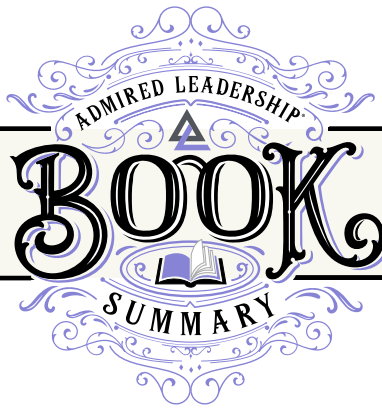




Eight Minutes, Not Eight Hours



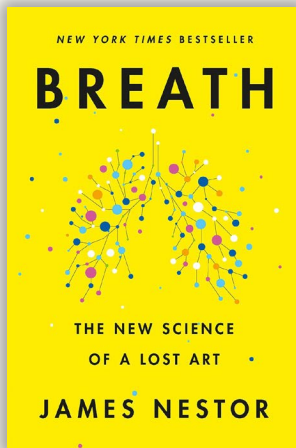
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# Breath

The New Science of a Lost Art

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After recovering from pneumonia for the second time within the span of two years and living with continuous wheezing, James Nestor's doctor recommended an introductory Sudarshan Kriya breathing course. After altering his breathing for one hour, Nestor had a "profound reaction," which led him on a decade-long journey to discover what had happened. In **Breath**, Nestor draws on research from ancient burial sites, secret Soviet facilities, free divers, medical texts, and scientific studies to discover how humans have become the worst breathers in the animal kingdom and how to fix it. His research outlines the science behind the many mental and physical benefits of breathing through the nose, breathing slower, and utilizing different breathing techniques.

## Key Quote

*Breathing is more than just a biochemical or physical act; the tens of billions of molecules we bring into our bodies influence nearly every internal organ, telling them when to turn on or off. Breathing is a power switch to a vast network called the autonomic nervous system" (pp. 143-144).*

## KEY POINTS AND CONCEPTS

### The Unexpected Power of Breathing

The greatest indicator of life span is lung capacity. Researchers in the 1980s, and again in 2000, evaluated thousands of subjects and concluded that the smaller and less efficient lungs became, (regardless of the cause), the shorter individuals lived. At the same time, larger lungs led to longer lives (p. 55).

Poor breathing can lead to several chronic illnesses such as asthma, anxiety, attention deficit hyperactivity disorder, psoriasis, and more that could be reduced or eliminated by altering the manner in which we breathe.

In a study conducted at an orthodontist office, “both adults and children—who’d regained the ability to breathe properly transformed: their slack-jawed and narrowed faces morphed back into a more natural configuration. They saw their high blood pressure drop, depression abate, headaches disappear” (p. 33).


“Whatever happens to the nose affects what’s happening in the mouth, the airways, and the lungs. These aren’t separate things that operate autonomously—it’s one united airway” (p. 27).

### The Perfect Breath


Each breath should be a continuous action, “one fluid movement from inhale to exhale” (p. 201).

Nestor suggests the perfect breath includes breathing in for 5.5 seconds and then exhaling for 5.5 seconds. This technique totals 5.5 breaths a minute for a total of about 5.5 liters of air (p. 212).

Breathing occasionally through the mouth will not have long-term effects on health, however, “the body is not designed to process raw air [through the mouth] for hours at a time, day or night” (p. 207).



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### Testing the Nose and Mouth

To test the prevailing belief in Western medicine that the nose is merely an ancillary organ, Nestor partnered with Anders Olsson, one of Scandinavia’s most respected and well-known breathing therapists, to participate in a two-part study at Stanford.

Phase 1 consisted of Nestor and Olsson plugging their noses to prevent even the faintest amount of air while attempting to live their everyday lives (p. 5).

In Phase 2, they ate, drank, exercised, and slept as they did in the first phase, but breathed through their noses and practiced several breathing techniques throughout the day (p. 8).

During both phases, they kept track of their vital signs by measuring blood pressure, heart rate variability, pulse, temperature, and pH levels. Between phases, they returned to Stanford to run more extensive tests to determine any physical detriments.

