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Go Green

Eating greens can heal disease

One of the many benefits of dark leafy greens is their ability to produce

Nitric Oxide

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What is Nitric Oxide?

Nitric Oxide is a powerful messenger molecule in our body that:

- signals arteries to relax and expand, allowing more blood to flow
- triggers immune cells to kill bacteria and cancer cells reducing risk of disease
- helps brain cells to communicate reducing risk of dementia

Nitric Oxide is a combination of one molecule of Nitrogen and one molecule of Oxygen. It is sometimes referred to as NO or N-O.

What it is NOT

Nitric oxide is **NOT** the "laughing gas" used by your dentist (nitrous oxide)

And it is **NOT** nitrogen dioxide, an air pollutant

Although N-O is a free radical, it is **NOT** damaging to tissues, but is essential to health

What does N-O do?

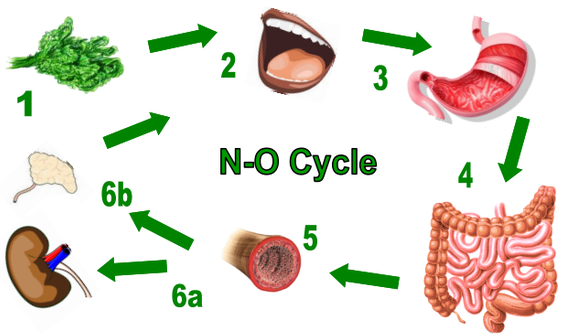
N-O is a gas that plays an important role in every cell of our body. Research indicates that N-O can:

- Prevent high blood pressure
- Keep arteries flexible
- Lower cholesterol and reduce plaque
- Reduce formation of blood clots
- Reduce risk of diabetes
- Limit swelling and pain of arthritis
- Protect bones from osteoporosis
- Protect skin from sun damage
- Reduce risk of developing dementia
- Reverse erectile dysfunction

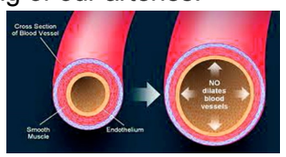
How does N-O work?

Nitric oxide is a gas we make within our own bodies from nitrates and nitrites found naturally in our foods. Good sources include dark green leafy vegetables like kale, arugula, Swiss Chard and spinach. Other great sources include beets, cabbage, cauliflower, carrots and broccoli.

When we chew these foods, friendly oral bacteria react with saliva to convert nitrates into nitrites (1). In the stomach, nitrites are converted to nitric oxide (3) where is goes into the blood stream (5) to meet the body's needs. Leftover nitrates and nitrites that are not converted to nitric oxide can be excreted (6a), or stored in the saliva glands (6b) or under the skin for later conversion into N-O.



Once nitric oxide enters the blood stream, it acts as a messenger to relax the smooth muscles within the lining of our arteries. When the muscle relaxes, the arteries widen, allowing for increased blood flow and circulation.



Worried about nitrates?

You may have heard that some nitrates and nitrites can cause cancer. *See next page.*

Heart Disease

Some heart patients take nitroglycerine tablets under the tongue to relieve angina pain, which is a function of restricted blood flow to the heart. Nitroglycerine pills help the body to create nitric oxide, which signals the arteries to expand and relax, allowing more blood to flow, thus helping to relieve angina pain.

Nitric Oxide can:

- Prevent high blood pressure
- Keep arteries young and flexible
- Prevent, slow or reverse arterial plaque
- Reduce formation of blood clots
- Lower cholesterol

Cancer and the immune system

- Nitric oxide signals the immune system to protect the body against bacteria and cancer cell growth
- N-O has been shown to stop the growth of cancerous tumors and protect the skin from sun damage that can lead to carcinoma
- Nitric oxide, when secreted as an immune response, is toxic to bacteria

The same mechanism behind nitroglycerine tablets is also behind the effectiveness of Viagra.® Nitric Oxide is the end product which increases blood flow, restoring erectile function.

Diabetes

Patients with diabetes are at high risk for vascular disorders such as hypertension, nephropathy and retinopathy.

Both Type 1 and Type 2 diabetes patients suffer from endothelial dysfunction (the innermost lining of the arteries). This dysfunction reduces blood vessel flexibility and increases the inflammatory response, influx of cholesterol and formation of blood clots, each of which contributes to diabetes and heart disease. Most diabetics suffer from heart disease as well as diabetes.

Nitric oxide can improve vascular function and responsiveness, and reduce progression and complications of both diabetes and heart disease.

Worried about Nitrates and Nitrites?

- Nitrates used for meat preservation can be converted to nitrosamines by stomach acid. Nitrosamines have been linked to cancer

- These nitrates and nitrites are not found naturally in the foods but are added in processing plants
- Nitrosamines form in the stomach when nitrites combine with amines (from amino acids) which are found in proteins like meat, fish and dairy
- Adding just 10% fat in the presence of protein can increase conversion of nitrites to nitrosamines instead of nitric oxide
- Diets high in saturated fats inhibit the production of nitric oxide, whereas unsaturated fats may improve N-O
- Nitrosamines can also be formed by frying at high temperatures
- Examples of foods with high risk of producing nitrosamines include processed meats like lunchmeat, hot dogs, ham, bacon and sausage
- Those who consume the most processed meats increase their risk of dying by 44%

Oral Health

Friendly bacteria on the tongue help reduce nitrates to nitrites found naturally in food. This is the first step in producing nitric oxide.

Interference with the healthy bacteria can reduce N-O production by at least one third.

The use of mouthwash kills the healthy bacteria that are necessary to produce nitric oxide.

Try using baking soda as a tooth paste and oral rinse.

Making Nitric Oxide with Food

The capacity to produce nitric oxide is reliant on nitrates from RAW vegetables and fruits.

Cooking, boiling, steaming, broiling, baking and blanching all destroy the nitrates necessary for N-O production.

Eating some raw greens and vegetables will provide raw materials for making N-O.

Since nitric oxide is a healthy free radical, consuming foods with an antioxidants improve N-O capacity.

Include sources of vitamin C like oranges, kiwi, bell peppers and broccoli.

Polyphenols are powerful antioxidants found in dark-colored fruit like grapes, berries, red wine and chocolate. These foods will help boost available nitric oxide.

Exercise, sunlight and deep breathing also help the body to produce nitric oxide.

Supplementation

One N-O researcher has developed lozenges that have been shown to increase production of N-O. The product is called *NEO40®* and is available on line by going to www.neogenesis.com.

The amino acid supplement L-arginine has been sold mainly to athletes to help N-O production but this pathway declines after age 40. Supplementing with L-arginine may be harmful and is not recommended.