

Langzeit – Antibiosen , Mono – Therapie, Kombination – Therapie
Long time - antibiotics, mono - therapy, combination - therapy

Prove that, for a chronic Lyme disease and Co-infections, the pathogen had disappeared within a 2 - or 4-week treatment with antibiotics, were never shown.

Beweise, dass bei einer chronischen Lyme-Borreliose und Ko-Infektionen der Krankheitserreger nach einer 2- oder 4-wöchiger Antibiotika-Behandlung verschwunden sei, wurden nie erbracht.

Evidence about whether chronic Lyme disease and co-infections with long-term antibiotic treatment only the placebo effect is effective or that the remaining symptoms cannot be correlated with the infection were also never produced, partly for ethical reasons.

Beweise dazu, ob bei einer chronischen Lyme-Borreliose und Ko-Infektionen unter Langzeitantibiose nur der Plazebo-Effekt wirksam ist, oder dass bleibende Symptome nicht mit der Infektion korreliert sein können, wurden z.T. aus ethischen Gründen ebenfalls nie erbracht.

Antibiotics reduce the host-specific pathogen load. Thus, the host's own immune system is assisted in its function. The host's own immune system is not weakened by Antibiotics.

Antibiotika vermindern die Erregerlast. Dadurch wird das wirtseigene Immunsystem in seiner Funktion unterstützt. Durch Antibiotika wird das Immunsystem des Wirtes nicht geschwächt.

But by the use of antibiotics the [bacterial colonization of the intestine](#) can be disturbed, a [mitochondriopathy](#) could be strengthened.

Durch die Anwendung von Antibiotika kann aber die [Bakterienbesiedlung des Darmes](#) gestört und eine [Mitochondriopathie](#) deutlicher werden.

Cortisone in therapeutic doses or heavy metals such as e.g. Gold or specific immune suppressive drugs such as MTX, Azathioprim or other cytostatic drugs or the so called biologicals weaken the host's own immune system, however lasting.

Cortison in therapeutischen Dosen oder Schwermetalle wie z.B. Gold oder spezielle Immun-Suppressiva wie z.B. MTX, Azathioprim, oder andere Zytostatika und sog. Biologicals schwächen das wirtseigene Immunsystem dagegen nachhaltig.

DOUBLE BLIND PLACEBO CONTROLLED STUDIES ON THE TREATMENT OF BORRELIOSIS are **prohibited for ethical reasons**. I remind the disaster with the **Tuskee study**. http://en.wikipedia.org/wiki/Tuskegee_syphilis_experiment
<http://www.cdc.gov/tuskegee/timeline.htm>

Doppelblind, placebo-kontrollierte Studien zur Behandlung einer Borreliose sind **aus ethischen Gründen verboten**. Ich erinnere an die Katastrophe mit der **Tuskee Studie**.
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Plazebo Effekt

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Immunsuppression ohne oder mit Antibiose, Immunosuppression with or without antibiotics

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Antibiose, Antibiosis

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Comment: Raphael Stricker 2016 Sep 04 05:28 a.m.
Study Conclusion is Incorrect This study did not have a true control group because all chronic Lyme disease patients received an additional two weeks of intravenous ceftriaxone therapy. The study clearly shows that this additional antibiotic treatment was associated with significant improvement in the SF-36 quality of life scale in all patient groups (see Figure 2). Thus the conclusion that additional antibiotic therapy was ineffective for chronic Lyme disease is incorrect.

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Monotherapie Langzeit – Antibiose, Monotherapy Longterm – Antibiosis

