

## **Chiropractic Care and Increased Immune System Response**

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1. Riley, G.W. Osteopathic Success in the Treatment of Influenza and Pneumonia. American Osteopathic Association – Chicago Session. July 1919. Journal of the American Osteopathic Association, August 1919.
2. Riley, G.W. Osteopathic Success in the Treatment of Influenza and Pneumonia. American Osteopathic Association – Chicago Session. July 1919. Journal of the American Osteopathic Association, August 1919. Special Reprint Journal of the American Osteopathic Association, Vol. 100. No. 5, May 2000.
3. Noll, DR., Shores, JH., Gamber, RG. Benefits of Osteopathic Manipulative Treatment for Hospitalized Elderly Patients with Pneumonia. Journal of the American Osteopathic Association. Vol. 100. No. 12. December 2000.
4. Breithaupt, T., Harris, K., Ellis, J. Thoracic lymphatic pumping and the efficacy of influenza vaccination in healthy young and elderly populations. Journal of the American Osteopathic Association. Vol. 101. No. 1. January 2001.
5. Noll DR, Degenhardt BF, Stuart MK, Werden S, McGovern RJ, Johnson JC. The effect of osteopathic manipulative treatment on immune response to the influenza vaccine in nursing homes residents: a pilot study. Altern Ther Health Med. 2004 Jul-Aug;10(4):74-6.
6. Degenhardt BF, Kuchera ML. Update on osteopathic medical concepts and the lymphatic system. J Am Osteopath Assoc. 1996 Feb;96(2):97-100.
7. Allen TW. Coming full circle: osteopathic manipulative treatment and immunity. J Am Osteopath Assoc. 1998 Apr;98(4):204.
8. Schmidt IC. Osteopathic manipulative therapy as a primary factor in the management of upper, middle, and pararespiratory infections. J Am Osteopath Assoc. 1982 Feb;81(6):382-8.
9. Ward, EA. Influenza and Its Osteopathic Management. Eastern Osteopathic Association's Seventeenth Annual Convention. New York, April 3, 1937. J. Am Osteopath Assoc. Sept. 1937.
10. Ward, EA. Influenza and Its Osteopathic Management. Eastern Osteopathic Association's Seventeenth Annual Convention. New York, April 3, 1937. J. Am Osteopath Assoc. Sept. 1937. Special Reprint. J. Am Osteopath Assoc. Vol. 100. No. 5. May 2000.
11. Smith, KR. One hundred thousand cases of influenza with a death rate of one-fortieth of that officially reported under conventional medical treatment. Annual Convention of the American Association of Clinical Research, New York. Oct. 18, 1919. J. Am Osteopath Assoc. January, 1920.
12. Smith, KR. One hundred thousand cases of influenza with a death rate of one-fortieth of that officially reported under conventional medical treatment. Annual Convention of the American Association of Clinical Research, New York. Oct. 18, 1919. J. Am Osteopath Assoc. January, 1920. Special Reprints. J. Am Osteopath Assoc. Vol. 100. No. 5. May 2000.
13. Patterson, M. Osteopathic methods and the great flu pandemic of 1917-1918. JAOA (The Journal of the American Osteopathic Association) May 2000; 100(5):309-10

