



Texas Lyme Disease Association

knowledge. support. hope.

FACT SHEET FOR PHYSICIANS

LYME IS ENDEMIC IN TEXAS

Texas Department of State Health Services

- 1) The presence of Lyme disease was established in Texas in 1984.
www.dshs.state.tx.us/idcu/disease/lyme/information/pamphlet
- 2) All 11 of the Texas Public Health districts have reported cases of Lyme/TBD
- 3) Lyme cases were recorded in Texas as early as 1983
Burgdorfer W, Keirans JE (1983) "Ticks and Lyme disease in the United States," *Ann Intern Med* 99: 121.
- 4) "In 1984, Lyme Disease was identified in Texas. There are typically 50-275 human cases of Lyme disease reported in Texas annually. Texas is endemic for the blacklegged tick, *Ixodes scapularis*. The diagnosis of Lyme disease may be made solely on clinical symptoms, with or without serologic testing." (last update 3/22/13)
www.dshs.state.tx.us/idcu/disease/lyme/description/
Texas Department of State Health Services Web Site
- 5) "The Texas Department of Health Laboratory began culturing the Lyme disease spirochete *Borrelia burgdorferi* in 1985. This organism was subsequently isolated from blood, cerebrospinal fluid, joint fluid, skin, bone, and autopsy tissues from humans. Fluorescent-antibody tests with murine monoclonal antibodies confirmed that seven of these isolates were *B. burgdorferi* and that two others belonged to the genus *Borrelia*."
1987 Rawlings J., Fournier P., Teltow G. "Isolation of *Borrelia* Spirochetes from Patients in Texas," *J. of Clin. Microbiol.* 25:1148-1150.
- 6) "While not being reported in epidemic proportions, Lyme *borreliosis* is endemic in Texas and physicians need to be familiar with it."
1991 Goldings AS, Taylor JP, Rawlings J. "Lyme *Borreliosis* in Texas" *Texas Med/The Journal.* 87: 62-66.
- 7) "Between 1990 and 1992, ticks from eight Texas parks were collected and analyzed to determine the prevalence of spirochete infected-ticks. *Borrelia* spirochetes were detected in 1.03% of 5,141 *Amblyomma americanum* (L.) adults examined, a species Texas residents often encounter. No spirochetes were observed in the other tick species tested."
1994 Rawlings J, Teltow G. "Relevance of *Borrelia* (*Spirochataeaceae*) in Texas Ticks," *J. Med Entomol.* 31(2): 297-301.
- 8) "...also addressed are issues of seronegativity, particularly as they apply to regions of the country where strain variation of *borrelia* is expected and its influence on standardized testing is unknown."
1995 Stein Goldings A. "Neuroborreliosis in Texas," *Journal of Spirochetal and Tick Borne Diseases.* 2:59-61.
- 9) "Even though rates of human cases of Lyme Disease as well as rates of *Ixodes* ticks infected with *Borrelia* bacteria are both relatively low in Texas, the best data currently available

indicate that the assumption of high levels of spatial concordance would not be correct in Texas (Kappa coefficient..."

2014 Atkinson SF et al. "A Determination of the Spatial Concordance between Lyme Disease Incidence and Habitat Probability of Its Primary Vector *Ixodes Scapularis* (black legged tick)," *GeoSpatial Health*. 9(1), 203-212.

Texas A&M University Research:

- 10) "Of the 1235 tick samples collected, 109 were identified as *I. scapularis*. Infection with *B. burgdorferi* was detected in 45% of the *I. scapularis* ticks collected. The model presented here indicates a wide distribution for *I. scapularis*, with higher probability of occurrence along the Gulf of Mexico coast. Results of the modeling approach applied predict that habitat suitable for the distribution of *I. scapularis* in the Texas-Mexico transboundary region will remain relatively stable until 2050."

2014 Ferria-Arroyo et al "Implications of Climate Change on the distribution of the tick vector *Ixodes scapularis* and risk for Lyme Disease in the Texas-Mexico transboundary region," *Parasites & Vectors* 7:199

- 11) A Texas strain is discussed... "The A in the Texas isolate makes them more similar to strains N40 and 297 than to B31."

2015 Esteve-Gassent et al "Prevalence of *Borrelia burgdorferi*-infected ticks from wildlife hosts," a response to Norris et al *Parasites & Vectors* 8:129

Centers for Disease Control:

- 12) "During 1992–2006, a total of 248,074 cases of Lyme disease were reported to the CDC by health departments in 50 states, D.C. and US territories..."

CDC. *Surveillance for Lyme Disease—United States. 1992–2006. MMWR* 2008; 57(SS10): 1–9)

- 13) "Lyme Disease is the most commonly reported vector-borne illness in the United States."