Studie Jahr	Krankheit bis Therapie	Pat. Zahl	Antibiotika	Behandlungsdauer	Behandlungs-Ergebnis und -Aussagen
Wahlberg 1994	-	100	Ceftriaxon Amoxicillin Cefadroxil	14 Tage 100 Tage 100 Tage	“Titres of IgG antibodies to <i>B. burgdorferi</i> flagella declined significantly after 6 and 12 months in the patients who had successful treatments”.
Donta 1997	-	277	Tetrazyklin	2 Monate 3 Monate ~4 Monate	20% geheilt, 70% gebessert, 10% unverändert “These results support the use of longer courses of treatment in the management of patients with chronic Lyme disease”.
Oksi 1998	-	30	Cefixime + + Probenicid Ceftriaxon, Amoxicillin	3 bis 4 Monate	“The general outcomes of infection in patients with disseminated Lyme borreliosis after 3-4 months of therapy indicate that prolonged courses of antibiotics may be beneficial in this setting, since 90% of the patients showed excellent or good treatment responses”.
Oksi 1999	-	165	Oral Antib. Ceftriaxon	3 Monate 1 ½ Monate	Rückfälle. Gute Ergebnisse “We conclude that the treatment of Lyme borreliosis with appropriate antibiotics for even more than 3 months may not always eradicate the spirochete”.
Fallon 1999	-	18	i.v., i.m. i.v. doxycycline, minocycline, amoxicillin, penicillin, azithromycin, clarithromycin, cefuroxime, cefixime	4 Monate	This uncontrolled study suggests that repeated antibiotic treatment can be beneficial, even among patients who have been previously treated and even among patients who are currently Western blot negative, with the intravenous route of treatment being the most effective. A double-blind placebo-controlled study is needed to confirm these results.
Klempner 2001	~4,7 Jahre	129	Ceftriaxon Doxycyclin	1 Monat 2 Monate	“Antibiotic treatment is highly effective for the acute and late septic manifestations of Lyme disease, which is caused by the tick-borne bacterium <i>Borrelia burgdorferi</i> ”. “During the six-month evaluation period, we observed improvement in health status in 36 percent of patients, worsening health status in 39 percent, and no significant change in 25 percent”.

					"There is considerable impairment of health-related quality of life among patients with persistent symptoms despite previous antibiotic treatment for acute Lyme disease. However, in these two trials, treatment with intravenous and oral antibiotics for 90 days did not improve symptoms more than placebo".
Krupp 2003	-	55	Ceftriaxon	1 Monat	64% Besserung der Erschöpfung, keine Besserung des Bewusstseins "Patients assigned to ceftriaxone showed improvement in disabling fatigue compared to the placebo group (rate ratio, 3.5; 95% CI, 1.50 to 8.03; $p = 0.001$)"
Fallon 2008	~9 Jahre	23	Ceftriaxon	2 bis 6 Monate	Signifikante Besserung "IV ceftriaxone therapy results in short-term cognitive improvement for patients with posttreatment Lyme encephalopathy, but relapse in cognition occurs after the antibiotic is discontinued".
Cameron 2008	~7,1 Mon.	52	Amoxicillin	3 Monate	2/3 der Patienten gebessert
Klemann 2009	~9 Jahre	105	Ceftriaxon Tetrazykline Makrolide Linkosamide Nitroimidazol Lysosomotropika	6 Monate bis 3 Jahre	38,8% beschwerdefrei, symptom-free 56,7% gebessert, improved 5,5% unverändert, unchanged
Stricker 2010	-	200	i.v.	~4 Monate	"Prolonged intravenous antibiotic therapy is associated with low morbidity and no IVD-related mortality in patients referred for treatment of neurologic Lyme disease. With proper IVD care, the risk of extended antibiotic therapy in these patients appears to be low".
Kuhn 2012	-	-	Amoxycillin	6 Monate	"The assessors also reported anecdotal data of improved speech, eye contact, sleep behaviors, and a reduction of repetitive behaviors".
DeLong 2012	-	-	Ceftriaxon	3 bis 6 Monate	"This biostatistical review reveals that retreatment can be beneficial. Primary outcomes originally reported as statistically insignificant were likely underpowered".

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“On the basis of this analysis, the conclusion that there is a meaningful clinical benefit to be gained from retreatment of such patients with parenteral antibiotic therapy cannot be justified”.

