

Transmission time of Bb from bites of infected ticks

Eine Zeckensaug-Dauer von 6 oder 12 oder 48 Stunden als grenzwertig für die Übertragung einer Infektion mit Borrelien anzugeben wurde an Menschen bisher nicht ausreichend dokumentiert.

A tick attachment duration of 6 or 12 or 48 hours as borderline for infection with *Borrelia burgdorferi* was never adequately documented in humans.

See also M. Kroun <http://lymerick.net/Transmission-Bb-rate-time.htm>

[Burgdorfer W](#) (1984) Discovery of the Lyme disease spirochete and its relation to tick vectors. *Yale J Biol Med.* 57(4), 515-20. <http://www.ncbi.nlm.nih.gov/pubmed/6516454>

BARBOUR AG, HAYES FS (1986) Biology of *Borrelia* species. *Microbiological reviews* 50(4), 381

Piesman J, Mather TN, R J Sinsky RJ, Spielman A (1987) Duration of tick attachment and *Borrelia burgdorferi* transmission. *J. Clin. Microbiol.* 25 (3) 557-558 <http://jcm.asm.org/content/25/3/557.abstract>
<http://jcm.asm.org/content/25/3/557.full.pdf+html>

Paul H, Gerth HJ, Ackermann R. (1987) Infectiousness for humans of *Ixodes ricinus* containing *Borrelia burgdorferi*. *Zentralbl Bakteriell Mikrobiol Hyg A* 263(3), 473-6. [Abstract](#)

Garcia-Monco JC, Villar BF, Alen JC, Benach JL (1990) [Borrelia burgdorferi in the central nervous system: experimental and clinical evidence for early invasion.](#) *J Infect Dis.* 61(6), 1187-93.

Shih CM, Spielman A. (1993) Accelerated Transmission of Lyme Disease Spirochetes by Partially Fed Vector Ticks. *J Clin Microbiol* 31(11), 2878-81 <http://www.ncbi.nlm.nih.gov/pubmed/8263171?dopt=Abstract>
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC266148/pdf/jcm00023-0052.pdf>

Patmas MA, Remorca C. (1994) Disseminated Lyme disease after short-duration tick bite. *Journal of Spirochetal and Tickborne Diseases* 1, 77-78

Leuba Garcia S, Kramer MD, Wallich R, Gern L. (1994) Characterization of *Borrelia burgdorferi* isolated from different organs of *Ixodes ricinus* ticks collected in nature. *Int J Med Microbiol Virol Parasitol Infect Dis* 280(4), 468-75 <http://www.ncbi.nlm.nih.gov/pubmed/8061407?dopt=Abstract>

Moskvitina GG, Korenberg EI, Gorban L. (1995) The presence of *Borrelia* in the intestines and salivary glands of spontaneously infected adult *Ixodes persulcatus* Schulze ticks during bloodsucking. *Med Parazitol Mosk* (3), 16-20 <http://www.ncbi.nlm.nih.gov/pubmed/7476674?dopt=Abstract>

Moskvitina GG, Korenberg EI, Spielman A, Shchegoleva TV. (1995) The frequency of generalized infection in adult fasting ticks of the genus *Ixodes* in foci of borreliosis in Russia and the USA. *Parazitologija* 29(5), 353-60 <http://www.ncbi.nlm.nih.gov/pubmed/8524615?dopt=Abstract>

Alekseev AN, Arumova EA, Vasilieva IS. (1995) *Borrelia burgdorferi* sensu lato in female cement plug of *Ixodes persulcatus* ticks (Acari, Ixodidae). *Exp Appl Acarol* 19(9), 519-22 <http://www.ncbi.nlm.nih.gov/pubmed/8575271?dopt=Abstract>

Alekseev AN, Burenkova LA, Vasilieva IS, Dubinina HV, Chunikhin SP. (1996) Preliminary studies on virus and spirochete accumulation in the cement plug of ixodid ticks. *Exp Appl Acarol* 20(12), 713-23 <http://www.ncbi.nlm.nih.gov/pubmed/9004495?dopt=Abstract>

Strle F, Nelson JA, Ruzic Sabljic E, Cimperman J. (1996) European Lyme borreliosis: 231 culture-confirmed cases involving patients with erythema migrans. *Clin Infect Dis* 23(1), 61-5. <http://www.ncbi.nlm.nih.gov/pubmed/8816130>