CDC. *Surveillance for Lyme Disease—United States. 1992–2006. MMWR* 2008; 57(SS10): 1–9

EM RASH IS NOT ALWAYS PRESENT

- 1) "Along with the 'flu-like' symptoms, many victims (about 35%) develop an unusual skin lesion."

www.dshs.state.tx.us/idcu/disease/lyme/information/pamphlet

- 2) "In approximately 70–80% of cases, patients develop a characteristic rash, *erythema migrans* (EM), within 30 days of infection with *B. burgdorferi*."

CDC. *Surveillance for Lyme disease—United States. 1992–2006. MMWR* 2008; 57(SS10): 1–9)

- 3) "Seventh nerve palsy due to Lyme disease can develop in patients who have no recollection of an *erythema migrans* lesion or of a tick bite."

Clin Infect Dis 2006; 43: 1106 (2006 IDSA Guidelines)

EM RASH APPEARANCE VARIES

- 1) "Classic bulls-eye is NOT the most common presentation of EM as is believed."

Tibbles CD, Edlow JA. *Does this Patient Have Erythema Migrans? JAMA* 2007; 297:2617–2627.)

- 2) "*Erythema migrans* skin lesions can vary in appearance (figure 3). Some lesions are homogeneously erythematous, whereas others have prominent central clearing or a distinctive target-like appearance. [65,91,110] On the lower extremities, the lesion may be partially purpuric. Vesicles or pustules are present at the center of a primary *erythema migrans* lesion in approximately 5% of cases [115]."

Clin Infect Dis 2006; 43:1101 (2006 IDSA Guidelines)

- 3) “EM is a red expanding rash, with or without central clearing, which is often accompanied by symptoms of fatigue, fever, headache, mild stiff neck, arthralgia, or myalgia.”
CDC. Surveillance for Lyme Disease—United States. 1992–2006. MMWR 2008; 57(SS10): 1–9

EM RASH IS DIAGNOSTIC FOR BORRELIA INFECTION

“*Erythema migrans* is the only manifestation of Lyme disease in the United States that is sufficiently distinctive to allow clinical diagnosis in the absence of laboratory confirmation.”
Clin Infect Dis 2006; 43:1101 (2006 IDSA Guidelines)

LYME DISEASE DIAGNOSIS

- 1) “Lyme Disease is diagnosed on the basis of physician-observed clinical manifestations and a history of probable exposure to infected ticks. Laboratory results are neither suggested nor required to confirm diagnosis for patients with recent onset (2–3 weeks) of a characteristic EM rash.”
CDC. Surveillance for Lyme Disease—United States. 1992–2006. MMWR 2008; 57(SS10): 1–9
- 2) “Lyme disease is diagnosed by medical history, physical exam, and sometimes a blood test. It may take four to six weeks for the human immune system to make antibodies against *Borrelia burgdorferi* and therefore show up in a positive blood test. That is why patients with the Lyme rash usually have a negative blood test and diagnosis is based on the characteristic appearance of the rash.”
www.idsociety.org/Lyme_Facts/ , Infectious Diseases Society of America website

PROBLEMS WITH SEROLOGICAL TESTING

- 1) “Serologic testing is too insensitive in the acute phase (the first 2 weeks of infection) to be helpful diagnostically. [102,103, 116] Patients should be treated on the basis of clinical findings.”
Clin Infect Dis 2006; 43: 1101 (2006 IDSA Guidelines)
- 2) “ELISA’s and immunoblots for detecting anti-*Borrelia* antibodies have widely divergent sensitivity and specificity, and immunoblots for detecting anti-*Borrelia* antibodies have only limited agreement. Therefore, the choice of ELISA-immunoblot combination severely influences the number of positive results, making the exchange of test results between laboratories with different methodologies hazardous.”
Ang CW, Notermans DW, Hommes M, Simoons-Smit AM, Herremans T. “Large differences between test strategies for the detection of anti-Borrelia antibodies are revealed by comparing eight ELISAs and five immunoblots,”
Eur J Clin Microbiol Infect Dis. 2011; August 30 (8):1027–1032.
- 3) Published studies detailing POOR *Borrelia burgdorferi* sensitivity to the Elisa test:

1995	Oksi J.	<i>J Clin Microbiol</i>
1996	Le Due T.	<i>J Clin Microbiol</i>
1997	Bakkan L.	<i>J Clin Microbiol</i>
1999	Trevejo RT.	<i>J Infect Dis</i>
1999	Wang G.	<i>Clin Microbiol Reviews</i>
1999	Goossens HA.	<i>Eur J Clin Microbiol Infect Dis</i>
2001	Van Dam AP.	<i>Expert Rev Mol Diagn</i>
2003	Bacon R.	<i>J Infect Dis</i>
- 4) Published studies showing CDC Two Tier Testing is NOT reliable for *Borrelia burgdorferi*

