

# Peer Reviewed Evidence of Persistence of Lyme Disease Spirochete *Borrelia burgdorferi* and Tick-Borne Diseases

The following is a list of over 700 peer reviewed articles that support the evidence of persistence of Lyme and other tick-borne diseases. It is organized into different categories—general, psychiatric, dementia, autism and congenital transmission.

## General: Persistence of Lyme Disease Spirochete *Borrelia burgdorferi*

The following section of references for persistence of Lyme disease (Lyme borreliosis) are listed alphabetically and chronologically:

1. Aalto A, Sjowall J, Davidsson L, Forsberg P, Smedby O. Brain magnetic resonance imaging does not contribute to the diagnosis of chronic neuroborreliosis. *Acta Radiol* 2007; 48: 755-762. [white matter hyperintensities or basal ganglia lesions].
2. Abele DC and Anders KH. The many faces and phases of borreliosis. *J Am Acad Dermatol* 1990; 23:401-410. [chronic Lyme borreliosis].
3. Aberer E and Klade H. Cutaneous manifestations of Lyme borreliosis. *Infection* 1991; 19: 284-286. [chronic Lyme borreliosis].
4. Aberer E, Breier F, Stanek G, and Schmidt B. Success and failure in the treatment of acrodermatitis chronica atrophicans skin rash. *Infection* 1996; 24: 85-87.
5. Aberer E, Kersten A, Klade H, Poitschek C, Jurecka W. Heterogeneity of *Borrelia burgdorferi* in the skin. *Am J Dermatopathol* 1996; 18(6): 571-519.
6. Akin E, McHugh GI, Flavell RA, Fikrig E, Steere AC. The immunoglobulin (IgG) antibody response to OspA and OspB correlates with severe and prolonged Lyme arthritis and the IgG response to P35 with mild and brief arthritis. *Infect Immun* 1999; 67: 173-181.
7. Albert S, Schulz J, Riegel H, Brade V. Lyme arthritis in a 12-year-old patient after a latency period of 5 years. *Infection* 1999; 27(4-5): 286-288.
8. Al-Robaiy S, Dihazi H, Kacza J, et al. Metamorphosis of *Borrelia burgdorferi* organisms—RNA, lipid and protein composition in context with the spirochete's shape. *J Basic Microbiol* 2010, 50 Suppl 1, S5-17.
9. Appel MJG, Allan S, Jacobson RH, Lauderdale TL, Chang YF, Shin SJ, Thomford JW, Todhunter RJ, and Summers BA. Experimental Lyme disease in dogs produces arthritis and persistent infection. *J Inf Dis* 1993; 167: 651-664.
10. Åsbrink E, Hovmark A. Successful cultivation of spirochetes from skin lesions of patients with erythema chronicum migrans, Afzelius and acrodermatitis chronica atrophicans. *Acta Pathol Microbiol Immunol Sect B* 1985; 93: 161-163.
11. Åsbrink E, Hovmark A, and Olsson I. Clinical manifestations of acrodermatitis chronica atrophicans in 50 Swedish patients. *Zentralbl Bakteriol Mikrobiol Hyg A* 1986; 26: 253-261. [chronic Lyme borreliosis].
12. Asch ES, Bujak DI, Weiss M, Peterson MGE, and Weinstein A. Lyme Disease: an infectious and postinfectious syndrome. *J Rheumatol* 1994; 21 (3): 451-461.
13. Bankhead T and Chaconas G. The role of VlsE antigenic variation in the Lyme disease spirochete: persistence through a mechanism that differs from other pathogens. *Molecular Microbiology* 2007; 65: 1547-1558.
14. Barthold SW, Persing DH, Armstrong AL, and Peebles RA. Kinetics of *Borrelia burgdorferi* dissemination and evolution of disease following intradermal inoculation of mice. *Am J Pathol* 1991; 139: 263-273. [in mice]
15. Barthold SW, deSouza MS, Janotka JL, Smith AL, and Persing DH. Chronic Lyme borreliosis in laboratory mouse. *Am J Pathol* 1993; 143: 951-971. [in mice]
16. Barthold S. Lyme borreliosis. Chapter 14, *In Persistent Bacterial Infections*. Edited by J.P. Nataro, M.J. Blaser, and S. Cunningham-Rundles, pp 281-304. ASM Press, Washington, D.C.
17. Barthold SW, Hodzic E, Imai DM, Feng S, Yang X, and Luft BJ. Ineffectiveness of tigecycline against persistent *Borrelia burgdorferi*. *Antimicrob Agents Chemother* 2010; 54(2): 643-651. [mice, rats, white-footed mice, hamsters, gerbils, guinea pigs, rabbits, dogs, nonhuman primates, and humans]
18. Barthold SW. Global challenges in diagnosing and managing Lyme disease—closing knowledge gaps. Testimony before House Committee on Foreign Affairs, United States Congress, 17 July 2012.
19. Battafarano DF, Combs JA, Enzenauer RJ, Fitzpatrick JE (1993) Chronic septic arthritis caused by *Borrelia burgdorferi*. *Clin Orthop* 297: 238-241. doi: 10.1097/00003086-199312000-00038. [Patients with chronic septic Lyme arthritis of the knee for seven years, despite multiple antibiotic trials and synovectomies. Bb documented in synovium and synovial fluid.]
20. Baum E, Hue F, Barbour AG (2012) Experimental infections of the reservoir species *Peromyscus leuopus* with diverse strains of *Borrelia burgdorferi*, a Lyme disease agent. *MBio* 3: e00434-12. doi: 10.1128/mbio.00434-12.
21. Bayer ME, Zhang L, Bayer MH. *Borrelia burgdorferi* DNA in the urine of treated patients with chronic Lyme disease symptoms. A PCR study of 97 cases. *Infection* 1996; 24: 347-353. [97 patients who had been treated with antibiotics for extended periods of time and had symptoms of chronic Lyme were PCR-positive.]
22. de Leeuw BHCGM, Maraha B, Hollemans L, Sprong H, Brandenburg AH, Westenend PJ, Kusters JG. Evaluation of *Borrelia* real time PCR DNA targeting OspA, FlaB and 5S-23S IGS and *Borrelia* 16S rRNA-qPCR. *Journal of Microbiological Methods* (2014). <http://doi.org/10.1016/j.mimet.2014.09.001>.
23. Benjamin J and J Luft. Chronic Lyme disease; an evolving syndrome. 9<sup>th</sup> Annual International Scientific Conference on Lyme Disease & Other Tick-Borne Disorders. 1996.
24. Berglund J, Stjernberg L, Ornstein K, Tykesson-Joelsson K, Walter H. 5-y follow-up study of patients with neuroborreliosis. *Scand. J. Infect. Dis.* 2002; 34(6): 421-425.

25. Berndtson K. Review of evidence for immune evasion and persistent infection in Lyme disease. *Int J of General Medicine* 2013; 6: 291-306. [Lyme disease spirochetes are adapted to persist in immune competent hosts; they are can remain infective despite aggressive antibiotic challenge.]
26. Bloom BJ, Wyckoff PM, Meissner HC, and Steere AC. Neurocognitive abnormalities in children after classic manifestations of Lyme disease. *Pediatric Infect. Dis. J.* 1998; 17(3): 189-196.
27. Bradley JF, Johnson RC, Goodman JL (1994) The persistence of spirochetal nucleic acids in active Lyme arthritis. *Ann Intern Med* 120: 487-489. doi: 10.7326/0003-4819-120-6-199403150-00007 [human]
28. Bransfield R, Brand S, and Sherr V. Treatment of patients with persistent symptoms and a history of Lyme disease. *N Engl Med* 2001; 345: 1424-5.
29. Breier F, Khanakah G, Stanek G, Aberer E, Schmidt B, and Tappeiner G. Isolation and polymerase chain reaction typing of *Borrelia afzelii* from a skin lesion in a seronegative patient with generalized ulcerating bullous lichen sclerosus et atrophicus. *Br J Dermatol* 2001; 144: 387-392.
30. Bockenstedt LK, J Mao, E Hodzic, SW Barthold, and D Fish. Detection of attenuated, non-infectious spirochetes in *Borrelia burgdorferi*-infected mice after antibiotic treatment. *J Infect Dis* 2002; 186: 1430-1437. [in mice]
31. Bockenstedt LK, Gonzalez DG, Hamberman AM, Belperron A (2012) Spirochete antigens persist near cartilage after murine Lyme borreliosis therapy. *J Clin Invest* 122: 2652-2660. doi: 10.1172/jci58813.
32. Breier F, Kkhkanakah G, Stanek G, Kunz G, Aberer E, Schmidt B, and Tappeiner G. Isolation and polymerase chain reaction of *Borrelia afzelii* from a skin lesion in a seronegative patient with generalized ulcerating bullous lichen sclerosus et atrophicus. *Br J Dermatol* 2001; 144: 387-392.
33. Brorson O and Brorson S-H. Transformation of cystic forms of *Borrelia burgdorferi* to normal mobile spirochetes. *Infection*. 1997; 25: 240-246. [change in physical characteristics; change of spirochetes to other pleomorphic forms, i.e., cell wall deficient forms, namely cysts.]
34. Brorson O and Brorson S. *In vitro* conversion of *Borrelia burgdorferi* to cystic forms in spinal fluid, and transformation to mobile spirochetes by incubation in BSK-H medium. *Infection*. 1998; 26: 144-150. [change in physical characteristics; change of spirochetes to other pleomorphic forms, i.e., cell wall deficient forms, namely cysts.]
35. Brorson O and Brorson SH. An *in vitro* study of the susceptibility of mobile and cystic forms of *Borrelia burgdorferi* to metronidazole. *APMIS* 1999; 107: 566-576.
36. Brorson O and Brorson SH. An *in vitro* study of the susceptibility of mobile and cystic forms of *Borrelia burgdorferi* to tinidazole. *International Microbiol* 2004; 7: 139-142.
37. Brorson O and Brorson SH. An *in vitro* study of the activity of telithromycin against mobile and cystic forms of *Borrelia afzelii*. *Infection* 2006; 34: 26-28.
38. Brorson O Brorson SH, Scythes J, MacAllister J, Wier A, and Margulis L. Destruction of spirochete *Borrelia burgdorferi* round-body propagules (RBs) by the antibiotic tigecycline. *Proc Natl Acad Sci USA* 2009; 106: 18656-61
39. Brown JP, Zachary JF, Teuscher C, Weis JJ, and Wooten M. Dual role of interleukin-10 in murine Lyme disease: regulation of arthritis severity and host defense. *Infect Immun* 1999; 67: 5142-5150. [suppression of harmful immune responses: defense stratagem of *B. burgdorferi*]
40. Burrascano J. Failure of aggressive antibiotic therapy to protect the placenta from invasion by *B. burgdorferi* in a pregnant patient with Lyme borreliosis. 6<sup>th</sup> Annual International Science Conference on Lyme Disease and other Tick-borne Diseases. 1993.
41. Cabello FC, Godfrey HP, and Newman SA. Hidden in plain sight: *Borrelia burgdorferi* and the extracellular matrix. *Trends in Microbiology* 2007; 15: 350-354. [sequestration]
42. Cadavid D, O'Neill T, Schaefer H, and Pachner AR. Localization of *Borrelia burgdorferi* in the nervous system and organs in a nonhuman primate model of Lyme disease. *Lab Invest* 2000; 80: 1043-1054.
43. Cadavid D, Y Bai, E Hodzic, K Narayan, SW Barthold, and Pachner AR. Cardiac involvement in non-human primates infected with the Lyme disease spirochete *Borrelia burgdorferi*. *Lab Invest* 2004; 84: 1439-1450. [in monkeys]
44. Cameron D, Gaito A, Harris N et al. Evidence-based guidelines for the management of Lyme disease. *Expert Rev Anti-Infect. Ther* 2004; 2 (Suppl. 1), S1-S13.
45. Cameron D. Results from Lyme disease treatment trial. Columbia University/LDA Conference, Lyme & Other Tick-Borne Diseases: Emerging Tick-Borne Diseases. October 28, 2005; Philadelphia, Pennsylvania.
46. Cameron DJ. Generalizability in two clinic trials of Lyme disease. *Perspectives and Innovation* 2006; 3(12). [http://dx.doi.org/10.1186/1742-5573-3-12].
47. Cameron D. Severity of Lyme disease with persistent symptoms. Insights from a double-blind placebo-controlled clinical trial. *Minerva Med* 2008; 99: 489-496.
48. Cameron DJ. Insufficient evidence to deny antibiotic treatment to chronic Lyme disease patients. *Med Hypotheses* (2009), doi:10.1016/j.mehy.2009.01.017
49. Cameron DJ. Proof that Lyme disease exists. 2010. [http://www.hindawi.com/60587146.html].
50. Cameron DJ. Proof that chronic Lyme disease exists. *Interdisciplinary Perspect Infect Dis* 2010. doi:10.1155/2010/876450.
51. Chancellor MB, McGinnis DE, Shenot PJ, Kiilholma P, and Hirsch IH. Urinary dysfunction in Lyme disease. *J Urol* 1993; 149: 26-30.
52. Chang YK, Ku YW, Chang CF, Chang CD, McDonough SP, Divers T, Pough M, and Torres A. Antibiotic treatment of experimentally *Borrelia burgdorferi*-infected ponies. *Vet Microbiol* 2005; 107: 285-294.
53. Chao L-L, Lu C-F, and Shih C-M. Molecular detection and genetic identification of *Borrelia garinii* and *Borrelia afzelii* from patients presenting with a rare skin manifestation of prurigo pigmentosa in Taiwan. *Int J Infect Dis* 2013, http://dx.doi.org/10.1016/j.ijid.2013.08.004.
54. Chary-Valckenaere I, Jaulhac B, Champigneulle J, Piemont Y, Mainard D, and Pourel J. Ultrastructural demonstration of intracellular localization of *Borrelia burgdorferi* in Lyme arthritis. *Br J Rheumatol* 1998; 37: 468-470.
55. Chmielewski T, Tylewska-Wierzhanowska S. Inhibition of fibroblast apoptosis by *Borrelia afzelii*, *Coxiella burnetii* and *Bartonella henselae*. *Poll Microbiol* 2011; 60(3); 269-272.
56. Cimmino MA, Azzolini A, Tobia F, Pesce CM. Spirochetes in the spleen of a patient with chronic Lyme disease. *Am J Clin Pathol* 1989; 91(1): 95-97.
57. Clarke AE, Esdaile JM, Bloch DA, Lacaille D, Danoff, and Fries JF. A Canadian study of the total medical costs for patients with systemic lupus erythemata and the predictors of costs. *Arthritis. Rheum.* 1993; 36(11): 1548-1593.

58. Cleveland CP, Dennler PS, Duray PH. Recurrence of Lyme disease presenting as a chest wall mass: *Borrelia burgdorferi* was present despite five months of IV ceftriaxone 2 g, and three months of oral cefixime 400 mg BID. The presence of *Borrelia burgdorferi* confirmed by biopsy and culture. Poster presentation at V Lyme Disease Foundation International Scientific Conference. Stamford, CT, April 10-11, 1992.
59. Cleveland CP, and Dennler S. Case history: recurrence of Lyme disease as a chest wall mass. Abstract presented at the 1993 LDF International Conference on Lyme Disease.
60. Coyle P. Lyme Disease. Mosby Year Book, pp. 235, 1993. St Louis, Mo. [seclusion into immune privileged sites: defense strategies of *B. burgdorferi*]
61. Craft J, Fischer DK, Shimamoto GT, Steere AC. Antigens of *Borrelia burgdorferi* recognized during Lyme disease appearance of a new immunoglobulin M response and expansion of the immunoglobulin G response late in the illness. *J. Clin. Invest.* 1986; 1978: 934-939.
62. Dattwyler RJ, Volkman DJ, Luft BJ, Halperin JJ, Thomas J, and Golightly MG. Seronegative Lyme disease. Dissociation of specific T- and B-lymphocyte response to *Borrelia burgdorferi*. *N Engl J Med* 1988; 319(22): 1441-1446.
63. Dejmková H, D Hulínska, D Tegzová, K Pavelka, J Gatterová, and P Vavřík. Seronegative Lyme arthritis caused by *Borrelia garinii*. *Clin Rheumatol* 2002; 21:330-334.
64. DeLong AK, Blossom B, Maloney E, and Phillips SE. Antibiotic retreatment of Lyme disease in patients with persistent symptoms: A biostatistical review of randomized, placebo-controlled, clinical trials. *Contemp Clin Trials* 2012; epub ahead of print. <http://dx.doi.org/10.1016/j.cct.2012.08.009>. [refutes Klempers {2001} conjecture that long-term antibiotics don't work]
65. de Koning J, et al. Demonstration of spirochetes in cardiac biopsies of patients with Lyme disease. *J. Infect. Dis.* 1989; 160: 150-153. [intracellular sanctuaries of Bb]
66. Demaerschalck I, Messaoud AB, de Kesel M, Hoyois B, Lobet Y, Hoet P, Bigaignon G, Bollen A, and Godfroid E. Simultaneous presence of different *Borrelia burgdorferi* genospecies in biological fluids of Lyme disease patients. *J Clin Microbiol* 1995; 33; 602-608.
67. Diterich I, Rauter C, Kirschning CJ, and Hartung T. *Borrelia burgdorferi*-induced tolerance as a model of persistence via immunosuppression. *Infect Immun* 2003; 71(7):3979-3987.
68. Donahue JG, Piesman J, Spielman A (1987) Reservoir competence of white-footed mice for Lyme disease spirochetes. *Am J Trop Med Hyg* 36: 92-96. [persistence in white-footed mice]
69. Donta ST. Tetracycline therapy for chronic Lyme disease. *Clin Inf Dis* 1997; 25 (Suppl 1); S52-56.
70. Donta ST. The existence of chronic Lyme disease. *Curr Treat Op Infect Dis* 2001; 3: 261-262.
71. Donta ST. Late and chronic Lyme disease. *Med Clin North Am* 2002; 86: 341-349.
72. Donta ST. Macrolide therapy of chronic Lyme disease. *Med Sci Monit* 2003; 9: 136-142.
73. Dorward DW, Fischer ER, and Brooks DM. Invasion and cytopathic killing of human lymphocytes by spirochetes causing Lyme disease. *Clin. Infect. Dis.* 1997. 25 Suppl 1: S2-8. [intracellular sanctuaries of Bb]
74. Dunham-Ems SM, Caimano MJ, Pal U, et al. Live imaging reveals a biphasic mode of dissemination of *Borrelia burgdorferi* within ticks. *J. Clin Invest.* 2009; 119: 3652-3665. [biofilms consist of a colony of spirochetes and cysts coated by a gelatinous, protective membrane]
75. Dupeyron A, J Lecocq, B. Jaulhac, M-E Isner-Horobeti, P Vautravets., J Cohen-Solal, C Sordet, and J-L Kuntz. Sciatica, disk herniation, and neuroborreliosis. A report of four cases. *Joint Bone Spine* 2004; 71: 433-437.
76. Dupeyron A, J Lecocq, B. Jaulhac, M-E Isner-Horobeti, P Vautravets., J Cohen-Solal, C Sordet, and J-L Kuntz. Sciatica, disk herniation, and neuroborreliosis. A report of four cases. *Joint Bone Spine* 2004; 71: 433-437.
77. Duray PH and Johnson RC. The histopathology of experimentally infected hamsters with the Lyme disease spirochete, *Borrelia burgdorferi*. *Proc Soc Exp Biol Med* 1986; 181: 263-269.
78. Duray PH. 1987. The surgical pathology of human Lyme disease. An enlarging picture. *Am J Surg Pathol* S1: 47-60. [Bb in brain].
79. Duray PH and Steere AC. Clinical pathologic correlations of Lyme disease by stage. *Ann N Y Acad Sci* 1988; 539: 65-79. Duray PH, et al. Invasion of human tissue *ex vivo* by *Borrelia burgdorferi*. *J. Infect. Dis.* 2005. 191(10): 1747-1754.
80. Durovska J, Bazovska S, Ondrisova M, and Pancak J. 2010. Our experience with examination of antibodies against antigens of *Borrelia burgdorferi* in patients with suspected Lyme disease. *Bratist. Lek. Listy* 2010; 111(3): 153-155.
81. Dvorakova J, and Celer V. [Pharmacological aspects of Lyme borreliosis] *Seska Slov Farm.* 2004(Jul); 53(4): 159-164.
82. Ekdahl KN, Henningsson AJ, Sandholm K, Forsberg P, Ernerudh J, Ekerfelt C; Immunity in borreliosis with special emphasis on the role of complement. *Adv Exp Med Biol* 2007; 598: 198-213.
83. Ebel GD, Campbell EN, Goethert HK, Spielman A, and Telford SR. Enzootic transmission of deer tick virus in New England and Wisconsin sites. *Am. J. Trop. Med. Hyg.* 2000; 63(1-2): 36-42.
84. Embers ME, SW Barthold, JT Borda, L Bowers, L Doyle, E Hodzic, MB Jacobs, NR Hasenkampf, DS Martin, S. Narasimhan, KM Phillippi-Falkenstein, JE Purcell, MS Ratterree, and MT Philipp ((2012) Persistence of *Borrelia burgdorferi* in rhesus macaques following antibiotic treatment of disseminated infection. *PLoS ONE* 7(1): e29914. doi:10.1371/journal.pone.0029914 [Bb was cultured from rhesus macaques after antibiotic treatment and confirmed by PCR.]
85. Embers M, Barthold SW (2012) *Borrelia burgdorferi* persistence post-antibiotic treatment, pp. 229-252. In: The pathogenic spirochetes: strategies for evasion of host immunity and persistence. Embers ME, editor. Springer, New York.
86. Fallon BA, Schwartzberg M, Bransfield R, Zimmerman B, Scotti A, Weber CA, and Liebowitz MR. Late-stage neuropsychiatric Lyme borreliosis. Case reports. *Psychosomatics* 1995; 36: 295-300.
87. Fallon BA, Das S, Plutchok JJ, Tager F, Liegner K, Van Heertum R. Functional brain imaging and neuropsychological testing in Lyme disease. *Clin Infect Dis* 1997; 25 (suppl 1): S57-S63.
88. Fallon BA, et al. Repeated antibiotic treatment in chronic Lyme disease. *J Spir Tick Borne Dis.* 1999; 6: 94-101.
89. Fallon BA, Keilp J, Prohovnik I, Heertum RV, Mann JJ. Regional cerebral blood flow and cognitive deficits in chronic Lyme disease. *J Neuropsychiatry Clin Neurosci* 2003; 15: 326-332.
90. Fallon BA, Keilp JG, Corbera KM, Petkova K, Britton CB, Dwyer E, et al. A randomized, placebo-controlled trial of repeated IV antibiotic therapy for Lyme encephalopathy. *Neurology* 2008; 70: 992-1003.
91. Fallon BA, Lipkin RB, Corbera KM, Yu S, Nobler MS, Keilp JG, Petkova E, Lisanby SH, Moeller JR, Slavov I, Van Heertum R, Mensh BD, and Sackeim HA. Regional cerebral blood flow and metabolic rate in persistent Lyme encephalopathy. *Arch Gen Psychiatry* 2009; 66: 554-563.

