Relaxation Breathing for Enhanced Sleep

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Professor, Research & Teaching Faculty,

Techniques to Reduce Stress

30 minutes of daily moderate exercise

Mindfulness and meditation

Progressive muscle relaxation

Yoga

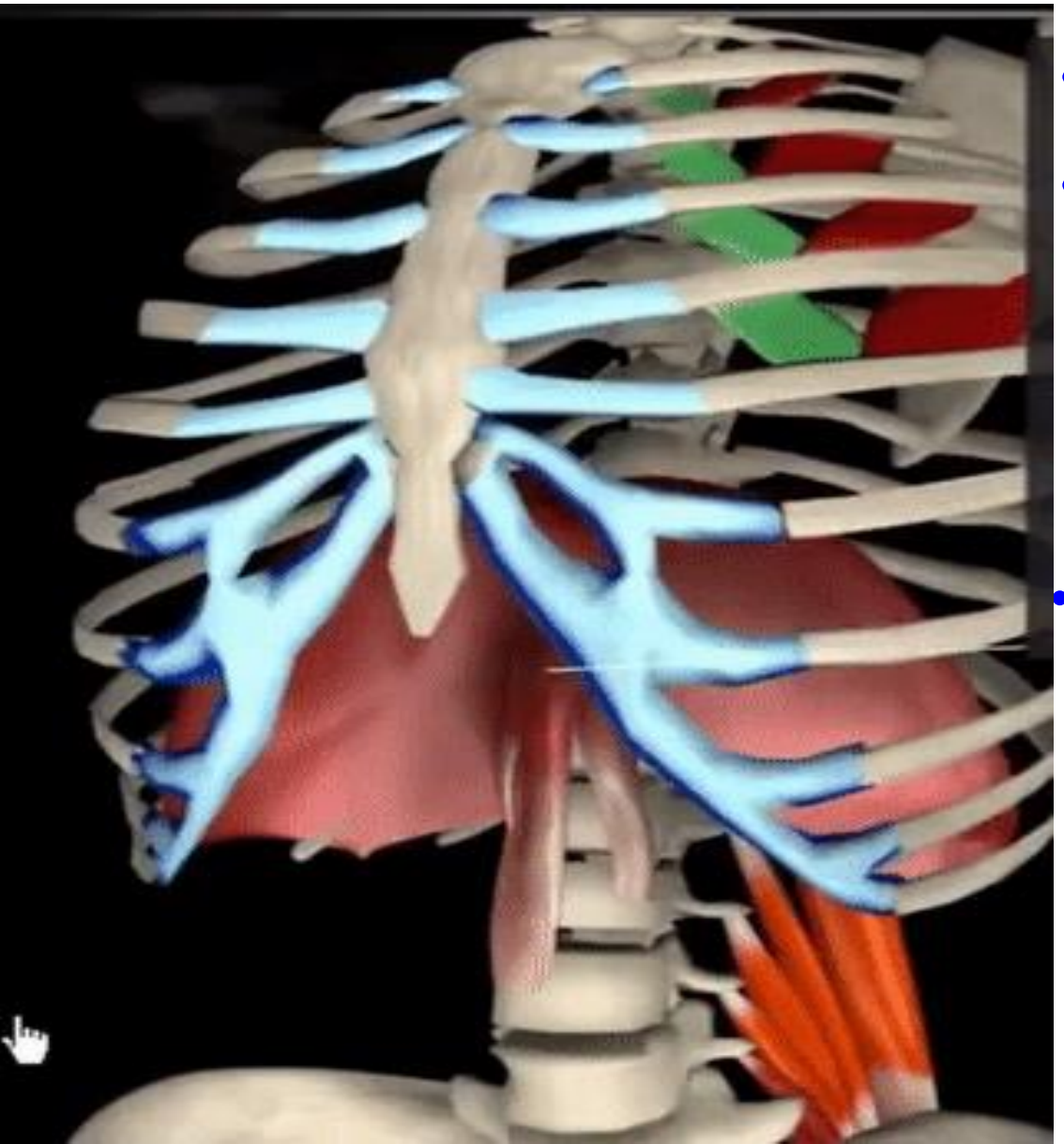
Visualization

Slow, deep breaths

Learning Objectives: Upon completing this course, participants should be able to:

- Recognize breath is the interconnection between mind & body in regulating physiological functions
- Examine different breathing styles & their unique impacts
- Apply practical relaxation breathing exercises to improve sleep. These exercises help down-regulate the sympathetic nervous system (fight & flight) while up-regulating the parasympathetic nervous system (rest & repair)
- Utilize intentional breathing practices to boost cognitive functions & manage emotions such as anxiety & anger
- Integrate proper breathing techniques into daily life for enhanced self-awareness & mindfulness

Diaphragmatic/Belly Breath - Improves O_2 & CO_2 Gas Exchange



- **Inhale**, diaphragm moves↓ abd out
- **Exhale**, diaphragm↑ → abd in
- Slow, quiet, rhythmic breathing ↑Vagal tone
- Diaphragm movement ↑circulation, lymphatic flow
- ↑Core muscle stability ↑physical, mental & spiritual health

Physiopedia- Diaphragmatic_Breathing_Exercises

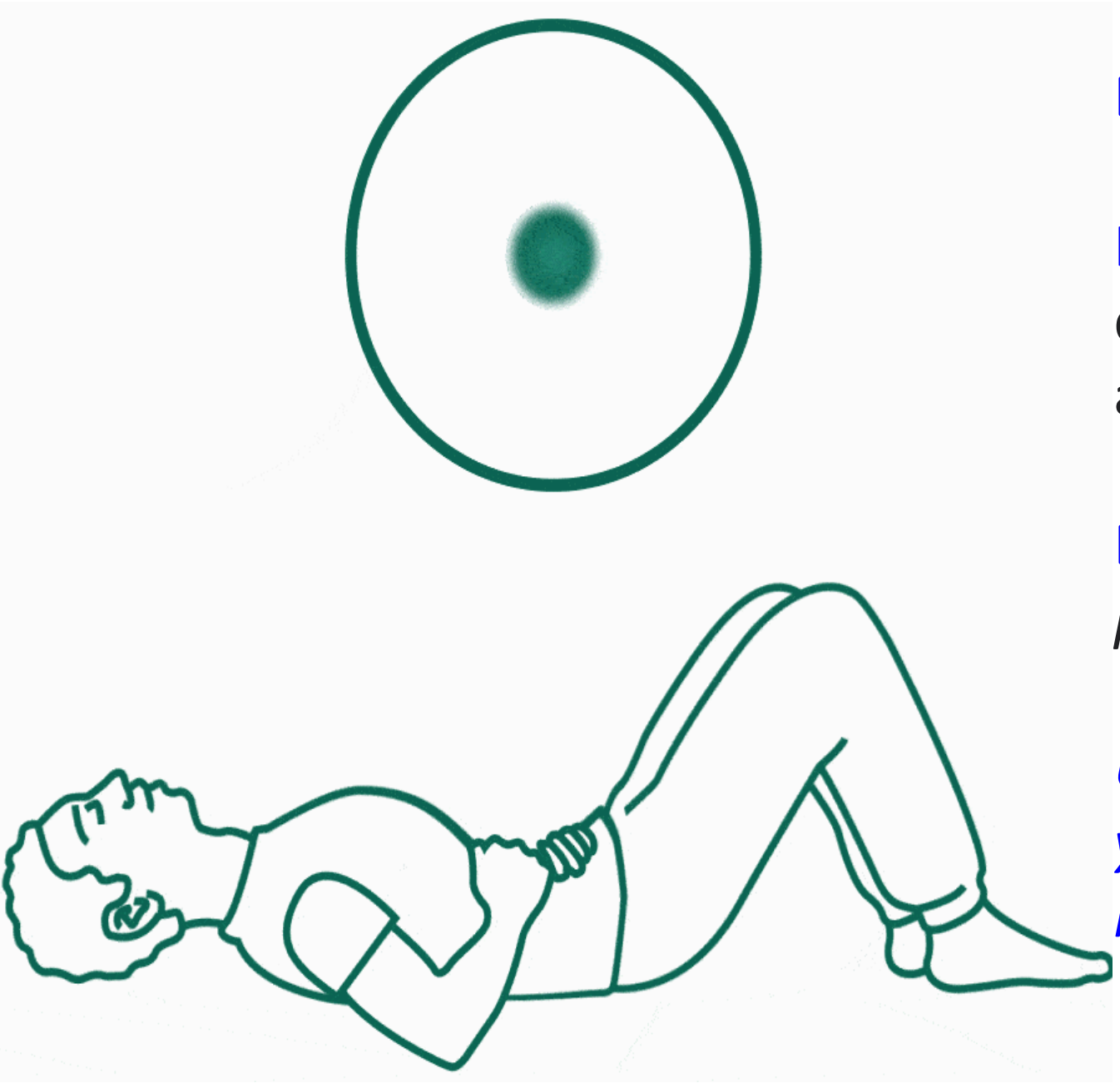
- *Sit Tall &* comfortably. Spine erect, shoulders relaxed, w/ a smile

