NITRIC OXIDE aka Nitrogen Oxide

Nitric Oxide acts as a signaling molecule (one atom of nitrogen, one atom of oxygen: NO). It is a gas, not a liquid or solid. When it is created and released, the gas easily and quickly penetrates nearby membranes and cells, sending its signals. In less than a second, it signals:

arteries to relax and expand
immune cells to kill bacteria and cancer cells
brain cells to communicate with each other

Many people get Nitric oxide confused with nitrous oxide which is used as an anesthetic (laughing gas), or with nitrogen dioxide which is a brown toxic gas and major air pollutant. Nitric oxide is rapidly oxidized in air to nitrogen dioxide.

To really get to know Nitric Oxide well, read the book called "The NItric Oxide (NO) Solution by Nathan S. Bryan, PhD and Janet Zand, OMD. They look at this little molecule as being able to reverse heart disease. They claim it can prevent high blood pressure; keep our arteries young and flexible; prevent, slow or reverse the build up of artery-clogging arterial plaques; help stop the formation of artery-clogging blood clots (result of plaques bursting and spilling into the blood stream); lower cholesterol, and therefore reduce our risk of heart attacks and strokes.

They also claim it can reduce the risk of diabetes, limit the swelling and pain of arthritis, and boost the power of pain-relieving drugs; reverse erectile dysfunction; calm the choking inflammation of asthma; protect our bones from osteoporosis; help provide the mood lifting power behind antidepressant medications; assist the immune system in killing bacteria; and limit skin damage from the sun.

How does Nitric Oxide work to correct Coronary Vascular Disease?

The said thing is: the older you are, the weaker your endothelium is. The endothelium is the thin layer of cells (endothelial cells) lining the inside surface of blood and lymph vessels. Vascular endothelial cells line the entire circulatory system, from the heart to the smallest capillaries. In the heart chambers, the endothelium is called 'endocardium'. Low levels of nitric oxide impair the function of these cells. Endothelial cells age. Damage from oxidative stress builds up. The aging immune system can't keep cell-damaging compounds (cytokines) under control. The genes of aging kick in and because of these changes boosting your NO through diet and exercise may become less effective over the age of 40.

Supplements

Nitric Oxide opens up the blood vessels for up to 24 hours therefore you will need to take supplements on a daily basis. Do not take Ephedrine while using this vasodilator. Do not exceed the dosage or you will overload the enzyme involved in nitric oxide production and can cause gastro-intestinal distress. Taking antioxidants like Vitamin C, E, Selenium and ALA increases the effectiveness of it. Eating less saturated fat helps avoid heart disease because a high fat meal decreases your nitric oxide.

Food Therapy To Help NO

Food therapy however has been found to be substantially helpful for coronary vascular disease. The famous Mediterranean Diet seemed to fit the bill by lowering death rates and increasing longevity. When they dissected the diet they were surprised to find that red wine had the greatest effect - a whopping 24%. Next they found that 17% lower death rate was awarded to what people were not eating: meat. They were eating mostly fish and chicken. But the food that had the most effect wasn't the lovely olive oil, or the fish or seafood, or the beans or nuts or seeds, and not even the fruits - it was the vegetables which lowered the death rate by 16%.

The wild greens of the Mediterranean are horta, which would be similar to our dandelion greens, mustard greens, collards, spinach, and beet greens). Dark leafy greens are among the foods richest in nitrate and nitrites, two dietary compounds that create nitric oxide in the body. A typical Mediterranean diet rich in leafy greens may contain up to 20 times more nitrate and nitrite than a typical Western diet. It has been found that leafy greens lower heart disease risk by 18% and a risk of stroke by 21%.

It is suggested when we buy greens, buy the best looking ones we can, nothing wilted or soggy, and when you bring them home to refrigerate, keep them moist but not wet - perhaps roll them lightly

in damp paper towels and store the bundle in a plastic bag with a few holes punched in the back so the humidity doesn't promote spoilage. Don't wash the greens until you use them. Adding some lemon on cooked greens or salads helps increase the conversion of nitrate and nitrite to nitric oxide. The parts highest in nitrites in order from best to least are:

stalk of leaf leaf stem root flower bulb fruit seed

Watermelon is high in Citrulline, an amino acid that helps the body make nitric oxide. For a NO smoothie combine zucchini, celery, kale, lemon juice, seasonings and tomato juice or water to taste.