Kahl O, Janetzki Mittmann C, Gray JS, Jonas R, Stein J, de Boer R. (1998) Risk of infection with *Borrelia burgdorferi* sensu lato for a host in relation to the duration of nymphal *Ixodes ricinus* feeding and the method of tick removal. *Zentralbl Bakteriell* 287(1-2), 41-52 <http://www.ncbi.nlm.nih.gov/pubmed/9532263?dopt=Abstract>

Maiwald M, Oehme R, March O, et al. (1998) Transmission risk of *Borrelia burgdorferi* sensu lato from *Ixodes ricinus* ticks to humans in southwest Germany. *Epidemiol Infect* 121(1), 103-8. [Abstract](#)

STRLE F, NADELMAN RB, CIMPERMAN J, NOWAKOWSKI J, PICKEN RN, SCHWARTZ I, MARASPIN V, AGUERO-ROSENFELD M, VARDA S, LOTRIC-FURLAN S, WORMSER GP (1999) Comparison of culture -

confirmed erythema migrans caused by *Borrelia burgdorferi* sensu stricto in New York State and by *Borrelia afzelii* in Slovenia. *Annals of internal medicine* 130(1), 32-36

NUTTALL PA, PAESEN GC, LAWRIE CH et al (2000) Vector - host interactions in disease transmission. *Journal of Molecular Microbiology and Biotechnology* 2(4) 381–386

[des Vignes F, Piesman J, Heffernan R](#) et al. (2001) **Effect of tick removal on transmission of *Borrelia burgdorferi* and *Ehrlichia phagocytophila* by *Ixodes scapularis* nymphs.** *J Infect Dis*. 183(5), 773-8. Epub 2001 Feb 1. <http://www.ncbi.nlm.nih.gov/pubmed/11181154#>
« Infected *I. scapularis* nymphs transmitted *E. phagocytophila* within 24 h in 2 of 3 attempts, which indicates that daily tick removal may not be adequate to prevent human infection with this agent ».

CRIPPA, Mara, Olivier RAIS, and Lise GERN. (2002) Investigations on the mode and dynamics of transmission and infectivity of *Borrelia burgdorferi* sensu stricto and *Borrelia afzelii* in *Ixodes ricinus* ticks. *Vector borne and zoonotic diseases* 2(1), 3–9

Schwann TG, Piesman J (2002) Vector interactions and molecular adaptations of Lyme disease and relapsing fever spirochetes associated with transmission by ticks. *Emerg Infect Dis* 8, 115-121
http://wwwnc.cdc.gov/eid/article/8/2/01-0198_article.htm
“When nymphal ticks feed, the bacteria pass through the hemocoel to the salivary glands and are transmitted to a new host in the saliva after 2 days.”

Mervine P. et al. (2004) Review: Risk of Infection From Tick Bite vs. Duration of Attachment of *Ixodes* Nymphs
http://www.mnlyme.com/files/Review_Risk_of_Infection_From_Tick_Bite.pdf

Zeidner NS, Brandt KS, Dadey E, Dolan MC, Happ C, Piesman J (2004) **Sustained-release formulation of doxycycline hyclate for prophylaxis of tick bite infection in a murine model of Lyme borreliosis.** *Antimicrob Agents Chemother* 48, 2697–9.

Zeidner N, Massung R, Dolan M, Dadey E, Gabitzsch E, Dietrich G, Levin M (2008) **A sustained-release formulation of doxycycline hyclate (Atridox) prevents simultaneous infection of *Anaplasma phagocytophilum* and *Borrelia burgdorferi* transmitted by tick bite.** *J Med Microbiol* 57, 463–8

[Warshafsky S, Lee DH, Francois LK, Nowakowski J, Nadelman RB, Wormser GP](#) (2010) Efficacy of **antibiotic prophylaxis** for the prevention of Lyme disease: an updated systematic review and meta-analysis. *J Antimicrob Chemother*. 65(6), 1137-44. <http://www.ncbi.nlm.nih.gov/pubmed/20382722>

PLATONOV AE, KARAN LS, KOLYASNIKOVA NM et al. (2011) Humans Infected with Relapsing Fever Spirochete *Borrelia miyamotoi* Russia. *Emerging infectious diseases* 17(10) 1816

Knauer J, Krupka I, Fuedner C, Lehmann J, Straubinger RK (2011) Evaluation of the preventive capacities of a topically applied azithromycin formulation against Lyme borreliosis in a murine model. *J Antimicrob Chemother* 66(12), 2814-22.