- Place 1 hand over your abdomen

- **Breathe-in** thru your nose, allow abdomen to move out against your hand
- **Breathe-out** slowly. Feel abdomen collapse & sink in

- Repeat by inhaling w/ awareness of cool breath entering your nose & abdomen distending like a balloon, then deflate

- Synergy of breath and movement quietens body-mind, reduces physical/mental tension



Efficient Diaphragmatic/Belly Breathing

Inhale: active contraction → diaphragm down → belly expands, compressing abdominal contents

Exhale: diaphragm & lung relax → *pushing air out*

Use your breath to untie the knots in your body and mind, esp before bedtime

Jens Spiesshoefer, Diaphragm Involvement in Heart Failure: Mere Consequence of Hypoperfusion or Mediated by HF-Related Pro-inflammatory Cytokine Storms, ncbi.nlm.nih.gov/2019

Relaxation Response ↑Vagal tone

- Eyes closed, spine erect, neck & shoulders relaxed
- ***Inhale*** *Calmness/Peace/Ease* ***Exhale*** *Release/Stress/Tension*
- Progressive muscle relaxation, Meditation

→ Hypo-metabolic physiological state

- De-Stress, ↓anxiety, anger → ↑sleep
- ↓BP , RR, Cortisol, Adrenaline, Noradrenaline

Wallace, RK et al., *A Hypometabolic Physiologic State,* Amer J Phys, 221(1971):795-9