Instead of using pop or soda, use pomegranate juice, apple juice or green or black tea.

Drink lots of water, the body makes more NO when hydrated. Eat slowly and chew food really well.

They also found that eating dark chocolate twice or more a week helped reduce the risk of heart attack by 66%! Dark chocolate increases NO. Make sure you get the good kind say organic, or from Europe. American common chocolate often contains wax which can damage the stomach.

Black and Green tea are also listed as good sources that trigger the NO. Fish oil boosts NO. If you can't eat fish twice a week, take 1,000 mg of EPA and DHA a day. The best fish are herring, mackerel, salmon, albacore tuna, sardines, oysters).

Antioxidants not only generate NO, they preserve NO so the body can use it.

Drinking 5 or more glasses of water a day lowered the risk of dying from heart disease by 46%. Drinking lots of water helps prevent cataracts, helps stop kidney stones, bladder infections, soothes aching joints and helps prevent colon cancer.

Here is the Nitric Oxide Index to help you decide on the best foods to eat:

HIGH		MEDIUM		LOW	
*Kale	6825	Coleslaw	84	String beans	9
Swiss chard	2055	Asparagus	82	Sausage	8
Argula	1452	Celery	80	Figs	7
Spinach	1123	Watercress	73	Prunes	6
Chicory	938	Artichoke	63	Sweet potato	5
Wild radish	814	Eggplant	39	Raspberries	5
Bok choy	775	Strawberry	34	Raisins	4
Beet	632	Potato	26	Banana	4
Chinese cabbage	499	Garlic	19	Cherries	3
Beet root juice	482	Tomato	14	Onion	3
Lettuce	388	Veg. juice	11	Red wine	3
Cabbage	312	Veg. soup	10	Bean sprouts	2
Mustard greens	226	Cereal	10	Hot dog	1
Cauliflower, raw	167	Melon	10	Bacon	1
Parsley	150			Chickpeas	1
Kohlrabi	136			French fries	0
Carrot	127			Ham	0
Broccoli`	122			Ketchup	0

- **careful with kale as it can adversely affect the thyroid**

Dr. Willliam Li tells us that nitric oxide is naturally boosted by eating:

- **a cup a blueberries a day**
- **2-3 small squares of Dark Chocolate that is 70% or higher in cacao**
- **1 cup cooked or raw beets and beet juice**
- **1 cup cooked barley (has beta D'glucan) lowers inflammation by feeding your gut bacteria and protects the walls of your blood vessels. Also helps body produce a natural peptide protein called VEGF (vascular endothelial growth factor) which helps muscle growth**
- **Apples which also contain polyphenols like ursolic acid in the skin , and quercetin in the flesh is anti-inflammatory, reducing the oxidative stress that can damage blood vessels. Apples also stimulate new blood vessels to grow. Organic is a better choice for apples.**
- **Coffee**

L ARGININE

This amino acid is a building block of protein and it is mostly found in protein foods such as RED MEAT, CHICKEN, DAIRY, NUTS, SEEDS, SOY, LEGUMES. L Arginine does play a key role in the formation of NO: enzymes called nitric oxide synthaste spark the oxidation of L Arginine to produce NO.

In 1998, the scientists won the Nobel Prize for discovering nitric oxide was a signaling molecule in the lining of arteries that was necessary in the prevention of high blood pressure, heart disease and stroke. They then thought that taking the amino acid L Arginine would be a way of getting more nitric oxide into the system because it triggers the enzyme endothelial nitric oxide synthase to make nitric oxide. Studies however didn't bring the expected results. One study showed that those who have actually had a heart attack didn't benefit and should not take L Arginine. Other studies revealed that L Arginine worsened peripheral arterial disease over the long term (over 2 months).