1993	Dressler	<i>J Infect Disease</i> 167:392-400
1993	Schmitz et al	<i>Eur J Clin Microb ID</i> 12: 419-424
1995	Engstrom et al	<i>J Clin Microbiology</i> 33: 419-427
1996	Ledue et al	<i>J Clin Microbiology</i> 34:2343-50
1997	Bakken et al	<i>J Clin Microbiology</i> 35(3):537—543
1999	Trevejo et al	<i>J Infect Disease</i> 179; 931-8
2001	Nowakowski et al	<i>Clinical Infect Dis</i> 33:2023-7
2003	Bacon et al	<i>J Infect Dis</i> 187:1187-99
2005	Coulter et al	<i>J Clin Micro</i> 43:5080-5084
2008	Wormser et al	<i>Clin Vaccine Immunol</i> (10):1519-22
2011	Ang CW	<i>Eur J Microbiol Infect Dis</i> 30(8):1027-32

5) Published studies showing C6 Elisa Test has POOR Sensitivity for *Borrelia burgdorferi*

1999	Liang FT	<i>J Clin Microbiol</i>
2003	Bacon RM	<i>J Infect Dis</i>
2004	Gottner G	<i>Int J Med Microbiol</i>
2007	Gomes-Solecki MJ	<i>Clin Vac Immunol</i>

LYME/BORRELIA CO-INFECTIONS

- 1) “Tickborne Diseases of the US: *Anaplasmosis, Babesiosis, Ehrlichiosis*, Lyme Disease, *Rickettsia parkeri Rickettsiosis*, Rocky Mountain Spotted Fever, STARI, Tickborne Relapsing fever, Tularemia, 364D *Rickettsiosis*.”

www.cdc.com/ticks/diseases

Additionally, recent studies have included Colorado Tick Fever, Powassan encephalitis and *Bartonellosis*, Heartland Virus and *B. myamotoi*.

- 2) “The etiology of residual patient complaints after treatment may include an inflammatory response unrelated to active infection or may be due to alternative disease processes. The possibility that these symptoms may be related to a tick-transmitted coinfection was not evaluated in any of the studies.”

Clin Infect Dis 2006; 43: 1103 (2006 IDSA Guidelines)

- 3) “Humans co-infected with LD and babesiosis appear to have more intense, prolonged symptoms than those with LD alone. Coinfected persons can also manifest diverse, influenza-like symptoms, and abnormal laboratory test results are frequently observed...Clinicians should consider the likelihood of coinfection when pursuing laboratory testing or selecting therapy for patients with tick-borne illness.”

Swanson SJ, Neitzel D, Reed KD, Belongia EA. “Coinfections Acquired from Ixodes Ticks” *Clinical Microbiol Rev.* 2006 October; 19(4): 708-727.

- 4) “In Lyme disease concurrent infections frequently occur...their pathological synergism can exacerbate Lyme disease...clinically relevant co-infections are caused by *Bartonella* species, *Yersinia enterocolitica*, *Chlamydia pneumonia*, *Chlamydia trachomatis* and *Mycoplasma pneumonia*.” In the USA, “human granulocytic anaplasmosis (HGA) and babesiosis” are also important to consider. “The diagnosis is even more complex when co-infections occur in association with Lyme disease.”

Berghoff W. “Chronic Lyme Disease and Co-Infections: Differential Diagnosis.” *Open Neurol J.* 2012. 6: 158-78.

LYME DISEASE CAN BE TRANSMITTED CONGENITALLY

In a May 2014 presentation to the Houston Lyme Disease Support Group, Steven Norris PhD (UT Medical School at Houston) discussed his 20+ year history of Lyme research, publications and patents. He stated during his presentation that he DOES now believe that the “*Borrelia burgdorferi* bacteria can be passed to the fetus.” In a May 24, 2014 email to the TXLDA Vice-President of Education he provided the

following references to be used whenever Texas patients are being told that the *Bb* infection is unable to be passed to their infant, along with the 1985 CDC MMWR report where Lyme disease and pregnancy is again discussed.