Wormser GP, Daniels TJ, Bittker S, Cooper D, Wang G, Pavia CS (2012) Failure of Topical Antibiotics to Prevent Disseminated *Borrelia burgdorferi* Infection Following a Tick Bite in C3H/HeJ Mice. *J Infect Dis* 205, 991-4

Hynote ED, Mervine PC, Stricker RB (2012) Clinical evidence for rapid transmission of Lyme disease following a tickbite. *Diagnostic Microbiology & Infectious Disease*. 72(2), 188-192
<http://www.dmidjournal.com/article/S0732-8893%2811%2900415-9/abstract>
“Lyme disease transmission to humans by *Ixodes* ticks is thought to require at least 36-48 h of tick attachment. We describe 3 cases in which transmission of *Borrelia burgdorferi*, the spirochetal agent of Lyme disease, appears to have occurred in less than 24 h based on the degree of tick engorgement, clinical signs of acute infection, and immunologic evidence of acute Lyme disease. Health care providers and individuals exposed to ticks should be aware that transmission of Lyme disease may occur more rapidly than animal models suggest. A diagnosis of Lyme disease should not be ruled out based on a short tick attachment time in a subject with clinical evidence of *B. burgdorferi* infection.”

Radolf JD, Caimano MJ, Stevenson B, Hu LT. (2012) Of ticks, mice and men: understanding the dual-host lifestyle of Lyme disease spirochaetes. *Nat Rev Micro* 10, 87-99.

Binnicker MU, Theel ES, Pritt BS (2012) Lack of evidence for rapid transmission of Lyme disease following a tick bite. *Diagn Microb Infect Dis* 73, 102-103 <http://www.ncbi.nlm.nih.gov/pubmed/22578945>

Piesman J, Gray J. (2012) Letter in response to the Hynote article. *Diagnostic Microbiology and Infectious Disease*. 73, 103-104 <http://www.ncbi.nlm.nih.gov/pubmed/22424899>

HOFHUIS, AT, HERREMANS DW, NOTERMANS H et al. (2013) A Prospective Study among Patients Presenting at the General Practitioner with a Tick Bite or Erythema Migrans in the Netherlands. PloS one 8(5), e64361

Piesman J, Hojgaard A, Ullmann AJ, Dolan MC (2014) Efficacy of an experimental azithromycin cream for prophylaxis of tick-transmitted Lyme disease spirochete infection in a murine model. Antimicrob Agents Chemother. 58(1), 348-51.

Saraiva DG, Soares HS, Soares JF, Labruna MB (2014) Feeding Period Required by Amblyomma aureolatum Ticks for Transmission of Rickettsia rickettsii to Vertebrate Hosts. Emerging Infectious Diseases • www.cdc.gov/eid • 20(9) http://wwwnc.cdc.gov/eid/article/20/9/14-0189_article
„ Unfed nymphs and unfed adult ticks had to be attached to the host for >10 hours to transmit *R. rickettsii*. In contrast, fed ticks needed a minimum of 10 minutes of attachment to transmit *R. rickettsii* to hosts.“

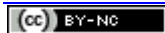
Cook M (2014) **Lyme borreliosis: a review of data on transmission time after tick attachment.** International Journal of General Medicine. 2015(8), 1-8. <http://www.ncbi.nlm.nih.gov/pubmed/25565881>
«The claims that removal of ticks within 24 hours or 48 hours of attachment will effectively prevent LB are not supported by the published data, and the minimum tick attachment time for transmission of LB in humans has never been established.»
<http://www.dovepress.com/lyme-borreliosis-a-review-of-data-on-transmission-time-after-tick-atta-peer-reviewed-article-IJGM>

[Perea AE](#), [Hinckley AF](#), [Mead PS](#) (2014) **Tick Bite Prophylaxis: Results From a 2012 Survey of Healthcare Providers.** *Zoonoses Public Health*. doi: 10.1111/zph.12159.
“Comment: the authors consider: tick bite antibiotic prophylaxis.» <http://www.ncbi.nlm.nih.gov/pubmed/25244410>

➔ Kroun M. (2013) **Transmission rate** of Bb from bites of infected ticks.
<http://lymerick.net/Transmission-Bb-rate-time.htm>

[Schwameis M](#), [Kündig T](#), [Huber G](#) et al. (2016) **Topical azithromycin for the prevention of Lyme borreliosis: a randomised, placebo-controlled, phase 3 efficacy trial.** DOI: [http://dx.doi.org/10.1016/S1473-3099\(16\)30529-1](http://dx.doi.org/10.1016/S1473-3099(16)30529-1) [http://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(16\)30529-1/abstract](http://www.thelancet.com/journals/laninf/article/PIIS1473-3099(16)30529-1/abstract)
“Inclusion of asymptomatic seroconversion into the primary efficacy analysis led to no prevention effect with topical azithromycin.”

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