Sitting *Cresent-Moon, ArdhaChandrasana*
Seated Konasana

With Mindfulness Feel the difference between Right & Left sides

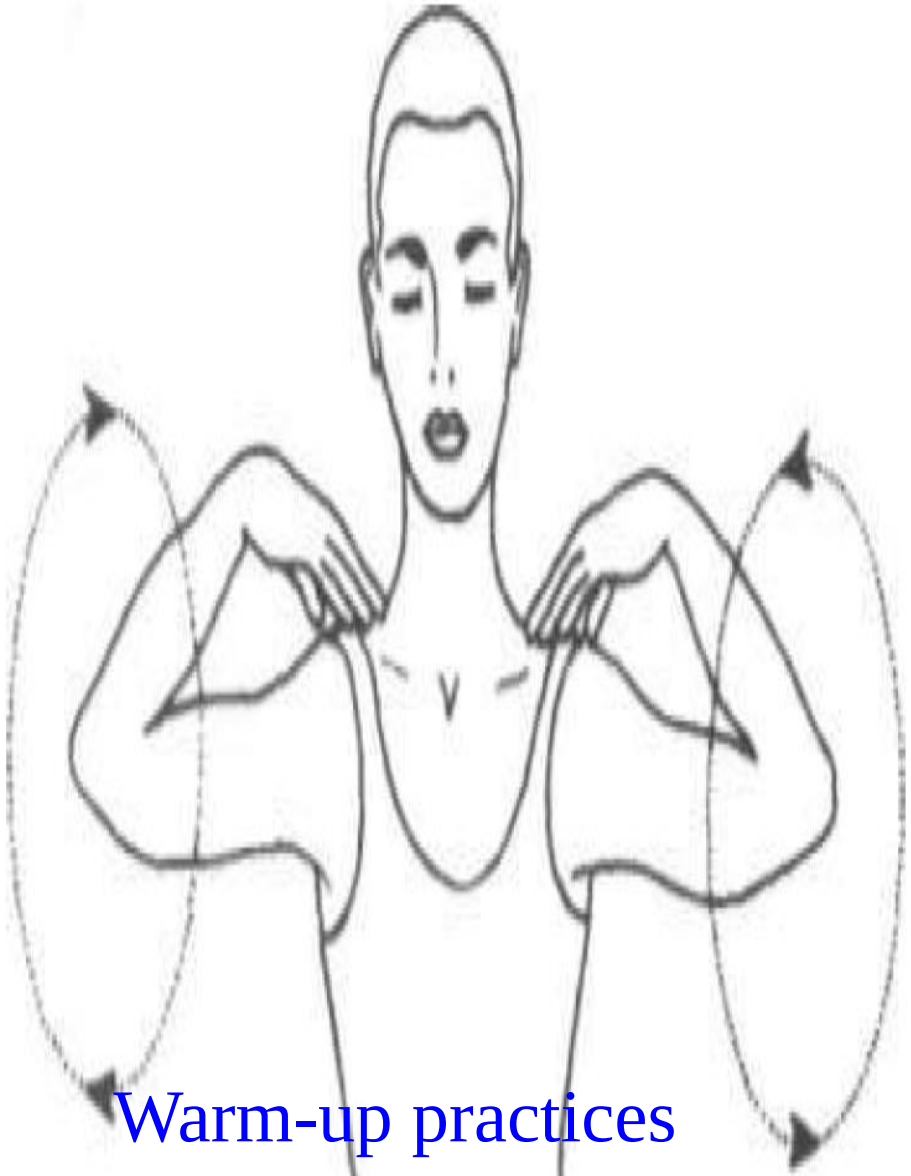
→Improve balance, flexibility, joint mobility, focus