Jerry Tenant says if you don't have the co-factors to make Nitric Oxide from L-Arginine, it can increase the amount of cytotoxic compounds made by the immune system pathway. This is similar to converting the thyroid hormone T4 to T3. If you don't have the vitamins and minerals necessary for the conversion, you make the fake hormone RT3 that keeps your cells from working correctly. If you don't have the cofactors necessary to convert L-Arginine, it can be harmful to you. Taking Citulline instead of L-Arginine helps solve this.

AVOID

- **Fluoride (as in toothpaste, some city waters)**
- **Mouthwash (kills off healthy mouth bacteria)**
- **Products that reduce stomach acid eg. proton pump inhibitors**
- **NSAIDs such as aspirin, alieve, advil**
- **Antibiotics**

EXERCISE

Exercising helps stop the decline of NO as you age. And NO improves your ability to exercise. Do what you can at your level. At 90 years old you won't be able to do what you can at 40 years old. Walking, swimming, tennis, jogging, riding a bike, gardening, pushing a lawn mower, rigorous house cleaning - everything helps. Start slowly if you are not used to activity, and build up each week to increase the strength of the muscles and heart. Best time to exercise is: anytime.

And don't forget to do some DEEP BREATHING daily.

IMPROVE NASAL BREATHING

Nasal breathing is more effective than mouth breathing for the delivery of nitric oxide from the sinuses to the lungs. Mouth breathing bypasses the nasal cavity where there is a high amount of nitric oxide.

IMPROVE THE ORAL MICROBIOME (Healthy Mouth Bacteria)

Brush your teeth twice a day
Avoid Mouthwash (will kill microbiome)Tongue Scraping may help
Swallow the saliva instead of spitting it
Here are the probiotics that can help mouth bacteria:

1000 species of bacteria inhabit the mouth. Best to get your probiotic in the form of a chewing gum or lozenges, otherwise it goes down into the gut when swallowed.

L. Reuteri (gum health, inflammation) (see above). Specifically Blis K-12 and Blis M-18 strains for plaque and cavities, biofilm. Another product uses L. Reuteri DSM 17938 and L.reuteri ATCC PTA 5289.

Streptococcus salivarius K12 (bad breath, harmful bacteria)

L.Salivarius (gut & mouth health) (see above)