14. Masarsky, C. 1918. Dynamic Chiropractic. November 17, 2003, Volume 21, Issue 24  
<http://www.chiroweb.com/archives/21/24/01.html>
15. Kent, C. Chiropractic and infectious disease — an historical perspective. The Chiropractic Journal April 2003.  
<http://www.worldchiropracticalliance.org/tcj/2003/apr/apr2003kent.htm>
16. Harte, D. Alternative to the sting of a failed flu vaccine. The Chiropractic Journal. March 2004. <http://www.worldchiropracticalliance.org/tcj/2004/mar/harte.htm>
17. Kent, C. Neuroimmunology and chiropractic. The Chiropractic Journal. October 1995. <http://www.worldchiropracticalliance.org/tcj/1995/oct/oct1995kent.htm>
18. Lerche Davis, J. Flu Shot Scare Fuels Scams. WebMd 11/2/2004  
<http://dailynews.att.net/cgi-bin/health?e=pub&dt=041102&cat=women&st=women103746&src=webmd#>
19. Lawrence, S. How to Dodge the Flu Without a Shot. Even without a flu shot, you can still do something to protect yourself. WebMd. October 22, 2004.  
<http://my.webmd.com/content/article/95/103481.htm>
20. Whelan et al: The effects of chiropractic manipulation on salivary cortisol levels. JMPT. 2002 (25)3
21. Takeda et al: Long term remission and alleviation of symptoms in allergy and Crohn's disease patients following spinal adjustment for reduction of vertebral subluxations. JVSR Vol 4. # 4. 2002
23. Selano, Grostic et al: The effects of specific upper cervical adjustments on the CD4 counts of HIV positive patients. CRJ. Vol 3. # 1. 1994.
24. Brennan et al: Enhanced neutrophil respiratory burst as a biological marker for manipulation forces. JMPT Vol. 15 # 2 Feb. 1992.
25. Brennan PC, Kokjohn K, Kaltinger CJ, Lohr GE, Glendening C, Hondras MA, McGregor M, Triano JJ "Enhanced Phagocytic Cell Respiratory Burst Induced by Spinal Manipulation: Potential Role of Substance P" J Manipulative Physiol Ther 1991; 14(7): 399-407.
26. Tuchin PJ "The Effect of Chiropractic Spinal Manipulative Therapy on Salivary Cortisol Levels." Australian Journal of Chiropractic and Osteopathy 2: 1998; pp. 86-92.
27. Vora GS, Bates HA "The Effects of Spinal Manipulation on the Immune System (A Preliminary Report)" The ACA Journal of Chiropractic 1980; 14: S103-105.
28. Masarsky CS, Weber M "Chiropractic and Lung Volumes – A Retrospective Study" ACA Journal of Chiropractic 1986; 20(9): 65-67.
29. Kessinger R "Changes in Pulmonary Function Associated with Upper Cervical Specific Chiropractic Care" J Vertebral Subluxation Res. 1997;1(3): 43-49.
30. Menon M, Plaughter G, Jansen R, Dhami MSI, Sutowski J "Effect of Thoracic Spinal Adjustment on Peripheral Airway Function in Normal Subjects – A Pilot Study" Conference Proceedings of the Chiropractic Centennial Foundation 1995; July 6-8: 244-245.
31. Masarsky CS, Weber M "Chiropractic and Lung Volumes – A Retrospective Study" ACA Journal of Chiropractic 1986; 20(9): 65-67.
32. Allen JM "The Effects of Chiropractic on the Immune System: A Review of Literature" Chiropractic Journal of Australia 1993; 23: 132-135.
33. Rhodes WR: "The Official History of Chiropractic in Texas." Texas Chiropractic Association. Austin, TX. 1978.