92. Farshad-Amacker NA, Scheffel H, Frauenfelder T, Alkadhi H. Brainstem abnormalities and vestibular nerve enhancement in acute neuroborreliosis. *BMC Research Notes* 2013; 6: 551. doi:10.1186/1756-0500-6-551.
93. Feder Jr., HM and Whitaker DL. Misdiagnosis of erythema migrans. *Am. J. Med.* 1995; 99: 412-419.
94. Fein L, and Tilton RC. Bone marrow as a source for *Borrelia burgdorferi* DNA. *J Spir Tick-borne Dis* 1997; 4: 58-60.
95. Ferris J, et al. Lyme borreliosis. [letter] *Lancet* 1995; 345: 1436-1437.
96. Franz JK, O Fritze, M Rittig et al. Insights from a novel three-dimensional in vitro model of Lyme arthritis: standardized analysis of cellular and molecular interactions between *Borrelia burgdorferi* and synovial explants and fibroblasts. *Arthritis Rheum* 2001; 44: 151-162.
97. Fraser DD, Kong LI, and Miller FW. Molecular detection of persistent *Borrelia burgdorferi* in a man with dermatomyositis. *Clinical and Experimental Rheumatology* 1992; 10: 387-390.
98. Frey M, Jaulhac B, Piemont Y, Marcellin L, Boohs PM, Vautravrs P, Jesel M, Kuntz JL, Monteil H, and Sabilia J. Detection of *Borrelia burgdorferi* DNA in muscle of patients with chronic myalgia related to Lyme disease. *Am J Med* 1988; 104: 591-594.
99. Fried MD, Duray P. Gastrointestinal disease in children with persistent Lyme disease: spirochetes isolated from the G.I. tract. IX Lyme Disease Foundation International Scientific Conference, Boston, MA, April 19-20, 1996.
100. Gaito A, Gjiwoje V, Lutz S, II, and Baxter B, II. Comparative analysis of the infectivity rate of both *Borrelia burgdorferi* and *Anaplasma phagocytophilum* in humans and dogs in a New Jersey community. *Infect. Drug Resist.* 2014; 7: 199-201. [persistence of Bb in humans and dogs]
101. Garcia-Monco JC, Benach JL. The pathogenesis of Lyme disease. *Rheum Dis Clin North Am* 1989; 15: 711-726.
102. Georgilis K, Peacocke M, and Klemperer MS. Fibroblasts protect the Lyme disease spirochete, *Borrelia burgdorferi*, from ceftriaxone in vitro. *J Infect Dis* 1992; 166: 440-444.
103. Giambartolomei GH, Dennis VA, and Philipp MT. *Borrelia burgdorferi* stimulates the production of interleukin-10 in peripheral blood mononuclear cells from uninfected humans and rhesus monkeys. *Infect Immun* 1998; 66: 2691-2697. [suppression of harmful immune responses: defense stratagem of *B. burgdorferi*]
104. Girschick HJ, Huppertz HI, Rüssmann H, Krenn V, and Karch H. Intracellular persistence of *Borrelia burgdorferi* in human synovial cells. *Rheumatol Int* 1996; 16: 125-132. [intracellular sanctuaries of Bb]
105. Goodman JL, Jurkovich P, Kodner C, and Johnson RC. Persistent cardiac and urinary tract infections with *Borrelia burgdorferi* in experimentally infected Syrian hamsters. *J Clin Microbiol* 1991; 29: 894-896. [hamsters]
106. Grignolo MC, Buffrini L, Monteforte P, and Rovetta G. Reliability of a polymerase chain reaction (PCR) technique in the diagnosis of Lyme borreliosis. *Minerva Med* 2001; 92(1): 29-33. [Article in Italian]
107. Gruntar I, et al. Conversion of *Borrelia garinii* cystic forms to motile spirochetes *in vivo*. *APMIS* 2001; 109(5): 383-388. [Persistence occurs when spirochetes change physical characteristics by converting to dormant cysts, and vis versa.]
108. Halperin JJ., Luft BJ, Anand AK, Roque CT, Alvarez O, Volkman DJ, Dattwyler RJ. Lyme neuroborreliosis: central nervous system manifestations. *Neurology* 1989; 39: 753-759. [hyperintensities persist after treatment]
109. Halperin JJ. Prolonged Lyme disease treatment: enough is enough. *Neurology* 2008; 70(13): 986-987.
110. Harvey WT and Salvato P. 'Lyme disease': ancient engine of an unrecognized borreliosis pandemic? *Med Hypotheses* 2003; 60: 742-759.
111. Hassett AL, Radvanski DC, Buyske S, Savage SV, and Sigal LH. Psychiatric comorbidity and psychological factor in patients with "chronic Lyme disease." *Am. J. Med.* 2009; 122(9): 843-850.
112. Hassler D, Riedel K, Zorn J and Preac-Mursic V. Pulsed high-dose cefotaxime therapy in refractory Lyme borreliosis (letter). *Lancet* 1991; 338: 193.
113. Häupl T, Hahn G, Rittig M, Krause A, Schoerner C, Schonherr U, et al. (1993) Persistence of *Borrelia burgdorferi* in ligamentous tissue from a patient with chronic Lyme borreliosis. *Arthritis Rheum*; 36(11): 1621-1626. [Repeated antibiotic treatment necessary to stop the progression of disease but did not completely eliminate Bb from all sites of infection. Bb cultured from ligament sample; intracellular sanctuaries for Bb]
114. Henneberg JP, and Neubert U. *Borrelia burgdorferi* group: *in vitro* antibiotic sensitivity. *Orv Hetil* 2002; 143: 1195-1198.
115. Heft PS, Brooks CS, Jett AM, White GL, Wikel SK, et al. (2002) OspE-related, OspF-related, and Elp lipoproteins are immunogenic in baboons experimentally infected with *Borrelia burgdorferi* and in human Lyme disease patients. *J Clin Microbiol* 40: 4256-4265. doi: 10.1128/jcm.40.11.4256-4265.2002. [baboons]
116. Hilton E, Tramontano A, DeVoti J, and Sood SK. Temporal study of immunoglobulin M seroreactivity to *Borrelia burgdorferi* in patients treated for Lyme borreliosis. *J Clin Microbiol* 1997; 35(3): 774-776.
117. Hodzic E, Feng S, and Barthold SW. Stability of *Borrelia burgdorferi* outer surface protein C under immune selection pressure. *J Infect Dis* 2000; 181: 750-753.
118. Hodzic E, Feng S, Holden K, Freet KJ, and Barthold SW. Persistence of *Borrelia burgdorferi* following antibiotic treatment in mice. *Antimicrob Agents Chemother* 2008; 52: 1728-1736. [in mice: following antibiotic treatment; mice remained infected with infectious spirochetes.]
119. Holl-Weiden A, Suerbaum S, and Girschick HJ. Seronegative Lyme arthritis. *Rheumatology International* 2007; 11: 1091-1093.
120. Honegr K, Hulínska D, Dostal V, Gebousky P, Hankova E, Horacek J, Vyslouzil L, and Havlasova J. Persistence of *Borrelia burgdorferi* sensu lato in patients with Lyme borreliosis. *Epidemiol Mikrobiol Immunol.* 2001; 50: 10-16.
121. Horowitz R. Chronic persistent Lyme borreliosis: PCR evidence of chronic infection despite extended antibiotic therapy – a retrospective review. 13<sup>th</sup> International Scientific Conference on Lyme Disease and Other Tick-Borne Disorders. CT, USA, 24-26 March 2000.
122. Hudson BJ, Stewart M, Lennox VA, Fukunaga M, Yabuki M, Macorison H, Kitchener-Smith J. Culture-positive Lyme borreliosis. *Med J Aust* 1998; 168(10): 500-502.
123. Hulínská D, Krausova M, Janovská D, Roháčová H, Hancil J, Mailer H. Electron microscopy and the polymerase chain reaction of spirochetes from the blood of patients with Lyme disease. *Cent Eur J Public Health* 1993; 1(2): 81-85.
124. Hulínska D, Votýpka J, and Valesova M. Persistence of *Borrelia garinii* and *Borrelia afzelii* in patients with Lyme arthritis. *Int J Med Microbiol Virol Parasitol Infect Dis* 1999; 289(3): 301-318.
125. Hunfeld KP, Ruzic-Sabljić E, Norris DE, Kraiczky P, and Strle F. In vitro susceptibility testing of *Borrelia burgdorferi* sensu lato isolates cultured from patients with erythema migrans before and after antimicrobial chemotherapy. *Antimicrob Agents Chemother* 2005; 49: 1294-1301.

126. Imai DM, Barr BC, Daft B, Bertone JJ, Feng S, Hodzic E, Johnston JM, Olsen KJ and Barthold SW. Lyme neuroborreliosis in 2 horses. *Vet Pathol* 2011; 48: 1151-1157.
127. International Lyme and Associated Diseases Society (ILADS). Evaluation of antibiotic treatment in patients with persistent symptoms of Lyme disease. [www.ilads.org/position2.htm](http://www.ilads.org/position2.htm)
128. James FM, JB Engiles, and J Beech. Meningitis, cranial neuritis, and radiculoneuritis associated with *Borrelia burgdorferi* infection in a horse. *J Am Vet Med Assoc* 2010; 237: 1180-1185. [Horse was seropositive for Bb, and PCR assay of CSF for *B. burgdorferi* DNA was positive; horse was treated with doxycycline, responded well, then relapsed, treated with oxytetracycline and later died; diagnosis consistent with neuroborreliosis.]
129. Johnson RC, Marek N, Kodner C. Infection of Syrian hamsters with Lyme disease spirochetes. *J. Clin. Microbiol.* 1984; 20: 1099-1101.
130. Johnson L and Stricker JB. Treatment of Lyme disease: a medicolegal assessment. *Expert Rev Anti-Infect Ther* 2004. 2: 533-557.
131. Kaiser R. Clinical courses of acute and chronic neuroborreliosis following treatment with ceftriaxone. *Nervenarzt.* 2004(June); 75(6): 553-557.
132. Kalish RA, Leong JM, and AC Steere. Association of treatment-resistant chronic Lyme arthritis with HLA-DR4 and antibody reactivity to OspA and OspB of *Borrelia burgdorferi*. *Infect Immun* 1993; 61: 2774-2779.
133. Kalish RA, McHugh G, Granquist J, Shea B, Ruthazer R, Steere AC. Persistence of immunoglobulin M or immunoglobulin G antibody responses to *Borrelia burgdorferi* 10-20 years after active Lyme disease. *Clin Infect Dis* 2001; 33: 780-785.
134. Karma A, Stenborg T, Summanen P, Immonen I, Mikkilä H, and Seppälä I. Long-term follow-up of chronic Lyme neuroretinitis. *Retina* 1996; 16: 505-509.
135. Keat AC, and Hughes R. Infectious agents in reactive arthritis. *Curr Opin Rheumatol* 1993; 5: 414-419.
136. Keller TL, Halperin JJ, and Whitman M. PCR detection of *Borrelia burgdorferi* DNA in cerebrospinal fluid of Lyme neuroborreliosis patients. *Neurology* 1992; 43: 32-42.
137. Kersten A, Poitschek C, Rauch S, and Aberer E. Effects of penicillin, ceftriaxone, and doxycycline on morphology of *Borrelia burgdorferi*. *Antimicrob Agents Chemother* 1995; 39: 1127-1133.
138. Keszler K, and Tilton RC. Persistent PCR positivity in a patient being treated for Lyme disease. *Journal of Spirochetal and Tick-Borne Diseases* 1995; 2: 57-58.
139. Kirsch M., Ruben FL, Steere AC, Duray PH, Norden CW, Winkelstein A. Fatal adult respiratory distress syndrome in a patient with Lyme disease. *JAMA* 1988; 259(18) 2737-2739.
140. Klemmner MS, Noring R, and Rogers RA. Invasion of human skin fibroblasts by the Lyme disease spirochetes, *Borrelia burgdorferi*. *J Infect Dis* 1993; 167: 1074-81.
141. Klemann W, Huismans BD, and Heyl S. Prolonged antibiotic therapy in PCR persistent Lyme disease. Grin Verlag 2011. ISBN 978-3-640-82803-6
142. Kraiczky P, Hellwage J, Skerka C, Becker H, Kirschfink M., Simon MM, et al. Complement resistance of *Borrelia burgdorferi* correlates with the expression of BbCRASP-1, a novel linear plasmid-encoded surface protein that interacts with human factor H and FHL-1 and is unrelated to Erp proteins. *J Biol Chem* 2004; 279: 2421-2429.
143. Krupp LB, Masur D, Schwartz J, Coyle PK, Langenback JJ, and Fernquist SK. Cognitive functioning in late Lyme borreliosis. *Arch Neurol* 1999; 48: 1125-1129.
144. Krupp LB, Hyman LG, Grimson R, Coyle PK, Melville P, Ahn S, et al. Study and treatment of post Lyme disease (STOP-LD): a randomized double masked clinical trial. *Neurology* 2003; 60: 1923-1930.
145. Krüger H, Helm E, Schuknecht B, and Scholz S. Acute and chronic neuroborreliosis with and without CNS involvement: a clinical, MRI, and HLA study of 27 cases. *J Neurol* 1991; 238: 271-280.
146. Kullberg BJ, Berende A, van der Meer JW. The challenge of Lyme disease: tired of the Lyme wars. *Neth J Med* 2011; 69: 98-100. [refutes Klempers {2001} conjecture that long-term antibiotics don't work]
147. Latov N, Wu AT, Chin RL, Sander HW, Alaedini A, and Brannagan TH. Neuropathy and cognitive impairment following vaccination with the OspA protein of *Borrelia burgdorferi*. *J Peripher Nerv Syst* 2004; 9: 165-167.
148. Lavoie PE. Failure of published antibiotic regimens in Lyme borreliosis: observations on prolonged oral therapy. Abstract. Lyme Borreliosis International Conference, Sweden, 1990.
149. Lavoie PE. Protocol from Rakef's: explains persistence of infection despite "standard" courses of antibiotics. *Lyme Times*, Lyme Disease Resource Center, 1992; 2: 25-27. Reprinted from Conn's Current Therapy, 1991.
150. Lawrence C, Lipton RB, Lowy RD, and Coyle PK. Seronegative chronic relapsing neuroborreliosis. *Eur Neurol* 1995; 35(2): 113-117. [Patient's CSF was positive for complex anti-Bb antibodies, *B. burgdorferi* nucleic acids and free antigen despite aggressive antibiotic therapy.]
151. Lawrenz MB, Hardham JM, Owens RT, Nowakowski J, Steere AC, Wormser GP, and Norris SJ. Human antibody responses to vlsE antigenic variation protein of *Borrelia burgdorferi*. *J Clin Microbiol* 1999; 37: 3997-4004.
152. Li X, McHugh GA, Hamle N, Sikland VI, Glickstein L, et al. (2011) Burden and viability of *Borrelia burgdorferi* in skin and joints of patients with erythema migrans or Lyme arthritis. *Arthritis Rheum* 63: 2238-2247. doi: 10.1002/art.30384. [humans]
153. Liang FT, Steere AC, Marques AR, Johnson BJB, Miller JN, and Philipp MT. Sensitive and specific serodiagnosis of Lyme disease by enzyme-linked immunosorbent assay with a peptide based on an immunodominant conserved region of *Borrelia burgdorferi* VlsE. *J Clin Microbiol* 1999; 37: 3990-3996.
154. Liang FT, Jacobs MB, Bowers LC, Philipp MT. An immune evasion mechanism for spirochetal persistence in Lyme borreliosis. *J Exp Med* 2002; 195: 415-422.
155. Liegner KB. Lyme disease: the sensible pursuit of answers. *J Clin Microbiol* 1993; 31: 1961-1963.
156. Liegner KB, Shapiro JR, Ramsay D, Halperin AJ, Hogrefe W, and Kong L. Recurrent erythema migrans despite extended antibiotic treatment with minocycline in a patient with persisting *Borrelia burgdorferi* infection. *J Am Acad Dermatol* 1993; 28: 312-314. [Eleven months following treatment, T-cell stimulation test with Bb antigens were strongly positive; a year later, paired serum and CSF samples were strongly positive.]
157. Liegner KB, Duray P, Agricola M, Rosenkilde C, Yannuzzi LA, Ziska M, Tilton RC, Hulinska D, Hubbard J, and Fallon BA. Lyme disease and the clinical spectrum of antibiotic responsive chronic meningoencephalomyelitis. *J Spir and Tick-Borne Dis* 1997; 4: 61-73. [live culture of Bb after antibiotic treatment]

158. Livengood JA and Gilmore RD, Jr. Invasion of human neuronal and glial cells by an infectious strain of *Borrelia burgdorferi*. *Microbes and Infection*. 2006; 8: 2832-2840. [intracellular sanctuaries of Bb]
159. Hodzic E, Feng S Holden K, Freet, KJ, and Barthold SW. Persistence of *Borrelia burgdorferi* following antibiotic treatment in mice. *Antimicrobial Agents and Chemotherapy* 2008; 52: 1728-1736. [Persistence of Bb in mice]
160. Hudson BJ, Stewart M, Lennox VA, Fukunaga M, Yabuki M, Macorison H, Kitchener-Smith J. Culture-positive Lyme borreliosis. *Med J Aust*. 1998; 168(10): 500-502.
161. Lawrence C, Lipton RB, Lowy FD, and Coyle PK. Seronegative chronic relapsing neuroborreliosis. *Eur. Neurol*. 1995; 35(2): 113-117.
162. Lee SH, Vigliotti JS, Vigliotti VS, James W, Moorcroft TA, and Lantsman K. DNA sequencing diagnosis of off-season spirochetemia with low bacterial density in *Borrelia burgdorferi* and *Borrelia miyamotoi* infections. *Int. J. Mol. Sci*. 2014, 15, 11364-11386; doi:10.3390/ijms150711364.
163. Livengood JA, and Gilmore, RD, Jr. Invasion of human neuronal and glial cells by an infectious strain of *Borrelia burgdorferi*. *Microbes and Infection* 2006; 8: 2832-2840.
164. Ljostad J, Mygland Å (2013) Chronic Lyme; diagnostic and therapeutic challenges. *Acta Neurol Scan Suppl* 196: 38-47. doi: 10.1111/ane.12048.
165. Logigian EL, Johnson KA, Kijewski MF, Kaplan RF, Becker JA, Jones KJ, Garada BM Holman BL, Steere AC. Reversible cerebral hypoperfusion in Lyme encephalopathy. *Neurology* 1997; 49: 1661-1670.
166. Logigian EL, Johnson KA, Kijewski MF, Kaplan RF, Becker JA, Jones KJ, Garada BM Holman BL, Steere AC. Reversible cerebral hypoperfusion in Lyme encephalopathy. *Neurology* 1997; 49: 1661-1670.
167. López-Andreu JA, Ferrís J, Canosa CA, Sala-Lizárraga JV. Treatment of late Lyme disease: a challenge to accept. *J Clin Microbiol* 1994; 32:1415-1416.
168. Luft BJ, Steinman CR, Neimark HC, Muralidhar B, Rush T, Finkel MF, Kundel M, and Dattwyler RJ. Invasion of the CNS by *Borrelia burgdorferi* in acute disseminated infection. *JAMA* 1992; 267: 1364-1367.
169. Lyme Disease Foundation. The controversies surrounding Lyme disease diagnosis and treatment and why it is not uncommon for patients to experience persistent symptoms despite receiving conventional (short-term) antibiotic therapy for Lyme disease. [www.lyme.org/lymelight/trtcontrov.html](http://www.lyme.org/lymelight/trtcontrov.html).
170. Ma Y, Sturrock A, and Weis JJ. Intracellular localization of *Borrelia burgdorferi* within human endothelial cells. *Infect Immun* 1991; 59: 671-678.
171. MacDonald AB and Miranda JM. Concurrent neocortical borreliosis and Alzheimer's disease. *Human Pathol* 1987; 18: 759-761.
172. MacDonald AB. Concurrent neocortical borreliosis and Alzheimer's disease: demonstration of a spirochetal cyst form. *Ann NY Acad Sci* 1988; 539: 468-470.
173. MacDonald AB, Berger BW, and Schwan TG. Clinical implications of delayed growth of the Lyme disease spirochete, *Borrelia burgdorferi*. *Acta Trop* 1990 48; (2): 89-94.
174. MacDonad AB. In situ DNA hybridization study of granulovacuolar degeneration in human Alzheimer autopsy neurons for flagellin b transcriptomes of *Borrelia burgdorferi*. *Alzheimer's Dis Dementia* 2006; 2 (Suppl. 1): S207.
175. MacDonald AB. Plaques of Alzheimer's disease originate from cysts of *Borrelia burgdorferi*. *Med Hypotheses* 2006; 67: 592-600. doi:10.1016/j.mehy.2006.02.035.
176. MacDonald AB. Cystic borrelia in Alzheimer's disease and in non-dementia neuroborreliosis. *Alzheimer's Dementia* 2006; 2 (Suppl. 1):S433.
177. MacDonald AB. Transfection "Junk" DNA — A link to the pathogenesis of Alzheimer's disease? *Med Hypotheses* 2006; 66: 1140-1141.
178. MacDonald AB. Alzheimer's neuroborreliosis with *trans*-synaptic spread of infection and neurofibrillary tangles derived from intraneuronal spirochetes. *Med Hypotheses* 2007; 68: 822-825. [7 of 10 cases of Alzheimer's disease had *B. burgdorferi* in their brains].
179. MacDonald AB. Biofilms of *Borrelia burgdorferi* on chronic cutaneous borrelia. *Am J Clin Pathol* 2008; 129: 988-989.
180. MacDonald, AB. *Borrelia burgdorferi* tissue morphologies and imaging methodologies. *Eur J Clin Microbiol Infect Dis* 2013. DOI 10.1007/s10096-013-1853-5 [shows non-spiral forms of Bb]
181. Mahmoud AAF. The challenge of intracellular pathogens (editorial). *N Engl J Med* 1992; 326: 761-762.
182. Malane MS, Grant Kels JM, Feder Hm Jr. et al. Diagnosis of Lyme disease based on dermatologic manifestations. *Ann Intern Med* 1991; 114:490-498. [chronic Lyme borreliosis].
183. Malawista SE, Barthold SW, and Persing DH. Fate of *Borrelia burgdorferi* DNA in tissues of infected mice after antibiotic treatment. *J Infect Dis* 1994; 170: 1312-1316.
184. Malawista SE. Resolution of Lyme arthritis, acute or prolonged: a new look. *Rheuma* 2000 (May 29 issue).
185. Manak MK, González-Villaseñor LI, Crush-Stanton S, and Tilton RC. Use of PCR assays to monitor the clearance of *Borrelia burgdorferi* DNA from blood following antibiotic therapy. *J Spir Tick-Borne Dis* 1997; 4: 11-20.
186. Maraspin V, Ruzic-Sabljić E, Strle F, Cimperman J, Jereb M, Preac-Mursic V. *Alpc Adria Microbiol J*. Persistence of *Borrelia burgdorferi* after treatment with antibiotics. 1995; 3: 211-216.
187. Maraspin V, Cimperman J, Lotrič-Furlan S, Ružič-Sabljić E, Jurca T, Picken RN, and Strle F. Solitary borrelial lymphocytoma in adult patients. *Wien Klin Wochenschr* 2002; 114: 515-523.
188. Marlovits S, Khanah G, Striessniq G, Vécsei V, and Stanek G. Emergence of Lyme arthritis after autologous chondrocyte transplantation. *Arthritis Rheum*. 2004; 50: 259-264.
189. Masters EJ, Lynxwiler P, and Rawlings J. Spirochetemia after continuous high-dose oral amoxicillin therapy. *Infect Dis Clin Practice* 1995; 3: 207-208. [Following six months of treatment, patient relapsed and Bb was cultured from blood.]
190. Matera G, Labate A, Quirino A, Lamberti AG, BorzÀ G, Barreca GS, Mumoli L, Peronace C, Giaccotti A, Gambardella A, FocÀ A, Quattrone A. Chronic neuroborreliosis by *B. garinii*: an unusual case presenting with epilepsy and multifocal MRI lesions. *New Microbiologica* 2014; 37: 393-397. [Bb in brain]

