The Power of Breath

When our mind is out of control, the power of breath can calm and centre us, explains Jason Liem

WRITER
JASON W BIRKEVOLD LIEM

Breathing is the link between the brain and the body. It's the number one thing to give our mind a reset. When we feel nervous, stressed, overwhelmed or catch ourselves overthinking, breathing protocols can get us back to a calm, relaxed and controlled state of being. When we are out of breath, it means we are out of control. When our mind is out of control, our breathing typically follows.

Breathing is something we do that is so subtle and automatic, yet essential to our health and wellbeing. We breathe approximately 25,000 times each day. Every breath impacts our heart rate, blood pressure, thinking and emotions. It's one of the most powerful things we can do every day or at any moment of stress. The power of breath allows us to steer our focus and energy.

Since breathing is both a voluntary and involuntary process, we can consciously tweak it to calm our brain activity to positively affect our mental and emotional health. It's about bringing awareness to your breath so you can get out of your head and into the present moment. This habit will serve us well when we catch ourselves over-analysing things.

One of my hopes is that you will implement one of the following breathing protocols in your life.

If you wish, you can skip to the end to read about the breathing protocols that work remarkably well to turn off our stress response and put us into a calm state. I find the skills are even more effective if I understand the science behind why and how the skills affect me psychologically and physiologically.

Keep your mouth shut

The key to physiologically buffering stress is dependent on our carbon dioxide (CO_2) tolerance.

The role of breathing is to exhale carbon dioxide (CO_2) and inhale oxygen (O_2). The primary function of the protein haemoglobin, found in our red blood cells, is to transport O_2 from the lungs to the tissues and transport CO_2 from the tissues to the lungs. When the body is in a healthy equilibrium, there is a balanced O_2 and CO_2 exchange.

CO_2 is responsible for offloading O_2 from the blood to our tissues. It means increased levels of CO_2 lead to increased release of O_2 by haemoglobin into our tissues, muscles and organs. With more O_2, our brains can think clearly, and our body feels energised.

We affect CO_2 levels by how we breathe. There are receptors in the brain that monitor O_2 and CO_2 concentrations in the blood. When CO_2 increases, these receptors tell us to breathe. The reason we breathe is in response to the accumulation of CO_2 in the blood.

Many of us breathe through our mouths and offload CO_2 too quickly and in large amounts. This rapid offloading means we are decreasing the concentration of CO_2, and it reduces the delivery of O_2 to our tissues and muscles. It can leave us gasping for air or feeling a general state of fatigue. This further perpetuates an increased breathing rate (over-breathing) to get more air.

If over-breathing becomes a habit, a biomechanical change happens to the receptors telling us when to breathe. This change translates into a decreased

tolerance to CO_2, the very gas that is needed to deliver O_2 into our blood. This intolerance also means the body and brain have a reduced capacity for dealing with stress.

The nose knows

The nose is a remarkable structure. Most of us will never have given any thought to its many advantages.

The nasal passages' design helps to warm and humidify the air we inhale. Our breath temperature can rise more than 4°C on the way from the nose to the lungs. Tiny hairs, called cilia, cover our nasal passages, which act as a filtering system. Cilia help remove a significant share of germs, irritants and bacteria, purifying the air before it reaches our lungs.

The nose's structure creates greater resistance to airflow when we exhale. It forces better use of our diaphragm, keeping the air in our lungs a little longer, which slows down the offloading of CO_2. This gradual release can increase the amount of O_2 that enters our bloodstream with each breath by as much as 20%. Nose breathing stimulates an area of our nasal sinuses that delivers nitric oxide, which mouth breathing doesn't activate.