34. "Chiropractic Statistics." The Chiropractic Research and Review Service. Burton Shields Press. Indianapolis, IN. 1925.
35. Wells BF, Janse J: "Chiropractic Practice. Volume 1. Infectious Diseases." National College of Chiropractic. Chicago, IL. 1942.
36. Kent C: "Neuroimmunology — an update." The Chiropractic Journal. August, 2001. <http://www.worldchiropracticalliance.org/tcj/2001/aug/aug2001kent.htm>
37. Kent C: "The mental impulse-biochemical and immunologic aspects." The Chiropractic Journal. February, 1999. <http://www.worldchiropracticalliance.org/tcj/1999/feb/feb1999kent.htm>
38. Elenkov IJ, Wilder RL, Chrousos GP, Vizi ES: "The sympathetic nerve-an integrative interface between the two supersystems: the brain and the immune system." *Pharmacol Rev* 2000;52:295-638. <http://pharmrev.aspetjournals.org/cgi/reprint/52/4/595.pdf>
39. Brennan PC, et al. Immunologic correlates of reduced spinal mobility. *Proceedings of the 1991 International Conference on Spinal Manipulation (FCER)*:118.
40. Todres-Masarsky M, Masarsky CS. The Somatovisceral Interface: Further Evidence. In Masarsky CS, Todres-Masarsky M (editors). *Somatovisceral Aspects of Chiropractic: An Evidence-Based Approach*, 2001, Churchill Livingstone, New York.
41. Korr IM: "Andrew Taylor Still memorial lecture: research and practice — a century later." *J Am Osteopath Assoc* 1974 73:362. Murray DR, Irwin M, Reardon CA, et al: "Sympathetic and immune interactions during dynamic exercise. Mediation via a beta 2 – adrenergic-dependent mechanism." *Circulation* 1992 86(1):203.
42. Felten DL, Felten SY, Bellinger DL, et al: "Noradrenergic sympathetic neural interactions with the immune system: structure and function." *Immunol Rev* 1987 100:225.
43. Felten DL, Felten SY, Bellinger DL, Madden KS: "Fundamental aspects of neural-immune signaling." *Psychother Psychosom* 1993 60(1):46.
44. Kolata G: "Nerve cells tied to immune system." *The New York Times* May 13, 1993.
45. Hosoi J, Murphy GF, Egan CL et al: "Regulation of Langerhans cell function by nerves containing calcitonin gene-related peptide." *Nature* 1993 363(6425):159.
46. Udem BJ: "Neural-immunologic interactions in asthma." *Hosp Pract (Off Ed)* 1994 29(2):59.
47. Sternberg EM, Chrousos GP, Wilder RL, Gold PW: "The stress response and the regulation of inflammatory disease." *Ann Intern Med* 1992 117(10):854.
48. Fricchioine GL, Stefano GB: "The stress response and autoimmunoregulation." *Adv Neuroimmunol* 1994 4(1):13.
49. Ottaway CA, Husband AJ: "Central nervous system influences on lymphocyte migration." *Brain Behav Immun* 1992 6(2):97.
50. Weihe E, Krekel J: "The neuroimmune connection in human tonsils." *Brain Behav Immun* 1991 5(1):41.
51. Grossman Z, Heberman RB, Livnat S: "Neural modulation of immunity: conditioning phenomena and the adaptability of lymphoid cells." *Int J Neurosci* 1992 64(1-4):275.
52. Fidelibus, J.; An overview of neuroimmunomodulation and a possible correlation with musculoskeletal system function *JOURNAL OF MANIPULATIVE AND PHYSIOLOGICAL THERAPEUTICS*. 1989 Vol. 12 Pgs. 289-292
53. Davison, S.; Parkin-Smith, G.F.; The possible effect of cervical chiropractic manipulation on short-term lymphocytic response – a pilot study *WFC'S 7TH*

BIENNIAL CONGRESS CONFERENCE PROCEEDINGS, MAY 1-3, 2003. 2003  
Vol. 7th Edt. Pgs. 278-80

54. Ali, S.; Hayek, R.; Holland, R.; Mckelvey, S.E.; Boyce, K.; EFFECT OF  
CHIROPRACTIC TREATMENT ON THE ENDOCRINE AND IMMUNE SYSTEM IN  
ASTHMATIC PATIENTS. PROCEEDINGS OF THE 2002 INTERNATIONAL  
CONFERENCE ON SPINAL MANIPULATION. 2002 OCT Vol. Pgs.

55. Pickar, J.G.; Kang, Y-M.; Kenney, M.J.; Inflammation of Lumbar Multifidus Muscle  
Reflexively Increases Sympathetic Nerve Activity to Spleen and Kidney THE  
JOURNAL OF CHIROPRACTIC EDUCATION. 2002 SPR Vol. 16(1) Pgs. 44-5

56. Davison, S.M.; Parkin-Smith, G.F.; Immunological profiles in asymptomatic subjects  
after chiropractic cervical spine manipulation PROCEEDINGS OF THE WORLD  
FEDERATION OF CHIROPRACTIC CONGRESS. 2001 MAY Vol. 6 Pgs. 264-5

57. Hoiriis, K.T.; Edenfield, D.; Chiropractic and The Immune Response: A Literature  
Review JOURNAL OF VERTEBRAL SUBLUXATION RESEARCH. 2000 OCT  
Vol. 4(1) Pgs.

