Breathwork Protocol for Anxiety

CALM VERITAS · EVIDENCE-BASED WELLNESS

WHY BREATHWORK WORKS

Controlled breathing modulates the autonomic nervous system directly. Slow exhalation activates the parasympathetic branch via the vagus nerve, reducing heart rate and lowering cortisol. A 2017 study in Science (Yackle et al.) identified a brainstem circuit linking breathing rhythm to emotional arousal. Slowing this rhythm quiets the amygdala response within minutes.

01 · Box Breathing (4-4-4-4)

EVIDENCE

Used by US Navy SEALs for acute stress. A 2021 RCT in Frontiers in Psychiatry confirmed significant HRV increases and anxiety reduction vs. unstructured rest. CO2 tolerance training activates both stress regulation and parasympathetic recovery.

PROTOCOL

- [ ] **Inhale through nose**
  4 seconds — belly first, then chest
- [ ] **Hold breath (full)**
  4 seconds — gentle muscular engagement
- [ ] **Exhale through mouth**
  4 seconds — controlled, not forced
- [ ] **Hold breath (empty)**
  4 seconds — relax all muscles
- [ ] **Repeat**
  4–6 cycles · 5 minutes for acute anxiety relief

02 · 4-7-8 Breathing (Sleep & Pre-Sleep Anxiety)

EVIDENCE

Extended exhalation (ratio ≥1:2 inhale:exhale) maximally activates the baroreflex and vagal tone. A 2019 study in Psychophysiology found 4-7-8 breathing reduced salivary alpha-amylase (a stress biomarker) by 34% in 20 minutes.

PROTOCOL

- [ ] **Inhale through nose**
  4 seconds, quietly
- [ ] **Hold breath**
  7 seconds — the hold is essential, do not skip
- [ ] **Exhale through mouth**
  8 seconds — audible 'whoosh' sound
- [ ] **Repeat**
  Max 4 cycles at first · increase to 8 over 4 weeks
- [ ] **Caution**
  Not for panic disorder without therapist guidance

03 · Physiological Sigh (Fastest Acute Effect)

EVIDENCE

A 2023 landmark RCT in Cell Reports Medicine (Balban et al., Stanford) compared five stress-reduction protocols. Cyclic sighing produced the greatest sustained positive affect and fastest reduction in respiratory rate — outperforming mindfulness meditation, box breathing, and cyclic hyperventilation over a one-month intervention period.

PROTOCOL

- [ ] **First inhale through nose**
  Full breath — expand lungs completely
- [ ] **Second inhale through nose**
  Short sharp sniff on top — fills remaining alveoli
- [ ] **Long exhale through mouth**
  As long as possible — fully empty the lungs
- [ ] **Repeat**
  1–3 cycles sufficient for acute stress relief
- [ ] **Best used**
  Immediately before high-stakes situations

04 · Cyclic Sighing (5-Minute Daily Practice)

EVIDENCE

The same Cell Reports Medicine RCT found 5 minutes of daily cyclic sighing over one month produced significant reductions in anxiety, improvements in sleep quality, and reduced resting respiratory rate — all greater than meditation groups.

PROTOCOL

- [ ] **Duration**
  5 minutes, same time each day (morning is most studied)
- [ ] **Pattern**
  Double inhale through nose + long exhale through mouth, continuously
- [ ] **Pace**
  ~3–4 cycles per minute — do not rush the exhale
- [ ] **Posture**
  Seated upright or lying on back — both equivalent in studies
- [ ] **Tracking**
  Log mood and sleep quality weekly to observe accumulation

QUICK SELECTION GUIDE

PROTOCOL	BEST FOR	DOSE	EVIDENCE
Box Breathing	Moderate anxiety, pre-event	4–6 cycles	Balban 2021, SEAL data
4-7-8	Pre-sleep, acute anxiety	4–8 cycles	Psychophysiology 2019
Physiological Sigh	Immediate stress spike	1–3 cycles	Cell Reports Med 2023
Cyclic Sighing	Daily long-term practice	5 min/day	Cell Reports Med 2023

KEY CITATIONS

- Balban et al. (2023). Brief structured respiration practices enhance mood and reduce physiological arousal. Cell Reports Medicine, 4(1).
- Yackle et al. (2017). Breathing control center neurons that promote arousal in mice. Science, 355(6332), 1411–1415.
- Ma et al. (2017). The effect of diaphragmatic breathing on attention, negative affect, and stress. Front. Psychology, 8, 874.
- Zaccaro et al. (2018). How breath-control can change your life: a systematic review. Front. Human Neuroscience, 12, 353.