

# Breathing Practices

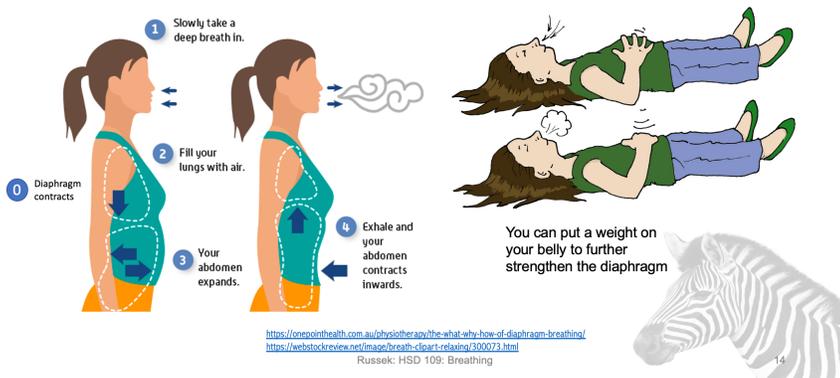
## Diaphragmatic Breathing

At rest, you should be using a diaphragmatic breathing pattern, not a chest breathing pattern. To figure out which pattern you are using, place one hand on your chest and one on your belly, and feel which moves. If the chest moves, or if both move, you are using accessory breathing muscles at rest, when they should only be used when you are exerting yourself (exercising or active). Problems if your diaphragm is not functioning properly:

- Overuse of accessory muscles of breathing in the neck and chest, leading to chest, back and arm pain
- Problems with swallowing and sleep apnea, sleep disturbance
- Asthma, shortness of breath, decreased exercise/activity tolerance
- Lumbar and sacroiliac instability and pain; Increased low back muscle spasm and excessive arch in the back
- Weak hamstring and abdominal muscles
- Decreased heart function
- Decreased lymphatic fluid movement through the body, increased fluid build-up
- Anxiety, psychological stress and increased sympathetic nervous system activity, aggravating POTS
- Migraine, tinnitus (ringing in your ear)
- Gastroesophageal reflux (GERD), irritable bowel syndrome (IBS), hypersensitive gut

(Kocjan, 2017, Bordoni, 2018; Hamasaki, 2020)

## Diaphragmatic Breathing Practice



To practice diaphragmatic breathing, either sit or lie on your back with one hand on your belly and one on your chest. As you inhale, try to expand your belly as though it were filling with air (actually, the diaphragm pushes the intestines out as the lungs fill). Placing a book on your belly can help your brain figure out what to do. When you exhale, try to just relax and let your belly drop. If you are practicing sitting, you may need to *gently* contract your abdominal muscles to pull your belly back in.

## Slow Breathing

Many people breathe too rapidly, leading to a condition called “over-breathing.” Normal breathing rates are 8-12 breaths per minute, but the healthiest rate is 6 breaths/minute (5 seconds in, 5 seconds out). Many people therefore benefit from practicing slow breathing. Benefits of slow breathing include: (Russo, 2017)

- Improved diaphragm mobility and function (see benefits of diaphragmatic breathing, above)
- Improved efficiency of breathing
- Increased heart function
- Improved heart rate variability (HRV), a measure of autonomic function, and improved parasympathetic function
- Improved vagus nerve function (improves gut function)
- Improved response to position changes (e.g. standing), which can be helpful for people with POTS

**Slow breathing practice:** 6 breaths/minute (5 seconds in, 5 seconds out)

- <https://youtu.be/PzwTAF2YLh4>; Apple Watch & Fitbit also have slow breathing functions
- **“365 Breathing”**
  - 3 times per day
  - Breath 6 times/minute (= 5 seconds in, 5 seconds out)
  - For 5 minutes
  - 365 days/year
- **4-7-8 breathing** (Video of Dr. Weil explaining: <https://youtu.be/p8fjYPC-k2k>)
  - Inhale through your nose for a count of 4
  - Hold your breath for a count of 7
  - Exhale through your mouth making a swooshing sound for a count of 8
  - Repeat only 4-8 times per session, 2x/day

## Nose Breathing is Better than Mouth Breathing

Most of the time, you should be breathing in and out through your nose. During some yoga breathing practices, you may be instructed to breathe in through the nose and out through the mouth. However, most times, you should be nose breathing. Tables 1 & 2, below, are from an article by Ruth, 2015.