58. Martin, C.; Chiropractic and HIV Infection JOURNAL OF THE AMERICAN  
CHIROPRACTIC ASSOCIATION. 1995 DEC Vol. 32(12) Pgs. 41-4

59. Spector NH. Anatomic and Physiologic connections between the central nervous  
system and the immune systems. Reprinted. In: Research Forum 1987;103-17.

60. Besedovsky HO, Del Rey A. Physiological Implications of the Immune-Neuro-  
endocrine Network. Psychoneuroimmunology, Academic Press, Inc. Second Edition.  
1991;589-603.

61. van Breda WM, van Breda JM. A comparative study of the health status of children  
raised under the health care models of chiropractic and allopathic medicine. J Chirop Res.  
1989;5(4):101-103.

62. Rose-Aymon S, Aymon M, Prochaska-Moss G, Moss R, Rebne R, Nielsen K. The  
relationship between intensity of chiropractic care and the incidence of childhood  
diseases. J Chirop Res 1989;5(3):70-7 .

63. Reubi JC, Horisberger U, Kappeler A, Laissue JA. Localization of Receptors for  
Vasoactive Intestinal Peptide, Somatostatin, and Substance P in distinct compartments of  
human lymphoid organs. Blood 1998;92(1):191-197.

64. Giron LT, Crutcher KA, Davis JN. Lymph nodes-A possible site for sympathetic  
neuronal regulation of immune response. Annals of Neurology 1980;8(5):520-525.

65. Murray DR., Irwin M, Rearden CA, Ziegler M, Motulsky H, Maisel AS. Sympathetic  
and Immune Interactions During Dynamic Exercise Mediation Via a Beta2-Adrenergic-  
Dependent Mechanism. Circulation 1992; 86:203-213.

66. Brennan PC, Graham MA, Triano JJ, Hondras MA, Anderson RJ., Lymphocyte  
profiles in patients with chronic low back pain enrolled in a clinical trial. J Manip Physiol  
Ther 1994 17(4): 219-227.

67. Lohr GE, O'Brien JC, Nodine DL, Brennan PC. Natural killer cells as an outcome of  
chiropractic treatment efficacy. In: Proceedings of the International Conference on  
Spinal Manipulation. Arlington, Virginia: Foundation for Chiropractic Education and  
Research 1990:109-12.

68. Injeyan, S. Studies on the effects of spinal manipulation on the immune response.  
Internet WWW 1999; <http://www.c3r.org/research/injeyan-R/injeyan-r.html>

