

Health Benefits of Arginine

By Harry Elwardt, N.D., Ph.D.

The following report, which is backed up by incredible scientific research, shows the many health benefits of increased Arginine in the human body. Arginine is a semi-essential amino acid, which is produced in the liver and can be found in protein rich foods like red meat. Medical research has now shown that by simply supplementing with 3 to 6 grams of Arginine everyday all the following is possible:

Aging Process

- Arginine inhibits one of the primary mechanisms of the aging process (it inhibits the process of cross-linking). (1)
- Arginine increases the release of the human growth hormone (HGH) (also known as the anti-aging hormone) from the pituitary gland. (2)

Cardiovascular System

- Arginine improves blood circulation, improves exercise capability and facilitates vasodilation in angina Patients. (3)
- Arginine helps to prevent atherosclerosis and reduces the severity of existing atherosclerosis. (4)
- Arginine inhibits the adhesion of monocytes to the endothelium (an underlying event in the course of atherosclerosis). (5)
- Arginine improves blood circulation (by stimulating the production of nitric oxide, an endogenous neurotransmitter that helps to prevent vasoconstriction and which initiates vasodilation by relaxing the smooth muscle cells of the blood vessels). (6)
- Arginine helps to prevent abnormal blood clotting (by stimulating the production of plasmin and by increasing vasodilation). (7)
- Arginine helps to prevent free radicals-induced damage to the lining of blood vessels (by enhancing the production of nitric oxide in blood vessels). (8)
- Arginine significantly increases stroke volume and cardiac output (without effect on heartbeat rate) in congestive heart failure patients. It also increases vasodilation (leading to increased blood circulation) in congestive heart failure patients. (9)
- Arginine reverses consequences of coronary heart disease. (10)
- Arginine lowers blood pressure in some hypertension patients (by facilitating the body's production of nitric oxide (NO) and by inhibiting the angiotensin converting enzyme (ACE)). (11)
- Arginine reverses adverse effects of high blood pressure. (12)
- Arginine decreases high blood pressure. (13)
- Arginine reduces pulmonary blood pressure and improves blood circulation in pulmonary hypertension Patients. (14)
- Arginine increases walking distance in intermittent claudication patients. (15)
- Arginine restores normal endothelial function in hypercholesterolemia. (16)
- Arginine improves walking distance in peripheral vascular disease. (17)
- Arginine improves outcome after bypass surgery. (18)
- Arginine reduces blood clots and strokes. (19)
- Arginine helps prevent restenosis after angioplasty and bypass. (20)
- Arginine may give protection against size of heart attack. (21)
- Arginine improves heart failure. (22)
- Arginine improves peripheral vascular disease. (23)

Digestive System

- Arginine deficiency can cause constipation.
- Arginine supplementation may decrease the incidence of gallstones.
- Arginine reduces intestinal permeability (due to arginine's role in the production of nitric oxide). (24)
- Arginine alleviates many cases of ulcerative colitis (by promoting the healing of the ulcers that occur in the colon of ulcerative colitis patients). (25)
- Arginine may improve irritable bowel syndrome (IBS). (26)
- Arginine reduces ulcers. (27)
- Arginine helps prevent post surgical damage after intestinal manipulation. (28)
- Arginine improves outcome in sepsis. (29)

Excretory System

- Arginine alleviates the pain and discomfort associated with interstitial cystitis. (30)
- Arginine significantly improves the function of the kidneys and helps to prevent age-related degradation of the kidneys. (31)

