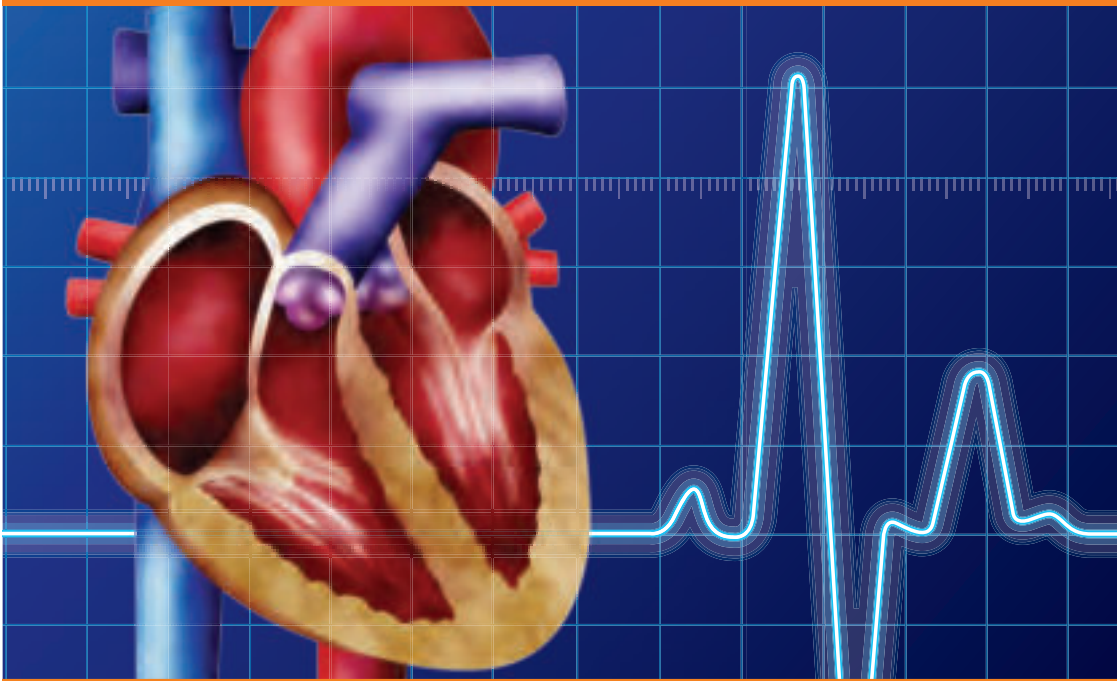


How to improve sports performance and recovery



A Nobel Prize winner's advice on how to stimulate Nitric Oxide...
The body's own natural cardiovascular drug.



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Is your health care practitioner government registered?

Australian Health Practitioner Regulation Agency
Provider Number: 2876113L
Masters of Sports Pysiotherapy

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- Mental Health Physiotherapy Group
- Neurology Group
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Your cardiovascular network of arteries and veins is so extensive that if it were laid end-to-end, the total length would be 100,000 kilometres, that's nearly two and a half times the circumference of the earth.

Yet your blood makes a complete circuit around your body about once a minute. Your heart beats approximately 100,000 times a day and pumps nearly 7,600 litres of blood throughout your body every twenty-four hours.

***Do you need any more good reasons
to keep your heart and circulatory
system in peak condition?***

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Cardiovascular System

We take our heart and its network of arteries and veins for granted until we start experiencing a decline in energy, shortness of breath and other symptoms.

Often it's a shock when a person is told they have cardiovascular disease, especially if there was no past history in the family.

Cardiovascular disease (CVD) covers all diseases and conditions of the heart and blood vessels. Traditionally, these diseases are known as high blood pressure, heart attacks and strokes.

In Australia, CVD affected 3,702,500 people in 2004-2005. In 2006-2007, 469,817 people were hospitalised and in 2006 there were 45,670 deaths.¹

In a new report from the Australian Institute of Health and Welfare it shows cardiovascular disease is the leading killer of women in Australia.

The research, funded by the National Health Foundation, found about 30 women die every day from heart disease, stroke or heart attack. The report also showed that about 2 million women have a form of the disease.²

It is clear then that heart disease is no longer predominantly confined to men.

In relation to direct expenditure on health care in Australia, CVD is the most expensive health condition, costing 11% or \$5.4 billion of the total allocated health system expenditure in 2000-2001.³

Risk factors for CVD include smoking, physical inactivity, poor diet, risky alcohol consumption, high blood pressure, high blood cholesterol, obesity and diabetes. It is estimated that 92% of Australian adults have at least one risk factor for CVD and almost 40% have three or more CVD risk factors.⁴

CVD can be found in millions and millions of people around the world and is one of the most debilitating diseases of the modern era.