[Stricker RB](#), [Johnson L](#). (2013) Borrelia burgdorferi aggrecanase activity: **more evidence for persistent infection in Lyme disease**. Front Cell Infect Microbiol. 3, 40. doi: 10.3389/fcimb.2013.00040. eCollection 2013. <http://www.ncbi.nlm.nih.gov/pubmed/23967405>

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Berndtson K. (2013) [Review of evidence for immune evasion and persistent infection in Lyme disease](#). Int J Gen Med. 6, 291-306. doi: 10.2147/IJGM.S44114. Print 2013. <http://www.ncbi.nlm.nih.gov/pubmed/23637552>

„Accumulating evidence indicates that Lyme disease spirochetes are adapted to persist in immune competent hosts, and that they are able to remain infective despite aggressive antibiotic challenge. Advancing understanding of the survival mechanisms of the Lyme disease spirochete carry noteworthy implications for ongoing research and clinical practice.“

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Merit E Cudkovicz ME, Sarah Titus S, Marianne Kearney M et al. (2014) **Safety and efficacy of ceftriaxone for amyotrophic lateral sclerosis: a multi-stage, randomised, double-blind, placebo-controlled trial** Lancet Neurol 13, 1083–91 <http://www.thelancet.com/journals/laneur/article/PIIS1474-4422%2814%2970222-4/abstract> http://www.researchgate.net/publication/266561222_Safety_and_efficity_of_ceftriaxone_for_amyotrophic_lateral_sclerosis_a_multi-stage_randomised_double-blind_placebo-controlled_trial
« Despite promising stage 2 data, stage 3 of this trial of ceftriaxone in amyotrophic lateral sclerosis did not show clinical efficacy. The adaptive design allowed for seamless transition from one phase to another, and central venous catheter use in the home setting was shown to be feasible»

Berende A, ter Hofstede HJM, A Rogier A et al. (2014) **Persistent Lyme Empiric Antibiotic Study Europe (PLEASE) - design of a randomized controlled trial of prolonged antibiotic treatment in patients with persistent symptoms attributed to Lyme borreliosis.** BMC Infectious Diseases, 14, 543 <http://www.biomedcentral.com/1471-2334/14/543> <http://www.ncbi.nlm.nih.gov/pubmed/25318999>

Melia MT, Auwaerter PG (2016) **Time for a different approach to Lyme disease and long-term symptoms.** N Engl J Med. 374, 1277-1278.
« Though prolonged antibiotic therapy is not the answer, we do not know what is truly helpful. ... Future research efforts should continue to explore such different strategies that may lead to proven options for helping our patients. »

➔ **Klemann W** <http://www.dr-w-klemann.de/htmldocs/neuigkeiten-erfahrungen-mit-langzeitantibiose-erkenntnisse-ueber-biofilme.php>

Kombinationstherapie Langzeit – Antibiose, Kombination- Longterm – Antibiosis

Studie Jahr	Krankheits-Dauer	Pat. Zahl	Antibiotika	Behandlungsdauer	Behandlungs-Ergebnis
Gasser 1990 Gasser 1996	-	18	Roxythromycin + Cotrim	-	76% of the patients recovered completely. These results show that oral therapy of cotrimoxazole and roxithromycin in combination provides similar results as i.v. antibiotics in earlier studies.
Gasser 1995	-	-	Penicillin G Cephalosporine + Sulbactam	-	-
Aygen 1996	-	10	Ceftriaxon + Rifampicin + Doxycyclin	2 bis 6 Wochen	-
Donta 2003	-	235	Macrolide + Hydroxychloroquine	2 Monate 3 Monate	->20% gebessert, prolonged therapy ->45% gebessert. "These results support the hypothesis... that the use of a lysosomotropic agent augments the clinical activity of macrolide

					antibiotics in the treatment of patients with chronic Lyme Disease”.
Schardt 2004	-	11	Antibiotika, im Anschluss daran Fluconazol	nach erfolgloser Antibiose 25 Tage lang	At the end of treatment eight patients had no borreliosis symptoms and remained free of relapse in a follow-up examination one year later. In the remaining four patients, symptoms were considerably improved.
Sparing 2004	-	-	Makrolide, Tetracycline, Fluorchinolone	-	-
Hartmann 2010	-	5000	Actos+Cholestyramin+Minocyclin+Quensyl, anschließend Metronidazol	Ca 4 Jahre, entspr. der Symptomatik	-

Gasser R, Dusleag J, (1990) Oral treatment of late lyme borreliosis with roxythromycine plus cotrimoxazole, Lancet, 1189-90
<http://www.lancet.com/journals/lancet/article/PII0140-6736%2890%2992801-N/fulltext>