69. Ottaway CA, Husband AJ. Central nervous system influences on Lymphocyte

- Migration. *Brain, Behavior, and Immunity*. 1992;6(2):97-116.
70. Neveu PJ, Le Moal M. Physiological basis for neuroimmunomodulation. *Fundam Clin Pharmacol* 1990;4:281-305.
71. Giron LT, Crutcher KA, Davis JN. Lymph nodes-A possible site for sympathetic neuronal regulation of immune response. *Annals of Neurology* 1980;8(5):520-525.
72. McCain HW, Lamster IB, Bozzone JM, Gribic JT. Beta-Endorphin modulates human immune activity via nonopioid receptor mechanisms. *Life Science* 1982;31:1619-24.
73. Payan DG, Brewster DR., Goetzl EJ. Specific Stimulation of Human Lymphocytes by Substance P. *J. Immunol.* 1983;131(4):1613-15.
74. Payan DG, Brewster DR, Missirian-Bastian A, Goetzl EJ. Substance P Recognition by a Subset of Human T Lymphocytes. *J Clin Invest.* 1984;74:1532-39.
75. Mertelsmann R, Welte K. Human Interleukin 2: molecular biology, physiology and clinical possibilities. *Immunobiol.* 1986;172:400-19.
76. Badalamente MA, Dee R, Ghillani R, Chien P, Daniels K. Mechanical Stimulation of Dorsal Root Ganglia Induces Increased Production of Substance P: A Mechanism for Pain Following Nerve Root Compromise. *Spine.* 1987;12(6):552-5.
77. Lindholm D, Neumann R, Meyer M, Thoenen H. Interleukin-1 regulates synthesis of nerve growth factor in non-neuronal cells of rat sciatic nerve. *Nature* 1987;330:658-659.
78. Lindholm D, Neumann R, Hengerer B, Thoenen H. Interleukin-1 increases stability and transcription of mRNA encoding nerve growth factor in cultured rat fibroblasts. *J. Biol. Chem.* 1988;263:16348-16351.
79. Neveu PJ, Le Moal M. Physiological basis for neuroimmunomodulation. *Fundam Clin Pharmacol* 1990;4:281-305.
80. Besedovsky HO, Del Rey A. *Physiological Implications of the Immune-Neuro-endocrine Network.* Psychoneuroimmunology, Academic Press, Inc. Second Edition. 1991;589-603.
81. Brennan PC, Kokjohn K, Triano JJ, Fritz TE, Wardip CL, Hondras MA. Immunologic correlates of reduced spinal mobility: preliminary observations in a dog model. In: *Proceedings of the International Conference on Spinal Manipulation.* Arlington, Virginia. Foundation for Chiropractic Education and Research. 1991:118-21.
82. Roszman TL, Carlson SL. *Neurotransmitters and Molecular signaling in the Immune Response.* Psychoneuroimmunology, Second Edition. Academic Press, Inc 1991:311-33.
83. Murray DR., Irwin M, Rearden CA, Ziegler M, Motulsky H, Maisel AS. Sympathetic and Immune Interactions During Dynamic Exercise Mediation Via a Beta2-Adrenergic-Dependent Mechanism. *Circulation* 1992; 86:203-213.
84. Ottaway CA, Husband AJ. Central nervous system influences on Lymphocyte Migration. *Brain, Behavior, and Immunity.* 1992;6(2):97-116.
85. Wells MR, Racis SP, Vaidya U. Changes in Plasma Cytokines Associated with Peripheral Nerve Injury. *J Neuroimmunol.* 1992;39:261-8.
86. Felten DL, Felten SY, Bellinger DL, Madden KS. *Fundamental Aspects of Neural-Immune Signaling.* Psychother Psychosom 1993;60:46-56.
87. Bellinger DL, Lorton D, Brouxhon S, Felten S, Felten DL. The significance of vasoactive intestinal polypeptide (VIP) in immunomodulation. *Adv Neuroimmunol* 1996;6(1):5-27.
88. Herzberg U, Murtaugh MP, Carroll D, Beitz AJ. Spinal Cord NMDA Receptors Modulate Peripheral Immune Responses and Spinal Cord c-fos Expression after Immune