¹ ABS 2004-2005 National Health Survey; ABS 2003 Survey of Disability, Ageing and Carers; National Hospital Morbidity Database & AIHW National Mortality Database

² ABC News Bulletin posted 1 June 2010.

³ Australian Bureau of Statistics 4821.0.55.001

⁴ Australian Institute of Health and Welfare 2005: Living dangerously: Australians with multiple risk factors for cardiovascular disease.

Nobel Prize Winner

Decades ago, Dr Louis J Ignarro, a distinguished Professor of Pharmacology at the University of California, Los Angeles School of Medicine began his research into CVD and his findings produced a breakthrough that would revolutionise medical science.

Along with his colleagues Ferid Murad and Robert Furchgott, they won the 1998 Nobel Prize in Medicine for their discovery of “the atom” of cardiovascular health, a tiny molecule called nitric oxide (NO).

Human bodies naturally produce NO to help keep arteries and veins free of the plaque that causes strokes and keeps the blood flowing to prevent coronaries.

Nitric oxide is a gas and is a highly responsive participant in many chemical reactions in the body and is the body’s natural cardiovascular wonder drug.

Cardiovascular Wonder Drug

Nitric oxide is mainly manufactured in the endothelium, which is the layer of cells lining the interior surface of blood vessels. When the endothelium is well nourished, NO is produced at optimal levels and blood flows unimpeded, nurturing the heart along with every other organ.

You need only small amounts of NO to take advantage of its powerful therapeutic functions, but most people do not produce enough of it to keep their cardiovascular systems functioning smoothly.⁵

The findings from studies by Dr Ignarro and his colleagues are based on medical and scientific results; they are proven and cannot be disputed.

Dr Ignarro said, “I believe that our findings may someday soon diminish the general incidence of cardiovascular disease beyond the most optimistic projections of medical science, even a decade ago”.⁶

⁵ NO More Heart Disease by Dr Louis J Ignarro page 49

⁶ NO More Heart Disease by Dr Louis J Ignarro page xiv

Women Are Also At Risk

Traditionally, heart disease was considered more a man's disease than a woman's. But the figures mentioned earlier show heart disease claims the lives of about 8.6 million women worldwide each year. It is now the number-one killer of women, outpacing even cancer.⁷

Nitric Oxide – The Ubiquitous Signalling Molecule

Literally thousands of scientific studies have been published and hundreds more are done each year on NO. It is becoming more clearly understood that NO has a regulatory influence on every cell and system of the body.

Power Vasodilator

Nitric oxide's most profound effect on the body is that of a power vasodilator. A vasodilator is a substance that increases the diameter of blood vessels and allows blood to flow unimpeded.

All cells and organs in the body require good blood flow for nourishment, to remove toxins and for general health.

Healthy NO levels are required to:

- Enhance cardiovascular health
- Improve blood pressure
- Reduce chronic inflammation
- Reduce oxidative stress
- Improve circulation
- Enhance sports performance
- Reduce muscle soreness
- Improve insulin resistance
- Prevent male impotence
- Increase weight loss and metabolism.

Nitric oxide is the body's own natural cardiovascular regulator and is produced by the vascular endothelium. This endothelium is a thin, fragile layer of cells, which line the blood vessels of the body. Many factors reduce the health of this lining and hence reduce the production of NO.

Nitric oxide relaxes the smooth muscles in the walls of blood vessels and has the potential to significantly improve and in some cases reverse cardiovascular disease.

The importance of NO to the functioning of the vascular system cannot be underestimated and any reduction in its production can be detrimental, greatly reducing quality of life and ultimately causing death.

⁷ NO More Heart Disease by Dr Louis J Ignarro page xvii

Causes of Decreased Nitric Oxide Production

As NO is involved in the regulation of not only the cardiovascular system, but has an influence on every cell in the body, it isn't hard to understand how a reduced, unhealthy level of NO can have a devastating effect.

During the aging process the production of NO naturally wanes. Any process that damages the lining of the arteries (endothelium) where the NO is produced will start a chain reaction, which will eventually lead to disease.

Poor nutrition, smoking, lack of exercise and a build up of plaque in the arteries will reduce NO production. This reduction increases blood pressure, reduces cardiovascular fitness and causes heart attacks and strokes.

Poor blood supply has also been associated with diabetes, arthritis, poor memory, dementia and male impotence.

Inflammation and Cardiovascular Disease

In 2002, doctors at Harvard University published the first of a series of landmark research studies revealing the central role of inflammation in cardiovascular disease. The cardiologist Paul Ridker, who led the study, said that, "we have to think of heart disease as an inflammatory disease, just as we think of rheumatoid arthritis as an inflammatory disease".⁸

Although inflammation is nature's way to help heal things such as traumas and pain, uncontrolled chronic inflammation can cause a number of diseases. Like a forest fire burning out of control, chronic inflammation damages the lining of the arteries and this reduces the production of NO.