Reduce back pain & stiffness from prolonged sitting


Side Stretch Pose
Upavsistha Lunge variation
Seated Warrior prep pose


Seated Trikonasana
John Travolta Pose

Skandha Chakrasana



Warm-up practices
Shoulder socket rotation
Draw circles with elbows

Cow-Face Pose
Gomukhasana

•Place right hand on scapula, turn thumb towards ground

•Place back of left hand on the spine. Bend elbow. Turn left palm outwards

•Interlock the fingers of both hands

• Spine erect, Shoulder-neck relaxed, head straight

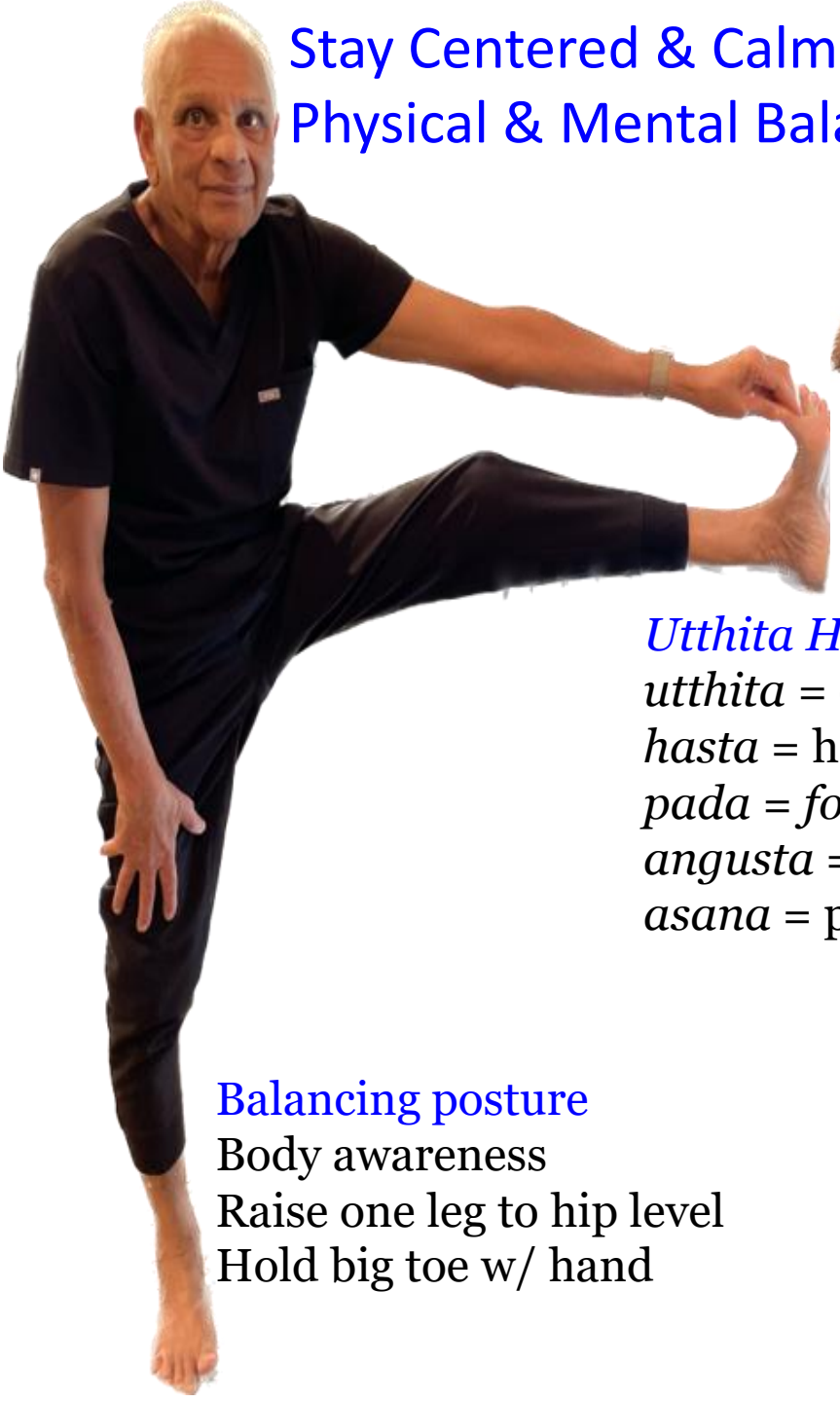
• Squeeze shoulder blades together, keep looking forward, push heart forward


Prep Ardha Matsyendrasana
Seated Spinal Twist, Vakrasana


Extended Side Angle Pose
Utthita Parsvakonasana
Sidebend, *Urdhva Hastasana*
Utthita=standing
Urdha=up
Sideway stretching activates core muscles
Expands breathing
Brings feelings of spaciousness & levity