Gasser, R et al (1995) Cases of Lyme borreliosis resistant to conventional treatment: improved symptoms with cephalosporin plus specific beta-lactamase inhibition, Microb Drug Resist, 1, 341-4
<http://online.liebertpub.com/doi/abs/10.1089/mdr.1995.1.341>

Gasser R, et al. (1996) Oral treatment of late Lyme Borreliosis with a combination of roxithromycine and cotrimazole – a pilot study on 18 patients. Acta Med Austria 23, 99-101
<http://www.ncbi.nlm.nih.gov/pubmed/8798283>

Aygen B, Sümerkan B, Mirza M et al. (1996) Treatment of neurobrucellosis with a combination of ceftriaxone, rifampicin and doxycycline (a study on ten cases) Médecine et Maladies Infectieuses, Volume 26, Issue 12, Pages 1199-1201 <http://www.sciencedirect.com/science/article/pii/S0399077X96801247>

Donta ST. (2003) Macrolide therapy of chronic Lyme Disease. Med Sci Monit 9(11), 136-42. PMID 14586290. <http://www.ncbi.nlm.nih.gov/pubmed/14586290>

Schardt WF (2004) Clinical effects of Fluconazole in patients with neuroborreliosis. Eur J Med Res 9(7) 334-336 <http://www.ncbi.nlm.nih.gov/pubmed/15337633>

Sparing R. (2004) Kombitherapie stoppt Mykoplasmen-Enzephalitis. Makrolide, Tetrazykline und Fluorchinolone töten Mykoplasmen / Betalaktame sind gegen die Erreger unwirksam. Der Nervenarzt 10, 16, Ärzte Zeitung <http://www.aerztezeitung.de/medizin/fachbereiche/allgemeinmedizin/article/341932/kombitherapie-stoppt-mykoplasmen-enzephalitis.html>

Stricker, RB (2007) Counterpoint – Long-term antibiotic therapy improves persistent symptoms associated with lyme disease. Clin Infect Dis 45, 149–157. <http://dx.doi.org/10.1086/518853>

Donta ST (2007) Lyme disease guidelines--it's time to move forward. Clin Infect Dis 44(8), 1134-5; author reply 1137-9. [Full Citation](#)

Stricker RB, Johnson L (2010) Lyme disease diagnosis and treatment: lessons from the AIDS epidemic. Minerva Med 101(6), 419-25. [Abstract](#)

Hartmann F, Müller-Marienburg H. (2010) Zur Entstehung und Behandlung der BORRELIOSE. hansadruck, Kiel <http://www.bfbd.de/media/literaturdownloads/Hartmann%20Borreliose%2071.pdf>

Waag DM (2012) **Q Fever**. Medical Aspects of Biological Warfare * Microbiologist, Division of Bacteriology, US Army Medical Research Institute of Infectious Diseases, 1425 Porter Street, Fort Detrick, Maryland 21702 http://www.bordeninstitute.army.mil/published_volumes/biological_warfare/BW-ch10.pdf
 “Q fever endocarditis patients generally receive **18 months** of therapy with doxycycline, 100 mg twice daily, and chloroquine, 200 mg three times daily. 107 Quinolones can also be used for those who cannot tolerate chloroquine. For these patients, **3 years** of therapy with doxycycline, 100 mg twice daily, and ofloxacin, 200 mg

three times daily, is recommended. **The long duration is recommended because relapses have occurred when the latter regimen was stopped**".

