Slower Belly Breathing Facilitates Extreme Wellness via Your Vagus Nerve

Slow breathing stimulates the vagus nerve, boosts HRV and lowers blood pressure.

Aristotelian ethics defines eudaimonia as "Extreme Wellness, the condition of human flourishing or living well." In this post, we'll look at a few science-based ways that hacking the vagus nerve by mindfully slowing down one's breathing can improve psychophysiological well-being in ways that facilitate eudaimonia (i.e., a happy, healthy, and contented life). Eudaimonia is a core tenet of positive psychology.
Taking a deep diaphragmatic inhalation through your nose, followed by a long, slow exhalation through pursed lips, stimulates your vagus nerve, boosts your parasympathetic nervous system's robustness, and creates an inner sense of calm. The power of deep, slow "belly breathing" to counterbalance fight-or-flight stress responses is well established. (See here, here, here)

"Longer Exhalations Are an Easy Way to Hack Your Vagus Nerve." Is an article, I recommended a 1:2 ratio of breathing in for four seconds and breathing out for eight seconds; this breathing cycle takes 12 seconds, equating to five rounds of inhaling/exhaling per minute.

As a competitive athlete, I stumbled on a 1:2 (inhale:exhale) ratio of diaphragmatic breathing combined with some "relaxation response" mindfulness exercises as a reliable way to secrete tranquilizing "vagusstoff" (vagus nerve substance) on demand.

That said, yogis, yoginis, and ayurvedic practitioners have been recommending similar pranayama breathing exercises for millennia. Numerous yoga-based breathing techniques can benefit one's autonomic nervous system and facilitate a happy and healthy psychophysiological state of being.

What's Hypertension Got to Do With Slow-Paced Breathing?

Elevated blood pressure (i.e., hypertension) is one of the leading causes of morbidity and premature mortality in the United States and worldwide. The American Heart Association's "Heart Disease and Stroke Statistics—2019 Update" (Benjamin et al., 2019) for adults over age 20 in the U.S. estimated that about 116 million women and men have high blood pressure.
Roughly one decade ago, a study (Pramanik et al., 2009) on the immediate effect of slow-paced bhasrika pranayama breathing on blood pressure found that a respiratory rate of six inhalation/exhalation cycles per minute for five minutes caused a significant decrease in systolic and diastolic blood pressure.

"Slow pace bhasrika pranayama (respiratory rate 6/min) exercise thus shows a strong tendency to improve the autonomic nervous system through enhanced activation of the parasympathetic system," the authors concluded.

Now, a new study (Brenner et al., 2020) corroborates the physiological benefits of taking about five to seven diaphragmatic breaths per minute in conjunction with practicing a mindfulness technique. This paper, "Mindfulness with paced breathing reduces blood pressure," appears in the September 2020 issue of Medical Hypotheses.

According to the authors: "Paced breathing is deep diaphragmatic breathing with typical rates equal to or less than 5 to 7 breaths per minute compared with the usual rate of 12 to 14."

How Does Slow-Paced Breathing Lower Blood Pressure?

"One of the most plausible mechanisms is that paced breathing stimulates the vagus nerve and parasympathetic nervous system, which reduces stress chemicals in the brain and increases vascular relaxation that may lead to lowering of blood pressure," corresponding author Suzanne LeBlang of Florida Atlantic University's Schmidt College of Medicine said in a news release.

Another study (Pal et al., 2004) of different effects slow-paced breathing vs. fast-paced breathing has on autonomic functions found that slow-paced breathing increases parasympathetic activity and decreases sympathetic activity. However, the researchers didn't observe any significant changes in autonomic functions or flexibility associated with fast-paced breathing.

"The findings of the present study show that regular practice of slow breathing exercise for three months improves autonomic functions, while the practice of fast breathing exercise for the same duration does not affect the autonomic functions," Pal et al. concluded.

A recent systematic review (Nivethitha et al., 2017) of scientific research related to different yogic pranayama breathing techniques also concluded that
slow-paced breathing produced beneficial effects on cardiovascular and autonomic variables. In contrast, fast-paced breathing techniques did not have the same results.

How Can Slow-Paced Breathing Create an Upward Spiral of Eudaimonia?

Slow breathing at a rate of about 5 to 7 inhalation/exhalation cycles per minute stimulates vagus nerve activity, improves autonomic flexibility, and increases heart rate variability (HRV); with regular practice, this improves vagal tone.

Previous research (Kok & Frederikson, 2010) suggests that "autonomic flexibility, as indexed by vagal tone, reciprocally and prospectively predicts positive emotions" and is associated with psychological well-being. Another recent study (Liu, Ni, & Peng, 2020) found that young adults with higher HRV also tended to have higher Satisfaction With Life Scale (SWLS) scores.

Taken together, this accumulating body of evidence suggests that slow-paced breathing is a cost-free and readily available way to facilitate eudaimonia by lowering blood pressure, improving psychophysiological well-being, and increasing happiness.

References