Immune System

- Arginine helps to prevent bacterial & viral diseases in persons with suppressed immune systems. (32)
- Arginine blocks the formation of some forms of cancer (arginine inhibits the cellular replication of 24 different types of cancer in animals). (33)
- Arginine boosts the ability of the immune system to fight breast cancer. (34)
- Arginine lowers tumor protein synthesis and tumor growth rate in liver cancer. (35)
- Arginine inhibits the further growth of some types of sarcomas. (36)
- One of the means by which arginine counteracts cancer is by reducing the activity of ornithine decarboxylase, an enzyme that is associated with some types of cancer.
*Caution: Arginine is also speculated to exacerbate some types of cancer, however this is just a theory.
- Arginine improves outcome of cancer treatment. (37)
- Arginine (in non-excessive quantities) stimulates numerous aspects of the immune system. (38)
- Arginine stimulates the production of helper T-cells. (39)
- Arginine stimulates activity and production of lymphocytes by the thymus gland. (40)
- Arginine increases the activity (cytotoxicity) of NK lymphocytes. (41)
- Arginine stimulates the production of T-lymphocytes within the thymus and makes them more active and effective. (42)
- Arginine increases the size of the thymus, stimulates the production of lymphocytes by the thymus and restores the production of thymic hormones to youthful levels. (43)
- Arginine helps to counteract inflammation. (44)
- Arginine accelerates the ability of the immune system to recover from surgery. (45)
- Arginine improves sickle cell disease. (46)

Metabolism

- Alkalosis can occur as a result of arginine deficiency. (47)
- Arginine exerts antioxidant effects that scavenge superoxide free radicals. (48)
- Arginine lowers total serum cholesterol levels. (49)
- Arginine lowers serum low-density lipoprotein (LDL) levels. (50)
- Arginine inhibits the process of cross-linking. (51)
- Arginine reduces insulin resistance and improves blood sugar disposal in diabetes type 2 patients. (52)
- Arginine reduces insulin resistance. (53)

- Arginine improves diabetes and reverses damage caused by diabetes. (54)
- Arginine may prevent diabetes. (55)
- Arginine increases oxygen uptake in the lungs in persons with hypoxia (due to its role in the production of nitric oxide, which improves blood circulation via vasodilatation). (56)
- Arginine increases oxygen uptake in the lungs in persons with altitude sickness (due to its role in the production of nitric oxide, which in turn improves blood circulation via vasodilatation). (57)
- Arginine improves asthma. (58)
- Arginine helps to detoxify the liver and alleviates cirrhosis. Liver malfunction can occur as a result of arginine deficiency. (59)
- Arginine lowers elevated serum triglyceride levels. (60)
- Arginine alleviates obesity and facilitates weight loss (by stimulating the release of human growth hormone (HGH) from the pituitary gland). (61)

Musculoskeletal System

- Arginine facilitates the healing of fractures. (62)
- Arginine facilitates muscle growth (by inhibiting muscle loss) and is required for the transport of the nitrogen used in muscle metabolism. (63)
- Muscle weakness can occur as a result of arginine deficiency. (64)
- Arginine may prevent and alleviate osteoporosis (by stimulating the release of human growth hormone (HGH) which is an important mediator of bone formation and bone turnover; it also stimulates nitric oxide synthesis which is a potent inhibitor of osteoclasts that cause the resorption of bone). (65)
- As a precursor for nitric oxide production, Arginine causes the relaxation of smooth muscle. (66)
- Arginine improves muscle performance. (67)
- Arginine improves glucose uptake into muscle cells. (68)

Nervous System

- Arginine may be useful for the treatment of Alzheimer's disease (due to its ability to repair damaged axons by increasing polyamines levels). (69)
- Arginine is essential for the regeneration of damaged axons of neurons (its role appears to be as an agent for degrading proteins that have been damaged through axon injury). (70)
- Arginine facilitates the potentiation of long-term memory (by stimulating the production of nitric oxide (NO) - a neurotransmitter responsible for the potentiation (storage) of long-term memory. (71)
- Arginine improves memory and cognitive functions. (72)
- Arginine improves pituitary responsiveness and modulates hormonal control. (73)