Hashemi S., Gachkar L., Keramat F. et al. (2012) Comparison of doxycycline–streptomycin, doxycycline–rifampin, and ofloxacin–rifampin in the treatment of **brucellosis**: a randomized clinical trial ☆ International Journal of Infectious Diseases Volume 16, Issue 4 , Pages e247-e251 http://www.ijidonline.com/article/S1201-9712%2812%2900015-X/abstract?elsca1=etoc&elsca2=email&elsca3=1201-9712_201204_16_4&elsca4=infectious_diseases#article-footnote-1

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<http://www.news-medical.net/news/20120831/Study-reports-flaws-in-design-analysis-and-interpretation-of-Lyme-disease.aspx>

[Stricker](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3743303/) RB, [Johnson](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3743303/) L (2013) *Borrelia burgdorferi* **aggrecanase activity**: more evidence for persistent infection in Lyme disease. Front Cell Infect Microbiol. 2013; 3: 40. Published online 2013 August 14. doi: [10.3389/fcimb.2013.00040](https://doi.org/10.3389/fcimb.2013.00040) PMID: PMC3743303
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3743303/>
"Discovery of the spirochetal aggrecanase raises many questions about the pathogenesis of Lyme arthritis and lends support to the concept of persistent B. burgdorferi infection in patients with chronic Lyme disease symptoms".

[Barten DG](http://www.ncbi.nlm.nih.gov/pubmed/24004470), [Delsing CE](http://www.ncbi.nlm.nih.gov/pubmed/24004470), [Keijmel SP](http://www.ncbi.nlm.nih.gov/pubmed/24004470) et al. (2013) **Localizing chronic Q fever**: a challenging query. BMC Infect Dis. 13(1), 413. [Epub ahead of print] <http://www.ncbi.nlm.nih.gov/pubmed/24004470>
"CONCLUSIONS: If chronic Q fever is diagnosed, 18F-FDG PET/CT is a helpful imaging technique for localization of vascular infections due to chronic Q fever. Patients with proven chronic Q fever were diagnosed significantly more often with mycotic aneurysms than in previous case series. Definite endocarditis due to chronic Q fever was less frequently diagnosed in the current study. Chronic Q fever often occurs in patients without a known episode of acute Q fever, so clinical suspicion should remain high, especially in endemic regions."

Hermans T, Jeurissen L, Hackert V, Hoebe C (2014) Land-Applied Goat Manure as a Source of Human Q-Fever in the Netherlands, 2006-2010. PLoS ONE 9(5), e96607.
doi:10.1371/journal.pone.0096607
<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0096607>

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http://www.diplomica-verlag.de/gesundheitswissenschaften_94/antibiotika-langzeit-therapie-bei-chronischer-lyme-borreliose-mit-borrelien-dna-nachweis-durch-pcr-intensivbehandlung-kombinationsbehandlung-langzeitbehandlung_159733.htm

Huisman BD, Klemann W, Heyl S (2014) **Prolonged antibiotic therapy in PCR confirmed persistent Lyme disease.** Anchor Academic Publishing.
<http://www.amazon.de/Prolonged-antibiotic-therapy-confirmed-persistent/dp/3954892413>

[Klemann W](http://www.hausarbeiten.de/faecher/vorschau/279155.html), [Huisman](http://www.hausarbeiten.de/faecher/vorschau/279155.html) B-D (2014) **Etude rétrospective sur la maladie de Lyme** (French Edition) Paperback GRIN Verlag GmbH. ISBN-10: 3656732833 ISBN-13: 978-3656732839
<http://www.hausarbeiten.de/faecher/vorschau/279155.html>

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<http://www.nejm.org/doi/full/10.1056/NEJMoa1505425>
"In patients with persistent symptoms attributed to Lyme disease, longer-term antibiotic treatment did not have additional beneficial effects on health-related quality of life beyond those with shorter-term treatment." „12-week oral course of doxycycline, clarithromycin plus hydroxychloroquine, or placebo. All study groups received open-label intravenous ceftriaxone for 2 weeks before initiating the randomized regimen".

Feng J, Zhang Sh, Shi W, Zhang Y (2017) **Activity of Sulfa Drugs and Their Combinations against Stationary Phase B. burgdorferi in vitro. Running title: Sulfa drugs and their combinations against B. burgdorferi persisters.** bioRxiv preprint <http://dx.doi.org/10.1101/112607>
doi: bioRxiv preprint first posted online Mar. 3, 2017

„Four drug combinations dapsone+minocycline+cefuroxime+azithromycin and dapsone+minocycline+cefuroxime+rifampin showed best activity against stationary phase *B. burgdorferi* in these sulfa drug combinations. However, these 4-sulfa drug containing combinations still had considerably less activity against *B. burgdorferi* stationary phase cells than the daptomycin+cefuroxime+doxycycline used as a positive control which completely eradicated *B. burgdorferi* stationary phase cells.“