191. Mattman LH. Cell wall deficient forms: stealth pathogens. 2<sup>nd</sup> edition. CRC Press, Inc., Boca Raton, FL. 1993. [change in physical characteristics; change of spirochetes to other pleomorphic forms, i.e., cell wall deficient forms, namely cysts.]
192. Meier P, Blatz R, Gau M, Spencker FB, Wiedermann P. [Pars plana vitrectomy in *Borrelia burgdorferi* endophthalmitis][German]. *Klin Monatsbl Augenheilkd* 1998; 213(6): 351-354.
193. Middelveen, MJ, McClain SA, Bandoski C, Israel JR, Burke J, MacDonald AB, Sapi E, Wang Y, Franco A, Mayne PJ, Stricker RB. Granulomatous hepatitis associated with chronic *Borrelia burgdorferi* infection: a case report. *Research* 2014; 1: 875. <http://dx.doi.org/10.130070/rs.en.1.875>.
194. Miklossy J. Alzheimer's disease — a spirochetosis? *NeuroReport* 1993; 4: 841-848.
195. Miklossy J, Kasas S, Janzer RC, Ardizzoni F, and Loos H. Further morphological evidence of a spirochetal etiology of Alzheimer's disease. *NeuroReport* 1994; 5: 1201-1204.
196. Miklossy J, Gern L, Darekar P, Janzer RC, Loos H. Senile plaques, neurofibrillary tangles and neuropil threads contain DNA? *J Spirochetal and Tick-borne Dis* 1995; 2: 1-5.
197. Miklossy JM, Khalili K, Gern L, Ericson RL, Darekar P, Bolle L, Hurlimann J, and Paster BJ. *Borrelia burgdorferi* persists in the brain in chronic Lyme neuroborreliosis and may be associated with Alzheimer's disease. *J Alzheimers Dis* 2004; 6: 639-649.
198. Miklossy J, Rosemberg S, and McGeer PL; Beta amyloid deposition in the atrophic form of general paresis. In *Alzheimer's Disease: New advances*. Medimond. Proceedings of the 10<sup>th</sup> International Congress on Alzheimer's Disease. Edited by: Iqbal K, Winblad B, and Avila J; 2006: 429-433.
199. Miklossy J, Kris A, Radenovic A, Miller L, Forro L, Martins R, Reiss K, Darbinian N, Darekara P, Mihaly L, and Khalili K. Beta amyloid deposition and Alzheimer's type changes induced by *Borrelia* spirochetes. *Neurobiol Aging* 2006; 27: 228-236.
200. Miklossy J. Chronic inflammation and amyloidogenesis in Alzheimer's disease — role of spirochetes. *J Alzheimers Dis* 2008; 13: 381-391.
201. Miklossy, J. 2008. Biology and neuropathology of dementia in syphilis and Lyme disease. In *Handbook of Clinical Neurology*, Vol. 89. C. Duyckaerts, I. Litvan (eds.). Elsevier, Amsterdam, Netherlands. p. 825-844. [Persistence of *B. burgdorferi* is evident in dementia patients.]
202. Miklossy J, Kasas S, Zurn AD, McCall S, Yu S, and McGeer PL. Persisting atypical and cystic forms of *Borrelia burgdorferi* and local inflammation in Lyme neuroborreliosis. *J Neuroinflammation* 2008; 5: 40-57.
203. Miklossy, J. 2011. Alzheimer's disease – a neurospirochetosis. Analysis of the evidence following Koch's and Hill's criteria. 2011; 8: 90 (<http://www.jneuroinflammation.com/content/8/1/90>) [91% of the brains of Alzheimer's patients sampled were positive for spirochetes; 25% of Alzheimer's patients analyzed had *B. burgdorferi* spirochetes in their brains. Persistence occurs when spirochetes change physical characteristics by converting to dormant cysts.]
204. Miklossy J (2012) Chronic or late Lyme neuroborreliosis: analysis of evidence compared to chronic or late neurosyphilis. *Open Neurol J* 6: 146-157.
205. Miller JC, K Narayan, B Stevenson, and AR Pachner. Expression of *Borrelia burgdorferi* erp genes during infection of non-human primates. *Microb Pathol.* 2005; 39: 27-33. [in monkeys]
206. Montgomery RR, Nathanson MH, and Malawista SE. The fate of *Borrelia burgdorferi* within endothelial cells. *Infect Immun* 1991; 59: 671-678.
207. Montgomery RR, MH Nathanson, and SE Malawista. The fate of *Borrelia burgdorferi*, the agent for Lyme disease, in mouse macrophages. Destruction, survival, recovery. *J Immunol* 1993; 150: 909-915. [in mice macrophages]
208. Moody KD, Barthold SW, and Terwilliger GA. Lyme borreliosis in laboratory animals: effect of host species and into passage of *Borrelia burgdorferi*. *Am J Trop Med Hyg* 1990; 43: 87-92.
209. Moody KD, Barthold SW, Terwilliger GA, Beck DS, Hansen GM, et al. (1990) Experimental chronic Lyme borreliosis in Lewis rats. *Am J Trop Med Hyg* 42: 65-74. [rats]
210. Moody KD, Adams RL, and Barthold SW. Effectiveness of antimicrobial treatment against *Borrelia burgdorferi* infection in mice. *Anticarb Agents Chemother* 1994; 38: 1567-1572.
211. Moriarty TJ, Norman MU, Colarusso P, Bankhead T, Kubes P, and Chaconas G. 2008. Real-time high resolution 3D imaging of the Lyme disease spirochete adhering to and escaping from the vasculature of a living host. *PLoS Pathog* 4(6):e1000090. doi:10.1371/journal.ppat.1000090.
212. Moses JM, RS Riseberg, and JM Mansbach. Lyme disease presenting with persistent headache. *Pediatrics* 2003; 112: 477-449.
213. Müller KE (2012) Damage of collagen and elastic fibres by *Borrelia burgdorferi* — known and new clinical and histopathological aspects. *Open Neurol J (Suppl 1-M11)* 6: 179-186. [Bb damages collagen and elastic fibres in ligaments and tendons, and weakens connective tissue, including ruptures of tendons, and prolapsed intervertebral discs.]
214. Mursic VP, Wanner G, Reinhardt S, Wilske B, Busch U, and Marget W. Formation and cultivation of *Borrelia burgdorferi* spheroplast L-form variants. *Infection* 1996; 24(4): 335.
215. Nanagara R, Duray PH, and Schumacher HR, Jr. Ultrastructural demonstration of spirochetal antigens in synovial fluid and synovial membrane in chronic Lyme disease: possible factors contributing to persistence of organisms. *Hum Pathol* 1996; 27(10): 1025-1034. [intracellular sanctuaries of Bb]
216. Nocton JJ, Dressler F, Rutledge BJ, Rys PN, Persing DH, and Steere AC. Detection of *Borrelia burgdorferi* DNA by polymerase chain reaction in synovial fluid from patients with Lyme arthritis. *N Eng J Med* 1994; 330: 229-234. [Of 19 Lyme arthritis patients treated with either parenteral antibiotics or long courses of oral antibiotics, PCR confirmed Bb detected in synovial fluid of 37% of patients.]
217. Nocton JJ, Bloom BJ, Rutledge BJ, Persing DJ, Logigian EL, Schmid CH, and Steere AC. Detection of *Borrelia burgdorferi* DNA by polymerase chain reaction in cerebrospinal fluid in Lyme neuroborreliosis. *J. Infect Dis* 1996; 174: 623-627.
218. Norgard MV, Riley BS, Richardson JA, et al. 1995. Dermal inflammation elicited by synthetic analogs of *Treponema pallidum* and *Borrelia burgdorferi* lipoproteins. *Infect Immun* 63: 1507-1515.
219. Oksi J, Mertsola J, Reunanen M, Marjamäki M, Viljanen MK. Subacute multiple-site osteomyelitis caused by *Borrelia burgdorferi*. *Clin Infect Dis* 1994; 19(5): 891-896.
220. Oksi J, Uksila J, Marjamäki M, Nikoskelainen J, and Viljanen MK. Antibodies against whole sonicated *Borrelia burgdorferi* spirochetes, 41-kilodalton flagellin, and P39 protein in patients with PCR- or culture-proven late Lyme borreliosis. *J Clin Microbiol* 1995; 33: 2260-2264.

221. Oksi J, Kalimo H, Marttila RJ, Marjamäki M, Sonninen P, Nikoskelainen J, and Viljanen MK. Inflammatory brain changes in Lyme borreliosis. A report on three patients and review of literature. *Brain* 1996; 119(6): 2143-2154.
222. Oksi J, Nikoskelainen J, and Viljanen MK. Comparison of oral cefixime and intravenous ceftriaxone followed by oral amoxicillin in disseminated Lyme borreliosis. *Eur J Clin Microbiol Int Dis* 1998; 17: 715-719.
223. Oksi J, Marjamäki M, Nikoskelainen J, and Viljanen MK. *Borrelia burgdorferi* detected by culture and PCR in clinical relapse of disseminated Lyme borreliosis. *Ann Med* 1999; 31(3): 225-232. [40% (13/32) patients had clinical relapses that were PCR or culture-confirmed.]
224. Pacheco e Silva AC. Espirochetose dos centros nervos Memorias do hospicio de Juguery. 1927, III-IV (3-4): 1-27.
225. Pachner AR, Delaney E, and O'Neill T. Neuroborreliosis in the nonhuman primate: *Borrelia burgdorferi* persists in the central nervous system. *Ann Neurol* 1995; 38: 667-9. [in monkeys].
226. Pachner AR, J Basta, E Delaney, D Hulinska. Localization of *Borrelia burgdorferi* in murine Lyme borreliosis by electron microscopy. *Am J Trop Med Hyg* 1995; 52: 128-133.
227. Pachner AR, Cadavid D, Shu G, Dail D, Pachner S, Hodzic E, and Barthold SW. Central and peripheral nervous system infection, immunity, and inflammation in the NHP model of Lyme borreliosis. *Ann Neurol* 2001; 50: 330-338. [in monkeys]
228. Pachner AR, D Dail, K Narayan, K Dutta, and D Cadavid. Increased expression of B-lymphocyte chemoattractant, but not pro-inflammatory cytokines, in muscle tissue in rhesus chronic Lyme borreliosis. *Cytokine* 2002; 19: 297-307. [in monkeys]
229. Pachner AR, Basta J, Delaney E, and Hulinska D. Localization of *Borrelia burgdorferi* in murine Lyme borreliosis by electron microscopy. *Am J Trop Med Hyg* 1995; 52: 128-133.
230. Pahl A, Kühbrandt U, Brune K, Röllinghoff M, and Gessner A. Quantitative detection of *Borrelia burgdorferi* by real-time PCR. *J Clin Microbiol* 1999; 37: 1958-1963.
231. Pal GS, Baker JT, and Wright DJM. Penicillin resistant *Borrelia* encephalitis responding to cefotaxime. *Lancet* 1988; 338: 50-51.
232. Reimers CD, de Koing J, Neubert U, Preac Mursic V, Koster JG, Muller Felber W, Pongratz DE, and Duray PH. *Borrelia burgdorferi* myositis: report of eight patients. *J Neurol* 1993; 240(5): 278-283.
233. Petrovic M, Vogelaers D, Van Renterghem L, Carton D, De Reuck J, and Afschrift M. Lyme borreliosis – review of the late stages and treatment of four cases. *Acta Clin Belg*. 1998; 53: 178-183.
234. Pfister HW, Preac Mursic V, Wilske B, Schielke E, Sorgel F, Einhaupl KMJ. Randomized comparison of ceftriaxone and cefotaxime in Lyme neuroborreliosis. *Infect Dis* 1991; 163(2): 311-318. [In one patient, Bb as isolated from the cerebrospinal fluid 7.5 months after ceftriaxone therapy and, thus, showing that extended therapy is necessary.]
235. Phillips SE, Mattman LH, Hulinska D, and Moayad H. A proposal for the reliable culture of *Borrelia burgdorferi* from patients with chronic Lyme disease, even from those aggressively treated. *Infection* 1998; 26: 364-67.
236. Phillips SE, Harris NS, Horowitz R, Johnson L, Stricker RB. Lyme disease: scratching the surface. *Lancet* 2005; 366: 1771.
237. Phillips SE, Burrascano JJ, Harris NS, Johnson L, Smith PV, Stricker RB. Chronic infection in 'post-Lyme borreliosis syndrome. *Int J Epidemiol* 2005; 34: 1439-1440.
238. Picha D, Moravcová L, Holecková D, Zd'ársky E, Valesová M, et al. (2008) Examination of specific DNA by PCR in clinical relapse of disseminated Lyme borreliosis. *Int J Dermatol* 47: 1004-1010. doi: 10.1111/j.1365-4632.2008.03709.x [in human urine]
239. Picken RN, Strle F, Picken MM et al. Identification of three species of *Borrelia burgdorferi* sensu lato (*B. garinii*, *B. afzelii*) among isolates from acrodermatitis chronica atrophicans lesions. *J Invest Dermatol* 1998; 110; 211-214. [chronic Lyme borreliosis].
240. Preac-Mursic V, Wilske B, Schierz G, et al. Repeated isolation of spirochetes from the cerebrospinal fluid of a patient with meningoradiculitis Bannwarth syndrome. *Eur J Clin Microbiol* 1984; 3: 564-565.
241. Preac-Mursic V, Weber K, Pfister HW, Wilske B, Gross B, Baumann A, and Prokop J. Survival of *Borrelia burgdorferi* in antibiotic-treated patients with Lyme borreliosis. *Infection* 1989; 17(6): 355-359.
242. Preac-Mursic V, Patsouris E, Wilske B, Reinhardt S, Gross, and Mehraein P. Persistence of *Borrelia burgdorferi* and histopathological alterations in experimentally infected animals: a comparison with histopathological findings in human Lyme disease. *Infection* 1990; 18: 332-341. [gerbils]
243. Preac-Mursic V, Pfister HW, Spiegel H, Burk K, Wilske B, Reinhardt S, and Boehmer R. First isolation of *Borrelia burgdorferi* from an iris biopsy. *J Clin Neuroophthalmol* 1993; 13(3): 155-161. [Patient with blurred vision treated with two separate month-long cycles of tetracycline had symptoms persist for several years. Bb cultured from iris biopsy.]
244. Preac Mursic V, Wanner G, Reinhardt S, Wilske B, Busch U, Marget W. Formation and cultivation of *Borrelia burgdorferi* spheroplast-L-form variants. *Infection* 1996; 24: 218-226.
245. Preac Mursic V, Marget W, Busch U, Rigler DP, Hagl S. Kill kinetics of *Borrelia burgdorferi* and bacterial findings in relation to the treatment of Lyme borreliosis. *Infection* 1996; 24(1): 9-16. [Bb was isolated by culture in five patients, four of whom had previously tested antibody-negative.]
246. Priem S, Burmester GR, Kamradt T, Wolbart K, Rittig MG, et al. (1998) Detection of *Borrelia burgdorferi* by polymerase chain reaction in synovial membrane, but not in synovial fluid from patients with persisting Lyme arthritis after antibiotic therapy. *Ann Rheum Dis* 57(2): 118-121. doi: 10.1136/ard.57.2.118 [After antibiotic treatment, synovial membrane still demonstrates spirochetes.][Although PCR was negative in synovial fluid and urine, PCR confirmed Bb in synovial membrane of four previously treated patients with Lyme arthritis; intracellular sanctuaries of Bb]
247. Reid MC, Schoen RT, Evans J, Rosenberg JC, and Horowitz RI (1998) The consequences of overdiagnosis and overtreatment of Lyme disease: an observational study. *Ann Intern Med* 128(5): 354-362.
248. Reimers CD, de Koning J, Neubert U, Preac Mursic V, Koster JG, Muller Felberl W, Pongratz DE, and Duray PH. *Borrelia burgdorferi* myositis: report of eight patients. *J Neurol* 1993; 240(5):278-283.
249. Rittig MG, Häupl T, Krause A, Kressel M, Groscurth P, Burmester GR. *Borrelia burgdorferi*-induced ultrastructural alterations in human phagocytes: a clue to pathogenicity? *J Pathol* 1994; 173: 269-282.
250. Roberts ED, Bohm RP, Jr., Cogswell FB, Lanners HN, Lowrie RC, Jr., et al. (1995) Chronic Lyme disease in the rhesus monkey. *Lab Invest* 72: 146-160. [rhesus monkey]
251. Roberts ED, Bohm RP, Jr., Lowrie RC, Jr., Habicht G, Katona L, Piesman J, and Philipp MT. Pathogenesis of Lyme neuroborreliosis in the rhesus monkey: the early disseminated and chronic phases of disease in the peripheral nervous system. *J Infect Dis* 1998; 178: 722-732.
252. Roháčová H, Hancil J, Hulinská D, Mailer H, Havlik J. Ceftriaxone in the treatment of Lyme neuroborreliosis. *Infection*. 1996 (Jan-Feb); 24(1): 88-90.



253. Roelcke U, Barnett W, Wilder-Smith E, Sigmund D, and Hacke W. Untreated neuroborreliosis: Bannwarth syndrome evolving into acute schizophrenia-like psychosis. *J Neurol* 1992; 239: 129-131.
254. Ruzic-Sabljić E, Strle F, and Cimperman J. The *Ixodes ricinus* tick as a vector of *Borrelia burgdorferi* in Slovenia. *Eur J Epidemiol* 1993; 9: 396-400.
255. Sala-Lizarraga JA, Salcedo-Vivo J, Ferris J, Lopez-Andreu JA. Lyme borreliosis [Letter] *Lancet* 1990; 345: 1436-1437.
256. Sapi E, and MacDonald A. Biofilms of *Borrelia burgdorferi* in chronic cutaneous borreliosis. *Am. J. Clin. Pathol.* 2008; 129: 988-989. [biofilms consist of a colony of spirochetes and cysts coated by a gelatinous, protective membrane]
257. Sapi E, Kaur N, Anyanwu S, Luecke DF, Datar A, Patel S, Rossi M, Stricker RB. Evaluation of in vitro antibiotic susceptibility of different morphologic form of *Borrelia burgdorferi*. *Drug Resist.* 2011; 4: 97-113. Epub 2011 May 3. [biofilms consist of a colony of spirochetes and cysts coated by a gelatinous, protective membrane]
258. Sapi E, Bastian SL, Mpoy CM, Scott S, Rattelle A, Pabbati N, Poruri A, Buruga D, Theophilus PAS, Pham TV, Datar A, Dhaliwai NK, MacDonald A, Rossi MJ, Sinha SK, and Luecke DF. 2012. Characterization of biofilm formation by *Borrelia burgdorferi* in vitro. *PLOS One* 7(10): e48277. doi: 10.1371/journal.pone.0048277 [biofilms consist of a colony of spirochetes and cysts coated by a gelatinous, protective membrane]
259. Sapi E, Pabbati N, Datar A, Davies EM, Rattelle A and Kuo BA. Improved culture conditions for the growth and detection of *Borrelia* from human serum. *Int J Med Sci* 2013; 10: 362-376.
260. Schoen RT, Aversa JM, Rahn DW, and Steere AC. Treatment of refractory chronic Lyme arthritis with arthroscopic synovectomy. *Arthritis Rheum* 1991; 34(8): 1056-1060.
261. Schlesinger P, Duray P, Burke B, Steere A, and Stillman A. Maternal-fetal transmission of the Lyme disease spirochete *Borrelia burgdorferi*. *Ann Intern Med* 1985; 103: 67-68.
262. Schmidli J, Hunziker T, Moesli P, and Schaad UB. Cultivation of *Borrelia burgdorferi* from joint fluid three months after treatment of facial palsy due to Lyme borreliosis. *J Inf Dis* 1988; 158(4): 905-906. [Bb was cultured from joint fluid after treatment.]
263. Schmitz JL, Schell RF, Lovrich SD, Callister SM and Coe JE; Characterization of the protective antibody response to *Borrelia burgdorferi* in experimentally infected LDH hamsters. *Infect Immun* 1991; 59: 1916-1921.
264. Schwan TG, Burgdorfer W, Schrupf ME, Karstens RH (1988) The urinary bladder: a consistent source of *Borrelia burgdorferi* in experimentally infected white-footed mice (*Peromyscus leucopus*). *J Clin Microbiol* 26: 893-895. [white-footed mice]
265. Schwann TG, Piesman J, Golde WT, Dolan MC, Ros PA. Induction of an outer surface protein on *Borrelia burgdorferi* during tick feeding. *Proc Natl. Acad. Sci. USA.* 1995; 92: 2909-2913. [change in physical characteristics by altering immunogenicity]
266. Seiler KP, and Weis JJ. Immunity to Lyme disease: protection, pathology and persistence. *Curr Opin Immunol* 1996; 8: 503-509.
267. Shadick NA, Phillips CB, Logigian EL, Steere AC, Kaplan RF, Berardi VP, et al. The long-term clinical outcomes of Lyme disease. A population-based retrospective cohort study. *Ann Int Med* 1994; 121: 560-567.
268. Sherr VT. "Bell's palsy of the gut" and other GI manifestations of Lyme and associated disease. *Practical Gastroenterology.* April 2006.
269. Silverman S, Dukes EM, Johnston SS, Brandenburg NA, Sadosky A, and Huse DM. The economic burden of fibromyalgia: comparative analysis rheumatoid arthritis. *Current Medical Research and Opinion* 2009; 25(4) 829-840.
270. Singh SK and HJ Girschick. Molecular survival strategies of the Lyme disease spirochete *Borrelia burgdorferi*. *Lancet Infect Dis* 2004; 4: 575-583. [*B. burgdorferi* survives in brachytophic tissue (ligament, tendon), fibroblasts, synovial cells, endothelial cell {linings of blood and heart vessels, and lymph vessels}, deep invaginations of cell membranes, myocytes, joints, eyes, and bones.]
271. Skogman BH, Croner S, Nordwall M, Eknefelt M, Emerudh J, and Forsberg P. Lyme neuroborreliosis in children: a prospective study of clinical features, prognosis, and outcome. *Pediatric Infect. Dis. J.* 2008; 27(12): 1089-1094.
272. Sonnesyn SW, Manivel JC, Johnson RC, Goodman JL (1993) A guinea pig model for Lyme disease. *Infect Immun* 61: 4777-4784. [guinea pig]
273. Stanek G, Klein J, Bittner R, and Glogar D. Isolation of *Borrelia burgdorferi* from the myocardium of a patient with long standing cardiomyopathy. *N Engl J Med* 1990; 322: 249-252.
274. Steere AC, Duray PH., and Butcher EC. Spirochetal antigens and lymphoid cell surface markers in Lyme synovitis. Comparison with rheumatoid synovium and tonsillar lymphoid tissue. *Arthritis Rheum* 1988; 31: 487-495.
275. Steere AC, Bernardi VP, Weeks KE., Logigian EL, Ackermann R. Evaluation of the intrathecal antibody response to *Borrelia burgdorferi* as a diagnostic test for Lyme neuroborreliosis. *J. Infect. Dis.* 1990(June); 161(6): 1203-1209.
276. Steere AC, Taylor E, McHugh GL, and Logigian EL. The overdiagnosis of Lyme disease. *J. Med. Ass.* 1993 269(14): 1812-1816.
277. Steere AC, Levin RE, Molloy PJ, Kalis RA, Abraham JH, Liu NY, and Schmid CH. Treatment of Lyme arthritis. *Arthritis Rheum* 1994; 37: 878-888.
278. Stein SL, Solvason HB, Biggart E, and Spiegel D. A 25-year-old woman with hallucinations, hypersexuality, nightmares, and a rash. *Am J Psychiatry* 1996; 153: 545-551.
279. Straubinger RK, Straubinger AF, Jacobson RH, Chang Y, Summers BA, Erb HN, and Appel MJG. Two lessons from the canine model of Lyme disease: migration of *Borrelia burgdorferi* in tissues and persistence after antibiotic treatment. *J Spir Tick-Borne Dis* 1997; 4: 24-31. [In dogs: 30-day treatment diminished but failed to eliminate persistent infection in dogs. Antibody titers fell, but after antibiotic treatment was discontinued antibody levels began to rise again, presumably in response to proliferation of the surviving pool of spirochetes.]
280. Straubinger RK, Summers BA, Chang YF, and Appel MJG (1997) Persistence of *Borrelia burgdorferi* in experimentally infected dogs after antibiotic treatment. *J Clin Microbiol* 35: 111-116. [dogs]
281. Straubinger RK. PCR-based quantification of *Borrelia burgdorferi* organisms in canine tissues over a 500-day postinfection period. *J Clin Microbiol* 2000; 38: 2191-2199. [All 8 infected dogs previously treated with 30-day antibiotics were PCR positive from tissue samples after necrosis; 25 tissue samples per dog were used. Interestingly, the number of *B. burgdorferi* organisms detected in skin biopsy samples was *inversely* to the antibody levels measured by enzyme-linked immunosorbent assay.]
282. Straubinger RK, Straubinger AF, Summers BA, and Jacobson RH (2000) Status of *Borrelia burgdorferi* infection after antibiotic treatment and the effects of corticosteroids: an experimental study. *J Infect Dis* 181: 1069-1081. doi: 10.1086/315340
283. Straubinger RK. Lyme borreliosis in dogs in recent advances in canine infectious diseases. Edited by L.E. Carmichael. International Veterinary Information Services. 2000.
284. Stricker RB, Winger EE. Decrease CD57 lymphocyte subset in patients with chronic Lyme disease. *Immunology Letters.* 2001. 76: 43-48.

