

Say **NO** to Disease



Preventing and reversing disease by generating Nitric Oxide with whole foods

WHAT IS NITRIC OXIDE?

Nitric oxide is a gas made within the lining of our arteries, consisting of one nitrogen (N) and one oxygen (O), and abbreviated **NO**. It is considered the body's only known *healthy* free radical.

NO is an important signaling molecule that lasts only a few seconds in the blood, but because of its role in human physiology, it has been called "the most important molecule in the body" by the 1998 Nobel Prize committee.

WHAT NITRIC OXIDE IS **NOT**

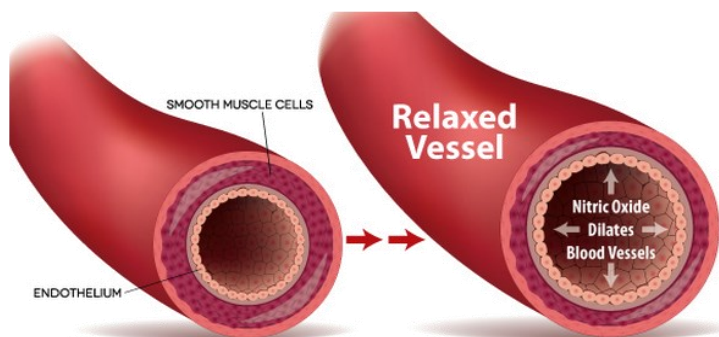
- ◆ Nitrous oxide or "laughing gas" used in the dentist's office (N_2O)
- ◆ Nitrogen dioxide, a poisonous air pollutant (NO_2)

HOW DOES NITRIC OXIDE WORK?

NO is a chemical messenger that signals:

- ◆ Arteries to relax and expand
- ◆ Immune cells to kill bacteria and cancer cells
- ◆ Brain cells to communicate

We can protect the nitric oxide molecule by consuming foods high in antioxidants.



WHY IS **NO** IMPORTANT? It can:

- ◆ Prevent or reverse high blood pressure, keeping arteries flexible and responsive to changes in blood pressure
- ◆ Limit swelling and pain of arthritis
- ◆ Reduce risk of diabetes and complications like kidney disease, blindness and limb amputations
- ◆ Reduce risk of heart disease since it can lower cholesterol, reduce formation of blood clots and prevent the build-up of fatty plaques
- ◆ Protect bones from osteoporosis
- ◆ Reduce risk of dementia
- ◆ Improve sleep
- ◆ Reverse erectile dysfunction
- ◆ Protect the skin from sun damage
- ◆ Increase oxygenation of tissues
- ◆ Improve sense of smell

PRIZE-WINNING MOLECULE

In 1992, Nitric Oxide was named "Molecule of the Year."
In 1998, 3 scientists were awarded the Nobel Prize for Physiology and Medicine for discovering the nitric oxide molecule.



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WHERE DO WE FIND NO?

We manufacture **NO** in our bodies through two different pathways:

- ◆ **L-Arginine**, an amino acid found in nuts, seeds, meat and dairy, and some fruit
- ◆ **Nitrates/nitrites** found naturally in whole vegetables and fruits, especially dark, leafy greens and beet root

Some people take L-Arginine supplements but this pathway reduces efficiency after age 40. The nitrate/nitrite pathway is the primary method for producing **NO** as we age.

HIGH NO PRODUCERS

Kale, Swiss chard, arugula, spinach, chicory, wild radish, bok choy, beet, lettuce, cabbage, mustard greens, cauliflower, parsley, kohlrabi, carrot and broccoli

MEDIUM NO PRODUCERS

Coleslaw, asparagus, celery, watercress, artichoke, eggplant, strawberry, potato, garlic, tomato, vegetable juice, vegetable soup, melon

LOW NO PRODUCERS

String beans, figs, prunes, sweet potato, raspberries, raisins, bananas, cherries, onion, bean sprouts, chickpeas, red wine

HOW CAN WE HELP OUR BODIES MAKE NO?

When we chew foods with nitrates, friendly oral bacteria react with saliva to convert nitrates into nitrites. In the stomach, nitrites are converted to nitric oxide where it goes into the blood stream to meet the body's needs.

- ◆ Consume plenty of raw vegetables, especially dark, leafy greens, beet root and some fruits.
- ◆ Foods must be raw since cooking and dehydrating destroy nitrates and nitrites that are the precursors to making nitric oxide.
- ◆ The nitrate/nitrite pathway requires healthy oral bacteria to make the conversion. Refrain from using mouthwash since it can kill the healthy bacteria and decrease **NO**-production by at least 1/3.
- ◆ Chew your greens thoroughly since saliva helps with the conversion. Putting greens in your smoothie will provide fiber and B vitamins but will not make **NO**.



BOOSTING NO PRODUCTION

1. Have a dark green salad every day, more often if you are experiencing compromised health.
2. Accompany greens with a source of vitamin C like citrus, bell peppers, broccoli or kiwi fruit. Greens also contain vitamin C.
3. Consume foods high in polyphenol antioxidants like dark colored fruit (berries), red wine or grapes, and dark chocolate (65% cacao or more).
4. Include exercise in your daily routine (a minimum of 30 minutes per day is recommended).
5. Fish oil and other unsaturated oils have been shown to boost **NO** production.
6. Diets high in saturated fat inhibit **NO** production whereas substituting unsaturated fats for saturated oils may improve **NO**.
7. Exposure to sunlight and deep-breathing exercises can also increase production of **NO**.

WHAT IF MY DOCTOR ADVISES AGAINST EATING LEAFY GREENS?

Some blood-thinning medications are affected by the vitamin K contained in green leafy vegetables and doctors may suggest you remove these foods. However, this inhibits your ability to produce nitric oxide, which seriously reduces your body's capacity to fight disease.

Instead, commit to consuming at least 1 cup of greens daily. If you are consistent, your doctor can adjust your medication for the vitamin K content.



REFERENCES

No More Heart Disease
Louis J. Ignarro,
2005

The Nitric Oxide Solution
Nathan Bryan
and Janet Zand, 2010

www.ncbi.nlm.nih.gov

www.pritikin.com

<http://clinchem.aaccjnls.org>