Lacout A, Marcy PY, El Hajjam M, Thariat J, Perronne C (2017) [Dealing with Lyme disease treatment](#). Am J Med, 2017; doi:10.1016/j.amjmed.2016.12.039
[http://www.amjmed.com/article/S0002-9343\(17\)30103-1/fulltext](http://www.amjmed.com/article/S0002-9343(17)30103-1/fulltext)

„This explain why Lyme disease treatment can be challenging, particularly in the chronic form of the disease. The importance of the bacterial load and the deep bacterial location may require long-term antibiotherapy by combining different therapeutic molecules.“

- ➔ **Borrelien Direkt – Nachweis, Direct Detection of Borrelia**
http://www.erlebnishaft.de/borrelien_direktnachweis.pdf
- ➔ **Antibiotherapie** www.kabilahsystems.de/antibiotherapieplan.pdf
- ➔ **Klemann W** <http://www.dr-w-klemann.de/htmldocs/neuigkeiten-erfahrungen-mit-langzeitantibiose-erkenntnisse-ueer-biofilme.php>
- ➔ **Interview with Prof. Ying Zhang at the NorVect Conference 2015**
<https://www.youtube.com/watch?v=krXSFmkwXxo&feature=youtu.be&app=desktop>
- ➔ **Antibiotika Pulstherapie, pulsed antibiotic therapy**
http://www.kabilahsystems.de/antibiotika_pulse.pdf
- ➔ **Management nach Zeckenkontakt**
www.xerlebnishaft.de/management_nach_zeckenkontakt_en.pdf
www.xerlebnishaft.de/management_nach_zeckenkontakt.pdf

Therapie – Komplikationen, Therapy complications

1. Gallenblasen – Komplikationen bei Infusionstherapie mit Ceftriaxon
2. Sepsis bei liegendem Katheter (Fremdkörper)
3. Candida – Sepsis
4. *Chlostridium difficile* – Sepsis
5. Allergische und pseudoallergische Reaktionen (Jarisch-Herxheimer – Reaktion)
6. evtl. bakterielle Hypermuation (Anlass zu häufigerem Medikamenten – Wechsel)

Nadelman RB, Arlin Z, Wormser GP (1991). Life-threatening complications of empiric ceftriaxone therapy for `seronegative Lyme disease'. South Med J 84, 1263-5. [CrossRefMedlineWeb of Science Search Google Scholar](#)

Ettestad PJ, Campbell GL, Welbel SF et al. (1995) **Biliary complications** in the treatment of unsubstanciated Lyme disease. J Infect Dis 171, 356-361 [Abstract/FREE Full Text](#)

Maloy AL, Black RD, Segurola RJ Jr. (1998) Lyme disease complicated by the **Jarisch-Herxheimer** reaction. J Emerg Med. 16(3), 437-8.

Bonnet JP, Abid L, Dabhar A, Lévy A, Soulier Y, Blangy S. (2000) Early biliary **pseudolithiasis** during **ceftriaxone** therapy for acute pyelonephritis in children: a prospective study in 34 children. *Eur J Pediatr Surg.* 10(6):368-71

Patel R., Grogg KL., Edwards WD., et al. (2000) **Death** from inappropriate therapy for Lyme disease. *Clin Infect Dis* 31, 1107-1109 <http://cid.oxfordjournals.org/content/31/4/1107.short>
[Cefotaxime, Venenkatheter, Candida, Sepsis]

Stricker RB, Green CL, Savely VR, Chamallas SN, Johnson L (2010) Safety of intravenous antibiotic therapy in patients referred for treatment of neurologic Lyme disease. *In: Minerva Med* 101(1), 1–7. <http://www.ncbi.nlm.nih.gov/pubmed/20228716>

Holzbauer S, Kemperman M, Lynfield R (2010) **Death** due to community-associated **Clostridium difficile** in a woman receiving prolonged antibiotic therapy for suspected Lyme disease. *CID* 51, 369-70 <http://www.ncbi.nlm.nih.gov/pubmed/20597684>

