

## O<sub>2</sub> + NO = Prana, the Vital Force

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Our spaceship Earth is floating in the vastness of space, revolving around the Sun at an incredible speed. Air, rain, and sunshine enable life on Earth. The most important components of the atmosphere are nitrogen (78%) and oxygen (20%). Everyone knows about oxygen – but do we ever stop to think about why there is so much nitrogen in the air? While nitrogen is a critical element of many biological and physical processes, including plant growth (and therefore for agriculture and fertilizer), can we or other life forms use nitrogen directly?

Nitrogen and oxygen molecules come in different forms. Nitric oxide (NO) is an important molecule, which has many health benefits that will be described later. NO is a simple molecule consisting of one atom of nitrogen and one atom of oxygen – making it molecularly more simple than water. N<sub>2</sub>O (nitrous oxide, commonly known as laughing gas) was used decades ago for anaesthetic purposes. NO<sub>2</sub> is an air pollutant in the atmosphere.

In practicing yoga for over 50 years, I intuitively felt that we use more than oxygen when we breathe. Indeed, for yogis, the word *prana* always meant more than just oxygen. When there is four times more nitrogen than oxygen in the air, surely there is some way that nitrogen is being used in our respiration and for our well-being. My hypothesis turned into fact when in 1998, three scientists won the Nobel Prize for discovering the role that nitric oxide plays in human health. Nitric oxide has been found to be beneficial in:

- preventing high blood pressure
- keeping arteries young and flexible
- preventing or reversing the build-up of arterial plaque
- helping to stop the formation of blood clots
- lowering bad cholesterol and increasing good cholesterol
- reducing the risk of diabetes
- reducing the swelling and pain of arthritis
- lowering triglycerides
- increasing energy and better sleep
- protecting bones from osteoporosis
- helping the immune system to kill bacteria
- limiting sun damage for skin and helps to heal wounds
- reducing the severity of erectile dysfunction
- helping to prevent glaucoma
- reducing platelet aggregation
- eliminating pathogen-causing cystic fibrosis
- protecting against side-effects of NSAIDs
- preventing metabolic syndrome
- increasing exercise endurance
- helping to combat ulcers and bladder infections

Following the first two steps of *astanga* yoga – *yama* and *niyama* – helps one to live in harmony with nature and live healthy, blissful lives. *Asanas* keep the body-mind glands and organs working in optimum condition for practitioners in all age categories. *Pranayama* is regulation and control of the

ten vital airs of the body. The five major airs are *prana*, *apana*, *samana*, *udana*, and *vyana*. In *prana*, ‘pra’ stands for *pranavayu* or oxygen, and the “na” stands for *natravaya* or nitrogen. Elemental nitrogen gets “fixed” (oxidized to NO or nitric oxide) by the endothelium, which is the lining of blood vessels – especially those in the sinuses and on top and back of the tongue.

Certain forms of *pranayama* such as alternate nostril breathing and *bhastrika*, as well as yogic techniques such as *khechari mudra*, help the body to manufacture this magical elixir which is nitric oxide. As Nathan Bryan, PhD says in “The Nitric Oxide Solution,”:

“The highest concentration of NO in the body is found in the nasal passages, in the back of your nose. When you breathe deeply through your nose, you transport NO to your lungs. The extra NO opens up the lungs allowing you to absorb more oxygen and expel more carbon dioxide. And because this is an NO-mediated effect, breathing through the NO-rich nose makes all the difference in the positive effects: researchers found that nose breathing led to a 10-15% higher oxidation of the blood than mouth breathing. That’s right: the same amount of breath – but much more oxidation because of NO.”

### Deep Breathing to Increase Production of Nitric Oxide

1. Sit comfortable on a chair or on a mat, with the back straight
2. Breathe in slowly and deeply allowing the stomach to rise like a balloon for 3-5 seconds.
3. Breathe out slowly and steadily so your belly approaches the spinal column for 5-8 seconds.
4. Make sure your breathing is comfortable and smooth. Try to do 8-9 complete breaths in one sitting.
5. Practice this *pranayama* every day for 8-10 minutes.

Deep breathing gives us abundant oxygen and NO to activate the parasympathetic nervous system. This calms us down, relaxes the muscles, combats stress, and many diseases.

On the contrary, shallow jerky breathing makes the blood more acidic ( $\text{CO}_2 + \text{H}_2\text{O} = \text{H}_2\text{CO}_3$  which is weak carbonic acid), acid blood makes kidneys very weak allowing the blood pressure to go sky high. Shallow breathing is naturally corrected when you do the bridge pose (*setubandhasana*) for 2-3 minutes. You cannot breathe in a shallow way during this posture and the breath automatically goes deep into the lowest part of the lungs. It increases oxygen and nitric oxide content to all the cells of the body and helps dropped and displaced organs like the bladder, intestines, colon and uterus to go back to their normal position after only a few months practice.

### Sites for the Production of NO in the Body

1. Nostrils
2. Mouth – tongue – saliva
3. Endothelium – the lining of the blood vessels
4. Skin – significant storage site for NO (acupuncture and reflexology releases NO)
5. Small & large intestine

### Enemies of Nitric Oxide

1. Processed animal products
2. Too much white sugar
3. Fast food – french fries, hot dogs, burgers

4. Smoking & drinking too much alcohol
5. Lack of exercise and obesity
6. Lack of sunshine
7. Stress – type A personalities
8. Lack of humour
9. Fast & shallow breathing
10. Mouthwashes & antibacterial soap
11. Strong antibiotics and prescription medication

#### Top 10 Food Sources of Nitric Oxide

1. Kale
2. Swiss chard
3. Arugula
4. Spinach
5. Chicory
6. Wild radish
7. Bok Choy
8. Beets
9. Chinese cabbage
10. Lettuce

If you can't follow this ideal diet and exercise regimen, nitric oxide is also available in supplemental form at quality health stores and through natural practitioners.

So in conclusion, breathe deeply and calmly, chew your food well and eat slowly if you want to live a very long and healthy life. Eat your greens, stay away from fast food & animal foods, and laugh frequently in the sunshine. Do your asanas with deep breathing and drink lots of water and use infrared saunas. And chant OM – OM – OM!

#### References

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