Sexual System

- Arginine alleviates male impotence (by stimulating the production of nitric oxide, the endogenous chemical that stimulates erections in males). (74)
- Arginine alleviates male infertility by improving sperm count and sperm motility (due to its involvement in the manufacture of endogenous spermidine). (75)
- Arginine enhances (male and female) sexual desire (libido). (76)
- Arginine enhances (female) sexual performance - due to its role in the production of nitric oxide in the clitoris (nitric oxide facilitates female orgasm in the clitoris). (77)
- Arginine improves (male) sexual performance by providing nitrogen to the nitric oxide (NO) molecule that is integral to the achievement of erections - Arginine produces erections that are bigger, harder and more frequent. It also increases male sexual

- endurance, i.e. erections that last for a longer period of time. (78)
- Arginine improves sperm count and sperm motility. (79)
- Arginine may improve prostate function. (80)
- Arginine deficiency can cause atrophy of the testicles of the testes.

Skin/Hair

- Hair loss (especially male pattern baldness) can occur as a result of Arginine deficiency. (81)
- Arginine concentrates in the skin.
- Arginine (applied topically) increases the level of vascular endothelial growth factor in the skin. (82)
- Arginine stimulates the proliferation of fibroblasts (skin cells). (83)
- Arginine is essential for and accelerates the healing of wounds (by stimulating the release of human growth hormone (HGH), stimulating the production of collagen and by stimulating the proliferation of fibroblasts). (84)
- Arginine accelerates the healing of burns. (85)
- Arginine dramatically accelerates the healing of wounds in people who have undergone surgery. (86)
- Arginine decreases post operative infection and length of hospital stay. (87)
- Arginine improves scleroderma. (88)

Safety

- Arginine has been shown to be safe in the above studies as well as thousands of others. (89)
- Arginine has been used safely in humans for the past 30 years.

Research

1. Radner, W., et al. L-arginine reduces kidney collagen accumulation and N-epsilon-(carboxymethyl)lysine in the aging NMRI-mouse. *J Gerontol.* 49(2):M44-M46, 1994.
2. Gianotti L, Macario M, Lanfranco F, et al. Arginine counteracts the inhibitory effect of recombinant human insulin-like growth factor I on the somatotroph responsiveness to growth hormone-releasing hormone in humans. *J Clin Endocrinol Metab* 2000 Oct;85(10):3604-8.
3. Ceremuzynski, L., et al. Effect of supplemental oral L-arginine on exercise capacity in patients with stable angina pectoris. *Am J Cardiol.* 80:331-333, 1997.
4. Adams, R. R., et al. Oral L-arginine improves endothelium-dependent dilatation and reduces monocyte adhesion to endothelial cells in young men with coronary artery disease. *Atherosclerosis.* 129(2):261-269, 1997.
5. Adams, M. R., et al. Cigarette smoking is associated with increased human monocyte adhesion to endothelial cells: reversibility with oral L-arginine but not vitamin C. *Journal of the American College of Cardiology.* 29(3):491-497, 1997.
6. Huk, I., et al. L-arginine treatment alters the kinetics of nitric oxide and superoxide release and reduces ischemia/reperfusion injury in skeletal muscle. *Circulation.* 96:667-675, 1997.
7. Drexler H, et al. Correction of endothelial dysfunction in coronary microcirculation of hypercholesterolaemic patients by L-arginine. *The Lancet.* 338:1546-50, 1991.
8. Huk, I., et al. L-arginine treatment alters the kinetics of nitric oxide and superoxide release and reduces ischemia/reperfusion injury in skeletal muscle. *Circulation.* 96:667-675, 1997.
9. Koifman, B., et al. Improvement of cardiac performance by intravenous infusion of L-arginine in patients with moderate congestive heart failure. *Journal of the American College of Cardiology.* 26(5): 1251-6, 1995.