- Challenge in Rats Subjected to Unilateral Mononeuropathy. *J Neurosci.* 1996;16(2):730-43.
89. Reubi JC, Horisberger U, Kappeler A, Laissue JA. Localization of Receptors for Vasoactive Intestinal Peptide, Somatostatin, and Substance P in distinct compartments of human lymphoid organs. *Blood* 1998;92(1):191-197.
90. Alcorn SM. Chiropractic treatment and antibody levels. *J Aust Chiropractors Assoc* 1977. 11(3):18-37.
91. Vora G, Bates H. The effects of spinal manipulation on the immune system. *Am Chiropr Assoc J Chiropr* 1980; 4:S103-5
92. Luisetto G, Spano D, Steiner W. et al. Immunoreactive ACTH, beta-endorphin and calcitonin before and after manipulative treatment of patients with cervical arthrosis and Barre's syndrome. In: Napolitano E., editor. *Research in chiropractic: Proceedings of ICA International Congress.* Washington, DC: International Chiropractor's Association. 1983;47-52.
93. Richardson DL, Kappler R, Klatz R. et al. The effect of osteopathic manipulative treatment on endogenous opiate concentration (abstract) *J AM Osteopath Assoc* 1984;84:127.
94. Vernon HT, Dhimi MSI, Howley TP, Annett R, Spinal Manipulation and Beta-Endorphin: A Controlled Study of the Effect of a Spinal Manipulation on Plasma Beta-Endorphin Levels in Normal Males. *J Manip Physiol Ther.* 1986;9(2):115-23
95. Christian GF, Stanton GJ, Sissons D, How HY, Jamison J, Alder B, Fullerton M, Funder JW. Immunoreactive ACTH, Beta-endorphin and cortisol levels in plasma following spinal manipulative therapy. *Spine* 1988;13(12):1411-1417.
96. van Breda WM, van Breda JM. A comparative study of the health status of children raised under the health care models of chiropractic and allopathic medicine. *J Chiropr Res.* 1989;5(4):101-103.
97. Rose-Aymon S, Aymon M, Prochaska-Moss G, Moss R, Rebne R, Nielsen K. The relationship between intensity of chiropractic care and the incidence of childhood diseases. *J Chiropr Res* 1989;5(3):70-7 .
98. Kokjohn K, Kaltinger C, Lohr GE, et al. Plasma substance P following spinal manipulation. . In: *Proceedings of the International Conference on Spinal Manipulation.* Arlington, Virginia: Foundation for Chiropractic Education and Research. 1990:105-8.
99. Lohr GE, O'Brien JC, Nodine DL, Brennan PC. Natural killer cells as an outcome of chiropractic treatment efficacy. In: *Proceedings of the International Conference on Spinal Manipulation.* Arlington, Virginia: Foundation for Chiropractic Education and Research 1990:109-12.
100. Brennan PC, Kokjohn K, Kaltinger CJ, Lohr GE, Glendening C, Hondras MA, McGregor M, Triano JJ. Enhanced phagocytic cell respiratory burst induced by spinal manipulation: Potential role of substance P. *J Manip Physio Ther.* 1991;14(7):399-408.
101. McGregor M, Brennan P, Triano JJ. Immunologic response to manipulation of the lumbar spine. In: *Proceedings of the International Conference on Spinal Manipulation.* Arlington, Virginia: Foundation for Chiropractic Education and Research 1991:153-5.
102. Brennan PC, Triano JJ, McGregor M, Kokjohn K, Hondras MA, Brennan PC. Enhanced neutrophil respiratory burst as a biological marker for manipulation forces: Duration of the effect and association with substance P and Tumor Necrosis Factor. *J Manip Physiol Ther.* 1992;15(2):83-9.

103. Brennan PC, Graham MA, Triano JJ, Hondras MA, Anderson RJ,. Lymphocyte profiles in patients with chronic low back pain enrolled in a clinical trial. *J Manip Physiol Ther* 1994 17(4): 219-227.
104. Injeyan, S. Studies on the effects of spinal manipulation on the immune response. Internet WWW 1999; [http://www.c3r.org/stephen\\_injeyan.htm](http://www.c3r.org/stephen_injeyan.htm)
105. Injeyan J, Ruegg, Injeyan S. Phenotypic analysis of peripheral blood lymphocytes in normal subjects receiving SMT. International Conference on Spinal Manipulation. October, 2002.
106. Spector NH. Anatomic and Physiologic connections between the central nervous system and the immune systems. Reprinted in: *Research Forum* 1987;103-17.
107. Fidelibus JC. An overview of neuroimmunomodulation and a possible correlation with musculoskeletal system function. *J Manip Physiol Ther* 1989;12(4):289-292.
108. Allen, JM. The effects of chiropractic on the immune system: A review of the literature. *Chiropractic Journal Aust* 1993;23:132-5.
109. Kent, C. Neuroimmunology. International Chiropractic Pediatric Association. 1996. Internet. <http://www.4icpa.org/research/psychone.htm>