Jolivet-Gougeon A, Kovacs B, Le Gall-David S, (2011) Bacterial **hypermutation**: clinical implications. *Journal of Medical Microbiology* 60, 563–573 <http://jmm.sgmjournals.org/content/60/5/563.abstract>
<http://www.ncbi.nlm.nih.gov/pubmed/21349992> **[methyl-directed mismatch repair (MMR) system]**

White B, Seaton RA, Evans TJ (2012) Management of suspected Lyme borreliosis: experience from an outpatient parenteral antibiotic therapy service. *QJM Advance Access.* 1-6
<http://www.ncbi.nlm.nih.gov/pubmed/23070203> **[Ceftriaxon 21-23 Tage, maximal 43 Tage, Venenkatheter, 40% Nebenwirkungen]**

Rashid MU, Lozano HM, Weintraub A et al. (2013) In vitro activity of **cadazolid** against **Clostridium difficile** strains isolated from primary and recurrent infections in Stockholm, Sweden. *Anaerobe*. pii: S1075-9964(13)00023-1. doi: 10.1016/j.anaerobe.2013.02.003.
<http://www.ncbi.nlm.nih.gov/pubmed/23454525>

Pena-Miller R, Laehnemann D, Jansen G, Fuentes-Hernandez A, Rosenstiel P, Schulenburg H, Beardmore R (2013) Research Article: **When the Most Potent Combination of Antibiotics Selects for the Greatest Bacterial Load: The Smile-Frown Transition**. *PLOS Biology* 11(4), e1001540, 1-13
[in vitro]
http://www.plosbiology.org/article/info%3Adoi%2F10.1371%2Fjournal.pbio.1001540?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+plosbiology%2FNewArticles+%28Ambra++Biology+New+Articles%29

Kalghatgi S et al. (2013) **Bactericidal antibiotics induce mitochondrial dysfunction and oxidative damage in mammalian cells**. *Science Translational Medicine*, 5, 192ra85
<http://stm.sciencemag.org/content/5/192/192ra85.short>

Berghoff W (2014) **Literaturübersicht Antibiotische Behandlung Lyme-Borreliose Stadium III**
http://www.praxis-berghoff.de/dokumente/berghoff150714/Kapitel_23-d_Literaturuebersicht_Antibiotische_Behandlung_LB_III.pdf

Nelson C, Elmendorf S, Mead P (2015) **Neoplasms misdiagnosed as “chronic Lyme disease**. *JAMA Intern Med.* 175, 132–133. 36.

Marzec NS, Nelson C, Waldron PR et al. (2017) **Serious Bacterial Infections Acquired During Treatment of Patients Given a Diagnosis of Chronic Lyme Disease - United States**. *MMWR Morb Mortal Wkly Rep.* 66(23), 607-609. doi: 10.15585/mmwr.mm6623a3.
https://www.ncbi.nlm.nih.gov/pubmed/28617768#cm28617768_69799

De Wilde M, Speeckaert M, Callens R, Van Biesen W (2017) **Ceftriaxone-induced immune hemolytic anemia as a life-threatening complication of antibiotic treatment of 'chronic Lyme disease'**. *Acta Clin Belg.* 72(2), 133-137. doi: 10.1080/17843286.2016.1180829.

➔ **Herxheimer** <http://kabilahsystems.de/herx.pdf>

Verlaufs – Muster, course pattern

Petersen LR, Sweeney AH, Checko PJ, Magnarelli LA, et al. (1989) Epidemiological and clinical features of 1,149 persons with Lyme disease identified by laboratory-based surveillance in Connecticut Yale J Biol Med 62, 253–62 <http://www.ncbi.nlm.nih.gov/pubmed/2683415>

Fahrer H, Sauvain MJ et al. (1998) Longterm survey (7 years) in a population at risk for Lyme borreliosis: what happens to the seropositive individuals? Eur J Epidemiol 14(2), 117-23 http://www.unboundmedicine.com/medline/citation/9556169/Longterm_survey_%287_years%29_in_a_population_at_risk_for_Lyme_borreliosis:_what_happens_to_the_seropositive_individuals?