- 1) "Confirmed trans placental transmission of *B.burgdorferi* has been documented in several cases"
Walsh CA, Mayer EW, Baxi LV, "Lyme Disease in Pregnancy: Case Report and Review of the Literature," *Obstetrical and Gynecological Survey*. 2006; 62 (1): 41-50.
- 2) "Trans placental transmission occurs as is evidenced by the presence of *B. burgdorferi* organisms isolated from postmortem and placental tissue."
Qasba N, Shamshirsaz AA, Feder HM, Campbell WA, Egan JF, Shamshirsaz AA. "A Case Report of Human Granulocytic *Anaplasmosis (Ehrlichiosis)* in Pregnancy and a Literature Review of Tick-Borne Diseases in the United States during Pregnancy," *Obstetrical and Gynecological Survey*. 2011; 66 (12): 788-795.
- 3) Schlesinger PA, Duray PH, Burke BA, et al. "Maternal-fetal transmission of the lyme disease spirochete, *Borrelia burgdorferi*." *Ann Intern Med*. 1985; 103: 67-68.
- 4) MacDonald A, Benach J, Burgdorfer W. "Stillbirth following maternal Lyme disease." *NY State J Med*. 1987; 87: 615-616.
- 5) Weber K, Bratzke HJ, Neubert U, et al. "Borrelia burgdorferi in a newborn despite oral penicillin for Lyme borreliosis during pregnancy." *Pediatr Infect Dis J*. 1988; 7: 286-289.
- 6) Lavoie PR, Lattner BP, Duray PH, et al. "Culture positive, seronegative transplacental Lyme borreliosis infant mortality." *Arthritis Rheum*. 1987; 3(suppl):S50.
- 7) "Prevention and early diagnosis are important during pregnancy. Rarely, Lyme disease acquired during pregnancy may lead to infection of the placenta and may possibly lead to stillbirth. Studies of women infected during pregnancy have found there are no negative effects on the fetus when the mother receives appropriate antibiotic treatment for her Lyme disease."
CDC Brochure #CS226008-A, "Lyme Disease: What You Need to Know"
[What To Do If You Suspect Lyme Disease During Pregnancy](#)

2006 IDSA GUIDELINES

- 1) "It is important to realize that guidelines cannot always account for individual variation among patients. They are not intended to supplant physician judgment with respect to particular patients or special clinical situations. The IDSA considers adherence to these guidelines to be voluntary, with the ultimate determination regarding their application to be made by the physician in the light of each patient's individual circumstances."
Clin Infect Dis 2007; 44: 1138 (15 April)
- 2) "More than half of the recommendations in practice guidelines issued here are based on opinions from experts rather than higher-level evidence from clinical trials."
Lee DH, Vilemeyer O. "Analysis of Overall Level of Evidence behind Infectious Disease Society of America practice guidelines," *Arch Intern Med*. 2011; 171(1): 18-22.)

TEXAS LEGISLATION AFFECTS DOCTORS

- 1) SENATE BILL 1360/HB 2975
Sec.156.059 "Continuing Education in Tick-Borne Diseases."
Enacted in 2011 encourages Texas physicians to pursue continuing medical education in the diagnosis and treatment of tick-borne diseases, including Lyme disease.

- 2) Physicians are required by law to report a case of Lyme Disease, a reportable disease.

Texas Health and Safety Code

SUBTITLE D. PREVENTION, CONTROL, AND REPORTS OF DISEASES

Communicable Disease Prevention and Control Act 1989

Sec. 81.049. FAILURE TO REPORT; CRIMINAL PENALTY.

- (a) A person commits an offense if the person knowingly fails to report a reportable disease or health condition under this subchapter.
- (b) An offense under this section is a Class B misdemeanor.

INFECTIONS ARE THE MOST OFTEN MISDIAGNOSED

“The most common misdiagnosed diseases were (in order) infection, neoplasm, myocardial infarction, pulmonary emboli and cardiovascular disease.”

C. McDonald, MB Hernandez, Y. Gofman, S. Suchecki, W. Schreier, “The Five Most Common Misdiagnoses: a meta-analysis of autopsy and malpractice data,” *The Internet Journal of Family Practice* 2009; Volume 7, Number 2. DOI: 10.5580/9ce

2014 ILADS GUIDELINES

- Available on the National Guidelines Clearinghouse website.
- The only guidelines available that are written in accordance with the Institute of Medicine (IOM) standards for the development of trustworthy guidelines.
- Only guidelines available that are based on the GRADE process.
- Only guidelines use a patient centered approach.
- Only guidelines which are current, replacing the old 2006 IDSA guidelines.

Cameron, Johnson, Maloney. “Evidence Assessments and Guideline Recommendations in Lyme Disease: the clinical management of known tick bites, *erythema migrans* rashes and persistent disease.” *Exp Rev of Anti Inf Therapy.*; 2014 (1-33)

Texas Lyme Disease Association
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