinal tap analysis and IV antibiotic treatment
- Cardiac involvement

Post Treatment Lyme Disease Syndrome, continued

- Occurs within 6 months after treatment for Lyme disease
- Fatigue, widespread musculoskeletal pain (pain in a least 3 areas)
- Medically unexplained symptoms
- Cognitive -Difficultly finding words, focusing or concentrating, Memory usually intact
- Autoimmune? Smoking makes symptoms worse!

Babesiosis

- Deer Ticks- co infections can occur!
- Malaria-like illness caused by parasite (Babesia microti)
- s/s fever, chills, headache, muscle pain, headache, s/s may be more severe if co-infection with Lyme disease
- Blood smears, IgM/IgG, PCR
- CBC- low platelet count and white blood cells, elevated liver enzymes
- Treatment- Mepron (atovaquone), azithromycin

Ehrlichiosis & Anaplasmosis

- Deer Tick -Anaplasma phagacytophilum:
- Lone Star Tick Ehrlichia chaffeensis
- s/s Fever, fatigue, chills, headache, severe muscle aches
- Blood smears, antibody testing (decreased platelets, ↓ WBC, elevated liver function tests)
- Doxycycline
- Rash may indicate co-infection with Lyme disease

Rocky Mountain Spotted Fever

- Mostly transmitted by Dog Tick-Rickettsia rickettsia
- s/s fever, headache, myalgia, spotted rash on wrists, ankles, palms/soles
- treatment -doxycycline

Other tick borne diseases

Borrelia miyamotoi- similar signs and symptoms to Lyme disease (tick relapsing fever)

 Treatment with antibiotics – doxycycline

STARI (Southern Tick-Associated Rash Illness)- Lone Star tick Similar to Lyme Disease, no test available

 Treatment with antibiotics – doxycycline

Powassan Encephalitis- virus: Sudden symptoms 7-14 days after biteheadache, fever, vomiting, neck stiffness, confusion, seizures. Death in 10-15% of infected individuals

- 50 % survivors –permanent neurologic deficits
- No specific treatment!

Alpha Gal Meat Allergy

- Galactose-alpha-1,3 galactose (antibody reaction to a carbohydrate present in nonprimate mammals) or Alpha Gal
- Lone Star tick larval bites late summer/early fall
- Usually thought of as "Chigger Bites"
- Delayed allergic reaction (6 hours) after eating mammalian meat "midnight anaphylaxis" can resolve over time with no further exposure to Lone star ticks-
- Worse reaction with high fat meats

Alpha Gal

- Symptoms range from itching, GI upset to full allergic reaction affecting breathing (medical emergency/911)
- Alpha gal testing
- Referral to allergist, avoid mammalian meat, gelatin
- Wanes with time as long as there is no re-exposure to Lone star larva

Need epi pen!

Tick Removal

Risk of Tick-Borne Disease

- Tick imbedded for 36 hours or more
- Tick engorged when removed
- Prophylactic single dose of doxycycline 200mg
- Doxycycline DOES NOT treat Babesiosis

Protect Yourself Against Lyme Disease in Spring, Summer, and Fall

FOUR POSTER PROGRAM

Repellant

When venturing into tick habitat, a combination of both DEET for skin and permethrin on clothing should be considered

Tick Prevention

- Repellant on skin
- Cover up
- Permethrin on shoes/clothing
- Shower immediately
- Daily tick checks
- Dry clothes first before washing
- Double sided tape
- Lint rollers
- No flip flops

Pets

- Frontline or oral medications
- Electric fence, enclosed areas
- Tick checks
- Keep off beds/furniture

Prevention

- Create tick free zones around home by cutting back wooded areas and increasing the size of open lawn
- Keep grass mowed to 3 inches or less
- Place play areas in sunshine
- Remove leaf litter, moist plant litter, brush, weeds and other debris
- Create borders (pebbles, cedar chips) to separate lawn from the wooded areas

PREVENTION, continued

- Eliminate dense plant beds such as ivy and pachysandra.
- Reduce/eliminate rock walls, woodpiles, and birdfeeders. These attract mice and chipmunks which hide, nest and eat spilled food from these sources
- Keep garbage in tightly closed containers
- Reduce plants that attract deer
- Spraying property

 Wood chip barrier Use a 3 ft. barrier of wood chips or rock to separate the "tick zone" and rock walls from the lawn. Wood pile Keep wood piles on the wood chip barrier, away from the home. Tick migration zone Maintain a 9 ft. barrier of lawn between the wood chips and areas such as patios, gardens, and play sets. Tick safe zone Bardens Plant deer resistant crops. If desired, an 8-ft. fence can keep deer out of the yard. Play sets Keep play sets in the "tick safe zone" in sunny areas where ticks have difficulty surviving. 	1	Tick zone	Avoid areas with forest and brush where deer, rodents, and ticks are common.
 Wood pile Keep wood piles on the wood chip barrier, away from the home. Tick migration zone Maintain a 9 ft. barrier of lawn between the wood chips and areas such as patios, gardens, and play sets. Tick safe Enjoy daily living activities such as gardening and outdoor play inside this perimeter. Gardens Plant deer resistant crops. If desired, an 8-ft. fence can keep deer out of the yard. Play sets Keep play sets in the "tick safe zone" in sunny areas where ticks have difficulty surviving. 	2	Wood chip barrier	Use a 3 ft. barrier of wood chips or rock to separate the "tick zone" and rock walls from the lawn.
Image: Antiperiod stateMaintain a 9 ft. barrier of lawn between the wood chips and areas such as patios, gardens, and play sets.Image: Antiperiod stateImage: Antiperiod stateImage: Antiperiod stateEnjoy daily living activities such as gardening and outdoor play inside this perimeter.Image: Antiperiod statePlant deer resistant crops. If desired, an 8-ft. fence can keep deer out of the yard.Image: Antiperiod stateKeep play sets in the "tick safe zone" in sunny areas where ticks have difficulty surviving.	3	Wood pile	Keep wood piles on the wood chip barrier, away from the home.
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Based on a diagram by K. Stafford, Connecticut Agricultural Experiment Station

Future vaccine

- Research involving proteins in tick salivary glands
- Blocks the tick's ability to feed and transmit pathogens causing the tick to drop off

- WEAR REPELLENT
- CHECK FOR TICKS DAILY
- SHOWER SOON AFTER BEING OUTDOORS
- CALL YOUR DOCTOR IF YOU GET A FEVER OR RASH

For more information: www.cdc.gov

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Thank you for your participation!

Do you have any questions? Do you think there was anything missing from the webinar? Was there something else you would have liked to discuss?

Do you have any suggestions for future webinar topics?