285. Stricker RB, Burrascano JJ, and Winger EE. Long-term decrease in the CD57 lymphocyte subset in a patient with chronic Lyme disease. *Ann Agric Environ Med* 2002; 9: 111-113.
286. Stricker RB, Laitin A, and Burrascano JJ. Lyme disease: point/counterpoint. *Expert Rev Anti-Infect Ther* 2005; 3: 155-165.
287. Stricker RB. Counterpoint: long-term antibiotic therapy improves persistent symptoms associated with Lyme disease. *Clin Infect Dis* 2007; 45: 149-157.
288. Stricker RB and Johnson L. Persistent *Borrelia burgdorferi* infection after treatment with antibiotics and anti-tumor necrosis factor- $\alpha$ . *J Infect Dis* 2008; 197: 1352-1353.
289. Stricker RB, Green CL, Savely VR, Chamallas SN, and Johnson L. Benefit of intravenous antibiotic therapy in patients referred for treatment of neurologic Lyme disease. *Int J Gen Med* 2011; 4: 639-646. [refutes Klempers {2001} conjecture that long-term antibiotics don't work]
290. Stricker RB, Johnson L. Lyme disease: the next decade. *Infect. Drug Resist.* 2011; 4: 1-9. Epub 2011. Jan 7. [biofilms consist of a colony of spirochetes and cysts coated by a gelatinous, protective membrane]
291. Stricker RB, Johnson L. 2013. Persistent infection in chronic Lyme disease: does form matter? *Res J Infect Dis* 1:2. <http://dx.doi.org/10.7243/2052-5958-1-2>. [Current experiments support persistent spirochetal infection as the cause of chronic Lyme disease.]
292. Stricker RB, Johnson L. *Borrelia burgdorferi* aggrecanase activity: more evidence for persistent infection in Lyme disease. *Frontiers in Cellular and Infection Microbiology*. [http://www.frontiersin.org/Cellular\\_and\\_Infection\\_Microbiology/10.33389/fcimb.2013.00040/abstract](http://www.frontiersin.org/Cellular_and_Infection_Microbiology/10.33389/fcimb.2013.00040/abstract) or <http://goo.gl/6sAi2S>
293. Strle F, Preac-Mursic V, Cimperman J, Ruzic E, Maraspin V, and Jereb M. Azithromycin versus doxycycline for treatment of erythema migrans: clinical and microbiological findings. *Infection* 1993; 21(2): 83-88.
294. Strle F, Cheng Y, Cimperman J, Maraspin V, Lotric-Furlan S, Nelson JA, Picken MM, Ruzic-Sabljić E, and Picken R. Persistence of *Borrelia burgdorferi* sensu lato in resolved erythema migrans lesions. *Clin Inf Dis* 1995; 23: 380-389.
295. Strle F, Maraspin V, Lotric-Furlan, Ruzic-Sabljić E, and Cimperman J. Azithromycin and doxycycline for treatment of *Borrelia* culture-positive erythema migrans. *Infection* 1996; 24: 64-68. [Skin-positive despite repeated antibiotic treatments.]
296. Summers BA, Straubinger AF, Jacobson RH, Chang YF, Appel MJG, and Straubinger RK. Histopathological studies of experimental Lyme disease in the dog. *J Comparative Pathol* 2005; 133: 1-13.
297. Sung SY, McDowell JV, Carlyon JA, and Marconi RT. Mutation and recombination in the upstream homology box-flanked *ospE*-related genes of the Lyme disease spirochetes result in the development of new antigenic variants during infection. *Infect Immun* 2000; 68: 1319-1327.
298. Valesová M, et al. Detection of *Borrelia* in the synovial tissue from a patient with Lyme borreliosis by electron microscopy. *J. Rheumatol.* 1989;16(11): 1502-1505. [intracellular sanctuaries of Bb]
299. Valesová H, Mailer J, Havlik J, Hulínková, D, Hercogová. Long-term results in patients with Lyme arthritis following treatment with ceftriaxone. *Infection.* 1996 (Jan-Feb); 24(1): 98-102.
300. Vartiavaara I. Living with Lyme. *Lancet* 1995; 345: 842-844.
301. Vázquez M, Sparrow SS, and Shapiro ED. Long-term neuropsychologic and health outcomes of children with facial nerve palsy attributable to Lyme disease. *Pediatrics* 2003; 112(2): e93-e97.
302. Walberg P, Granlund H, Nyman D, Panelius J, and Seppälä I. Treatment of late Lyme borreliosis. *J Infection* 1994; 29: 255-261.
303. Waniek K, Prohovnik I, Kaufman MA, and Dwork AJ. Rapid progressive frontal-type dementia associated with Lyme disease. *J Neuropsychiatry Clin Neurosci* 1995; 7: 345-347. (*B. burgdorferi* detected at autopsy).
304. Wang P, Gartenhaus R, Sood SK, DeVoti J, Singer C, Dorante G, and Hilton E. Detection of *Borrelia* DNA in circulating monocytes as evidence of persistent Lyme disease. *J Spir and Tick-Borne Dis* 2000; 7: 16-19.
305. Weber K, Bratzke HJ, Neubert U, Wilske B, and Duray PH. *Borrelia burgdorferi* in a newborn despite oral penicillin for Lyme borreliosis during pregnancy. *Pediatr Infect Dis J* 1988; 7: 286-289.
306. Weber K. Treatment failure in erythema migrans: a review. *Infection* 1996; 24: 73-75.
307. Weis JJ, Yang L, Seiler KP, and Silver RM. Pathological manifestations in murine Lyme disease: association with tissue invasion and spirochete persistence. *Clin Infect Dis* 1997 Suppl 1: S18-24.
308. Wienecke R, Zoechling N, Neubert U. Molecular subtyping of *Borrelia burgdorferi* in erythema migrans and acrodermatitis chronica atrophicans. *J Invest Dermatol* 1994; 103: 19-22. [chronic Lyme borreliosis].
309. Xu Q, Meshan K, and Liang FT. Modification of *Borrelia burgdorferi* to overproduce OspA or VlsE alters its infectious behaviour. *Microbiology* 2008; 154: 3420-3429.
310. Yang L, Weis JH, Eichwald E, Kolbert CP, Persing DH, and Weis JJ. Heritable susceptibility to severe *Borrelia burgdorferi*-induced arthritis is dominant and is associated with persistence of large numbers of spirochetes in tissues. *Infect Immun* 1994; 62: 492-500.
311. Young D, Hussell T, and Dougan G. Chronic bacterial infections: living with unwanted guests. *Nat Immunol* 2002 Nov; 3(11): 1026-1032.
312. Yrjänäinen H, Hytönen J, Söderström KO, Oksi J, Hartiala K, Viljanen MK (2006) Persistent joint swelling and *Borrelia*-specific antibodies in *Borrelia garinii*-infected mice after eradication of vegetative spirochetes with antibiotic treatment. *Microbes Infect* 8: 2044-2051. doi: 10.1016/j.micinf.2006.03.008 [persistence if Bb in mice]
313. Yrjänäinen H, Hytonen J, Song SR, Oksi J, Hartiala K, et al. (2007) Anti-tumor necrosis factor-alpha treatment activates *Borrelia burgdorferi* spirochetes in 4 weeks after ceftriaxone treatment in C3H/He mice. *J Infect Dis* 195: 1489-1496. doi: 10.1086/513873. [mice]
314. Yrjänäinen H. *Borrelia burgdorferi* evades the effects of ceftriaxone treatment in mouse model. *Medica Odontologica* 2009 [thesis]
315. Yrjänäinen H, Hytönen J, Hartiala P, Oksi J, Viljanen MK (2010) Persistence of borrelial DNA in the joints of *Borrelia burgdorferi*-infected mice after ceftriaxone treatment. *APMIS* 118(9): 665-673. doi: 10.1111/j.1600-0463.2010.02615.x [*Borrelia burgdorferi* DNA in joints and tissue adjacent to the joint is the niche of persisting *B. burgdorferi* in ceftriaxone-treated mice.]
316. Zhang JR, Hardham JM, Barbour AG, and Norris SJ. Antigenic variation in Lyme disease borreliae by promiscuous recombination of VMP-like sequence cassettes. *Cell* 1997; 89: 275-285. [antigenic variation: a defense stratagem of *B. burgdorferi*]
317. Zhang Y (2014) Persisters, persistent infections and the Yin-Yang model. *Emerging Microbes and Infections* 3, e3; doi:10.1038/emi.2014.3.
318. Ziska MH, Donta ST, and Demarest FC. Physician preferences in the diagnosis and treatment of Lyme disease in the United States. *Infection* 1996; 24: 182-186.

This section compiled by: John D. Scott, Research Division, Lyme Ontario, February 2015

## Psychiatric Symptoms and Lyme/Tick-Borne Diseases

This section is organized alphabetically by the title of the article.

A controlled study of deficits in children with chronic Lyme disease. **AUTHORS:** Tager, F., Fallon, B., Keilp, J, Rissenberg, M., Jones, C.R. & Liebowitz, M. **SOURCE:** *Journal of Neuropsychiatry and Clinical Neurosciences*, 2001; **13**: 500-507.

[Acute disseminated encephalomyelitis \[letter\]](#) **AUTHORS:** Fallon BA, Niels JA. **SOURCE:** *J Neuropsychiatry Clin Neurosci* 1998 Summer;10(3):366-7

Acute and Chronic Lyme Disease: Controversies for Neuropsychiatry **AUTHORS:** Hurley RA, Taber KH. **SOURCE:** *J Neuropsychiatry Clin Neurosci* 20:1, Winter 2008 <http://neuro.psychiatryonline.org>

Acute and chronic pain associated with Lyme borreliosis: clinical characteristics and pathophysiologic mechanisms. **AUTHORS:** Zimering JH, Williams MR, Eiras ME, Fallon BA, Logigian EL, Dworkin RH et al. **SOURCE:** *Pain*. 2014 Aug;155(8):1435-1438.

[Acute and chronic neuroborreliosis with and without CNS involvement: a clinical, MRI, and HLA study of 27 cases.](#) **AUTHORS:** Krüger H, Heim E, Schuknecht B, Scholz S. **SOURCE:** *J Neurol*. 1991 Aug;238(5):271-80.

Acute Lyme Neuroborreliosis With Transient Hemiparesis and Aphasia **AUTHORS:** Sokolov A, Lienhard R, Du Pasquier R, Véronique Erard V **SOURCE:** *Annals of Emergency Medicine*. Published Online: February 25, 2015 [http://www.annemergmed.com/article/S0196-0644\(15\)00028-1/abstract](http://www.annemergmed.com/article/S0196-0644(15)00028-1/abstract)

[A Girl with Seizures](#) **AUTHOR:** Carla Rothaus **SOURCE:** *NEJM*. May 22nd, 2015

<http://blogs.nejm.org/now/index.php/a-girl-with-seizures/2015/05/22/comment-page-1/#comment-225701> A Groundhog, a Novel Bartonella Sequence, and My Father's Death **AUTHORS:** Breitschwerdt EB, Maggi RG, Cadenas MB, Vissotto de Paiva Diniz PP **SOURCE:** *Emerging Infectious Diseases* • www.cdc.gov/eid • 2009 Aug;15(12): 2080-6 <http://www.cdc.gov/eid/content/15/12/pdfs/2080.pdf>

Alcohol and epilepsy: A case report between alcohol withdrawal seizures and neuroborreliosis. **AUTHORS:** Gheorghiev C, De Montleau F, Defuentes G **SOURCE:** *Encephale* 2011 06; 37 (3): 231-237

[Alcohol and epilepsy: a case report between alcohol withdrawal seizures and neuroborreliosis]. **AUTHORS:** Gheorghiev C, De Montleau F, Defuentes G. **SOURCE:** *Encephale*. 2011 Jun;37(3):231-7.

[Altered mental status, an unusual manifestation of early disseminated Lyme disease: A case report.](#) **AUTHORS:** Chabria SB, Lawrason J. **SOURCE:** *J Med Case Reports*. 2007 Aug 9;1:62.

Alzheimer's disease and infection: Do infectious agents contribute to progression of Alzheimer's disease? **AUTHORS:** Honjo K, van Reekum R, Rand Nicolaas, Verhoeff NPLG. **SOURCE:** *Alzheimer's and Dementia*. Vol 5;4, July 2009, p 348-360

Alzheimer's disease - a neurospirochetosis. Analysis of the evidence following Koch's and Hill's criteria. **AUTHOR:** Miklossy J. **SOURCE:** *J Neuroinflammation*. 2011 Aug 4;8(1):90. [Epub ahead of print]

[Alzheimer's disease Braak Stage progressions: reexamined and redefined as Borrelia infection transmission through neural circuits.](#) **AUTHOR:** MacDonald AB. **SOURCE:** *Med Hypotheses*. 2007;68(5):1059-64. Epub 2006 Nov 17.

[Alzheimer's neuroborreliosis with trans-synaptic spread of infection and neurofibrillary tangles derived from intraneuronal spirochetes.](#) **AUTHOR:** MacDonald AB. **SOURCE:** *Med Hypotheses*. 2007;68(4):822-5. Epub 2006 Oct 20.

[Antibodies against OspA epitopes of Borrelia burgdorferi cross-react with neural tissue.](#) **AUTHORS:** Alaedini A, Latov N. **SOURCE:** *J Neuroimmunol*. 2005 Feb;159(1-2):192-5. Epub 2004 Nov 26.

Anti-neural antibody reactivity in patients with a history of Lyme borreliosis and persistent symptoms. **AUTHORS:** Stricker RB, Johnson L **SOURCE:** *Brain, Behavior, and Immunity* 24 (2010) 1025

Anti-neural antibody reactivity in patients with a history of Lyme borreliosis and persistent symptoms. **AUTHORS:** Volkman D **SOURCE:** *Brain, Behavior, and Immunity* 24 (2010) A Review of Death Certificates Listing Lyme Disease as a Cause of Death in the United States.

**AUTHORS:** Kugeler KJ, Griffith KS, Gould LH et al. **SOURCE:** *Clin Infect Dis*. (2011) 52 (3), 364-367. doi: 10.1093/cid/ciq157 <http://cid.oxfordjournals.org/content/52/3/364.full.pdf> <http://cid.oxfordjournals.org/content/52/3/364.long>

[The association between tick-borne infections, Lyme borreliosis and autism spectrum disorders](#) **AUTHORS:** Bransfield RC, Wulfman JS, Harvey WT, Usman AI. **SOURCE:** *Medical Hypotheses*. 5 Nov 2007

Association of Lyme Disease and Schizoaffective Disorder, Bipolar Type: Is it Inflammation Mediated? **AUTHORS:** Mattingley DW, Koola MM. **SOURCE:** *Indian J Psychol Med*. 2015 Apr-Jun;37(2):243-6.

[Audiologic manifestations of patients with post-treatment Lyme disease syndrome](#) **AUTHORS:** Shotland LI, Mastroianni MA, Choo DL, Szymko-Bennett YM, Dally LG, Pikus AT, Sledjeski K, Marques A **SOURCE:** *Ear Hear*. 2003 Dec;24(6):508-17

[Autism and Lyme Disease](#) **AUTHORS:** Robert C. Bransfield, MD, Mason Kuhn, MS. **SOURCE:** *JAMA*. 2013;310(8):856 doi:10.1001/jama.2013.194747

A woman in her 50s with manic psychosis. **AUTHORS:** Pasareanu AR, Mygland Å, Kristensen Ø. **SOURCE:** *Tidsskr Nor Laegeforen*. 2012 Mar 6;132(5):537-9

[Bartonella henselae bacteremia in a mother and son potentially associated with tick exposure](#) **AUTHORS:** Maggi RG, Ericson M, Mascarelli PE, Bradley JM, Breitschwerdt EB **SOURCE:** *Parasites & Vectors* April 2013, 6:101 doi:10.1186/1756-3305-6-101 <http://dx.doi.org/10.1186/1756-3305-6-101>

[Bartonella henselae infection in a family experiencing neurological and neurocognitive abnormalities after woodlouse hunter spider bites](#) **AUTHORS:** Mascarelli PE, Maggi RG, Hopkins S, Mozayani BR, Trull CL, Bradley JM, Hegarty BC, Breitschwerdt EB **SOURCE:** *Parasites & Vectors* 2013, 6:98 doi:10.1186/1756-3305-6-98 <http://www.parasitesandvectors.com/content/6/1/98/abstract>

[Bartonella sp. Bacteremia in Patients with Neurological and Neurocognitive Dysfunction.](#) **AUTHORS:** *Journal of Clinical Microbiology*. 46(9):2856-2861 **SOURCE:** Breitschwerdt EB, Maggi RG, Nicholson WL, Cherry NA, Woods CW.

The basic syndromes of neurological disorders in Lyme borreliosis. **AUTHORS:** Dekonenko EP, Umanskii KG, Virich IE, Kupriianova LV, Rudometov, IuP, Bagrov FI. **SOURCE:** Ter Arkh 1995; 67 (11) : 52-53

Benefit of intravenous antibiotic therapy in patients referred for treatment of neurologic Lyme disease. **AUTHORS:** Stricker RB, DeLong AK, Green CL, Savely VR, Chamallas SN, Johnson L. **SOURCE:** Int J Gen Med 2011 9; 4 : 639-646

Behavioral Consequences of Infections of the Central Nervous System: With Emphasis on Viral Infections. **AUTHORS:** Tselis A, MD, Booss J. **SOURCE:** J Am Acad Psychiatry Law 31:289-98, 2003

[Beta-amyloid deposition and Alzheimer's type changes induced by Borrelia spirochetes.](#) **AUTHORS:** Miklossy J, Kis A, Radenovic A, Miller L, Forro L, Martins R, Reiss K, Darbinian N, Darekar P, Mihaly L, Khalili K. **SOURCE:** Neurobiol Aging. 2006 Feb;27(2):228-36.

Bell's Palsy of the Gut and other Manifestations of Lyme and Associated Diseases. **AUTHOR:** Sherr VT **SOURCE:** Practical Gastroenterology April 2006

Benefit of intravenous antibiotic therapy in patients referred for treatment of neurologic Lyme disease. **AUTHORS:** Stricker RB, DeLong AK, Green C, Savely VR, Chamallas SN, Johnson L. **SOURCE:** International Journal of General Medicine 2011;4 639-646  
[http://www.dovepress.com/articles.php?article\\_id=8224](http://www.dovepress.com/articles.php?article_id=8224).

[Bilateral dorsolateral thalamic lesions disrupts conscious recollection.](#) **AUTHORS:** Edelstyn NM, Hunter B, Ellis SJ. **SOURCE:** Neuropsychologia. 2006;44(6):931-8. Epub 2005 Oct 25.

Biology and neuropathology of dementia in syphilis and Lyme disease. **AUTHOR:** MIKLOSSY J **EDITORS:** Duyckaerts C, Litvan I **SOURCE:** Handbook of Clinical Neurology, Vol. 89 (3rd series) Dementias 2008 Elsevier B.V.  
<http://www.miklossy.ch/media/ChapterHandbookClinNeuroFinalPdf.pdf>

Borrelia burgdorferi: A Clinical Chameleon **AUTHORS:** Samuel B, Axelband J, Mckim K, Leh D. **SOURCE:** Consultant. 2015;55(7):530-535.  
<http://www.consultant360.com/articles/borrelia-burgdorferi-clinical-chameleon>

Borrelia burgdorferi: Cell Biology and Clinical Manifestations in Latent Chronic Lyme. **AUTHORS:** Smith AJ, Oertle J, Prato D **SOURCE:** Open Journal of Medical Microbiology, Vol.4 No.4, December 2014  
<http://www.scirp.org/Journal/PaperInformation.aspx?PaperID=51411#VJDIHivF9M1>

[Borrelia burgdorferi in the central nervous system: experimental and clinical evidence for early invasion.](#) **AUTHORS:** Garcia-Monco JC, Villar BF, Alen JC, Benach JL. **SOURCE:** J Infect Dis. 1990 Jun;161(6):1187-93.

[Borrelia burgdorferi central nervous system infection presenting as an organic schizophrenialike disorder.](#) **AUTHORS:** Hess A, Buchmann J, Zettl UK, Henschel S, Schlaefke D, Grau G, Benecke R. **SOURCE:** Biol Psychiatry 1999 Mar 15;45(6):795

Borrelia burgdorferi in the nervous system: the new "great imitator". **AUTHOR:** Pachner AR. **SOURCE:** Ann N Y Acad Sci. 1988;539:56-64.

[Borrelia burgdorferi persists in the brain in chronic lyme neuroborreliosis and may be associated with Alzheimer disease.](#) **AUTHORS:** Miklossy J, Khalili K, Gern L, Ericson RL, Darekar P, Bolle L, Hurlimann J, Paster BJ. **SOURCE:** J Alzheimers Dis. 2004 Dec;6(6):639-49; discussion 673-81.

[Borrelia burgdorferi-seropositive chronic encephalomyelopathy: Lyme neuroborreliosis? An autopsied report.](#) **AUTHORS:** Kobayashi K, Mizukoshi C, Aoki T, Muramori F, Hayashi M, Miyazu K, Koshino Y, Ohta M, Nakanishi I, Yamaguchi N. **SOURCE:** Dement Geriatr Cogn Disord. 1997 Nov-Dec;8(6):384-90.

[\[Borreliosis--simultaneous Lyme carditis and psychiatric disorders--case report\]](#) **AUTHORS:** Legatowicz-Koprowska M, Gziut AI, Walczak E, Gil RJ, Wagner T. **SOURCE:** Pol Merkur Lekarski. 2008 May;24(143):433-5. Polish.

Brain SPECT Imaging in Chronic Lyme Disease. **AUTHORS:** Plutchok JJ, Tikofsky RS, Liegner KB, Fallon BA, Van Heertum RL. **SOURCE:** Journal of Spirochetal and Tick Borne-Diseases, 1999; 6: 10-16.

[Can infections and immune reactions to them cause violent behavior?](#) **AUTHOR:** Bransfield RC **SOURCE:** Abstracts of 11th **Psychoimmunology Expert Meeting, March 8-11, 2012** Neurology, Psychiatry and Brain Research. Volume 18, Issue 2, Page 42 (March 2012)

[Carbamazepine in the treatment of Lyme disease-induced hyperacusis.](#) **AUTHORS:** Nields JA, Fallon BA, Jastreboff PJ. **SOURCE:** J Neuropsychiatry Clin Neurosci 1999 Winter;11(1):97-9

A case of meningoencephalitis by the relapsing fever spirochaete Borrelia miyamotoi in Europe. **AUTHORS:** Hovius JWR et al. **SOURCE:** [www.thelancet.com](http://www.thelancet.com) Vol 382 August 17, 2013

Case report: Lyme disease and complex partial seizures. **AUTHOR:** Bransfield RC. **SOURCE:** Journal of Spirochetes and Tick-borne Diseases; Fall/Winter 1999, Vol 6, p123-125

Case Shows How Lyme Disease Can Mimic New-Onset Panic Disorder. **AUTHOR:** Sinclair L **SOURCE:** Psychiatric News. 2013 Vol 48(13)1 DOI: 10.1176/appi.pn.2013.6b19 <http://psychnews.psychiatryonline.org/newsarticle.aspx?articleid=1700960>

Catatonia in a 14 year-old girl: treatment with clorazepam and carbamazepine, a 10-year follow-up]. **AUTHORS:** Askenazy F, Dor E, Benoit M, Dupuis G, Serret S, Myquel M, Seddiki Y. **SOURCE:** Encephale. 2010 Feb;36(1):46-53.

Catatonic syndrome in acute severe encephalitis due to Borrelia burgdorferi infection. Pfister HW, Preac-Mursic V, Wilske B, Rieder G, Forderreuther S, Schmidt S, **AUTHORS:** Kapfhammer HP. **SOURCE:** Neurology. 1993 Feb;43(2):433-5.