Stay Centered & Calm

Physical & Mental Balance on & off the mat

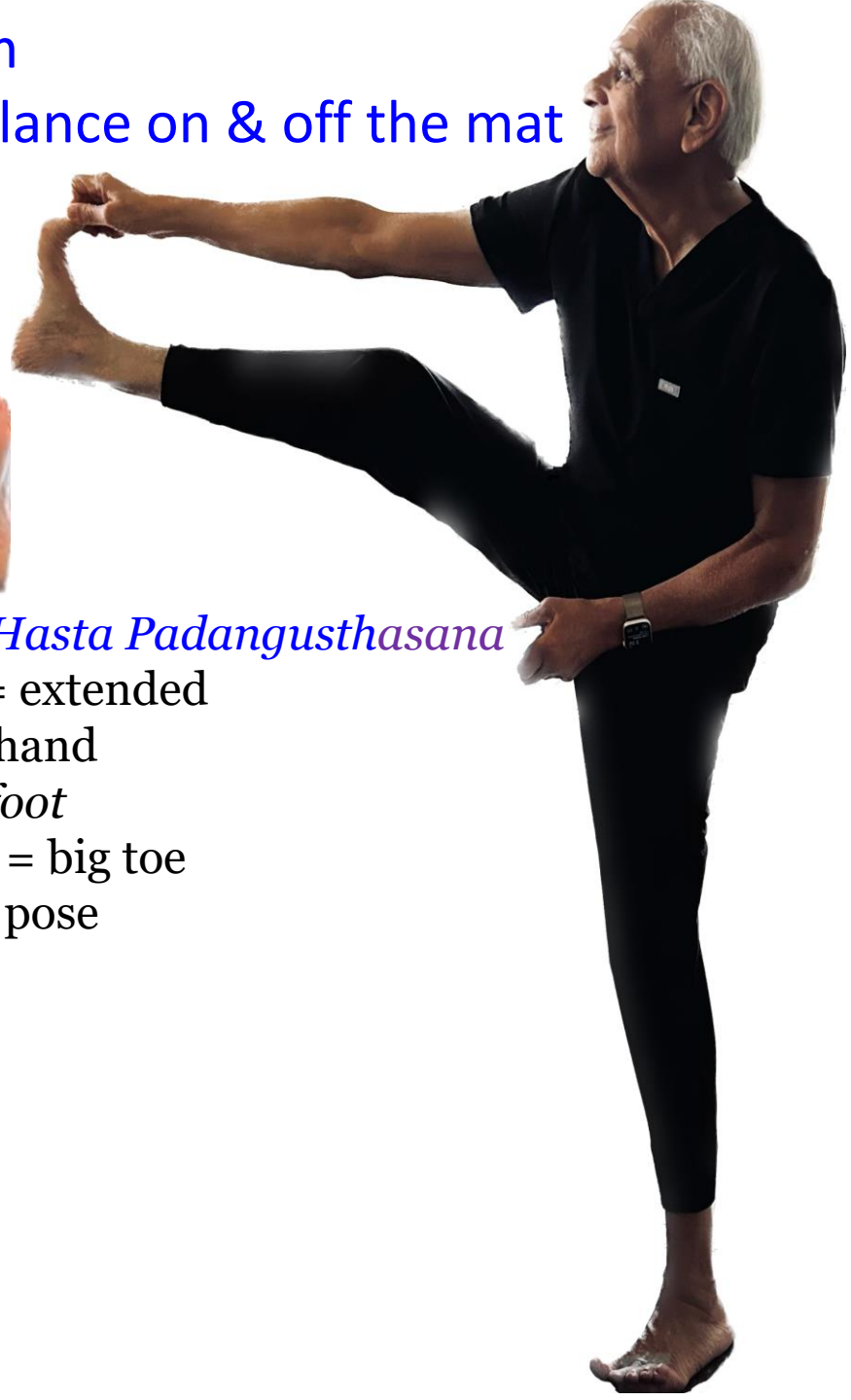


Balancing posture

Body awareness

Raise one leg to hip level

Hold big toe w/ hand



Utthita Hasta Padangusthasana

