

Nobel Prize Winner's Breakthrough – Prevent Heart Attack and Stroke with Nitric Oxide

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One tiny molecule produced by the body may do more than any drug to prevent heart attack and stroke. Nitric oxide, a gas that occurs naturally in the body, is critical for healthy circulation. It helps dilate blood pressure, and it may inhibit the accumulation of arterial plaque.

How It Works

Nitric oxide is a signaling molecule primarily produced by cells in the endothelium (inner lining) of blood vessels. A signaling molecule fits into docking sites (receptors) on cell walls and triggers biochemical reactions. *Nitric oxide helps prevent heart disease and stroke by...*

- Expanding blood vessels. Nitric oxide protects the blood vessels' smooth muscle tissue from harmful constriction, and this allows blood to circulate with less force. Some doctors report that elevating nitric oxide in hypertensive patients can lower blood pressure by 10 to 60 points.
- Controlling platelet function. Platelets, cell-like structures in blood that can clump up together, may form blood-blocking clots, the main cause of heart attack and stroke. A vascular network that is enhanced by nitric oxide sheds platelets and inhibits dangerous clots.
- Reducing arterial plaque by 50%. Arterial plaque, which consists of fatty deposits in the coronary arteries, is the underlying cause of heart diseases. Nitric oxide is an antioxidant that inhibits the passage of monocytes, a type of immune cell, into the artery wall. This in turn reduces the underlying inflammation that promotes plaque.
- Lowering total cholesterol by 10% to 20%. That's a modest decrease – but there's some evidence that nitric oxide is even more effective when combined with the cholesterol lowering statins. Nitric oxide lowers cholesterol through its antioxidant activity. The preliminary research suggests that stimulating nitric oxide production in people who have elevated cholesterol makes it possible to lower their statin doses by at least 50%.

To Boost Nitric Oxide Levels

It is not yet known how much nitric oxide normally is present in the body or what levels are optimal. This gas is difficult to measure because it disappears almost instantly upon exposure to air. Research scientists can measure levels with electrodes inserted in blood vessels. Simpler tests are needed before doctors can measure nitric oxide as part of standard checkups.

Beginning in early adulthood, nitric oxide level gradually decline, probably due to damage to the endothelial cells caused by such factors as a high-fat diet and a sedentary lifestyle.

Nitric oxide can't be taken in supplement form because it is a gas. However, patients can take other supplements that increase production of nitric oxide in the blood vessels. *These supplements, all available at health-food stores, have few if any side effects...*

- **L-arginine**, an amino acid found in meats, grains and fish, passes through the intestine into the blood. From the blood, it enters endothelial cells, where it is used to make nitric oxide. A Mayo Clinic study found that people taking L-arginine showed significant improvement in endothelial function and blood flow compared with those taking placebos. It is hard to get sufficient L-arginine from food, so supplements are recommended.

Dose: 2,000 to 3,000 milligrams (mg) taken twice daily – for a total of 4,000 to 6,000 mg.

- **L-citrulline.** Supplemental arginine doesn't enter cells readily unless it is combined with L-citrulline, another amino acid. Melons and cucumbers are rich sources of L-citrulline, but they don't provide high enough levels to significantly increase nitric oxide levels.
Dose: 400 to 600 mg daily.
- **Daily multivitamin that includes vitamin E.** Vitamin E helps reduce the assault of cell-damaging free radicals on the endothelial lining and may promote higher levels of nitric oxide. The amount of vitamin E that is in most multi-vitamin/mineral supplements is about 50 international units (IU), an effective dose.
Warning: Don't take the high-dose vitamin E supplements. Recent studies suggest that people who take daily doses of 400 IU or higher may be more susceptible to heart disease and other illnesses.
- **Vitamin C.** Like vitamin E, vitamin C will reduce oxidation in the blood vessels and may cause an increase in nitric oxide. People who consume high levels in vitamin C experience a reduction in arterial plaque, which is associated with higher levels of nitric oxide. You can get your vitamin C from food, but I recommend supplements because they are so convenient and easy to take.
Dose: 500 mg daily.

Diet and Exercise

In addition to take supplements, it is important to maintain a healthy lifestyle by watching what you eat and being active. *Try to...*

- **Do aerobic exercise for at least 20 minutes three days a week.** This stimulates endothelial cells to continuously produce nitric oxide, even on days that you don't exercise.
- **Minimize intake of saturated fat.** Saturated fat, found in such animal products as red meat, poultry, butter, and whole milk, contributes to the accumulation of arterial plaque and impairs nitric oxide production.
Better: Olive oil, fish and flaxseed. The fats found in these foods help protect the endothelium by elevating levels of beneficial HDL cholesterol and lowering the harmful LDL form.
- **Eat More Fiber.** The dietary fiber in grains, fruits and vegetables lowers blood pressure and LDL cholesterol and raises HDL, thereby protecting endothelial cells.
Bonus: Many of the foods that contain fiber also are rich in antioxidants, which inhibit the cell damage that lowers nitric oxide. Eat at least 25 grams (g) of fiber daily – and drink at least eight 8-ounce glasses of water each day to make sure that the fiber moves through your system properly.