[Central nervous system manifestations of human ehrlichiosis.](#) **AUTHORS:** Ratnasamy N, Everett ED, Roland WE, McDonald G, Caldwell CW. **SOURCE:** Clin Infect Dis 1996 Aug;23(2):314-9

Central nervous system manifestations of Lyme disease. **AUTHORS:** Pachner AR, Duray P, Steere AC. **SOURCE:** Arch Neurol. 1989 Jul; 46(7):790-5.

[Cerebral metabolic changes associated with Lyme disease](#) **AUTHORS:** Newberg A, Hassan A, Alavi A. **SOURCE:** Nucl Med Commun 2002 August;23(8):773-777

Chronic Bacterial and Viral Infections in Neurodegenerative and Neurobehavioral Diseases. **AUTHORS:** Nicholson GL. **SOURCE:** Lab Medicine. 2008;39(5):291-9.

[Chronic borrelia encephalomyelorradiculitis with severe mental disturbance: immunosuppressive versus antibiotic therapy.](#) **AUTHORS:** Kollikowski HH, Schwendemann G, Schulz M, Wilhelm H, Lehmann HJ. **SOURCE:** J Neurol. 1988 Jan;235(3):140-2.

Chronic central nervous system involvement in Lyme borreliosis. **AUTHORS:** Kohler J, Kern U, Kasper J, Rhese-Küpper B, Thoden U. **SOURCE:** Neurology. 1988 Jun;38(6):863-7.

[Chronic inflammation and amyloidogenesis in Alzheimer's disease -- role of Spirochetes.](#) **AUTHORS:** Miklossy J. **SOURCE:** J Alzheimers Dis. 2008 May;13(4):381-91. Review.

Chronic Lyme Disease Linked to ADHD in Adults. **AUTHOR:** Young JL **SOURCE:** American Psychiatric Association's 2012 Annual Meeting. Medscape. May 08,2012. <http://www.medscape.com/viewarticle/763458>

Chronic neuroborreliosis in infancy. **AUTHORS:** Zamponi N, Cardinali C, Tavoni MA, Porfiri L, Rossi R, Manca A. **SOURCE:** Ital J Neurol Sci (1999) 20:303-307

[Chronic neurologic manifestations of erythema migrans borreliosis.](#) **AUTHORS:** Ackermann R, Rehse-Kupper B, Gollmer E, Schmidt R. **SOURCE:** Ann N Y Acad Sci. 1988;539:16-23.

[Chronic neurologic manifestations of Lyme disease.](#) **AUTHORS:** Logigian EL, Kaplan RF, Steere AC. **SOURCE:** N Engl J Med. 1990 Nov 22;323(21):1438-44.

Chronic or late Lyme neuroborreliosis: analysis of evidence compared to chronic or late neurosyphilis. **AUTHORS:** Miklossy J. **SOURCE:** Open Neurol J 2012; 6: 146-57.

Chronic or Late Lyme Neuroborreliosis: Present and Future. **AUTHORS:** Miklossy J, Donta S, Mueller K, Nolte O, Perry G. **SOURCE:** *The Open Neurology Journal*. 2012; 6: Pp. 78 [DOI: 10.2174/1874205X01206010078]

<http://benthamscience.com/open/tonuj/articles/V006/SI0078TONEUJ/78TONEUJ.pdf>

[Clinical and demographic characteristics of psychiatric patients seropositive for Borrelia burgdorferi.](#) **AUTHORS:** Hájek T, Libiger J, Janovská D, Hájek P, Alda M, Höschl C. **SOURCE:** Eur Psychiatry. 2006 Mar;21(2):118-22.

[\[Clinical manifestations and epidemiological aspects leading to a diagnosis of Lyme borreliosis: neurological and psychiatric manifestations in the course of Lyme borreliosis\]](#) **AUTHORS:** Créange A. **SOURCE:** Med Mal Infect. 2007 Jul-Aug;37(7-8):532-9. Epub 2007 Mar 26. Review. French.

[Co-existence of toxoplasmosis and neuroborreliosis - a case report.](#) **AUTHORS:** Gustaw K, Beltowska K, Dlugosz E. **SOURCE:** Ann Agric Environ Med. 2005;12(2):305-8.

Coexisting of borreliosis, depression and psoriasis--case report. **AUTHORS:** Oglodek E, Mos D, Araszkiwicz A. **SOURCE:** Pol Merkur Lekarski. 2010 Jan;28(163):53-5.

[Cognitive functioning in late Lyme borreliosis.](#) **AUTHORS:** Krupp LB, Masur D, Schwartz J, Coyle PK, Langenbach LJ, Fernquist SK, Jandorf L, Halperin JJ. **SOURCE:** Arch Neurol. 1991 Nov;48(11):1125-9.

Cognitive Impairments after Tick-borne Encephalitis. **AUTHORS:** Gustaw-Rothenberg K. **SOURCE:** Dementia and Geriatric Cognitive Disorders. 2008;26:165-168.

[Cognitive processing speed in Lyme disease.](#) **AUTHORS:** Pollina DA, Sliwinski M, Squires NK, Krupp LB. **SOURCE:** Neuropsychiatry Neuropsychol Behav Neurol. 1999 Jan;12(1):72-8.

[Complaints attributed to chronic Lyme disease: depression or fibromyalgia?](#) **AUTHORS:** Berman DS, Wenglin BD. **SOURCE:** Am J Med. 1995 Oct;99(4):440.

[Concepts of trust among patients with serious illness.](#) **AUTHORS:** Mechanic D, Meyer S. **SOURCE:** Soc Sci Med. 2000 Sep;51(5):657-68.

[Concurrent infection of the central nervous system by Borrelia burgdorferi and Bartonella henselae: evidence for a novel tick-borne disease complex.](#) **AUTHORS:** Eskow E, Rao RV, Mordechai E. **SOURCE:** Arch Neurol. 2001 Sep;58(9):1357-63.

Concurrent Lyme disease and babesiosis. Evidence for increased severity and duration of illness. **AUTHORS:** Krause PJ, Telford SR 3rd, Spielman A, Sikand V, Ryan R, Christianson D, Burke G, Brassard P, Pollack R, Peck J, Persing DH. **SOURCE:** JAMA. 1996 Jun 5;275(21):1657-60.

[Concurrent medical conditions with pediatric bipolar disorder.](#) **AUTHORS:** Scheffer RE, Linden S. **SOURCE:** Curr Opin Psychiatry. (2007) 20(4), 398-401. Review.

Concurrent neocortical borreliosis and Alzheimer's disease: Demonstration of a spirochetal cyst form. **AUTHOR:** MacDonald AB. **SOURCE:** Ann N Y Acad Sci 1988; 539:468-470.

[Concurrent medical conditions with pediatric bipolar disorder.](#) **AUTHORS:** Scheffer RE, Linden S. **SOURCE:** Curr Opin Psychiatry. 2007 Jul;20(4):398-401. Review.

[Consequences of treatment delay in Lyme disease.](#) **AUTHORS:** Cameron DJ **SOURCE:** J Eval Clin Pract. 2007 Jun;13(3):470-2.

[Constipation Heraldng Neuroborreliosis](#) **AUTHORS:** Shamim A, Shamim S; Liss G; Nylen E; Pincus J; Yepes M. **SOURCE:** Arch Neurol. 2005;62:671-673.

[A Controlled Study of Cognitive Deficits in Children With Chronic Lyme Disease](#) **AUTHORS:** Tager FA, Fallon BA, Keilp J, Rissenberg M, Jones CR, Liebowitz MR. **SOURCE:** J Neuropsychiatry Clin Neurosci 13:500-507, November 2001

**FULL TEXT:** <http://www.lymediseaseassociation.org/Tager.pdf>

Correlates of Perceived Health-Related Quality of Life in Post-treatment Lyme Encephalopathy. **Authors:** Chandra AM, Keilp JG, Fallon BA **Source:** Psychosomatics 2013 (Jul)

*Psychosomatics*. 2013 Jul 9. pii: S0033-3182(13)00078-9. doi:10.1016/j.psych.2013.04.003. [Epub ahead of print]

[Delirium and Lyme disease.](#) **AUTHORS:** Caliendo MV, Kushon DJ, Helz JW. **SOURCE:** Psychosomatics. 1995 Jan-Feb;36(1):69-74.

[Delusional disorders in the course of tick-born encephalitis and borreliosis in patients with hemophilia A and posttraumatic epilepsy--diagnostic and therapeutic difficulties\]](#) **AUTHORS:** Grzywa A, Karakuła H, Górecka J, Chuchra M. **SOURCE:** Pol Merkur Lekarski. 2004 Jan;16(91):60-3. Polish.

[Dementia associated with infectious diseases.](#) **AUTHOR:** Almeida OP, Lautenschlager NT. **SOURCE:** Int Psychogeriatr. 2005;17 Suppl 1:S65-77. Review.

Demyelinating polyradiculitis in neuro borreliosis: **AUTHORS:** Corral I, Sanchis G, Garcia-Ribas G, Quereda C, Escudero R, de Blas G: **SOURCE:** Neurologia 1995 Feb; 10 (2) : 110-113

[Detection of Bartonella henselae by polymerase chain reaction in brain tissue of an immunocompromised patient with multiple enhancing lesions. Case report and review of the literature.](#) **AUTHORS:** George TI, Manley G, Koehler JE, Hung VS, McDermott M, Bollen A. **SOURCE:** J Neurosurg. 1998 Oct;89(4):640-4. Review.

Diagnosis of Infectious or Inflammatory Psychosyndromes. **AUTHOR:** Bechter K. **SOURCE:** *The Open Neurology Journal*, 2012, 6:113-118. [DOI: 10.2174/1874205X01206010113] <http://benthamscience.com/open/tonuj/articles/V006/SI0078TONEUJ/I13TONEUJ.pdf>

[The diagnosis of Lyme disease.](#) **AUTHOR:** Bransfield RC. **SOURCE:** Hosp Pract (Minneap). 1996 Aug 15;31(8):35, 40.

[Diagnosis, treatment, and prevention of Lyme disease.](#) **AUTHOR:** Bransfield RC. **SOURCE:** JAMA. 1998 Sep 23-30;280(12):1049; author reply 1051.

Differential Diagnosis and Treatment of Lyme Disease with Special Reference to Psychiatric Practice. **AUTHORS:** Nields JA, Fallon BA. **SOURCE:** Directions in Psychiatry, 1998, 18: 209-228.

**Differential Diagnosis and the Suspension of Judgment.** **AUTHOR:** Ashley Graham Kennedy\* **SOURCE:** *J Med Philos* (2013) doi: 10.1093/jmp/jht043 First published online: August 29, 2013 <http://jmp.oxfordjournals.org/content/early/2013/08/28/jmp.jht043>

[\[Differential diagnostic problems in Lyme disease \(Borrelia infection resulting in acute exogenous psychosis\)\]](#) **AUTHORS:** Császár T, Patakfalvi A. **SOURCE:** Orv Hetil. 1994 Oct 9;135(41):2269-71.

[A disease in disguise. Lyme can masquerade as migraine, or as madness.](#) **AUTHORS:** Cowley G, Underwood A. **SOURCE:** Newsweek. 2004 Aug 23;144(8):62.

Divergent Opinions of Proper Lyme Disease Diagnosis and Implications For Children Co-Morbid with Autism Spectrum Disorder. **AUTHORS:** Kuhn M, Bransfield RC. **SOURCE:** Medical Hypotheses Accepted: June 6, 2014; Published Online: June 16, 2014. [http://www.medical-hypotheses.com/article/S0306-9877\(14\)00233-3/abstract](http://www.medical-hypotheses.com/article/S0306-9877(14)00233-3/abstract)

[Do bartonella infections cause agitation, panic disorder, and treatment-resistant depression?](#) **AUTHORS:** Schaller JL, Burkland GA, Langhoff PJ. **SOURCE:** MedGenMed. 2007 Sep 13;9(3):54.

[Does process-specific slowing account for cognitive deficits in Lyme disease?](#) **AUTHORS:** Pollina DA, Elkins LE, Squires NK, Scheffer SR, Krupp LB. **SOURCE:** Appl Neuropsychol. 1999;6(1):27-32.

Early disseminated Lyme disease: Lyme meningitis. **AUTHOR:** Pachner AR **SOURCE:** Am J Med; (1995) 98(4A):30S-37S

Early-life programming of later-life brain and behavior: a critical role for the immune system. **AUTHORS:** Staci D, BilboSD, Jaelyn M. Schwarz JM. **SOURCE:** Frontiers in Behavioral Neurosciences. 2009;3

[Efficacy of a long-term antibiotic treatment in patients with a chronic Tick Associated Poly-organic Syndrome \(TAPOS\).](#) **AUTHOR:** Clarissou J, Song A, Bernede C, Guillemot D, Dinh A, Ader F, Perronne C, Salomon J. **SOURCE:** Med Mal Infect. 2009 Feb;39(2):108-15. Epub 2009 Jan 4.

Elevated cerebrospinal fluid kynurenic acid levels in patients with tick-borne encephalitis. **AUTHORS:** Holtze M, Mickiene´ A. Atlas A, Lindquist L, Schwieler L. **SOURCE:** Journal of Internal Medicine. 2012, 272; 394–401.

[Emerging infectious determinants of chronic diseases.](#) **AUTHORS:** O'Connor SM, Taylor CE, Hughes JM. **SOURCE:** Emerg Infect Dis. 2006 Jul;12(7):1051-7.

[Endogenous paranoid-hallucinatory syndrome caused by Borrelia encephalitis](#) **AUTHORS:** Barnett W, Sigmund D, Roelcke U, Mundt C. **SOURCE:** Nervenarzt 1991 Jul;62(7):445-7 [German]

[Epidemiologic, clinical, and laboratory findings of human ehrlichiosis in the United States, 1988.](#) **AUTHORS:** Eng TR, Harkess JR, Fishbein DB, Dawson JE, Greene CN, Redus MA, Satalowich FT. **SOURCE:** JAMA 1990 Nov 7;264(17):2251-8

Etiopathogenesis of autism spectrum disorders: Fitting the pieces of the puzzle together. **AUTHORS:** Gentile I, Zappulo E, Militerni R, Pascotto A, Borgia G, Bravaccio C. **SOURCE:** Med Hypotheses. 2013 Jul;81(1):26-35. doi: 10.1016/j.mehy.2013.04.002. Epub 2013 Apr 25.

European neuroborreliosis: quality of life 30 months after treatment. **AUTHORS:** Eikeland R, Mygland A, Herlofson K, Ljøstad U. **SOURCE:** Acta Neurol Scand. 2011 Nov;124(5):349-54.

[\[Evaluation of cerebrospinal fluid serotonin \(5-HT\) concentration in patients with post-Lyme disease syndrome--preliminary study\]](#) **AUTHORS:** Kepa L, Oczko-Grzesik B, Badura-Glombik T. **SOURCE:** Przegl Epidemiol. 2008;62(4):793-800. Polish.

Evidence for Mycoplasma, ssp., Chlamydia pneumoniae, and Human Herpes-virus 6 Coinfections in Blood of patients with Autistic Spectrum Disorders. **AUTHORS:** Nicholson GL, Gann R, Nicholson NL, Haier J. **SOURCE:** Journal of Neuroscience Research 2007 85.

[Failure of tetracycline therapy in early Lyme disease.](#) **AUTHORS:** Dattwyler RJ, Halperin JJ. **SOURCE:** Arthritis Rheum. 1987 Apr;30(4):448-50.

[First-episode psychosis in a managed care setting: clinical management and research.](#) **AUTHORS:** Jarskog LF, Mattioli MA, Perkins DO, Lieberman JA. **SOURCE:** Am J Psychiatry. 2000 Jun;157(6):878-84.

[FLAIR and magnetization transfer imaging of patients with post-treatment Lyme disease syndrome.](#) **AUTHORS:** Morgen K, Martin R, Stone RD, Grafman J, Kadom N, McFarland HF, Marques A. **SOURCE:** Neurology. 2001 Dec 11;57(11):1980-5.

[Functional Brain Imaging and Neuropsychological Testing in Lyme Disease](#) **AUTHORS:** Fallon BA, Das S, Plutchok JJ, Tager F, Liegner K, Van Heertum R. **SOURCE:** CID 1997; 25:S57-63 **COMPLETE ARTICLE AT:** [http://www.journals.uchicago.edu/CID/journal/issues/v25nS1/jy21\\_57/jy21\\_57.web.pdf](http://www.journals.uchicago.edu/CID/journal/issues/v25nS1/jy21_57/jy21_57.web.pdf)

[Geographical and seasonal correlation of multiple sclerosis to sporadic schizophrenia.](#) **AUTHOR:** Fritzsche M. **SOURCE:** Int J Health Geogr. 2002 Dec 20;1(1):5.

[Geographic correlation of schizophrenia to ticks and tick-borne encephalitis.](#) **AUTHOR:** Brown JS Jr. **SOURCE:** Schizophr Bull 1994;20(4):755-75

[Geographic distribution of Lyme disease in Mudanjiang](#) **AUTHOR:** Zhang Z. **SOURCE:** Zhonghua Liu Xing Bing Xue Za Zhi. 1991 Jun;12(3):154-7. [Chinese]

[Gestational Lyme borreliosis. Implications for the fetus.](#) **AUTHOR:** MacDonald AB. **SOURCE:** Rheum Dis Clin North Am. 1989 Nov;15(4):657-77. Review.

Gifted Students and Lyme Disease: What Educators, Counselors, and Parents Need to Know. **AUTHOR:** Schuler PA. **SOURCE:** *Gifted Child Today* 2013 36: 35. DOI: 10.1177/1076217512465288 <http://gct.sagepub.com/content/36/1/35>

Hallucinations, Sensory Neuropathy, and Peripheral Visual Deficits in a Young Woman Infected with *Bartonella koehlerae*. **AUTHORS:** Edward B. Breitschwerdt EB, Mascarelli PE, Schweickert LA, Ricardo G. Maggi RG, Hegarty BC, Bradley JM, Woods CW. **SOURCE:** JOURNAL OF CLINICAL MICROBIOLOGY, Sept. 2011, Vol. 49, No. 9: p. 3415–3417

[Higher Prevalence of Antibodies to Borrelia burgdorferi in Psychiatric Patients Than in Healthy Subjects.](#) **AUTHORS:** Hajek T, Paskova B, Janovska D, Bahboub R, Hajek P, Libiger J, Hoschl C. **SOURCE:** Am J Psychiatry 159:297-301, February 2002. **COMPLETE TEXT AT:** <http://ajp.psychiatryonline.org/cgi/reprint/159/2/297>

Historic evidence to support a causal relationship between spirochetal infections and Alzheimer's disease. **AUTHOR:** Miklossy J. **SOURCE:** Frontiers in Aging Neuroscience. 2015 Apr 16;7:46. eCollection 2015. <http://doi.org/10.3389/fnagi.2015.00046>

Human babesiosis--an unrecorded reality. **AUTHOR:** Sherr VT. **SOURCE:** Med Hypotheses. 2004;63(4):609-15

Hypochondriasis and obsessive compulsive disorder: overlaps in diagnosis and treatment. **AUTHORS:** Fallon BA, Javitch JA, Hollander E, Liebowitz MR. **SOURCE:** Journal of Clinical Psychiatry. November 1991; 52(11):457-60.

Increased anti-streptococcal antibodies in patients with Tourette's syndrome. **AUTHORS:** Muller N, Riedel M, Straube A, Gunther W, Wilske B. **SOURCE:** Psychiatry Res. 2000 Apr 24;94(1):43-9.

Increased IFN $\alpha$  activity and differential antibody response in patients with a history of Lyme disease and persistent cognitive deficits. **AUTHORS:** Jacek E, Fallon BA, Chandra A, Crow MK, Wormser GP, Alaedini A. **SOURCE:** J Neuroimmunol. 2012 Nov 7. doi:pii:S0165-5728(12)00314-1. 10.1016/j.jneuroim.2012.10.011.

Infectious Agents in Schizophrenia and Bipolar Disorder. **AUTHORS:** Yolken RH, Torrey EF. **SOURCE:** 2006 June 43(7)

Inflammation and Central Nervous System Lyme Disease. **AUTHORS:** Fallon BA, Levin ES, Schweitzer PJ, Hardesty D. **SOURCE:** Neurobiol Dis. 2009 Nov 25; [Epub ahead of print]

Inflammation in the pathogenesis of Lyme neuroborreliosis. Ramesh G, Didier PJ, England JD, Santana-Gould L, Doyle-Meyers LA, Martin DS. **AUTHORS:** Jacobs MB, Philipp MT. **SOURCE:** Am J Pathol. 2015 May;185(5):1344-60.

Inflammatory brain changes in Lyme Borreliosis. A report on three patients and review of literature; **AUTHORS:** Oksi J, Kalimo H, Marttila RJ, Marjamaa M, Sonninen P, Nikoskelainen J, Viljanen MK. **SOURCE:** Brain, 1996 Dec; 119 (Pt 6) : 2143-2154

Integrating Infectious Disease and Neuropsychimmunology Research into the Practice of Psychiatry. **AUTHOR:** Bransfield RC. **SOURCE:** 9th Psychoimmunology Expert Meeting, Gunzburg, Germany. In Vivo (International Journal of Experimental and Clinical Pathophysiology and Drug Research) suppl. October 2007.

Interaction of the Lyme Disease Spirochete Borrelia burgdorferi with Brain Parenchyma Elicits Inflammatory Mediators from Glial Cells as Well as Glial and Neuronal Apoptosis **AUTHORS:** Ramesh R, Borda JT, Dufor J, Kaushal D, Ramamoorthy R, Lackner AA, Philipp MT. **SOURCE:** The American Journal of Pathology, Vol. 173, No. 5, November 2008

[Invasion of human neuronal and glial cells by an infectious strain of Borrelia burgdorferi.](#) **AUTHORS:** Livengood JA, Gilmore RD Jr. **SOURCE:** Microbes Infect. 2006 Nov-Dec;8(14-15):2832-40. Epub 2006 Sep 22.

[\[Isocyanate exposure in first line differential diagnosis. A case report illustrates general practitioners' symptom dilemma\]](#) **AUTHOR:** Järhult B. **SOURCE:** Lakartidningen. 2004 Jul 22;101(30-31):2417-9. Swedish.

[Isolated monolateral neurosensory hearing loss as a rare sign of neuroborreliosis.](#) **AUTHORS:** Iero I, Elia M, Cosentino FI, Lanuzza B, Spada RS, Toscano G, Tripodi M, Belfiore A, Ferri R. **SOURCE:** Neurol Sci. 2004 Apr;25(1):30-3.

Kindling, carbamazepine, and Lyme-induced hyperacusis. **AUTHORS:** Niels J, Fallon BA, Jastreboff P. **SOURCE:** Journal of Neuropsychiatry and Clinical Neurosciences 11: 97-99,1999.

[Late-Stage Neuropsychiatric Lyme Borreliosis: Differential Diagnosis and Treatment](#) **AUTHORS:** Fallon BA, Schwartzberg M, Bransfield R, Zimmerman B, Scotti A, Weber CA, Liebowitz MR. **SOURCE:** Psychosomatics 1995;36:295-300 **COMPLETE TEXT AT:** <http://www.wadhurst.demon.co.uk/lyme/lyme101.htm>

[A life cycle for Borrelia spirochetes?](#) **AUTHOR:** MacDonald AB. **SOURCE:** Med Hypotheses. 2006;67(4):810-8. Epub 2006 May 22.

Long term antibiotic therapy may be an effective treatment for children co-morbid with Lyme disease and Autism Spectrum Disorder. **AUTHORS:** Kuhn M, Grave S, Bransfield R, Harris S **SOURCE:** Medical Hypotheses, , Available online 21 February 2012. <http://www.sciencedirect.com/science/article/pii/S0306987712000485>

[The long-term clinical outcomes of Lyme disease. A population-based retrospective cohort study.](#) **AUTHORS:** Shadick NA, Phillips CB, Logigian EL, Steere AC, Kaplan RF, Berardi VP, Duray PH, Larson MG, Wright EA, Ginsburg KS, Katz JN, Liang MH. **SOURCE:** Ann Intern Med. 1994 Oct 15;121(8):560-7.

[Long-term cognitive effects of Lyme disease in children.](#) **AUTHORS:** Adams WV, Rose CD, Eppes SC, Klein JD. **SOURCE:** Appl Neuropsychol 1999;6(1):39-45

[The long-term course of Lyme arthritis in children.](#) **AUTHORS:** Szer IS, Taylor E, Steere AC. **SOURCE:** N Engl J Med. 1991 Jul 18;325(3):159-63.