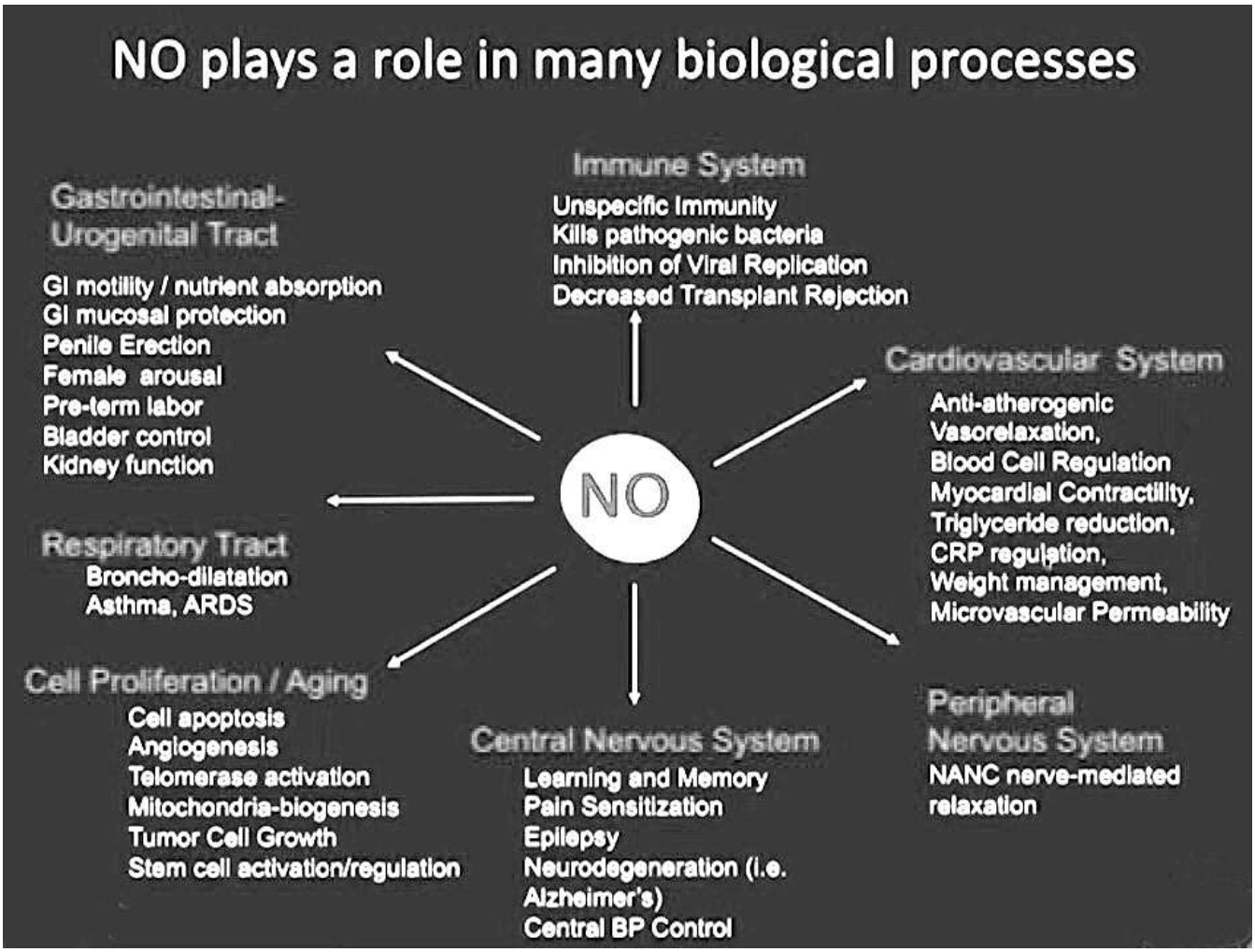
L. Paracasei for gums, sinuses (find in ProvaDent chewing gum)

L. Brevis (gum infections, bleeding)

L. Rhamnosus (inhibits cavity bacteria, GG strain for diarrhea after using antibiotics)

L. Plantarum 299v and P-F found in fermented foods, as in kimchi, pickles etc. makes lactic acid (weight loss, helps gut and mouth microbes)

For fungi infections: Saccharomyces boulardii (see above)



e 1970s found that elevated levels of nitric oxide leads to cancer in the body; however, this study has since been proven wrong. Reports of nitric oxide causing cancer are erroneous. The greatest risk it provides is methemoglobinemia, or nitrites causing the oxidation of hemoglobin, resulting in the blood becoming incapable of carrying oxygen throughout the bloodstream. This condition only exists when exposed to 150 times the amount of nitric oxide used for therapy. So the average person consuming a standard amount of nitrates, comes nowhere near the risk of consuming enough to cause methemoglobinemia [Dr. Bryan].

Ultimately, the main concerns for nitric oxide toxicity are low blood pressure, dizziness, shortness of breath, and so on. And if an individual does experience these symptoms, he or she should cut back on nitrate consumption and the conditions should resolve.

Conclusion

So what does it all mean? Nitric oxide has incredible health benefits. It can literally save lives and prevent disease if we can get enough of it into our system. Americans are generally nitric oxide deficient, and the amount we get in an average diet is far below the levels needed to cause any toxic harm, so there is always room to improve.

Nitrate from our diet is broken down into nitrite and nitric oxide, but the environment in the body must be just right to allow this process to occur. We need the healthy bacteria at the back of our tongue as well as an appropriate stomach pH level to allow for the breakdown of nitrate. People in their 20s generally have no problem producing nitrate, but natural production tends to decrease the older we get. So individuals who are 40 years or older should enhance their diets with nitric oxide supplements, or at least be sure to include nitrate-rich foods to ensure they are consuming appropriate levels. As we maintain sufficient levels of nitric oxide in our bodies, we have better vasodilation, blood flow, and cellular

function.