10. Quyyumi AA. Does acute improvement of endothelial dysfunction in coronary artery disease improve myocardial ischemia? *J Am Coll Cardiol* 1998 Oct;32(4): 904-11.
11. Khosh, F. Natural approach to hypertension. *Alternative Medicine Review*. 6(6), 2001.
12. Sisic D, Francishetti A, Frolich ED. Prolonged L-arginine on cardiovascular mass and myocardial hemodynamics and collagen in aged spontaneously hypertensive and normal rats. *Hypertension* 1999 Jan;33(1 Pt 2):451-5.
13. Nakaki T, et al. L-arginine induced hypotension. *Lancet* 1990 Oct 20; 336(8721):1 016-7.
14. Nagaya, N., et al. Short-term oral administration of L-arginine improves hemodynamics and exercise capacity in patients with precapillary pulmonary hypertension. *Am J Resp Crit Care Med*. 1 63(4):887-891, 2001.
15. Roberts, A. J., et al. *Nutraceuticals: The Complete Encyclopedia of Supplements, Herbs, Vitamins and Healing Foods*. Berkely Publishing Group. New York, USA. 2001:319.
16. Maxwell AJ, Anderson B Zapien MP, Cooke JP. Endothelial dysfunction in hypercholesterolemia is reversed by: nutritional product designed to enhance nitric oxide activity. *Cardiovasc Drugs Ther* 2000 Jun; 14(3): 309-16.
17. Maxwell AJ, Anderson BE Cooke JP. Nutritional therapy for peripheral artery disease. *Vasc Med* 2000;5(1):1 1-19.
18. Wallace AW, Ratcliffe MB, Galindez D, Kong JS. L-arginine infusion dilates coronary vasculature in patients undergoing coronary bypass surgery. *Anesthesiology* 1999 Jun;90(6): 1577-8.
19. Bode-Boger SM, Boger RH, et al. Differential inhibition of human platelet aggregation and thromboxane A₂ formation by L-arginine in vivo and in vitro. *Arch Pharmacol* 1998; 357:143-150.
20. Le Yorneau T, Van Belle E, Corseaux D, et al . Role of nitric oxide in re-stenosis after experimental balloon angioplasty in the hypercholesterolemic rabbit. *J Am Coll Cardiol* 1999 Mar;33(3):876-82.
21. Suematsu Y, Ohtsuka T, et al. L-Arginine given after ischemic preconditioning can enhance cardioprotection in isolated rat hearts. *Eur J Cardiothorac Surg* 2001, Jun; 1 9(6):873-9.
22. Hambrecht R, et al. Correction of endothelial dysfunction in chronic heart failure: additional effects of exercise training and oral L-arginine supplementation. *J Am Coll Cardiol* 2000 Mar 1; 35(3):706-1 3.
23. Bode-Boger SM, Boger RH, et al. L-arginine induces nitric oxide-dependent vasodilation in patients with critical limb ischemia. A randomized, controlled study. *Circulation* 1996 Jan 1; 93(1):85-90.
24. Miller, A. L. The pathogenesis, clinical implications, and treatment of intestinal hyperpermeability. *Alternative Medicine Review*. 2(5):330-345, 1997.
25. Segala, M. (editor). Disease Prevention and Treatment 3rd Edition. *Life Extension Media*. Florida, USA. 2000:202.
26. Sahin AS, Atalik KE, Gunel E, Dogan N. Nonadrenergic, noncholinergic responses of the human colon smooth muscle and the role of K⁺ channels in these responses. *Methods Find Exp Clin Pharmacol* 2001 Jan-Feb;23(1):1 3-7.
27. Khattab MM, Gad MZ, Abdallah D. Protective role of nitric oxide in indomethacin-induced gastric ulceration by a mechanism independent of gastric acid secretion. *Pharmacol Res* 2001 May;43(5):463-7.
28. Thomas S, Ramachandran A, Patra S, et al. Nitric oxide protects the intestine from the damage induced by laparotomy and gut manipulation. *J Surg Res* 2001 Jul;99(1):25-32.