**Table 1: Possible adverse consequences of chronic mouth breathing**

### Chronic mouth breathing may contribute to:

- Introduction of unfiltered, poorly humidified air into the lungs
- Upper-chest breathing (inefficient and tiring)
- Chronic over-breathing
- Greater incidence of snoring and sleep apnoea
- Bad breath, dental decay, gum disease
- Dysfunction of the jaw joint (temporomandibular joint disorders)
- Narrowing of the dental arch, jaw and palate
- Crowded and crooked teeth
- Open bite, malocclusion (teeth not fitting together properly)
- Greater potential for relapse of orthodontic corrections
- Dysfunctions of the muscles around the jaw and lips
- Loss of lip tone with the lips becoming flaccid
- Noisy eating, speech and swallowing problems
- Trauma to soft tissues in the airways
- Enlarged tonsils and adenoids

*Adapted from Graham T (2012)*

**Table 2: Benefits of nose breathing**

### Nose breathing is beneficial because it:

- Warms, moistens and filters the air
- Traps large particles with the nose hairs and small particles via mucous membranes
- Facilitates inhalation of nitric oxide – a vasodilator and bronchodilator that increases oxygen transport throughout the body
- Helps prevent colds, flu, allergic reaction, hay fever, irritable coughing
- Retains some moisture from exhaled air, preventing nasal dryness
- Provides a sense of smell
- Regulates (slows) airflow because of the nose's intricate structures
- Facilitates correct action of the diaphragm
- Promotes activity of the parasympathetic nervous system, which calms and relaxes the body, slows the breathing and the heart, promotes digestion
- Allows the correct position of the tongue (against the upper palate) and lips (together), assisting formation of the natural dental arches and straight teeth
- Reduces likelihood of snoring and apnoea

*Adapted from Graham T (2012)*

To clear the sinuses: (if you are hypermobile, do the head nod very gently, or move your body instead)

“To decongest the nose, instruct the student to perform the following:

- Take a normal breath in and out through your nose;
- Pinch your nose with your fingers to hold your breath;
- As you hold your breath, move your body or gently nod your head up and down;
- Hold your breath for as long as you can—until you feel a strong air hunger;
- Let go of your nose and breathe through it as calmly as possible.
- Repeat 6 times with a 30–60 s rest between each repetition.” (McKeown, 2021)

(Video of this clearing the sinus exercise: <https://youtu.be/vKKO8DC3cgo>)

## Resources:

- Andre C. Proper Breathing Brings Better Health. *Scientific American*. Jan, 2019. Available at: <https://www.scientificamerican.com/article/proper-breathing-brings-better-health/> (popular science article)
- Nestor J. *Breath: The New Science of a Lost Art* (book focuses on research findings, with breathing exercises at the end)
- Buteyko breathing: <https://innovativemedicine.com/wp-content/uploads/2017/04/Buteyko-Breathing-Guide.pdf>.
- Bordoni B, Morabito B. Symptomatology Correlations Between the Diaphragm and Irritable Bowel Syndrome. *Cureus*. Jul 23 2018;10(7):e3036.
- Hamasaki H. Effects of Diaphragmatic Breathing on Health: A Narrative Review. *Medicines (Basel)*. Oct 15 2020;7(10).
- Kocjan J, Adamek M, Gzik-Zroska B, Czyżewski D, Rydel M. Network of breathing. Multifunctional role of the diaphragm: a review. *Adv Respir Med*. 2017;85(4):224-232.
- McKeown P, O'Connor-Reina C, Plaza G. Breathing Re-Education and Phenotypes of Sleep Apnea: A Review. *J Clin Med*. Jan 26 2021;10(3).
- Russo MA, Santarelli DM, O'Rourke D. The physiological effects of slow breathing in the healthy human. *Breathe (Sheff)*. Dec 2017;13(4):298-309.
- Ruth A. The health benefits of nose breathing. *Nursing in General Practice*. 2015. Available at: <https://www.lenus.ie/bitstream/handle/10147/559021/JAN15Art7.pdf>. Accessed 7/1/20.