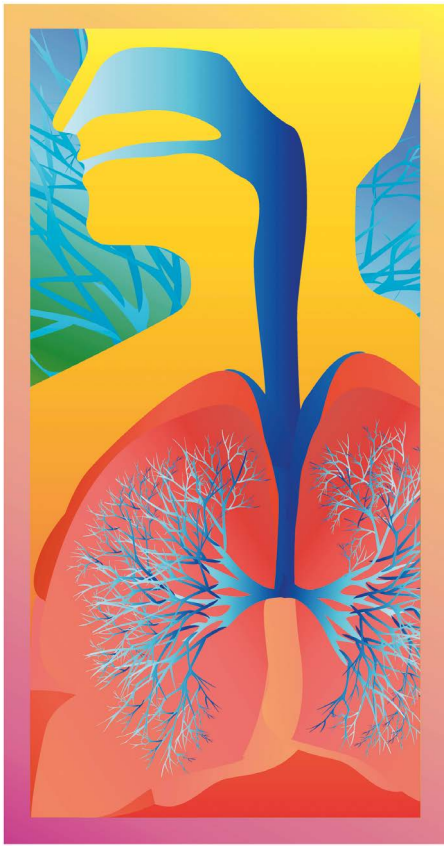
The 'wow' effect of nitric oxide (NO)

Nitric oxide (NO) plays a significant role in respiration by expanding blood vessels and alveoli to increase O_2 uptake in the blood. Alveoli is where the exchange of O_2 and CO_2 takes place. (Our lungs consist of approximately 300 million alveoli – tiny air sacs that look like clusters of grapes.)

The benefits of NO don't end there:

- It plays an anti-inflammatory role in the arteries.
- It aids in preventing clotting and obstructions in the arteries.
- It decreases blood pressure and improves blood flow to the organs.
- It enhances memory and learning.
- It promotes a healthy digestive tract by regulating the secretion of digestive hormones and enzymes.

When we breathe lightly through the nose, we carry a higher concentration of NO into the lungs. We can increase the



concentration of NO in the nasal cavity by 15% merely by humming as we exhale through our nose. The vibration caused by humming mixes the air from the paranasal sinuses with the air in the nasal passage. It's in the paranasal sinuses where the primary production of NO happens.

One last fact about NO is that it has a strong antibacterial effect, killing both viruses and bacteria. Several studies have shown that NO has killed bacteria such as salmonella, shigella, and many other types.

Stress and breathing

Our breathing directly impacts the autonomic nervous system (ANS), which consists of two branches, the sympathetic and the parasympathetic.

The sympathetic nervous system (SNS) – the fight or flight – is engaged each time we inhale and puts us into a more alert state. It primes the body for acting in threatening situations for survival.

The parasympathetic nervous system (PNS) – the rest and digest – is activated any time we exhale and shifts us into a calmer state – such as when we are sleeping or eating.

The vagus nerve, a part of the PNS, runs from the brain stem and connects the tongue, vocal cords, lung, heart, and other organs. This major nerve also influences our metabolism, digestion, production of enzymes, hormones, and so much more.

If we want to manage an anxious or stressed state, it means activating the PNS through the different breathing protocols found below. These protocols stimulate the vagus nerve, shifting us into a more relaxed state.

Shifting states

Consider each of these three elements (the mental, physical and emotional) as a state. Particular breathing patterns accompany our different states. When we feel secure and confident, our breath is deep and relaxed. When we feel uncertainty and self-doubt, our breath is shallow and constricted.

The ability to shift our state is dependent on being aware of how we are breathing at any one moment. Once we get into the habit of tracking the way we breathe, we open a window to observe and reflect on our current state.

For example, if I feel overwhelmed by work and deadlines, I need to take a brief moment to monitor my breath. I notice that my breathing is shallow and restricted.This awareness allows me the space to ask and answer the question – how do I choose to respond?

Whenever we notice/observe/perceive our breathing, it allows us to shift perspective from subjective to objective and take conscious action to change to a more helpful state. The fastest and most direct way to change our state is to consciously change our breathing patterns.

An excellent place to start is to teach ourselves to monitor our respiration with milder states such as when we are feeling a little annoyed or slightly concerned. This way, we will be more prepared when stickier states arise.

Nose breathing protocols

Remember, when we inhale, this increases our alertness by activating the SNS. When we exhale, this calms us by engaging the vagus nerve of the PNS. In general, our exhales should be longer than our inhales to put us into a calmer state.