[Loss of the sense of humor.](#) **AUTHOR:** Ramanan SV. **SOURCE:** Arch Intern Med 2000 Sep 11;160(16):2546

[Lyme borreliosis in neurology and psychiatry.](#) **AUTHOR:** Kohler J. **SOURCE:** Fortschr Med. 1990 Apr 10;108(10):191-3, 197. Review. [German]

Lyme Borreliosis: Neuropsychiatric Aspects and Neuropathology. **AUTHORS:** Fallon BA, Vaccaro BJ, Romano M, Clemente MD. **SOURCE:** Psychiatric Annals 2006;36(2):120-8.

Lyme Disease: A Neuropsychiatric Illness. **AUTHORS:** Fallon BA, Niels JA. **SOURCE:** Am J Psychiatry 1994 Nov;151(11):1571-83 **COMPLETE TEXT AT:** <http://www.angelfire.com/biz/romarkaraoke/lymeart.html>

Lyme disease and pediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS): an overview. **AUTHORS:** Rhee H, Cameron DJ. **SOURCE:** International Journal of General Medicine, February 2012 **Volume** 2012:5 **Pages** 163-174. <http://www.dovepress.com/lyme-disease-and-pediatric-autoimmune-neuropsychiatric-disorders-assoc-peer-reviewed-article-IJGM>

Lyme disease: an infectious and postinfectious syndrome. **AUTHOR:** Asch ES, Bujak DI, Weiss M, Peterson MG, Weinstein A. **SOURCE:** Journal of Rheumatology. 1994 Mar;21(3):454-61

Lyme disease: a review of its epidemiology, evaluation, and treatment. **AUTHORS:** Gerstenblith TA, Stern TA. **SOURCE:** Psychosomatics. 2014 Sep-Oct;55(5):421-9.

Meningoencephalomyelitides. **AUTHORS:** Liegner KB, Duray P, et al. **SOURCE:** Journal of Spirochetal and Tick-Borne Diseases. 1997 Fall.Winter;4:61-72

[Lyme Disease, Comorbid Tick-Borne Diseases, and Neuropsychiatric Disorders - Psychiatric Times.](#) **AUTHOR:** Bransfield RC. **SOURCE:** Psychiatric Times. 2007 Dec; 24(14):59-61 <http://www.psychiatrictimes.com/articles/lyme-disease-comorbid-tick-borne-diseases-and-neuropsychiatric-disorders>

Lyme disease: Etiology, neuropsychological sequelae and educational impact. **AUTHORS:** Hamlen, R.A. & Kliman, D.S. **SOURCE:** Pediatric School Psychology Communique. Volume 36: No. 5, February, 2007, pp. 34-36.

[Lyme disease--neuroborreliosis](#). **AUTHORS:** Jovanovic J, Cvjetkovic D, Vukadinov J. **SOURCE:** Med Pregl. 1995;48(3-4):120-2. [Serbo-Croatian: Roman]

Lyme disease presenting as Tourette's syndrome. **AUTHORS:** Riedel M, Straube A, Schwarz MJ, Wilske B, Muller N. **SOURCE:** Lancet. 1998 Feb 7;351(9100):418-9

[Lyme disease surveillance in Maryland, 1992](#). **AUTHORS:** Steinberg SH, Strickland GT, Pena C, Israel E. **SOURCE:** Ann Epidemiol. 1996 Jan;6(1):24-9.

[Lyme encephalopathy](#). **AUTHORS:** Sanders K, Rogers JD. **SOURCE:** Neurology. 1991 Jun;41(6):952-3.

[Lyme encephalopathy: long-term neuropsychological deficits years after acute neuroborreliosis](#). **AUTHORS:** Benke T, Gasse T, Hittmair-Delazer M, Schmutzhard E. **SOURCE:** Acta Neurol Scand. 1995 May;91(5):353-7.

[Lyme encephalopathy: a neuropsychological perspective](#). **AUTHORS:** Kaplan RF, Jones-Woodward L. **SOURCE:** Semin Neurol. 1997 Mar;17(1):31-7. Review.

Lyme neuroborreliosis. **AUTHORS:** Garcia-Monco JC, Benach JL. **SOURCE:** Ann Neurol 1995 Jun; 37 (6) : 691-70

Lyme neuroborreliosis and dementia. J Alzheimers. **AUTHORS:** Blanc F, Philippi N, Cretin B, Kleitz C, Berly L, Jung B, Kremer S, Namer IJ, Sella F, Jaulhac B, de Seze J. **SOURCE:** Dis. 2014; 41 (4) : 1087-93 .

[Lyme neuroborreliosis: central nervous system manifestations](#). **AUTHORS:** Halperin JJ, Luft BJ, Anand AK, Roque CT, Alvarez O, Volkman DJ, Dattwyler RJ. **SOURCE:** Neurology. 1989 Jun;39(6):753-9.

Lyme Neuroborreliosis: infection, immunity and inflammation. **AUTHORS:** Pachner AR, Steiner I **SOURCE:** Lancet Neurology 2007 6:544-52.

Lyme neuroborreliosis presenting with alexithymia and suicide attempts. **AUTHORS:** Banerjee R, Liu JJ, Minhas HM. **SOURCE:** J Clin Psychiatry. 2013 Oct;74(10):981.

Lyme Neuroborreliosis: Manifestations of a Rapidly Emerging Zoonosis. **AUTHORS:** P. Hildenbrand, D.E. Craven, R. Jone et al. **SOURCE:** Am J Neuroradiol 30:1079-87. Jun-Jul 2009

[Lyme neuroborreliosis manifesting as an intracranial mass lesion](#). **AUTHORS:** Murray R, Morawetz R, Kepes J, el Gammal T, LeDoux M. **SOURCE:** Neurosurgery. 1992 May;30(5):769-73.

[Lyme neuroborreliosis of mental manifestation. Apropos of a case](#). **AUTHORS:** Gueglio B, Raffi F, Marjolet M. **SOURCE:** Rev Med Interne. 1996;17(7):599. [French]

Lyme Neuroborreliosis Presenting as Alice in Wonderland Syndrome. **AUTHORS:** Ibrahim M, Binalsheikh IM, David Griesemer D, Sonya Wang S, Rebeca Alvarez-Altalef R **SOURCE:** Pediatric Neurology. Volume 46, Issue 3, Pages 185-186, March 2012

[Lyme neuroborreliosis revealed as a normal pressure hydrocephalus: a cause of reversible dementia](#). **AUTHORS:** Etienne M, Carvalho P, Fauchais AL, Pestel-Caron M, Doucet J, Chassagne P. **SOURCE:** J Am Geriatr Soc. 2003 Apr;51(4):579-80.

[Lyme Psychosis](#) **AUTHORS:** van den Bergen HA, Smith JP, van der Zwan A. **SOURCE:** Ned Tijdschr Geneesk 1993 Oct 9;137(41):2098-100 [Dutch]

[Measurement of long-term outcomes in observational and randomised controlled trials](#). **AUTHORS:** Hodgson R, Bushe C, Hunter R. **SOURCE:** Br J Psychiatry Suppl. 2007 Aug;50:s78-84. Review.

[Memory and executive functions in adolescents with posttreatment Lyme disease](#) **AUTHORS:** McAuliffe P, Brassard MR, Fallon B **SOURCE:** Applied Neuropsychology, Volume 15, Issue 3 July 2008, pp. 208 - 219

[Memory impairment and depression in patients with Lyme encephalopathy: comparison with fibromyalgia and nonpsychotically depressed patients](#). **AUTHORS:** Kaplan RF, Meadows ME, Vincent LC, Logigian EL, Steere AC. **SOURCE:** Neurology. 1992 Jul;42(7):1263-7.

[Meningoradiculoneuritis in Lyme disease. A case with major regressive mental disorders](#). **AUTHORS:** Ferroir JP, Reignier A, Nicolle MH, Guillard A. **SOURCE:** Presse Med. 1988 Apr 16;17(14):697. [French]

[Mental disorders in the course of lyme borreliosis and tick borne encephalitis](#). **AUTHORS:** Juchnowicz D, Rudnik I, Czernikiewicz A, Zajkowska J, Pancewicz SA. **SOURCE:** Przegł Epidemiol 2002;56 Suppl 1:37-50 [Polish]

[Mental disorders in the course of neuroborreliosis: own observation](#). **AUTHORS:** Zajkowska JM, Poplawska R, Pancewicz SA, Kondrusik M, Gudel I, Snarska I. **SOURCE:** Psychiatr Pol 1999 Nov-Dec;33(6):939-46 [Polish]

[Mental disorders in Lyme disease](#). **AUTHORS:** Rudnik-Szalaj I, Poplawska R, Zajkowska J, Szulc A, Pancewicz SA, Gudel I. **SOURCE:** Pol Merkuriusz Lek. 2001 Nov;11(65):460-2. Review. [Polish]

[Mental disorders in the course of lyme borreliosis and tick borne encephalitis](#). **AUTHORS:** Juchnowicz D, Rudnik I, Czernikiewicz A, Zajkowska J, Pancewicz SA. **SOURCE:** Przegł Epidemiol. 2002;56 Suppl 1:37-50. Polish.

[Mental disorders in the course of neuroborreliosis: own observation](#) **AUTHORS:** Zajkowska JM, Poplawska R, Pancewicz SA, Kondrusik M, Gudel I, Snarska I. **SOURCE:** Psychiatr Pol. 1999 Nov-Dec;33(6):939-46. Polish.

[Mental nerve neuropathy in Lyme disease](#). **AUTHORS:** Maillefert JF, Dardel P, Piroth C, Tavernier C. **SOURCE:** Rev Rhum Engl Ed. 1997 Dec;64(12):855.

[Mental problems in Lyme disease](#). **AUTHORS:** Rudnik I, Poplawska R, Zajkowska J, Konarzewska B, Juchnowicz D, Pancewicz SA **SOURCE:** Pol Merkuriusz Lek. 2003 Aug;15(86):161-4

[Microbes' roadmap to neurons](#). **AUTHOR:** Kristensson K **SOURCE:** Nat Rev Neurosci. 2011 Jun;12(6):345-57.

[Morgellons disease, illuminating an undefined illness: a case series](#) **AUTHOR:** Harvey WT, Bransfield RC, Mercer DE, Wright AJ, Ricchi RM, Leitao MM. **SOURCE:** Journal of Medical Case Reports 2009, 3:8243

[Multiple neurologic manifestations of Borrelia burgdorferi infection](#). **AUTHOR:** Dupuis MJ. **SOURCE:** Rev Neurol (Paris) 1988;144(12):765-75 [French]

[Munchausen's syndrome by proxy and Lyme disease: medical misogyny or diagnostic mystery?](#) **AUTHOR:** Sherr VT. **SOURCE:** Med Hypotheses. 2005;65(3):440-7.

Musical Hallucinations in Patients with Lyme Disease. **AUTHORS:** Stricker R, Winger **SOURCE:** Southern Medical Journal 2003; 96(7):711-715

Mystery Diagnosis: Treatment of Neuropsychiatric Lyme Disease-Mental Disorders Due to a General Medical Condition. **AUTHOR:** Fallon BA. **SOURCE:** In Spitzer. RL, First MB, Williams JBW, Gibbon M. (Eds.) DSM-IV-TR Case Book Vol. 2: Experts Tell How they Treated Their Own Patients. pp 39-50. American Psychiatric Association Press. Washington DC. 2006.



Neurocognitive abnormalities in children after classic manifestations of Lyme disease. **AUTHORS:** Bloom BJ, Wyckoff PM, Meissner HC, Steere AC. **SOURCE:** *Pediatr Infect Dis J* 1998; 17(3):189-96.

Neuroinflammation in Lyme neuroborreliosis affects amyloid metabolism. **AUTHORS:** Mattsson N, Bremell D, Anckarsater R, Blennow K, Anckarsater H, Zetterberg H, Hagberg L. **SOURCE:** *BMC Neurol*. 2010 Jun 22;10(1):51  
<http://eutils.ncbi.nlm.nih.gov/entrez/eutils/elink.fcgi?dbfrom=pubmed&id=20569437&retmode=ref&cmd=prlinks>

Neopterin production and tryptophan degradation in acute Lyme neuroborreliosis versus late Lyme encephalopathy. **AUTHORS:** Gasse T, Murr C, Meyersbach P, Schmutzhard E, Wachter H, Fuchs D. **SOURCE:** *Eur J Clin Chem Clin Biochem*. 1994 Sep;32(9):685-9.

Neuroborreliosis. **AUTHOR:** Kaiser B. **SOURCE:** *J Neurol* (1998); 245:247-255

Neuroborreliosis: a psychiatric problem? **AUTHORS:** Poplawska R, Szulc A, Zajkowska J, Pancewicz S. **SOURCE:** *Psychiatr Pol* 1999 Mar-Apr;33(2):241-50 [Polish]

[Neuroborreliosis in a patient with progressive supranuclear paralysis. An association or the cause?] **AUTHORS:** García-Moreno JM, Izquierdo G, Chacón J, Angulo S, Borobio MV. **SOURCE:** *Rev Neurol*. 1997 Dec;25(148):1919-21. Spanish.

Neurocognitive abnormalities in children after classic manifestations of Lyme disease. **AUTHORS:** Bloom BJ, Wyckoff PM, Meissner HC, Steere AC. **SOURCE:** *Pediatr Infect Dis J*. 1998 Mar;17(3):189-96.

Neuroinflammation in Lyme neuroborreliosis affects amyloid metabolism. **AUTHORS:** Mattsson N, Bremell D, Anckarsater R, Blennow K, Anckarsater H, Zetterberg H, Hagberg L. **SOURCE:** *BMC Neurology* 2010, 10:51doi:10.1186/1471-2377-10-51. Published 22nd June 2010  
<http://www.biomedcentral.com/content/pdf/1471-2377-10-51.pdf>

Neurologic manifestations of Lyme disease, the new "great imitator". **AUTHOR:** Pachner AR. **SOURCE:** *Rev Infect Dis*. 1989 Sep-Oct;11 Suppl 6:S1482-6.

Neurologic syndromes in Lyme disease. **AUTHORS:** Zajkowska JM, Hermanowska-Szpakowicz T, Kondrusik M, Pancewicz SA. **SOURCE:** *Pol Merkurusz Lek*. 2000 Aug;9(50):584-8. Review. [Polish]

[Neurologic and psychiatric manifestations of Lyme disease]. **AUTHORS:** Blanc F, GEBLY. **SOURCE:** *Med Mal Infect*. 2007 Jul-Aug;37(7-8):435-45. Epub 2007 Mar 9. Review.

Neurologic manifestations in children with North American Lyme disease. **AUTHORS:** Belman AL, Iyer M, Coyle PK, Dattwyler R. **SOURCE:** *Neurology*. 1993 Dec;43(12):2609-14.

Neurological Complications of Lyme Disease: Dilemmas in Diagnosis and Treatment. **AUTHORS:** Stratmoen M. **SOURCE:** *Neurology Today* 2004;4(4)71-5.

[Neurological manifestations of Lyme disease] **AUTHORS:** García-Moncó JC, Benach JL. **SOURCE:** *Enferm Infecc Microbiol Clin*. 1989 Nov;7(9):501-6. Review. Spanish.

Neurological Manifestations of Lyme Disease, The New "Great Imitator" **AUTHOR:** Pachner AR. **SOURCE:** *Infectious Disease*; 11 Suppl 6:S1482-1486;1989

Neurological and psychological symptoms after the severe acute neuroborreliosis. **AUTHORS:** Gustaw K, Beltowska K, Studzinska MM. **SOURCE:** *Ann Agric Environ Med* 2001;8(1):91-4 **COMPLETE TEXT AT:** <http://www.aem.pl/pdf/aaem0113.htm>

Neurological Manifestations of Bartonellosis in Immunocompetent Patients: A Composite of Reports from 2005–2012. **AUTHORS:** Breitschwerdt EB, Sontakke, Hopkins S **SOURCE:** *Journal of Neuroparasitology*. Vol. 3 (2012), Article ID 235640, 15 pages

Neurologic Manifestations of Lyme disease. **AUTHORS:** Ragnaud JM, Morlat P, Buisson M, Perron X, Orgogozo JM, Julien J, **SOURCE:** Beylot J, Aubertin J: Apropos of 25 cases: *Rev Med Interne* 1995; 16 (7) : 487-494

Neurologic manifestations of Lyme borreliosis in children: **AUTHOR:** Millner M: **SOURCE:** *Wien Med Wochenschr* 1995; 145 (7-8): 178-182

Neurologic manifestations in children with North American Lyme disease. **AUTHORS:** Belman AL, Iyer M, Coyle PK, Dattwyler R. **SOURCE:** *Neurology*. 1993 Dec;43(12):2609-14.

Neurologic manifestations of Lyme disease: the new "Great Imitator." **AUTHORS:** Pachner, A. **SOURCE:** *Review of Infectious Diseases*, 1989, 11(suppl 6): S1482-S1486.

Neuropsychiatric and Neuropathologic Aspects of Lyme Disease. **AUTHORS:** Fallon BA, Vaccaro B, Romano M, Clemente D. **SOURCE:** *Psychiatric Annals*, 36:120-128, 2006.

Neuropsychiatric Aspects of Non-HIV Infectious Diseases. **AUTHOR:** Fallon BA. **SOURCE:** In *Comprehensive Textbook of Psychiatry*, Eighth Edition. Ed. Kaplan and Sadock. Williams and Wilkins, 2005

Neuropsychiatric Aspects of Non-HIV Infectious Diseases. **AUTHOR:** Fallon BA. **SOURCE:** In *Comprehensive Textbook of Psychiatry*, Seventh Edition. Ed. Kaplan and Sadock. Williams and Wilkins. 2000.

Neuropsychiatric Disorders and Infection. **AUTHORS:** Fatemi SH, Ed, **SOURCE:** Taylor and Francis, 2005. ISBN 1 84184 520 5

Neuropsychiatric Lyme Disease: the New 'Great Imitator' **AUTHOR:** Fallon B **SOURCE:** *Psychiatric Times*, June 2004

The neuropsychiatric manifestations of Lyme borreliosis **AUTHORS:** Fallon BA, Niels JA, Burrascano JJ, Liegner K, DelBene D, Liebowitz MR. **SOURCE:** *Psychiatr Q* 1992 Spring;63(1):95-117 **COMPLETE TEXT AT:** <http://www.lymenet.org>

Neuropsychiatric Lyme Disease. **AUTHOR:** Fallon BA. **SOURCE:** *Harvard Mental Health Letter*, Forum 10/95

Neuropsychiatric manifestations of Lyme disease. **AUTHOR:** Paparone PW. **SOURCE:** *J Am Osteopath Assoc* 1998 Jul;98(7):373-8

Neuropsychiatric Masquerades - *Psychiatric Times*. **AUTHOR:** Kaplan A. **SOURCE:** *Psychiatric Times* 2009 Feb 26(2)1-8.

Neuropsychiatric presentation of Lyme disease in Australia. **AUTHORS:** Maud C, Berk M. **SOURCE:** *Aust N Z J Psychiatry* 2012(Sep)

Neuropsychological deficits in Lyme disease patients with and without other evidence of central nervous system pathology. **AUTHORS:** Kaplan RF, Jones-Woodward L, Workman K, Steere AC, Logigian EL, Meadows ME. **SOURCE:** *Appl Neuropsychol*. 1999;6(1):3-11.

Neuropsychological deficits in neuroborreliosis. **AUTHORS:** Primavera A, Gazzola P, De Maria AF. **SOURCE:** *Neurology*. 1999 Sep 11;53(4):895-6.

The neuropsychological examination of naming in Lyme borreliosis. **AUTHORS:** Svetina C, Barr WB, Rastogi R, Hilton E. **SOURCE:** *Appl Neuropsychol*. 1999;6(1):33-8.

Neuropsychological functioning in chronic Lyme disease. **AUTHORS:** Westervel HJ, McCaffrey RJ. **SOURCE:** *Neuropsychol Rev* 2002 Sep;12(3):153-77 Review.

Neurosyphilis: a psychiatric perspective. **AUTHORS:** Rundell JR, Wise MG. **SOURCE:** *Psychosomatics* (1985) 26, 287-295.  
<http://www.ncbi.nlm.nih.gov/pubmed/3887454>

Neuro-Visual Processing Rehabilitation: An Interdisciplinary Approach, **AUTHOR:** Padula, W., Munitz, R. & Magrun, W.M. **SOURCE:** Optometric Extension Program Foundation, Inc., Santa Ana, CA, 2012

New insights into stages of Lyme disease symptoms from a novel hospital-based registry. **AUTHORS:** Lobraico J, Butler A, Petrini J, Ahmadi R. **SOURCE:** J Prim Care Community Health. 2014 Oct;5(4):284-7.

New-onset panic, depression with suicidal thoughts, and somatic symptoms in a patient with a history of Lyme disease. **AUTHORS:** Garakani A, Mitton AG. **SOURCE:** Case Rep Psychiatry. 2015;2015:457947. <http://dx.doi.org/10.1155/2015/457947>

One-year Follow-up of Tick-borne Central Nervous System Infections in Childhood **AUTHORS:** Engman M-L, Lindström K, Sallamba M, Hertz C, et al. **SOURCE:** *The Pediatric Infectious Disease Journal*. (2012) 31(6): 570-4.

Ongoing Discussion About the US Clinical Lyme Trials. **AUTHORS:** Fallon BA, Petkova E, Keilp JG, Britton CB. **SOURCE:** Am J Med. 2014 Feb;127(2):e7. [http://www.amjmed.com/article/S0002-9343\(13\)00827-9/fulltext](http://www.amjmed.com/article/S0002-9343(13)00827-9/fulltext)

On the question of infectious aetiologies for multiple sclerosis, schizophrenia and the chronic fatigue syndrome and their treatment with antibiotics. **AUTHOR:** Frykholm BO. **SOURCE:** Medical Hypotheses (2009) in print

The organic disorders in the course of Lyme disease **AUTHORS:** Rudnik I, Konarzewska B, Zajkowska J, Juchnowicz D, Markowski T, Pancewicz SA **SOURCE:** Pol Merkuriusz Lek. 2004 Apr;16(94):328-31

Other Tick-Borne Diseases in Europe. **AUTHORS:** Bitam I, Raoult D. **SOURCE:** Curr Probl Dermatol. 2009;37:130-154. Epub 2009 Apr 8

Outcomes of cases of chronic disseminated Lyme disease for 3 infected physicians, described in their own essays. **AUTHORS:** Sherr V **SOURCE:** 2000. Available online at [www.thehumansideoflyme.net](http://www.thehumansideoflyme.net)

Pain, fatigue, depression after borreliosis. Antibiotics used up--what next? **AUTHORS:** Woessner R, Treib J **SOURCE:** MMW Fortschr Med. 2003 Sep 18;145(38):45-8

Painful hallucinations and somatic delusions in a patient with the possible diagnosis of neuroborreliosis. **AUTHORS:** Bar KJ, Jochum T, Hager F, Meissner W, Sauer H. **SOURCE:** Clin J Pain. 2005 Jul-Aug;21(4):362-3.

Panic Attacks May Reveal Previously Undiscovered Chronic Disseminated Lyme Disease **AUTHOR:** Sherr VT. **SOURCE:** Journal of Psychiatric Practice, 6:352-356, November 2000

Parainfectious meningo-encephalo-radiculo-myelitis (cat scratch disease, Lyme borreliosis, brucellosis, botulism, legionellosis, pertussis, mycoplasma). **AUTHORS:** Greenblatt D, Krupp LB, Belman AL **SOURCE:** Handb Clin Neurol 2013; 112: 1195-207.

Parasitic delirium in patient with multiorganic pathology: a complex situation **AUTHORS:** Hernandez-Albujar S, Rubio G, Gopar J, Galeote G, Rey R, Gil A. **SOURCE:** An Med Interna 1996 Nov;13(11):549-51 [Spanish]

Paediatric autoimmune neuropsychiatric disorders associated with streptococcal infection (PANDAS). **AUTHORS:** Leonard HL, Swedo SE. **SOURCE:** Int J Neuropsychopharmacol. 2001 Jun;4(2):191-8.

Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections/ Pediatric Acute-onset Neuropsychiatric Syndromes vs. Pediatric Bipolar Disorder - A possible Connection? **AUTHOR:** Greenberg R. **SOURCE:** Neurology, Psychiatry and Brain Research. 2014 Available online 9 July 2014  
<http://www.sciencedirect.com/science/article/pii/S094195001400195X>

Pediatric Lyme Disease A School Issue: Tips for School Nurses. **AUTHORS:** Hamlen RA, Kliman DS **SOURCE:** NASN School Nurse 2009; 24; 114

PET imaging of microglia activation in neuropsychiatric disorders with potential infectious origin. **AUTHORS:** Klein HC, de Witte L, Bransfield RC, De Deyn PP **SOURCE:** In Print. 2014. Copyright Holder Springer-Verlag Berlin Heidelberg

The Physician as a Patient: Lyme Disease, Ehrlichiosis, and Babesiosis: A Recounting of a Personal Experience with Tick-Borne Diseases **AUTHORS:** Sherr VT. **SOURCE:** Practical Gastroenterology, January 2000

Plaques of Alzheimer's disease originate from cysts of Borrelia burgdorferi, the Lyme disease spirochete. **AUTHORS:** MacDonald AB. **SOURCE:** Med Hypotheses. 2006;67(3):592-600. Epub 2006 May 3.

Polymorphic mental disorders in the course of Lyme borreliosis--case study. **AUTHORS:** Helon B, Tluczek TW, Buczyjan A, Adamczyk-Helon A, Wojnarowicz M, Mikula R, Cicinski P, Bojarska J. **SOURCE:** Psychiatr Pol. 2009 May-Jun;43(3):353-61.

[Positive anti-Borrelia antibodies in patients with clinical manifestations compatible with neuroborreliosis] **AUTHORS:** Izquierdo G, Aguilar J, Barranquero A, Navarro G, Borobio MV, Angulo S, Domínguez I, Quesada MA. **SOURCE:** Neurologia. 1992 Feb;7(2):50-4. Spanish.

Post-Lyme syndrome and chronic fatigue syndrome. Neuropsychiatric similarities and differences. **AUTHORS:** Gaudino EA, Coyle PK, Krupp LB. **SOURCE:** Arch Neurol. 1997 Nov;54(11):1372-6.

Postural orthostatic tachycardia syndrome following Lyme disease. **AUTHORS:** Kanjwal K, Karabin B, Kanjwal Y, Grubb BP. **SOURCE:** Cardiology Journal. 2011;18(1):63-6. [www.cardiologyjournal.org](http://www.cardiologyjournal.org)

Potential uses of Modafinil in Psychiatric Disorders. **AUTHOR:** Bransfield RC. **SOURCE:** Journal of Applied Research, 2004 Spring; 4(2): 198-208

Preventable cases of autism: relationship between chronic infectious disease and neurological outcome. **AUTHORS:** Bransfield RC. **SOURCE:** Pediatric Health. (2009) April 3(2).

Primarily chronic and cerebrovascular course of Lyme neuroborreliosis: case reports and literature review. **AUTHORS:** Wilke M, Eiffert H, Christen HJ, Hanefeld F. **SOURCE:** Arch Dis Child. 2000 Jul;83(1):67-71. Review.

Post-Lyme syndrome and chronic fatigue syndrome. Neuropsychiatric similarities and differences. **AUTHORS:** Gaudino EA, Coyle PK, Krupp LB. **SOURCE:** Arch Neurol 1997 Nov;54(11):1372-6

Prevalence of Borrelia burgdorferi serum antibodies in 651 patients with predominantly neurologic diseases. **AUTHORS:** Muller M, Retzl J, Plank E, Scholz H, Ziervogel H, Stanek G. **SOURCE:** Wien Klin Wochenschr. 1993;105(21):599-602. [German]

Protein markers for Alzheimer disease in the frontal cortex and cerebellum. **AUTHORS:** Verdile G, Gnjec A, Miklosy J, Fonte J, Veurink G, Bates K, Kakulas B, Mehta PD, Milward EA, Tan N, Lareu R, Lim D, Dharmarajan A, Martins RN. **SOURCE:** Neurology. 2004 Oct 26;63(8):1385-92.

Psychiatric aspects of Lyme disease in children and adolescents: A community epidemiologic study in Westchester, New York. **AUTHORS:** Fallon BA, Bird H, Hoven C, Cameron D, Liebowitz MR, Shaffer S. **SOURCE:** JSTD 1994; 1:98-100

Psychiatric and Cognitive Features of Lyme Disease. **AUTHORS:** Tager FA, Fallon BA. **SOURCE:** Psychiatric Annals 31: 173-181, 2001.

Psychiatric Issues in Infectious Diseases. **AUTHOR:** Levenson JL **SOURCE:** Primary Psychiatry 2006;13(5):29-32.

[Psychiatric manifestations of Lyme borreliosis](#) **AUTHORS:** Fallon BA, Nields JA, Parsons B, Liebowitz MR, Klein DF. **SOURCE:** J Clin Psychiatry 1993 Jul;54(7):263-8

[Psychiatric presentations of non-HIV infectious diseases](#). **AUTHORS:** Schneider RK, Robinson MJ, Levenson JL. **SOURCE:** Psychiatr Clin North Am 2002 Mar;25(1):1-16

Psychiatric symptomatology associated with presumptive Lyme disease: Clinical evidence. **AUTHORS:** Battaglia H, Alvarez G, Mercu A, Fay M, Campodonico M. **SOURCE:** Journal of Spirochetal and Tick-Borne Diseases 2000; Spring/September;1-6.

[The psychoimmunology of Lyme and associated diseases](#) Abstracts of 12th Psychoimmunology Expert Meeting, March 6-9, 2014. **AUTHOR:** Bransfield RC. **SOURCE:** Neurology, Psychiatry & Brain Research. 20(1);8. (February 2014) [http://ac.els-cdn.com/S0941950014001444/1-s2.0-S0941950014001444-main.pdf?\\_tid=12770e98-aba3-11e3-81d2-0000aab0f6b&acdnat=1394820443\\_7d0643c714fa90fc11196aba8793233a](http://ac.els-cdn.com/S0941950014001444/1-s2.0-S0941950014001444-main.pdf?_tid=12770e98-aba3-11e3-81d2-0000aab0f6b&acdnat=1394820443_7d0643c714fa90fc11196aba8793233a)

The Psychoimmunology of Lyme/Tick-Borne Diseases and its Association with Neuropsychiatric Symptoms. **AUTHOR:** Bransfield RC **SOURCE:** *The Open Neurology Journal*, 2012, 6, 2012; 6:88-93. [DOI: 10.2174/1874205X01206010088] <http://benthamscience.com/open/tonen/article/V006/SI0078TONEUJ/88TONEUJ.pdf>

[Psychologic disorders in acute and persistent neuroborreliosis](#). **AUTHORS:** Poplawska R, Konarzewska B, Gudiel-Trochimowicz I, Szulc A. **SOURCE:** Pol Merkurizusz Lek 2001 Jan;10(55):36-7 [Polish]

[Psychological states and neuropsychological performances in chronic Lyme disease](#). **AUTHORS:** Elkins LE, Pollina DA, Scheffer SR, Krupp LB. **SOURCE:** Appl Neuropsychol 1999;6(1):19-26

[A randomized, placebo-controlled trial of repeated IV antibiotic therapy for Lyme encephalopathy](#) **AUTHORS:** Fallon BA, et al. **SOURCE:** Neurology, first published on October 10, 2007 as doi

[Rapidly progressive frontal-type dementia associated with Lyme disease](#) **AUTHORS:** Wanick C, Prohovnik I, Kaufman MA, Dwork AJ. **SOURCE:** J Neuropsychiatry Clin Neurosci 1995 Summer;7(3):345-7

Rare and unusual dementias. **AUTHORS:** Gupta S, Fiertag O, James Warner J. **SOURCE:** Advances in psychiatric treatment (2009), vol. 15, 364-371 doi: 10.1192/apt.bp.107.003558

A Reappraisal of the U.S. Clinical Trials of Post-Treatment Lyme Disease Syndrome. **AUTHORS:** Fallon BA, Petkova E, Keilp JG, Britton CB. **SOURCE:** *The Open Neurology Journal*, 2012; 6:79-87. [DOI: 10.2174/1874205X01206010079] <http://benthamscience.com/open/tonen/article/V006/SI0078TONEUJ/79TONEUJ.pdf>

[Recurrent and relapsing course of borreliosis of the nervous system](#). **AUTHORS:** Omasits M, Seiser A, Brainin M. **SOURCE:** Wien Klin Wochenschr. 1990 Jan 5;102(1):4-12. Review. [German]

[Regional cerebral blood flow and cognitive deficits in chronic Lyme disease](#). **AUTHORS:** Fallon BA, Keilp J, Prohovnik I, Heertum RV, Mann JJ. **SOURCE:** J Neuropsychiatry Clin Neurosci. 2003 Summer;15(3):326-32.

Regional cerebral blood flow and metabolic rate in persistent Lyme encephalopathy. **AUTHORS:** Fallon BA, Lipkin RB, Corbera KM, Yu S, Nobler MS, Keilp JG, Petkova E, Lisanby SH, Moeller JR, Slavov I, Van Heertum R, Mensh BD, Sackeim HA. **SOURCE:** Arch Gen Psychiatry. 2009 May;66(5):554-63.

Relationship of Inflammation and Autoimmunity to Psychiatric Sequelae in Lyme Disease. **AUTHOR:** Bransfield RC. **SOURCE:** PSYCHIATRIC ANNALS. 2012 42(9):337-41 [http://www.ilads.org/ilads\\_news/2012/relationship-of-inflammation-and-autoimmunity-to-psychiatric-sequelae-in-lyme-disease/](http://www.ilads.org/ilads_news/2012/relationship-of-inflammation-and-autoimmunity-to-psychiatric-sequelae-in-lyme-disease/)

Relevance of Chronic Lyme Disease to Family Medicine as a Complex Multidimensional Chronic Disease Construct: A Systematic Review. **AUTHORS:** [Borgermans L](#), [Godoris G](#), [Vandevoorde J](#), [Devroey D](#). **SOURCE:** International Journal of Family Medicine. Volume 2014 (2014)

Repeated Antibiotic Therapy in Chronic Lyme Disease. **AUTHORS:** Fallon BA, Weis N, Tager F, Fein L, Liegner K, Liebowitz MR. **SOURCE:** Journal of Spirochetal and Tick Borne Diseases, 1999; 6: 1-9.

Results of a prospective standardized study of 30 patients with chronic neurological and cognitive disorders after tick bites. **AUTHORS:** Roche Lanquetot R, Ader F, Durand MC, Carlier R, Defferriere H, Dinh A, Herrmann JL, Guillemot D, Perronne C, Salomon J. **SOURCE:** Med Mal Infect. 2008 Aug 20. [Article in French]

[Reversible cerebral hypoperfusion in Lyme encephalopathy](#). **AUTHORS:** Logigian EL, Johnson KA, Kijewski MF, Kaplan RF, Becker JA, Jones KJ, Garada BM, Holman BL, Steere AC. **SOURCE:** Neurology 1997 Dec;49(6):1661-70.

"Reversible" dementia in 2011. **AUTHORS:** Michel JM, Sella F. **SOURCE:** *Geriatr Psychol Neuropsychiatr Vieil* 2011 05 1; 9 (2): 211-225

Role of Chronic Bacterial and Viral Infections in Neurodegenerative, Neurobehavioral, Psychiatric, Autoimmune and Fatiguing Illnesses. **AUTHORS:** Nicholson GL, Haier J. **SOURCE:** British Journal of Medical Practitioners. 2009;2(4)20-8.

[The role of kynurenes in disorders of the central nervous system: Possibilities for neuroprotection](#). **AUTHORS:** Vamos E, Pardutz A, Klivenyi P, Toldi J, Vecsei L. **SOURCE:** J Neurol Sci. 2009 Mar 4.

Role of psychiatric comorbidity in chronic Lyme disease. **AUTHORS:** Hassett AL, Radvanski DC, Buyske S, Savage SV, Gara M, Escobar JJ, Sigal LH. **SOURCE:** Arthritis Rheum. 2008 Dec 15;59(12):1742-9. <http://www.ncbi.nlm.nih.gov/pubmed/19035409>

Safety of intravenous antibiotic therapy in patients referred for treatment of neurologic Lyme disease. **AUTHORS:** Stricker RB, Green CL, Savely VR, Chamallas SN, Johnson L. **SOURCE:** Minerva Med. 2010 Feb;101(1):1-7.

Schizophrenia - a Mild Encephalitis? **AUTHOR:** [Bechter K](#). **SOURCE:** Fortschr Neurol Psychiatr. (2013) 2013 Apr 29. [Epub ahead of print] <http://www.ncbi.nlm.nih.gov/pubmed/23629631>

[Screening for Lyme disease in hospitalized psychiatric patients: prospective serosurvey in an endemic area](#). **AUTHORS:** Nadelman RB, Herman E, Wormser GP. **SOURCE:** Mt Sinai J Med. 1997 Nov;64(6):409-12.

[Seasonal correlation of sporadic schizophrenia to Ixodes ticks and Lyme borreliosis](#) **AUTHOR:** Fritzsche M. **SOURCE:** International Journal of Health Geographics 2002 1:2 **COMPLETE TEXT AT:** <http://www.pubmedcentral.nih.gov/articlerender.fcgi?tool=pubmed&pubmedid=12453316>

[\[Secondary normal pressure hydrocephalus. A complication of chronic neuroborreliosis\]](#). **AUTHORS:** Druschky K, Stefan H, Grehl H, Neundörfer B. **SOURCE:** Nervenarzt. 1999 Jun;70(6):556-9. German.

[Severity of Lyme disease with persistent symptoms. Insights from a double-blind placebo-controlled clinical trial](#). **AUTHOR:** Cameron D. **SOURCE:** Minerva Med. 2008 Oct;99(5):489-96.

Signs and significance of a tick-bite: psychiatric disorders associated with Lyme disease. **AUTHOR:** Sno HN. **SOURCE:** Tijdschr Psychiatr. 2012;54(3):235-43.

Short-course treatment in neurobrucellosis: a study in Iran. **AUTHORS:** Asadipooya K, Dehghanian A, Omrani GH, Abbasi F. **SOURCE:** *Neurol India*. 2011 Jan-Feb;59(1):101-3.

[Sleep quality in Lyme disease.](#) **AUTHORS:** Greenberg HE, Ney G, Scharf SM, Ravdin L, Hilton E. **SOURCE:** *Sleep*. 1995 Dec;18(10):912-6.

[Spirochetal cyst forms in neurodegenerative disorders...hiding in plain sight.](#) **AUTHORS:** MacDonald AB. **SOURCE:** *Med Hypotheses*. 2006;67(4):819-32. Epub 2006 Jul 7.

SPECT Brain Imaging in Chronic Lyme Disease. **AUTHORS:** Donta ST, Noto RB, Vento JA. **SOURCE:** *Clinical Nuclear Medicine & Volume 37, Number 9, September 2012*

[Spirochetal diseases of the nervous system.](#) **AUTHORS:** Cintron R, Pachner AR. **SOURCE:** *Curr Opin Neurol*. 1994 Jun;7(3):217-22. Review.

Startle myoclonus induced by Lyme neuroborreliosis: a case report. **AUTHORS:** Schoof J, Kluge C, Heinze HJ, Galazky I. **SOURCE:** *J Med Case Rep* 2013(May); 7(1): 124. DOI: 10.1186/1752-1947-7-124

[Study and treatment of post Lyme disease \(STOP-LD\): a randomized double masked clinical trial.](#) **AUTHORS:** Krupp LB, Hyman LG, Grimson R, Coyle PK, Melville P, Ahnn S, Dattwyler R, Chandler B. **SOURCE:** *Neurology*. 2003 Jun 24;60(12):1923-30.

Subarachnoid hemorrhage in a patient with Lyme disease. **AUTHORS:** Cheherama M, Zagardo MT, Koski CL **SOURCE:** *Neurology* (1997);48:520-523

[Successful treatment of Lyme encephalopathy with intravenous ceftriaxone.](#) **AUTHORS:** Logigian EL, Kaplan RF, Steere AC. **SOURCE:** *J Infect Dis*. 1999 Aug;180(2):377-83.

[Survival strategies of Borrelia burgdorferi, the etiologic agent of Lyme disease.](#) **AUTHORS:** Embers ME, Ramamoorthy R, Philipp MT. **SOURCE:** *Microbes Infect*. 2004 Mar;6(3):312-8. Review.

Tc-99m HMPAO Brain SPECT Imaging in Chronic Lyme Disease **AUTHORS:** Plutchok JJ, Tikofsky RS, Liegner K, Kochevar JM, Fallon BA, Van **SOURCE:** *Heertum RL. J of Spirochetal and Tick-borne Diseases* 6: 117-122, 1999.

The association of lyme disease with loss of sexual libido and the role of urinary bladder detrusor dysfunction. **AUTHORS:** Puri BK, Shah M, Julu PO, Kingston MC, Monro JA. **SOURCE:** *Int Neurorol J*. 2014 Jun;18(2):95-7.

The lack of correlation between the incidence of Lyme disease and deaths due to Alzheimer's disease cannot reflect the lack of involvement of Borrelia burgdorferi in Alzheimer's dementia **AUTHOR:** Miklossy J **SOURCE:** *The Journal of Alzheimer's Disease*. Aug 2014 <http://j-alz.com/node/384>

The neuropsychiatric assessment of Lyme disease **AUTHOR:** Bransfield, R. **SOURCE:** Available online at [www.mentalhealthandillness.com](http://www.mentalhealthandillness.com)

The neuropsychiatric manifestations of Lyme Borreliosis. **AUTHORS:** Fallon BA, Nields JA, Burrascano JJ, Liegner K, DelBene D, Liebowitz MR. **SOURCE:** *Psychiatric Quarterly* 1992; 63: 95-117

The American Psychiatric Association Psychiatric Guidelines for the Psychiatric Assessment of Adults Third Edition. **AUTHORS:** APA Work Group on Psychiatric Evaluation. **SOURCE:** <http://psychiatryonline.org/doi/pdf/10.1176/appi.books.9780890426760>

The Psychoimmunology of Lyme/Tick-Borne Diseases and its Association with Neuropsychiatric Symptoms. **AUTHOR:** Bransfield RC. **SOURCE:** *The Open Neurology Journal*. (2012) 6, (Suppl 1-M3) 88-93.

The Putative Role of Viruses, Bacteria, and Chronic Fungal Biotoxin Exposure in the Genesis of Intractable Fatigue Accompanied by Cognitive and Physical Disability. **AUTHORS:** Morris G, Berk M, Walder K, Maes M. **SOURCE:** *Mol Neurobiol*. 2015 Jun 17.

The Relationship between Tourette's Syndrome and Infections **AUTHORS:** Krause D L, Norbert Müller N **SOURCE:** *The Open Neurology Journal*, 2012, 6, (Suppl 1-M8) 124-128 <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3514747/pdf/TONEUJ-6-124.pdf>

The underdiagnosis of neuropsychiatric Lyme disease in children and adults. **AUTHORS:** Fallon BA, Kochevar J, Nields J. **SOURCE:** In *Diagnostic Dilemmas*. Edited by David Tomb. *Psychiatric Clinics of North America*. 1998.

Tick-Borne Encephalitis Carries a High Risk of Incomplete Recovery in Children. **AUTHORS:** Fowler A, Forsman L, Eriksson M, Wickstrom R. **SOURCE:** *J Pediatr* 2013;:----).

Tick-borne infections--a growing public health threat to school-age children. Prevention steps that school personnel can take. **AUTHOR:** Hamlen R **SOURCE:** *NASN Sch Nurse* 2012(Mar); 27(2): 94-100. <http://nas.sagepub.com/content/27/2/94>

[Transfection "Junk" DNA - a link to the pathogenesis of Alzheimer's disease?](#) **AUTHORS:** MacDonald AB. **SOURCE:** *Med Hypotheses*. 2006;66(6):1140-1. Epub 2006 Feb 14.

Treating Depression and Compensatory Narcissistic Personality Style in a Man with Chronic Lyme Disease. **AUTHOR:** Leedy MJ, Jackson M, Callahan JL. **SOURCE:** *Clinical Case Studies*. 2007 Oct 6(5):430-42. <http://www.psyc.unt.edu/~jennifercallahan/CompensatoryNarcissism.pdf>

[Treatment of patients with persistent symptoms and a history of Lyme disease.](#) **AUTHORS:** Bransfield R, Brand S, Sherr V. **SOURCE:** *N Engl J Med*. 2001 Nov 8;345(19):1424-5.

Treatment-Resistant Depression: Progress and Limitations. **AUTHORS:** Amsterdam JD, O'Reardon JP. **SOURCE:** *Psychiatric Annals*. 1998;28(11):633

Tremor, seizures and psychosis as presenting symptoms in a patient with chronic lyme neuroborreliosis (LNB). **AUTHORS:** Markeljević J, Sarac H, Rados M. **SOURCE:** *Coll Antropol*. 2011 Jan;35 Suppl 1:313-8.

[Tullio phenomenon and seronegative Lyme borreliosis \[letter\]](#) **AUTHORS:** Nields JA, Kueton JF. **SOURCE:** *Lancet* 1991 Jul 13;338(8759):128-9

The neuropsychiatric assessment of Lyme disease. **AUTHOR:** Bransfield, R.. **SOURCE:** Available online at [www.mentalhealthandillness.com](http://www.mentalhealthandillness.com)

[The role of kynurenines in disorders of the central nervous system: Possibilities for neuroprotection.](#) **AUTHORS:** Vamos E, Pardutz A, Klivenyi P, Toldi J, Vecsei L. **SOURCE:** *J Neurol Sci*. 2009 Mar 4.

[The Underdiagnosis of Neuropsychiatric Lyme Disease in Children and Adults](#) **AUTHORS:** Fallon BA, Kochevar JM, Gaito A, Nields JA. **SOURCE:** *Psychiatric Clinics of North America*, 1998; 21: 693-703 **COMPLETE TEXT AT:** <http://www.lymenet.org>

Undiagnosed Lyme disease in adults with schizophrenia. **AUTHORS:** Koola MM et al. **SOURCE:** *Schizophrenia Research*. Published Online: August 06, 2015. <http://dx.doi.org/10.1016/j.schres.2015.06.029>

[Untreated neuroborreliosis: Bannwarth's syndrome evolving into acute schizophrenia-like psychosis. A case report.](#) **AUTHORS:** Roelcke U, Barnett W, Wilder-Smith E, Sigmund D, Hacke W. **SOURCE:** *J Neurol* 1992 Mar;239(3):129-31

[An unusual presentation of cat scratch encephalitis.](#) **AUTHORS:** Chan L, Reilly KM, Snyder HS. **SOURCE:** *J Emerg Med*. 1995 Nov-Dec;13(6):769-72.

[Update on lyme disease: the hidden epidemic.](#) **AUTHOR:** Savely VR. **SOURCE:** *J Infus Nurs*. 2008 Jul-Aug;31(4):236-40.

[The use of atypical antipsychotics in the treatment of schizophrenia in North Staffordshire.](#) **AUTHORS:** Hodgson R, Belgamwar R, Al-tawarah Y, MacKenzie G. **SOURCE:** Hum Psychopharmacol. 2005 Mar;20(2):141-7.

Value of clinical symptoms, intrathecal specific antibody production and PCR in the diagnosis of childhood Lyme neuroborreliosis: **AUTHORS:** Issakainen J, Gnehm HE, Lucchini GM, Zbinden R: **SOURCE:** Klin Padiatr 1996 May-Jun; 208 (3) : 106-109

Wann ist eine Borreliose eine Neuroborreliose? Die Borreliose und ihre neuro-psychiatrischen Symptome. **AUTHORS:** Lorenz M, Redecker H **SOURCE:** (2013) <http://www.borreliose-lorenz.de/neuroborreliose.html>

[WAIS-III and WMS-III performance in chronic Lyme disease.](#) **AUTHORS:** Keilp JG, Corbera K, Slavov I, Taylor MJ, Sackeim HA, Fallon BA. **SOURCE:** J Int Neuropsychol Soc. 2006 Jan;12(1):119-29

[A 25-year-old woman with hallucinations, hypersexuality, nightmares, and a rash.](#) **AUTHORS:** Stein SL, Solvason HB, Biggart E, Spiegel D. **SOURCE:** Am J Psychiatry. 1996 Apr;153(4):545-51.