The results proved mouth breathing is significantly worse than nasal breathing. After Phase 1, measurements of both participants suggested their bodies were under physical and mental duress and experienced a spike in blood pressure and a drop in heart rate variability (p. 206).

### Mouth breathing

Mouth breathing is, as the name suggests, breathing through the mouth and is often caused by a nasal obstruction.

Mouth breathing begets more mouth breathing, just as nasal breathing begets more nasal breathing (p. 27).

Mouth breathing creates a constant flow of unpressurized, unfiltered air, which contributes to inflammation in the throat and polyps. These contribute to snoring and sleep apnea (p. 17).

After just 24 hours of nasal obstruction during Phase 1 of the experiment mentioned above, Nestor's "snoring increased by 1,300 percent and he had suffered a fourfold increase in sleep apnea events." After 10 days, Nestor's "snoring increased 4,820 percent and at his worst, averaged 25 sleep apnea events" (p. 29).

### The Anatomy of Nasal Breathing

Six maze-like bones called turbinates make up the nose, beginning at the opening of your nostrils and ending just below the eyes. Turbinates direct the trillions of molecules entering your nose in every breath (p. 44).

The lower turbinates at the opening of the nostrils are covered in erectile tissue; this tissue is covered in a mucous membrane. The mucous membrane is the body's "first line of defense," moving all of the inhaled junk and debris down the throat to the stomach where they're "sterilized by stomach acid, delivered to the intestines, and sent out of your body" (pp. 44-45).

During nasal breathing, "the different areas of the turbinates work together [and] they heat, clean, slow, and pressurize air so that the lungs can extract more oxygen with each breath," making it superior to mouth breathing (p. 45).


The erectile tissue in the lower nostrils can mirror the health of the body. For example, they can become inflamed when someone is sick or during other states of imbalance. "The right and left nasal cavities work like an HVAC system, controlling temperature and blood pressure and feeding the brain chemicals to alter our moods, emotions, and sleep states" (p. 41).

### Alternate Nose Breathing Technique


Alternate nose breathing improves lung function and lowers heart rate, blood pressure, and stress. It can be utilized to relax (open left nostril) or to heat the body and aid digestion (open right nostril). Cycling between nostrils can also help gain focus and balance the body and mind (p. 43).

When inhaling predominantly through the right nostril, the right nostril acts like a gas pedal. It activates the sympathetic nervous system — the 'fight or flight' mechanism that puts the body in an elevated state of alertness and readiness. The left has the opposite effect and acts like a brake system, activating the parasympathetic nervous system — the rest and relax side that lowers blood pressure, cools the body, and reduces anxiety (pp. 41-42).

Cycling between both nostrils allows our bodies to operate most efficiently in a state of balance, pivoting between action and relaxation, creativity, and reasoned thought (p. 42).



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"the different areas of the turbinates work together [and] they heat, clean, slow, and pressurize air so that the lungs can extract more oxygen with each breath," making it superior to mouth breathing.*



One technique is to begin by closing your right nostril with your finger and inhaling slowly through your left nostril. Pause briefly at the top of the breath, pinch both nostrils closed, and then release the right nostril to exhale. At the conclusion of the breath, pinch both nostrils closed and then release the right nostril to inhale. Continue alternating breaths for five to ten cycles (pp. 219-220).

### **Slow Down: Resonant (Coherent) Breathing**

“When breathing at a normal rate, our lungs will absorb only about a quarter of the available oxygen in the air. The majority of that oxygen is exhaled back out. By taking longer breaths, we allow our lungs to soak up more in fewer breaths” (p. 81).

Breathing more slowly allows us to enter aerobic respiration, the process by which the body utilizes oxygen to make energy from air and food. When our cells operate with oxygen, “we gain some 16 times more energy efficiency over anaerobic respiration” (pp. 24-25).

When we breathe too quickly or too much, our body resorts to anaerobic respiration, the process by which the body utilizes stored glucose to make energy from air and food when it does not have enough oxygen. This process is intended to serve as a backup system. It is “inefficient and can be toxic, creating an excess of lactic acid” (pp. 24-25).