Damaged arteries become "sticky" and allow cholesterol to form plaque and eventually block blood vessels.

Twenty-first century lifestyles that do not include a certain amount of exercise, healthy eating and a reduction in stress can contribute greatly to the amount of inflammation within the body.

⁸ Reverse Heart Disease Now by Stephen T Sinatra, MD, James C Roberts, MD with Martin Zucker page 17

The Solution – Increasing Nitric Oxide Naturally

Based on the research and recommendations of Dr Ignarro, as well as numerous other published medical studies, there are a number of substances, referred to as “substrates” and “precursors” which profoundly stimulate NO production directly and indirectly.

The following four non-toxic nutrients synergistically enhance NO production, as well as protecting the functions of the very cells that provide NO:

- Arginine Alpha-Keto Glutarate Acid
- L-citrulline Malate
- Carnitine
- R-alpha Lipoic Acid

The first two are amino acids, Carnitine is a derivative of an amino acid and R-alpha Lipoic Acid is an antioxidant.

Each one of these nutrients plays a role in the production of NO and many other important health enhancing functions.

Western sedentary lifestyles, poor diet and many disease processes increase inflammation and reduce NO.

Nitric oxide has been shown to reduce the swelling and discomfort of inflammatory diseases such as arthritis.

Reducing chronic inflammation in the cardiovascular system can halt and often reverse heart disease.

Nitric Oxide for Athletes

Nitric oxide can enhance the performance of athletes and people in training programs as it increases blood flow and in turn delivers more nutrients to muscles, including the heart.

As blood flow increases, so does the natural production of NO, which also helps flush away the metabolic toxins that are a by-product of exercise. This enhances recovery and reduces muscle soreness.

Arginine – The Lead Remedy

Arginine is a non-essential amino acid that adults produce within their bodies. Infants cannot produce it and must obtain it from food.

It has a number of functions in the body and plays a critical role in blood circulation. Because of this, Arginine is considered a semi-essential amino acid and has been included in **THE NITRIC FACTOR** formula because it helps synthesise NO.

Dr Robert Furchgott discovered that the endothelial tissue lining the walls of blood vessels manufactured a substance that kept the vessels smooth and dilated in a healthy person.⁹

But it was British scientist, Salvador Moncada who identified the substance L-arginine that converts to NO in the endothelium.

It is this reaction that causes blood vessels to relax and allows a better flow of blood. As the level of NO increases and the arteries relax and widen, blood flows more easily and blood pressure decreases.

Medical researchers have gathered enough clinical evidence to bring L-arginine to the forefront of modern medicine as an accepted treatment for a variety of human ailments. The L-arginine phenomenon is changing standard treatment methodologies in heart disease, immune function, genetic growth deficiencies, high blood pressure, sexual dysfunction and human ageing.¹⁰

Scientific studies carried out at Stanford University School of Medicine, achieved positive results in trials on humans that confirmed Arginine did provide benefits to the cardiovascular system.

The endothelium lining of the arteries needs L-arginine to increase the production of NO and this amino acid can be found in many foods, although dosages required to stimulate NO and reverse heart disease must be obtained from supplements for a few reasons.

First of all, absorption of L-arginine from foods is very slow and this doesn't have the stimulatory effect of a quickly absorbed dose.

Secondly, dosages of the four nutrients mentioned in **THE NITRIC FACTOR** would be difficult to consume in a normal healthy diet.

⁹ NO More Heart Disease by Dr Louis J Ignarro page 87

¹⁰ Arginine Research Official Online L-arginine Database www.argineresearch.com

Arginine Research states that the benefits and functions attributed to oral ingestion of L-arginine include:

- Precursor for the synthesis of NO
- Stimulates the release of the growth hormone, the most important anti-aging hormone in the body
- Improves immune function
- Reduces healing time of injuries
- Reduces risk of heart disease
- Improves male sexual performance
- Increases muscle mass
- Reduces adipose tissue body fat
- Helps improve insulin sensitivity
- Helps decrease blood pressure
- Improves infertility by improving sperm production and motility.

A therapeutic dose of L-arginine stimulates the body to produce more NO, which provides better protection against many damaging health problems such as smoking, diabetes, high blood pressure, obesity/insulin resistance and many of the problems relating to CVD.

Age is also a factor. As people age, the health of their arteries decreases, the smooth inner walls become thicker as plaque accumulates and this restricts blood flow. The layman's term used for this is hardening of the arteries.