[A 58-year-old man with a diagnosis of chronic Lyme disease, 1 year later.](#) **AUTHOR:** Steere AC. **SOURCE JAMA.** 2002 Aug 28;288(8):1002-10.

[A 58-year-old man with a diagnosis of chronic Lyme disease, 1 year later.](#) **AUTHOR** Burns RB, Hartman EE. **SOURCE JAMA.** 2003 Dec 24;290(24):3247.

#### **Additional Articles:**

[Aggression and Lyme Disease.](#) Bransfield R.

[All In Your Head?](#) Bransfield R.

[A Tale of Two Spirochetes.](#) Bransfield R.

[Lyme Disease and Cognitive Impairments.](#) Bransfield R.

[Lyme, Depression, and Suicide.](#) Bransfield R.

Lyme Neuroborreliosis and Aggression, Bransfield RC.

14th International Scientific Conference on Lyme Disease and Other Tick-Borne Disorder. April 21-23, 2001

[Microbes and Mental Illness.](#) Bransfield R.

[Posttraumatic Stress Disorder and Infectious Encephalopathies.](#) Bransfield R.

[Sex and Lyme Disease.](#) Bransfield R.

[Spirochetes on the Brain.](#) Bransfield R.

[The Klemmner Article.](#) Bransfield R. Brand R.

The Lyme-Autism Connection: Unveiling the Shocking Link Between Lyme Disease and Childhood Developmental Disorders. Duncan T, Rosner B (2008)

<http://www.amazon.com/gp/product/0976379759?ie=UTF8&tag=lymeinfo-20&linkCode=as2&camp=1789&creative=9325&creativeASIN=0976379759>

The Neuropsychiatric Assessment of Lyme Disease. Bransfield R.

[www.mentalhealthandillness.com/tnaold.html](http://www.mentalhealthandillness.com/tnaold.html) <http://www.anapsid.org/lyme/bransfield-neuropsych.pdf>

[The Psychotropic Management of Late-Stage Lyme and Associated Diseases.](#) Bransfield R.

[What Causes Illness and Mental Illness?](#) Bransfield R.

#### **Some of the above references and additional articles are also listed online at:**

Neuropsychiatric Lyme Disease Online Resources: <http://www.lymeinfo.net/neuropsych.html>

And Cavete Diagnosen (Cavete, lat.: hütet euch davor, d.h. hier: vor diesen Diagnosen): [http://www.erlebnishaft.de/cavete\\_diagnosen.pdf](http://www.erlebnishaft.de/cavete_diagnosen.pdf)

<http://www.erlebnishaft.de/kommentalternativ.pdf> Compiled by Robert Bransfield, MD, DLFAPA, Rutgers, RWJ Medical School, September 2015

#### **Tick-Borne Diseases and Dementia**

This list is organized by date.

- MacDonald AB, Miranda JM. Hum Pathol. 1987 Jul;18(7):759-61. Concurrent neocortical borreliosis and Alzheimer's disease.
- Miklossy J. Neuroreport. 1993 Jul;4(7):841-8. Alzheimer's disease--a spirochetosis?
- Miklossy J, Kasas S, Janzer RC, Ardizzoni F, Van der Loos H. Further ultrastructural evidence that spirochaetes may play a role in the aetiology of Alzheimer's disease. Neuroreport. 1994 Jun 2;5(10):1201-4.
- Waniek C, Prohovnik I, Kaufman MA, Dwork AJ. Rapidly progressive frontal-type dementia associated with Lyme disease. J Neuropsychiatry Clin Neurosci. 1995;7(3):345-7.
- Miklossy J, Kis A, Radenovic A, Miller L, Forro L, Martins R, Reiss K, Darbinian N, Darekar P, Mihaly L, Khalili K. Beta-amyloid deposition and Alzheimer's type changes induced by Borrelia spirochetes. Neurobiol Aging. May 12, 2005.
- Osvaldo P, Almeida and Nicola T. Lautenschlager. Dementia associated with infectious diseases. *International Psychogeriatrics* (2005), 17:Supp., S65-S77 C \_ 2005.
- MacDonald AB. Plaques of Alzheimer's disease originate from cysts of Borrelia burgdorferi, the Lyme disease spirochete. Med Hypotheses. 2006;67(3):592-600.
- Macdonald AB. Transfection "Junk" DNA – A link to the pathogenesis of Alzheimer's disease? Medical Hypothesis. 2006 30 January.
- MacDonald AB (2006) Alzheimer's & Dementia: The Journal of the Alzheimer's Association, 2 (3), Supplement, S207, S275, S433.
- Meer-Scherrer L, Chang Loa C, Adelson ME, Mordechai E, Lobrinus JA, Fallon BA, Tilton RC. Lyme Disease Associated with Alzheimer's Disease. Curr Microbiol. 2006 Mar 9.
- Miklossy J. Biology and neuropathology of dementia in syphilis and Lyme disease. Handb Clin Neurol. 2008;89:825-44.
- Miklossy J. Chronic inflammation and amyloidogenesis in Alzheimer's disease -- role of Spirochetes. J Alzheimers Dis. 2008 May;13(4):381-91.
- Aboul-Enein F, Kristoferitsch W. Normal pressure hydrocephalus or neuroborreliosis? Wien Med Wochenschr. 2009;159(1-2):58-61.

- Miklossy J. Alzheimer's disease - a neurospirochetosis. Analysis of the evidence following Koch's and Hill's criteria. *J Neuroinflammation*. 2011 Aug 4;8(1):90.
- Bannwarth, A. (1944) Zur Klinik und Pathogenese der chronischen lymphocytären Meningitis. *Arch. Psychiatr.Nervenkr.* 117, 161-185.
- MacDonald, A. B. (1986) *Borrelia* in the brains of patients dying with dementia. *J. Am. Med. Assoc.* 256, 2195-2196.
- MacDonald AB (1988) Concurrent Neocortical Borreliosis and Alzheimer's Disease: Demonstration of a Spirochetal Cyst Form. *Annals of the New York Academy of Sciences, Lyme Disease and Related Disorders.* 539, 468-470.
- Pappolla MA, Omar R, Saran B, et al. (1989) Concurrent neuroborreliosis and Alzheimer's disease: analysis of the evidence. *Hum Pathol* 20(8), 753-7.
- Miklossy J, Kuntzer T, Bogousslavsky J, Regli F, Janzer RC. (1990) Meningovascular form of neuroborreliosis: Similarities between neuropathological findings in a case of Lyme disease and those occurring in tertiary neurosyphilis. *Acta Neuropathol* 80. 568-572.
- Miklossy J, Van der Loos H. (1991) The long distance effects of brain lesions: A study of myelinated pathways in the human brain using polarizing and fluorescence microscopy. *J Neuropathol Exp Neurol* 50, 1-15.
- Mirra SS, Heyman A, McKeel D et al (1991) The Consortium to Establish a Registry for Alzheimer's Disease (CERAD). II. Standardization of the neuropathologic assessment of Alzheimer's disease. *Neurology* 41, 479-86.
- Miklossy J, Taddei K, Martins R et al. (1999) Alzheimer disease: curly fibers and tangles in organs other than brain. *J Neuropathol Exp Neurol.* 58, 803-814.
- Bransfield RC. *Hosp Pract* (1995). 1996 Aug 15;31(8):35, 40. The diagnosis of Lyme disease.
- McLaughlin R, Kin NM, Chen MF, et al. (1999) Alzheimer's disease may not be a spirochetosis. *Neuroreport* 10(7), 1489-91.
- Lue LF, Kuo YM, Roher AE, Brachova L, Shen Y, Sue L, Beach T, Kurth JH, Rydel RE, Rogers J (1999) Soluble amyloid beta peptide concentration as a predictor of synaptic change in Alzheimer's disease. *Am J Pathol* 155, 853-862
- Zajkowska JM, Hermanowska-Szpakowicz T (2002) New aspects of the pathogenesis of lyme disease. *Przeegl Epidemiol* 57-67.
- Suter O-C, Sunthorn T, Kraftsik R, Straubel J, Darekar P, Khalili K, Miklossy J (2002) Cerebral Hypoperfusion Generates Cortical Watershed Microinfarcts in Alzheimer Disease. *Stroke* 33, 1986-1992
- Lue LF, Kuo YM, Roher AE, Brachova L, Shen Y, Sue L, Beach T, Kurth JH, Rydel RE, Rogers J (1999) Soluble amyloid beta peptide concentration as a predictor of synaptic change in Alzheimer's disease. *Am J Pathol* 155, 853-862
- Zajkowska JM, Hermanowska-Szpakowicz T (2002) New aspects of the pathogenesis of lyme disease. *Przeegl Epidemiol* 57-67.
- Suter O-C, Sunthorn T, Kraftsik R, Straubel J, Darekar P, Khalili K, Miklossy J (2002) Cerebral Hypoperfusion Generates Cortical Watershed Microinfarcts in Alzheimer Disease. *Stroke* 33, 1986-1992
- Hardy J, Selkoe DJ (2002) The amyloid hypothesis of Alzheimer's disease: progress and problems on the road to therapeutics. *Science* 297, 353-6
- Miklossy J, Khalili K, Gern L, Ericson RL, Darekar P, Bolle L, Hurlimann J, Paster BJ. (2004) *Borrelia burgdorferi* persists in the brain in chronic Lyme neuroborreliosis and may be associated with Alzheimer disease. *J Alzheimer's Disease* 6 (6), 1-11.
- Miklossy J, Khalili K, Gern L, et al. (2004) *Borrelia burgdorferi* persists in the brain in chronic lyme neuroborreliosis and may be associated with Alzheimer disease. *J Alzheimers Dis.* 6(6), 639-49; discussion 673-681.
- Ruitenberg A, den Heijer T, Bakker SL, van Swieten JC, Koudstaal PJ, Hofman A, Breteler MM (2005) Cerebral hypoperfusion and clinical onset of dementia: the Rotterdam study. *Ann Neurol* 57, 789-94.
- Guo JP, Arai T, Miklossy J, McGeer PL (2006) A $\beta$  and tau form soluble complexes that may promote self aggregation of both into the insoluble forms observed in Alzheimer's disease. *PNAS* 103(6)
- MacDonald AB (2006) Alzheimer's neuroborreliosis with trans-synaptic spread of infection and neurofibrillary tangles derived from intraneuronal spirochetes. *Med Hypotheses* 68(4), 822-5.
- MacDonald AB (2006) Cystic borrelia in Alzheimer's disease and in non-dementia neuroborreliosis. *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*, 2(3), Supplement, Page S207, S275, S433
- Riek R (2006) Cell biology: Infectious Alzheimer's disease? *Nature* 444, 429-431
- MacDonald AB (2007) Alzheimer's disease Braak Stage progressions: reexamined and redefined as *Borrelia* infection transmission through neural circuits. *Med Hypotheses.* 68(5), 1059-64
- MacDonald AB (2007) Alzheimer's neuroborreliosis with trans-synaptic spread of infection and neurofibrillary tangles derived from intraneuronal spirochetes. *Med Hypotheses.* 68(4), 822-5.
- MacDonald AB (2007) Alzheimer's disease Braak Stage progressions: reexamined and redefined as *Borrelia* infection transmission through neural circuits. *Med Hypotheses* 68(5), 1059-64.
- Haass C, Selkoe DJ (2007) Soluble protein oligomers in neurodegeneration: lessons from the Alzheimer's amyloid beta-peptide. *Nat Rev Mol Cell Biol* 8, 101-12.
- MacDonald, A. B. (2008) (on-line manuscript). Plaques of Alzheimers disease originate from cysts of *Borrelia burgdorferi*, the Lyme disease spirochete. Manuscript no. YMEHYD-06-00134R1. Elsevier Editorial System™ for Medical Hypotheses. 5 pp.
- Miklossy J, Kasas S, Zurn AD, McCall S, Yu S, McGeer PL. (2008) Persisting atypical and cystic forms of *Borrelia burgdorferi* and local inflammation in Lyme neuroborreliosis. *J. Neuroinflammation.* 5, 40 Doi: 10.1186/1742-2094-5-40.
- Galbusera A, Tremolizzo L, Isella V, et al. (2008) Lack of evidence for *Borrelia burgdorferi* seropositivity in Alzheimer disease. *Alzheimer Dis Assoc Disord* 22(3), 308.
- Holmes C, Cotterell D (2009) Role of infection in the pathogenesis of Alzheimer's disease: implications for treatment. *CNS Drugs* 23(12), 993-1002.
- Duyckaerts C, Delatour B, Potier MC (2009) Classification and basic pathology of Alzheimer disease. *Acta Neuropathol* 118, 5-36
- Sorensen AA (2009) Alzheimer's Disease Research: Scientific Productivity and Impact of the Top 100 Investigators in the Field. *Journal of Alzheimer's Disease*, 16, 451-465
- Jack CR Jr, Knopman DS, Jagust WJ, Shaw LM, Aisen PS, Weiner MW, Petersen RC,
- Trojanowski JQ (2010) Hypothetical model of dynamic biomarkers of the Alzheimer's pathological cascade. *Lancet Neurol* 9, 119-28

- Miklossy J (2011) Emerging roles of pathogens in Alzheimer disease. *Expert Rev Mol Med* e30.
  - Miklossy J (2011) Alzheimer's disease - a neurospirochetosis. Analysis of the evidence following Koch's and Hill's criteria. *J Neuroinflammation* 90.
  - Zlokovic BV (2011) Neurovascular pathways to neurodegeneration in Alzheimer's disease and other disorders. *Nat Rev Neurosci* 12, 723-38.
  - Selkoe DJ (2012) Preventing Alzheimer's disease. *Science* 337, 1488-92.
  - Miklossy J, Donta SE, Mueller K, Nolte O, Perry G (2012) Editorial: Chronic or Late Lyme Neuroborreliosis: Present and Future. *The Open Neurology Journal*, 2012, 6, (Suppl 1-M1)
  - Miklossy J. (2012) Chronic or late lyme neuroborreliosis: analysis of evidence compared to chronic or late neurosyphilis. *Open Neurol J.* 6, 146-57
  - Nilsson P et al. (2013) A $\beta$  secretion and plaque formation depend on autophagy. *Cell Reports* 5(1), 61-69
  - Williams WM, Torres S, Siedlak SL, Castellani RJ, Perry G, Smith MA, Zhu X. (2013). Antimicrobial peptide beta-defensin-1 expression is upregulated in Alzheimer's brain. *J Neuroinflammation.* 10(1), 127.
  - Usman A Khan, Li Liu, Frank A Provenzano, Diego E Berman, Caterina P Profaci, Richard Sloan, Richard Mayeux, Karen E Duff, Scott A Small. (2013) Molecular drivers and cortical spread of lateral entorhinal cortex dysfunction in preclinical Alzheimer's disease. *Nature Neuroscience*, DOI: 10.1038/nn.3606
  - Blanc F, Philippi N, Cretin B, Kleitz C, Berly L, Jung B, Kremer S, Namer IJ, Sellal F, Jaulhac B, de Seze J. Lyme Neuroborreliosis and Dementia. *J Alzheimers Dis.* 2014, 41(4): 1087-93.
  - Miklossy J. The lack of correlation between the incidence of Lyme disease and deaths due to Alzheimer's disease cannot reflect the lack of involvement of *Borrelia burgdorferi* in Alzheimer's dementia. *The Journal of Alzheimer's Disease.* Aug 2014 <http://j-alz.com/node/384>
  - Miklossy J. Historic evidence to support a causal relationship between spirochetal infections and Alzheimer's disease. *Frontiers in Aging Neuroscience.* 2015 Apr 16;7:46.
- Compiled by Robert Bransfield, MD, DLFAPA, Rutgers-RWJ Medical School, July 2015.

#### Tick-Borne Disease and Autism Spectrum Disorders

- Bransfield RC, Fallon BA, Raxlen B, Shepler L, Sherr VT. A Modest Proposal, *Psychiatric News*, 31(18):16 (1998)
- Nicolson GL, Gan R, Nicolson NL, Haier J. Evidence for *Mycoplasma*, *Chlamydia pneumoniae* and HHV-6 Co-infections in the blood of patients with Autism Spectrum Disorders. *J Neuroscience Res.* 2007;85:1143-1148.
- Bransfield RC, Wulfman JS, Harvey WT, Usman AI. The association between tick-borne infections, Lyme borreliosis and autism spectrum disorders *Medical Hypotheses.* 70(5):967-974 (2008)
- Nicholson G. Chronic Bacterial and Viral Infections in Neurodegenerative and Neurobehavioral Diseases *Laboratory Medicine.* 39(5):291-9 (2008)
- Vojdani A. Antibodies as predictors of complex autoimmune diseases and cancer. *Int J Immunopathol Pharmacol.* 21(3):553-66 (2008) Erratum in: *Int J Immunopathol Pharmacol.* 21(4):following 1051 (2008)
- Bransfield RC. Preventable cases of autism: relationship between chronic infectious diseases and neurological outcome *Pediatric Health.* 3(2):125-140. (2009)
- Bransfield R. Chronic Infections Contributing to Autism Spectrum Disorders. *Neurology Psychiatry & Brain Research.* Universitätsverlag, Heidelberg. 16, Suppl 1 (2009)
- Kuhn M, Grave S, Bransfield R, Harris S. Long term antibiotic therapy may be an effective treatment for children co-morbid with Lyme disease and autism spectrum disorder. *Med Hypotheses.* 78(5):606-15 (2012)
- Bransfield R. Relationship of Inflammation and Autoimmunity to Psychiatric Sequelae in Lyme Disease. *Psychiatric Annals.* 42(9):337-341. September 2012.
- Bransfield R. The Psychoimmunology of Lyme/Tick-Borne Diseases and its Association with Neuropsychiatric Symptoms. *The Open Neurology Journal.* 2012, 6, (Suppl 1-M3) 88-93
- Bransfield R, Kuhn M. Autism and Lyme Disease. *JAMA.* 310(8). (2013)
- Burbelo PD, Swedo SE, Thurm A, Bayat A, Levin AE, Marques A, Iadarola MJ. Lack of serum antibodies against *Borrelia burgdorferi* in children with autism. *Clin Vaccine Immunol.* 2013 Jul;20(7):1092-3
- Planche P, Botbol M. Lyme disease, Autism Spectrum Disorder and antibiotic therapy: A case report. *Annales Médico-psychologiques, revue psychiatrique* 171(10):711-715. (2013)
- Kuhn M, Bransfield R. Divergent opinions of Lyme disease diagnosis and implications for children co-morbid with Autism Spectrum Disorder. *Med Hypotheses.* 2014.

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#### Congenital Transmission of Lyme/TBD

- MacDonald A. Gestational Lyme borreliosis. Implications for the fetus. *Rheum Dis Clin North Am.* 1989 Nov;15(4):657-77.
- MacDonald AB, Benach JL, Burgdorfer W. Stillbirth following maternal Lyme disease. *N Y State J Med.* 1987 Nov;87(11):615-6.

- MacDonald A. Human fetal borreliosis, toxemia of pregnancy, and fetal death. *Zentralbl Bakteriol Mikrobiol Hyg A*. 1986 Dec;263(1-2):189-200.
- Schlesinger PA, Duray PH, Burke BA, Steere AC, Stillman MT. Maternal-fetal transmission of the Lyme disease spirochete, *Borrelia burgdorferi*. (1985) *Ann Intern Med*, 103, 67-8.
- Markowitz LE, Steere AC, Benach JL, et al. Lyme disease during pregnancy. *JAMA*.(1986); 255(24), 3394-6.
- Lavoie PE, Lattner BP, Duray PH, Barbour AG, Johnson HC. Culture positive seronegative transplacental Lyme borreliosis infant mortality. (1987) *Arthritis Rheum*, 30(4), 3(Suppl):S50.
- Mikkelsen AL, Palle C. Lyme disease during pregnancy. (1987) *Acta Obstet Gynecol Scand* 66(5), 477-8.
- Weber K; Bratzke HJ, Neubert U, Wilske B, Duray PH. (1988) *Borrelia burgdorferi* in a newborn despite oral penicillin for Lyme borreliosis during pregnancy. *Pediatr Infect Dis J*, 7:286-9.
- Carlomagno G, Luksa V, Candussi G, et al. (1988) Lyme *Borrelia* positive serology associated with spontaneous abortion in an endemic Italian area. *Acta Eur Fertil* 19(5), 279-81. Abstract
- Weber K, Bratzke HJ, Neubert U, et al. (1988) *Borrelia burgdorferi* in a newborn despite oral penicillin for Lyme borreliosis during pregnancy. *Pediatr Infect Dis J* 7(4), 286-9. Full Citation
- Nadal D, Hunziker UA, Bucher HU, et al. (1989) Infants born to mothers with antibodies against *Borrelia burgdorferi* at delivery. *Eur J Pediatr* 148(5), 426-7. Abstract
- Schutzer SE, Janniger CK, Schwartz RA (1991) Lyme disease during pregnancy. *Cutis* 47(4), 267-8. Abstract
- Strobino BA, Williams CL, Abid S, et al. (1993) Lyme disease and pregnancy outcome: a prospective study of two thousand prenatal patients. *Am J Obstet Gynecol* 169(2 Pt 1), 367-74.
- Jovanovi R, Hajri A, Cirkovi A, et al. (1993) [Lyme disease and pregnancy]. *Glas Srp Akad Nauka Med* (43), 169-72.
- Kumi D J, Harris O.(1995) Viability of *Borrelia burgdorferi* in stored semen. *Br Vet J Mar-Apr*;151(2): 221-4 PMID: 8920118
- Williams CL, Strobino B, Weinstein A, et al. (1995) Maternal Lyme disease and congenital malformations: a cord blood serosurvey in endemic and control areas. *Paediatr Perinat Epidemiol* 9(3), 320-30.
- Silver H. (1997) Lyme Disease During Pregnancy. *Inf Dis Clinics of N. Amer.* Vol 11, No 1,
- van Holten J, Tiems J, Jongen VH (1997) Neonatal *Borrelia duttoni* infection: a report of three cases. *Trop Doct* 27(2), 115-6.
- Harvey WT, Salvato P. (2003) 'Lyme disease': ancient engine of an unrecognized borreliosis pandemic? *Med Hypotheses*. 60(5), 742-59.
- Stricker, R.B., D.H. Moore, and E.E. Winger. (2004). Clinical and immunologic evidence of transmission of Lyme disease through intimate human contact. *J. Invest. Med.* 52, S15
- Onk G, Acun C, Kalayci M, Cagavi F, et al. (2005) Gestational Lyme disease as a rare cause of congenital hydrocephalus. *J Turkish German Gynecology Association Artemis*, 6(2), 156-157.
- Jones CR, Smith H, Gibb E, Johnson L (2005) Gestational Lyme Disease: Case Studies of 102 Live Births. *Lyme Times. Gestational Lyme Studies* 34-36
- Hercogova J, Vanousova D (2008) Syphilis and borreliosis during pregnancy. *Dermatol Ther* 21(3), 205-9.
- Lakos A, Solymosi N (2010) Maternal Lyme borreliosis and pregnancy outcome. *Int J Infect Dis* 14(6), e494-8.
- Mylonas I (2011) Borreliosis During Pregnancy: A Risk for the Unborn Child? *Vector Borne Zoonotic Dis.* 11:891-8.
- Gardner T. *Infectious Diseases of the Fetus and Newborn*, 5th edition, (1995) Chapter 11, page 447 – 528.
- Gardner T. Lyme disease. 66 Pregnancies complicates by Lyme Borreliosis. *Infec Dis Fetus and Newborn Infant*. Saunders, 2000.
- Kumi-Diaka J, Harris O. *Br Vet J. Viability of Borrelia burgdorferi in stored semen.* 1995 Mar-Apr;151(2):221-4.

MEDLINE results for: borrelia pregnancy AND human. 88 journal articles in the PubMed database BDH, July 2012, Latest Revision November 2012, <http://www.Huismans.de.vu>