The technique outlined below is a calming practice that places the heart, lungs, and circulation into a state of coherence, aiding the systems of the body to work at peak efficiency. Nestor believes this breathing exercise to be the most essential technique (p. 221).

Sit up straight, relax, and exhale. Begin by breathing in, filling up the belly and then the chest. Without pausing, exhale for 5.5 seconds pushing the air out of your chest first and then belly. “Each breath should feel like a circle.” Repeat for at least 10 breaths, or as many times as possible (p. 221).


### **Breathe Less**

Just as America has become a culture of overeaters, “we’ve also become a culture of over breathers... up to a quarter of the modern population suffers from more serious chronic breathing” (p. 86).


When we breathe too much, issues can arise in our lung function and constrict our airways. In addition, over breathing expels too much carbon dioxide and our blood pH levels become more alkaline.

Alternatively, when we breathe slower, our blood pH lowers and our blood becomes more acidic. Our body functions best at a blood pH of 7.4, a sweet spot between alkaline and acidic (p. 102).

In order to align our breath with our bodies’ metabolic needs, the majority of us need to breathe less, more deeply, and slower.



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## Don't Forget to Breathe

"Breathing is more than just a biochemical or physical act; the tens of billions of molecules we bring into our bodies influence nearly every internal organ, telling them when to turn on or off. Breathing is a power switch to a vast network called the autonomic nervous system" (pp. 143-144).

The vagus nerve is a meandering network within the autonomic nervous system that connects to all the major internal organs. It acts as a power switch, turning organs on or off in response to stress (p. 148).

In the modern world, the vagus nerve stays half-stimulated because we spend a majority of our day experiencing some level of anxiety, never fully relaxing (p. 149).

Continuous partial attention and "email apnea" are conditions commonly found in many office workers. The distractions of the modern world prevent us from ever really focusing on one task and can contribute to a lack of breathing for a half minute or longer, which can contribute to the same symptoms as sleep apnea (p. 172).

Communication problems along the vagal and autonomic network brought on by chronic stress are linked to maladies such as tingling in the fingers, rapid heart rate, and diabetes (p. 149).

### The Role of Chemoreceptors

Breathing at a normal rate also helps us control "a cluster of neurons called the central chemoreceptors, located at the base of the brain stem" (p. 169).


These chemoreceptors instruct the body to breathe more slowly when we're breathing too quickly and vice versa, dictating how fast and how often we breathe. However, the indicator for the chemoreceptors is the level of carbon dioxide, not oxygen, in our bodies (p. 170).

Chemoreceptors have the ability to flex and shift; free divers, singers, sprinters, and elite mountain climbers have trained their chemoreceptors "to withstand extreme fluctuations in carbon dioxide without panic" (p. 170).

A broken line of communication between chemoreceptors and the brain can impact our mental health because we are conditioned to panic when we're denied a breath or believe we cannot breathe.


Panic can be generated not only by external psychological threats, but also by chemoreceptors and breathing (pp. 170-171).

Breath-holding techniques can help train chemoreceptors and decrease the panic associated with the fear of not being able to take another breath.



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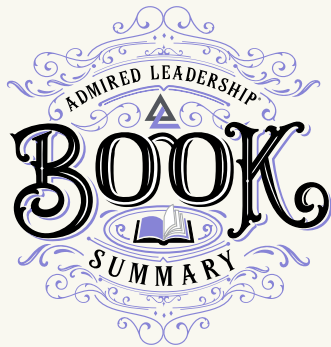
*Breath-holding techniques can help train chemoreceptors and decrease the panic associated with the fear of not being able to take another breath.*



Outlined below is a basic breath-holding technique intended to extend the time between inhalations and exhalations which will, in turn, reduce your blood pressure and lower anxiety.

Begin by sitting up with a straight back, inhale and then exhale to the natural conclusion. Then using a stopwatch, note the time it takes to feel the first potent desire to breathe and inhale. This time is your Control Pause. Next, exhale gently and hold your breath for half the time of the Control Pause. Repeat from 100 to 500 times daily (pp. 222-223).

Nestor, J. (2020). **Breath: The New Science of a Lost Art**. New York: Penguin Random House.



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