29. Vallet B. Microthrombosis in sepsis. *Minerva Anesthesiol* 2001 Apr;67(4):298-301.
30. Smith, S. D., et al. Improvement in interstitial cystitis symptoms scores during treatment with oral L-arginine. *J Urol*. 158(3 Part 1):703-708, 1997.
31. Reckelhoff, J. F., et al. Long-term dietary supplementation with L-arginine prevents age-related reduction in renal function. *Am J Physiol*. 272(6 Part 2):R1 768-R1 774, 1997.
32. Field, C. J., et al. Glutamine and arginine: immunonutrients for improved health. *Med Sci Sports Exerc*. 32:(Suppl) S377-88, 2000.
33. Reynolds, J., et al. Immunologic effects of arginine supplementation in tumor-bearing and non-tumor-bearing hosts. *Annals of Surgery*. 211:202-209, 19.
34. Cha-Chung, Y. Arrest of mammary tumor growth by l-arginine. *Biochemical and Biophysical Research Communications*. 95:1306-1313, 1980.
35. Weisburger, J. Prevention by arginine glutamate of the carcinogenicity of acetamide in rats. *Toxicology and Applied Pharmacology*. 14:163-175, 1969.
36. Rettura, G., et al. Supplemental arginine increases thymic cellularity in normal and murine sarcoma virus-inoculated mice and increases the resistance to murine sarcoma virus tumour. *J Par Ent Nutr*. 3:409-416, 1979.
37. Heys SD, et al. Dietary supplementation with L-arginine: Modulation of tumor infiltrating lymphocytes in patients with colo-rectal cancer. *Br J Surg* 1997 Feb;84(2):238-41.
38. Kirk, S. J., et al. Arginine stimulates wound healing and immune function in elderly human beings. *Surgery*. 114(2):155-159, 1993.
39. Blechman, S., et al. L-arginine boosts the immune system. *Muscular Development*. 38(10):72, 2001.
40. Barbul, A., et al. Arginine stimulates lymphocyte immune response in healthy human beings. *Surgery*. 90:224-251, 1981.
41. Ochoa, J. B., et al. Effects of L-arginine on the proliferation of T lymphocyte subpopulations. *J Parenteral Enteral Nutr*. 25:23-29, 2001.
42. Moriguchi, S., et al. Functional changes in human lymphocytes and monocytes after in vitro incubation with arginine. *Nutrition Research*. 7:719-729, 1987.
43. Dean, W. The neuroendocrine theory of aging part IV: the immune homeostat. *Vitamin Research News*. October 1999.
44. Efron, D. T., et al. Modulation of inflammation and immunity by arginine supplements. *Curr Opin Clin Nutr Metab Care*. 1:531-538, 1998.
45. Wilmore, D. W. The effect of glutamine supplementation in patients following elective surgery and accidental injury. *Journal of Nutrition*. 131(9 Supplement):2543S-2549S, 2001.
46. Morric CR, Kuypers FA, et al. Patterns of arginine and nitric oxide in patients with sickle cell disease with vaso-occlusive crisis and acute chest syndrome. *J Ped Hemat/Onc* 2000 Nov-Dec;22(6):51 5-20.
47. Braverman, Eric R. *The Healing Nutrients Within*. Keats Publishing, New Canaan, Connecticut, USA. 1997:221.
48. Wascher, T. C., et al. Vascular effects of L-arginine: Anything beyond a substrate for NO synthase? *Biochem Biophys Res Com*. 234:35-38, 1997.
49. Rossitch E, Jr., et al. L-arginine normalizes endothelial function in cerebral vessels from hypercholesterolemic rabbits. *Journal of Clinical Investigation*. 87(4): 1295-1299, 1991.
50. Ryzenhov, V. E., et al. Action of arginine on the lipid and lipoprotein content in blood serum of animals. *Voprosy Meditsinskoj Khimi*. 30(6):76-80, 1984.
51. Radner, W., et al. L-arginine reduces kidney collagen accumulation and N-epsilon-(carboxymethyl)lysine in the aging NMRI-mouse. *J Gerontol*. 49(2):M44-M46, 1994.