Nowakowski J, Nadelman RB, Sell R, et al. (2003) Long-term follow-up of patients with culture-confirmed Lyme disease 115(2), 91-6. [http://www.ncbi.nlm.nih.gov/sites/entrez?filters=&orig_db=PubMed&db=pubmed&cmd=Search&term=12893393\[uid\]](http://www.ncbi.nlm.nih.gov/sites/entrez?filters=&orig_db=PubMed&db=pubmed&cmd=Search&term=12893393[uid])

Hassler D. (2006) **Phasengerechte Therapie der Lyme-Borreliose**. Chemother J 15, 106-11. <http://www.dieterhassler.de/fileadmin/PDF/CTJ806.pdf>

„Je nach Region zeigen Seroprävalenzstudien, dass bis zu 20 % der Probanden Antikörper gegen Borrelia burgdorferi sensu lato aufweisen. Diese hohe Rate von Seropositiven hat die Annahme begründet, dass der Nachweis von Immunglobulin-G-Antikörpern (IgG-Antikörpern) in vielen Fällen lediglich auf eine früher durchgemachte Infektion zu interpretieren wäre. Diese Ansicht wird noch heute vielfach publiziert. In einer Langzeituntersuchung des genannten Kollektivs konnten wir dann aber zeigen, dass alle seropositiven Probanden irgendwann auch klinisch symptomatisch werden. Die maximale Latenzzeit bis zum Auftreten von Krankheitssymptomen betrug acht Jahre. **Daher kann heute als geklärt gelten, dass die Lyme-Borreliose eine primär chronisch verlaufende Infektionskrankheit ist, bei der es in Analogie zur Syphilis keine Spontanheilung gibt. Die These eines „Durchseuchungstiters“ im Sinne einer durchgemachten, spontan überstandenen Infektion konnte nie belegt werden und sollte heute obsolet sein.**“

In English now: Therefore, it can be said today that Lyme borreliosis is a primarily chronically infectious disease in which there is no spontaneous healing in analogy to syphilis. The thesis of a "penetration titrix" in the sense of a spontaneously surrendered infection could never be proven and should be obsolete today.

Lyme disease.org <http://www.lymedisease.org/resources/handouts5.html>

Relapses and Failure Rates Using Short Term Approaches

<http://www.lymedisease.org/resources/Relapses%20and%20Failure%20Rates.pdf>

“This listing of peer-reviewed, published articles illustrates the high failure rates, ranging from 26% to 50%, using short term antibiotic approaches.”

Berghoff W (2014) **LNB Verlaufsbeobachtungen nach antibiotischer Behandlung**.

Literaturübersicht. http://www.praxis-berghoff.de/dokumente/berghoff150714/Kapitel_23-e_LNB_Verlaufsbeobachtungen_nach_antibiotischer_Behandlung_Literaturuebersicht.pdf

Cadavid D, Auwaerter PG, Rumbaugh J, Gelderblom H. (2016) **Antibiotics for the neurological complications of Lyme disease**. Cochrane Database of Systematic Reviews Issue 12. Art. No.: CD006978. DOI: 10.1002/14651858.CD006978.pub2. [View/save citation](http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD006978.pub2/abstract)

<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD006978.pub2/abstract>

“None of the trials revealed any between-group differences in symptom resolution in response to active treatment”. “There is mostly low- to very low-quality clinical evidence from a limited number of mostly small, heterogeneous trials with diverse outcome measures, comparing the relative efficacy of central nervous system-penetrant antibiotics for the treatment of LNB. The few existing randomized studies have limited power and lack consistent and well-defined entry criteria and efficacy endpoints. It is not possible to draw firm conclusions on the relative efficacy of accepted antibiotic drug regimens for the treatment of LNB.”

- ➔ **Borrelien Populationsdynamik** <http://www.erlebnishaft.de/stressvar2.pdf>
- ➔ **Bakterielle L-Formen** <http://www.erlebnishaft.de/stressvar1.pdf>
- ➔ **Biofilme in der Medizin** <http://www.erlebnishaft.de/biofilmmed.pdf>

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- ➔ **Die Koch'schen Postulate** http://www.xerlebnishaft.de/expand_koch_post.pdf
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