

A Special Report On *Arginine*

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“... a few grams of prevention is worth a ton of cure.”¹

So just what is Nitric Oxide(NO)? Over 20,000 articles in the medical literature since 1980 attest that “absolutely everything in the body depends on it.” Its function in human physiology is so important that the American Academy of Science named Nitric Oxide the “Molecule of the year” in 1992. The Nobel Prize in Medicine was awarded to scientists who began the research on Nitric Oxide in 1998 and now NO has been referred to as “The Molecule of the Millennium”. Dr. Jonathan S. Stamler, a professor of medicine at Duke University Medical Center, put it best when he said of Nitric Oxide:

“It does everything, everywhere. You cannot name a major cellular response or physiological effect in which [Nitric Oxide] is not implicated today. It’s involved in complex behavioral changes in the brain, airway relaxation, beating of the heart, dilation of blood vessels, regulation of intestinal movement, function of blood cells, the immune system, even how fingers and arms move.”

There are three types of NO. endothelial-derived NO diffuses out of endothelial cells (cells lining arteries and veins) and into smooth muscle cells of arteries enhancing relaxation and other properties of vascular physiology. Endothelial-derived NO also functions in platelets (blood cells responsible for blood clots) to inhibit aggregation or blood clotting. Brain-derived NO affects several types of nerve cells and appears to be important in neurotransmitter pathways in both the central as well as peripheral nervous system and regulates the production and release of many hormones. Macrophage-derived NO is important in the immune system. This type of NO helps macrophages (a type of immune cell) kill bacteria and tumor cells. So, NO is important to the nervous system, the immune system and the vascular system, which supplies nutrients to all parts of the body. **Arginine**, when combined with Oxygen, forms NO. **Arginine is the** source of all forms of NO.^{2,3}

NO decreases with age^{4,5,6}, various age related conditions and many medications^{7,8}. Among the most common disease states to affect NO and therefore sexual function are:

- Diabetes
- Heart disease
- Hypertension (high blood pressure)
- Peripheral Vascular Disease
- Neurological Damage
- Peptic Ulcer
- Arthritis
- Allergy
- Low HDL

- Some of the most common drugs affecting NO and/or sexual functions are antidepressants – many common drugs like Elavil[®], Prozac[®], Paxil[®], Zoloft[®], etc.
- Anti-anxiety drugs, including Xanax[®] and Valium[®]
- Anti-psychotic drugs
- Blood Pressure medications
- Other Cardiac drugs, like lanoxin or other drugs that affect cardiac rhythm
- Anti-heartburn drugs like Tagamet[®] and Zantac[®]
- Opioids especially chronic use of legal (e.g., Lortab[®], codeine, etc.) and illegal (e.g., heroin) narcotics and pain medicines
- Alcohol, especially chronic use
- Tobacco

The use of many of these drugs and the incidence of most of these disease conditions increase after the age of 40. Obviously it is also the age group most likely to benefit from the use of **arginine** though any age group can benefit. The 40 and above age group is also the most likely age group (both men and women) to want to use **arginine** for the treatment of sexual dysfunction. In the genital tissue, NO triggers the release of c-GMP, which is a molecule that causes engorgement of this tissue. **Arginine** releases NO to make sure there is plenty of c-GMP. *Viagra*[®] on the other hand, is a drug that blocks an enzyme to make sure there is plenty of c-GMP. **Arginine** has been shown to be a safe and effective alternative to *Viagra*[®]. *Viagra*[®] has been reported to be safe; however, the FDA public records suggest the opposite. These records reported that between April of 1998 and May of 1999 there were 1,473 adverse events including 255 serious heart rhythm disturbances, 53 episodes of congestive heart failure (weakened heart) 119 strokes, 517 heart attacks and 522 deaths.⁹

Every major disease process today is directly or indirectly related to lack of NO. Diabetes, Hypertension, Hyperlipidemia, Hypercholesterolemia, Cancer, Peripheral Vascular Disease, Coronary Artery Disease, Sickle Cell, Scleroderma, Renal Failure, Pulmonary Hypertension and Atherosclerosis are all associated with decreased levels of NO. With the exception of cancer, where NO functions in the immune system, most of these disease processes involve the vascular system and endothelial derived NO.

The primary function of endothelial derived NO is vascular homeostasis, or balance. NO maintains vascular health by enhancing endothelial reactivity. The endothelium is the inner lining of the blood vessels and as long as the endothelium remains reactive, they are supple, pliable and flexible. They are able to respond appropriately to the various changes that occur in blood vessels in the course of normal and abnormal physiology. When NO decreases, the vessels become stiff and rigid. This is called atherosclerosis or hardening of the arteries. When we develop atherosclerosis, the results are high blood pressure, heart attack and stroke and ultimately death. As long as we have plenty of NO, as can be supplied arginine, our blood pressure remains low and we have protection from many of the consequences of the aging process.

To date **arginine** has been shown in animal as well as human trials that it may be effective in the following:

- Decreasing and reversing atherosclerosis by decreasing intimal thickening and monocyte accumulation^{9,10,11,12,13,14}
- Restore normal endothelial function in hypercholesterolemia^{14,15,16,17,18,19,20,21}
- Reversing consequences of coronary artery disease^{22,23,24,25,26,27,28,29,30}
- Decreasing cholesterol and triglycerides³²
- Improves walking distance in peripheral vascular disease^{31,33,34,35,36}
- Improves pain in interstitial cystitis^{37,38}
- Prolonged administration of arginine reverses adverse effects of high blood pressure^{39,40,41,42}
- Decreases high blood pressure⁴³
- Decreases post operative infection and length of stay⁴⁴
- Increases human growth hormone^{45,46,47,48,49,50,116}
- Improves outcome after bypass surgery⁵¹
- Improves sexual function⁵²
- Improves exercise tolerance^{53,54}
- Improves renal function^{55,56,57,58,59,60}
- Improves glucose uptake in muscle cells⁶¹
- Improves asthma^{61,62,63,64,65,66}
- Improves cell mediated immunity^{67,68,69,70,71}
- Improves pituitary responsiveness and modulates hormonal control^{72,73,74}
- Improves muscle performance⁷⁵
- Improves diabetes and reverses damage^{76,77,78,79}
- May prevent diabetes⁷⁸
- Reduces blood clots and strokes^{80,81,82}
- Helps prevent restenosis after angioplasty and bypass^{83,84,85}
- Helps prevent post surgical damage after intestinal manipulation⁸⁶
- May improve irritable bowel syndrome⁸⁷
- Improves osteoporosis⁸⁸
- May improve prostate function⁸⁹
- May give protection against size of heart attack⁹⁰
- Helps protect in cardiac transplants^{91,92}
- Improve scleroderma⁹³
- Improve sickle cell disease⁹⁴
- Prevent pre-eclampsia⁹⁵
- Improves exercise capacity in pulmonary hypertension^{96,117,118}
- Improves wound healing^{97,98,99}
- Reduces ulcers^{101,102}
- Improves peripheral vascular disease^{103,104}
- Improves outcome in sepsis¹⁰⁵
- Improves heart failure¹⁰⁶
- Improves outcome of cancer treatment^{107,108}
- Improve alzheimer's^{109,110,111,112}
- Improves memory and cognitive functions^{113,114,115}
- L-arginine has been shown to safe in the above studies as well as others^{100,116}

To summarize, **arginine**, by virtue of being a safe and natural Nitric Oxide donor can be an extremely significant factor in the treatment and reversal of most major diseases. The impact of **arginine** on preventative healthcare and anti-aging is profound, not to mention that it is a safe and effective replacement for the *Viagra*[®] type drugs.

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