Arginine helps the body to produce beneficial amounts of NO, which will help to maintain a healthy cardiovascular system.

A reassuring fact is that Arginine has no side effects even when taken in doses of between three and six grams. Some patients in studies took as much as nine grams a day without any problems.

As amino acids work closely together, it is necessary that for Arginine to work effectively, it needs the help of another amino acid, L-citrulline.

L-citrulline – The Arginine Turbo Charger

This amino acid is often referred to as the turbo charger for Arginine because it enhances the effects and stimulates the body into producing NO.

The vascular endothelial cells, which line the blood vessels, convert L-citrulline to arginine so the cells can produce even more NO.

L-citrulline is a non-essential amino acid that is naturally produced in the body and helps to defend the body against illness. It boosts the body's immune system, promotes energy, reduces mental fatigue and enhances sexual function.

L-citrulline enhances the body's ability to detoxify by stimulating the elimination of toxins.

Dr Ignarro states that if you have high blood pressure, elevated cholesterol levels and/or atherosclerosis, L-arginine generated by L-citrulline can help restore the endothelium in your blood vessels, increase the body's production of NO and improves your cardiovascular wellbeing.

He said you must remember that L-citrulline combines with L-arginine to create a synergistic effect, and it is therefore critical for you to include L-citrulline in your supplement program.¹¹

¹¹ NO More Heart Disease by Dr Louis J Ingarrro page 93

Carnitine For Heart Energy

Carnitine is found in nearly all cells within the body and is the generic term for a number of compounds that include L-carnitine, acetyl-L-carnitine and propionyl-L-carnitine.

This amino acid plays a critical role in energy production. It transports long-chain fatty acids into the mitochondria so they can be oxidised (“burned”) to produce energy. It also transports the toxic compounds generated out of this cellular organelle to prevent their accumulation. Given these key functions, carnitine is concentrated in tissues such as skeletal and cardiac muscle that utilise fatty acids as a dietary fuel.

In his book *L-Carnitine and the Heart*, Stephen T Sinatra MD said, “L-carnitine can rocket your heart and muscle energy to new heights. It does this by maximising the amount of oxygen your heart and skeletal muscle can extract from your blood, oxygen that is vital to producing the energy that keeps your heart beating.

“In fact, since free fatty acids (i.e. fats) are the major fuel for the heart to pump effectively L-carnitine’s crucial role is that it supports the oxidation of these fatty acids in the inner mitochondrial membrane. Research shows that the heart uses these free fatty acids as its main energy source.”

Carnitine has been studied extensively because it is important to energy production and is a well-tolerated and generally safe therapeutic agent.

The dietary ingredient Glycine propionyl-L-carnitine has been shown to possess both antioxidant properties and to increase blood NO.¹²

This dual action role makes this ingredient one to consider for both general health enthusiasts and athletes who are interested in improving antioxidant defence while potentially stimulating an increase in blood flow due to the increased levels of NO.¹³

People who suffer from cardiovascular disease have a restricted blood flow and lower levels of carnitine, which may affect peripheral arteries resulting in poor circulation in the legs.

L-carnitine is a heart-specific supplement you must consider if you have a cardiac condition.¹⁴ L-carnitine is a key nutrient for cardiac tissue, particularly in situations where the heart muscle is not getting enough oxygen.

The symptoms of angina are caused by an insufficient supply of oxygen to the heart tissues, usually resulting from blockages and/or spasm of the coronary arteries.

¹² Bloomer et al., in press

¹³ White Paper: Oxidative Stress and Exercise, Dr Richard J Bloomer PhD

¹⁴ L-Carnitine and the Heart by Stephen T Sinatra MD, FACC with Jan Sinatra RN, MSN

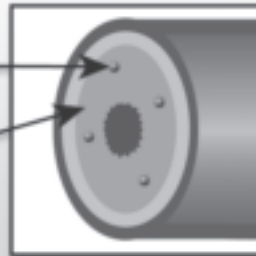
How Does THE NITRIC FACTOR Work?

Constricted Artery

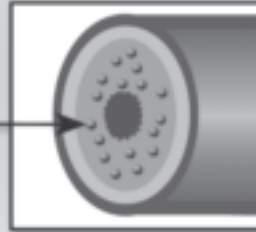


Low Nitric Oxide Levels

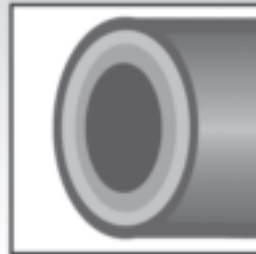
Endothelial Wall



Nitric Oxide levels increase
after THE NITRIC FACTOR
reaches the blood stream



Arteries Dilate



Dilated Artery

Allows increased blood flow