52. Piatti, P. M., et al. Long-term oral L-arginine administration improves peripheral and hepatic insulin sensitivity in type 2 diabetic patients. *Diabetes Care*. 24(5):875-880, 2001.
53. Wascher, T. C., et al. Effects of low-dose L-arginine on insulin mediated vasodilation and insulin sensitivity. *Eur J Clin Invest*. 27:690-695, 1997.
54. Giugliana D, et al. Vascular effects of acute hyperglycemia are reversed by L-arginine. *Circulation* 1997; 95(7): 1783-90.
55. Mohan IK, Cas UN. Effects of L-arginine-nitric oxide system on chemical induced diabetes mellitus. *Free Radic Biol Med* 1998 Nov 1 ;25(7):757-65.
56. Arginine improves blood flow and exercise capacity. *Life Enhancement*. February 2002:23-26.
57. Beall, C. M., et al. Pulmonary nitric oxide in mountain dwellers. *Nature*. 414(6862):411-412, 2001.
58. De Gouw HW, Verbruggen MB, Twiss IM, Sterk PJ. Effect of oral L-arginine on airway hyper-responsiveness to histamine in asthma. *Thorax* 1999 Nov;54(11):1033-5.
59. Moss, Ralph W. *Cancer Therapy: The Independent Consumer's Guide to Non-Toxic Treatment & Prevention*. Equinox Press, Brooklyn, New York, USA. 1992:285-287.
60. Khedara A, Kawai Y, Kayashita J, Kato N. Feeding rats the nitric oxide synthase inhibitor, L-N(omega) nitroarginine, elevates serum triglycerides and cholesterol and lowers hepatic fatty acid oxidation. *J Nutr* 1996 Oct;126(10):2563-7.
61. Gianotti L, Macario M, Lanfranco F, et al. Arginine counteracts the inhibitory effect of recombinant human insulin-like growth factor I on the somatotroph responsiveness to growth hormone-releasing hormone in humans. *J Clin Endocrinol Metab* 2000 Oct;85(10):3604-8.
62. Ashish, D., et al. Nitric oxide modulates fracture healing. *Journal of Bone and Mineral Research*. 15(2):342-351, 2000.
63. Barbul, A. Arginine: biochemistry, physiology, and therapeutic implications. *J Parent Ent Nutr*. 10:227-238, 1986.
64. Braverman, Eric R. *The Healing Nutrients Within*. Keats Publishing, New Canaan, Connecticut, USA. 1997:220.
65. Visser, J. J., et al. Arginine supplementation in the prevention and treatment of osteoporosis. *Medical Hypotheses*. 43(5):339-342, 1994.
66. Arginine improves blood flow and exercise capacity. *Life Enhancement*. February 2002:23-26.
67. Stevens BR, Godfrey MD, Kaminski TW, Braith RW. High intensity dynamic human muscle performance enhanced by a metabolic intervention. *Med Sci Sports Exerc* 2000 Dec;32(12):2102-2104.
68. Bradley SJ, Kingwell BA, McConell GK. Nitric oxide synthase inhibition reduces leg glucose uptake but not blood flow during dynamic exercise in humans. *Diabetes* 1999 Sep; 48(9):1815-21.
69. Tarkowski E, et al. Intrathecal release of nitric oxide in Alzheimer's disease and vascular dementia. *Dement Geriatr Cogn Disord* 2000 Nov- Dec;11(6):322-6.
70. Cestaro, B. Effects of arginine, S-adenosylmethionine and polyamines on nerve regeneration. *Acta Neurol Scand Suppl*. 154:32-41, 1994.
71. Pautler EL. The possible role and treatment of deficient microcirculation regulation in age-associated memory impairment. *Med Hypotheses* 1994 Jun;42(6):363-6.
72. Pandhi P, Balakrishnan S. Cognitive dysfunction induced by phenytoin and valproate in rats: effect of nitric oxide. *Indian J Physiol Pharmacol* 1999 Jul; 43(3):378-82.