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Protocol 1

Start with a 1:2 breath ratio, which means you engage the PNS pathway twice as much as the SNS. Inhale for a count of 3 and then exhale for 6. Do this for 10 to 15 breath cycles. One breath cycle includes an inhale and an exhale.

Once you feel comfortable with the 1:2 ratio, you can increase it to a 1:3 ratio. For example, you inhale for a count of 3 and then exhale for 9.

Protocol 2

Researchers from the Neurobiology Department at Stanford identified a natural breathing pattern called a physiological sigh. It is a biological, hard-wired circuit in our brains for rapidly destressing. It is most noticeable after someone has cried. Their inhales seem to shudder as they do a successive double or triple inhale. It is the physiological sigh in action.

If you recall from earlier in the article, 300 million alveoli make up our lungs. Some of these tiny air sacs collapse over time, and as a result, O_2 levels drop and CO_2 levels increase in the bloodstream. The build-up of too much CO_2 triggers the body's stress response.

Increasing the levels of O_2 in our bodies has a calming effect on our nervous system. The double inhales pop the alveoli open, allowing more O_2 in than a regular single inhale. And it is through the subsequent long exhale that we offload a massive amount of CO_2.

Picture blowing up a new balloon. You usually need to breathe twice into the balloon before it inflates. The first breath releases the balloon's insides that tend to adhere together. The second breath can then fill the balloon with air. This balloon effect is what happens to the alveoli when we inhale twice. More O_2 means more calm.

Protocol 3

The 4-7-8 breathing protocol, developed by Andrew Weil, is thought to reduce stress and calm anxiety.

Begin with an audible exhale to open your lungs and release any tension in your shoulders. Inhale slowly and deeply for a count of 4 while keeping your tongue pressed gently to the roof of your mouth. Then hold your breath for a count of 7 (this time allows for greater absorption of O_2 into our tissues). Finally, audibly exhale nice and slow for a count of 8 (offloading CO_2).

Protocol 4

On average, Westerners tend to breathe between 12 to 18 times per minute, with a moderate intake of about half a litre per breath. When breathing at this rate, our lungs absorb about a quarter of the available O_2 in the air. By taking longer and slower breaths, we allow our lungs to soak up more O_2.

James Nestor, the author of Breath: The New Science of a Lost Art, says the perfect breath cycle is a breathing rhythm of 5.5-second inhales followed by 5.5- second exhales, which works out almost exactly to 5.5 breaths a minute.

I practice this a couple of times a day. At first, it was awkward. After doing it for a few days, it became easier. Currently, I do this breathing protocol 2 to 3 times a day, and it always leaves me feeling alert, calm and focused.

Protocol 5

Box breathing is a breathing protocol designed to help you stay calm in intense situations.

It is quite simple. Inhale for a count of 4. Hold your breath for a count of 4. Exhale for a count of 4. With empty lungs, hold for a count of 4. Then repeat the entire breath cycle. Do this for 10 to 15 cycles before entering a demanding situation.

Conclusion

There is such a depth to the science of breathing that it's impossible to capture it all in one article.

I've shared what I believe to be the most useful science and breathing protocols, which significantly impact my work and life. I use them to improve my running and climbing. I use them when I'm feeling overloaded or to jolt my nervous system when I feel lethargic. These are the same protocols I teach to clients, which have a tremendous impact on managing stress.

One message I hope I've been able to communicate in this article is how something as simple as breathing can have such dramatic and positive effects on our psychology and physiology.

Jason W Birkevold Liem helps people to think about their thinking so they are better at managing themselves, others and situations. He achieves this through an informative and engaging process that educates people about the brain, cognitive psychology and interpersonal communication. As a result, clients are better able to face their professional and private challenges with more confidence, certainty and clarity. Through his company, MINDtalk, he designs and delivers brain-based leadership and personal resilience programs to individuals and to teams. Learn more at www.MINDtalk.no.

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