73. di Luigi L, Guidetti L, Pigozzi F, et al. Acute amino acid supplementation enhances pituitary responsiveness in athletes. *Med Sci Sports Exerc* 1999 Dec;31(12): 1748-54.
74. Chen, J., et al. Effect of oral administration of high-dose nitric oxide donor L-arginine in men with organic erectile dysfunction: results of a double blind, randomized, placebo-controlled study. *British Journal of Urology*. 83:269-273, 1999.
75. Papp, G., et al. [The role of arginine and arginase activity in fertility]. *Andrologia*. 11:37-41, 1979.
76. Women and sex drive. *Life Enhancement*. December 1999.
77. Block, W. Sexual enhancement available to women too. Viagra duality: better to NO? *Life Enhancement*. July 1998:15-1 8.
78. Chen J, Wollman Y, Chernichovsky T, et al. Effect of high dose nitric oxide donor L-arginine in men with organic erectile dysfunction. *BJU Int* 1999 Feb;83(3):269-73.
79. Keller, D. W., et al. L-arginine stimulation of human sperm motility in vitro. *Biol Reprod*. 13:154-157, 1975.
80. Aikawa K, Yokota T, et al. Endogenous nitric oxide-mediated relaxation and nitrinergic innervation in the rabbit prostate: the change with aging. *Prostate* 2001 Jun 1 5;48(1):40-6.
81. Revolutionary treatments for baldness: The hair re-growth formulas of Peter Proctor, M. D., Ph.D. *Life Extension*. 3(3):2-8, 1997.
82. Block, W. The science of keeping your skin young. *Life Enhancement*. January 1998:15-1 8.
83. Kirk, S. J., et al. Arginine stimulates wound healing and immune function in elderly human beings. *Surgery*. 114(2):155-160, 1993.
84. Barbul, A., et al. Arginine: Supplemental arginine, wound healing, and thymus: Arginine-pituitary interaction. *Surgical Forum*. 29:93, 1978.
85. Yu, Y., et al. Kinetics of plasma arginine and leucine in pediatric burn patients. *American Journal of Clinical Nutrition*. 64(1):60-66, 1996.
86. Tepaske, R., et al. Effect of preoperative oral immune-enhancing nutritional supplement on patients at high risk of infection after cardiac surgery: a randomised placebo-controlled trial. *Lancet*. 358:696-701, 2001.
87. Braga M, Gianotti L Raedelli G, et al. Perioperative immunonutrition in patients undergoing cancer surgery: results of a randomized double-blind phase 3 trial. *Arch Surg* 1999 Apr;134(4):428-33.
88. Freedman RR, Girgis R, Mayers MD. Acute effect if nitric oxide on Raynaud's phenomenon in scleroderma. *Lancet* 1999 Aug 28;354;739.
89. Fideieff HL, et al. Reproducibility and safety of the arginine test in normal adults. *Medicina (B Aires)* 1999; 59(3):249-53.

About the Author:

Dr. Harry Elwardt is a Naturopathic Doctor, Master Herbalist, Certified Nutritional Counselor and a Ph.D. in Health & Nutrition. Dr. Elwardt has been working in the alternative medicine field for 10 years and is passionate about helping people through naturopathic therapies. Dr. Elwardt is author of the book "Let's STOP The #1 Killer Of Americans TODAY," a natural approach to preventing and reversing heart disease. Dr. Elwardt also serves on the Medical Advisory Board for Nutrition & Kids, Life Mission International, The Bahamas Health Institute, and Ark World International.