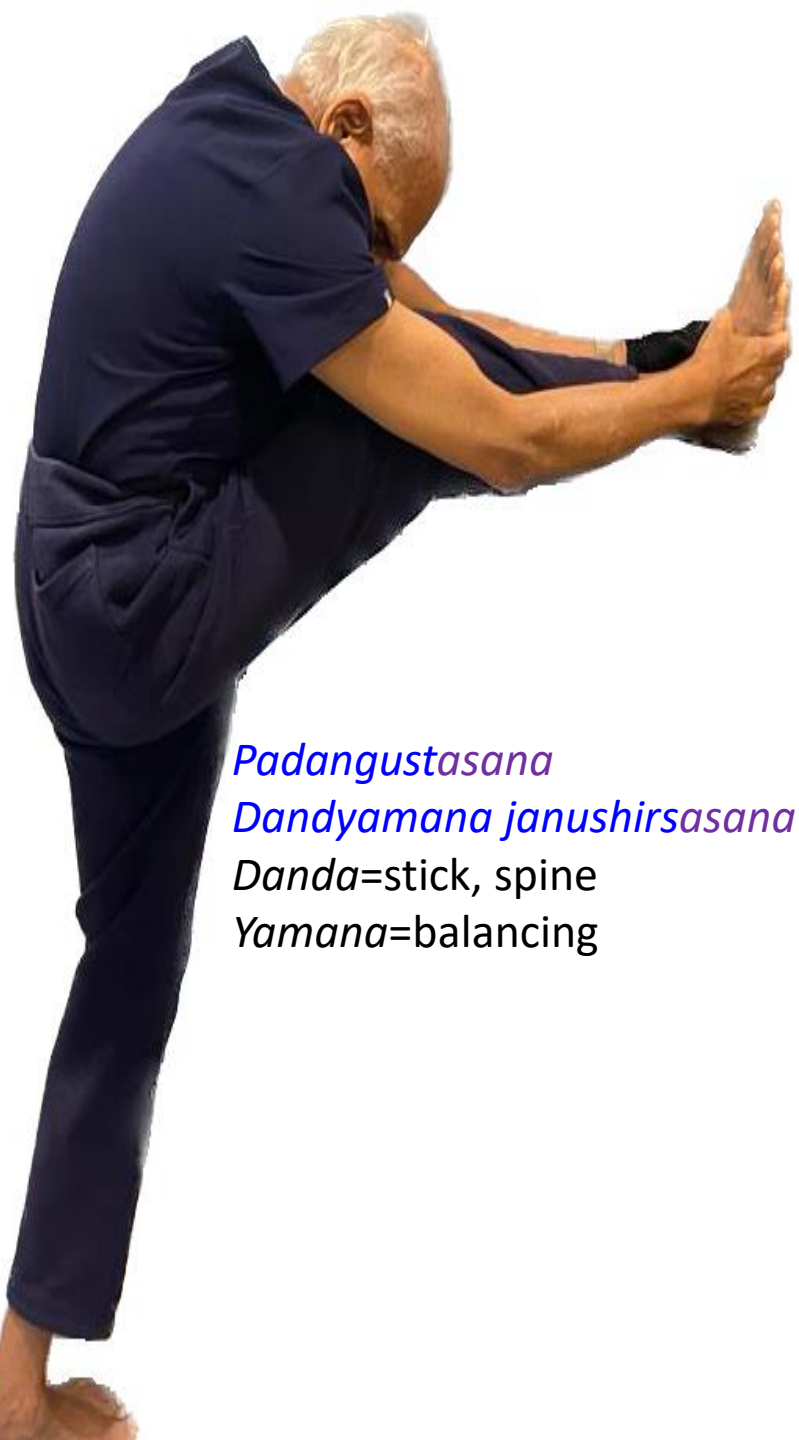
utthita = extended

hasta = hand

pada = *foot*

angusta = big toe

asana = pose



Padangustasana

Dandyamana janushirsasana

Danda=stick, spine

Yamana=balancing

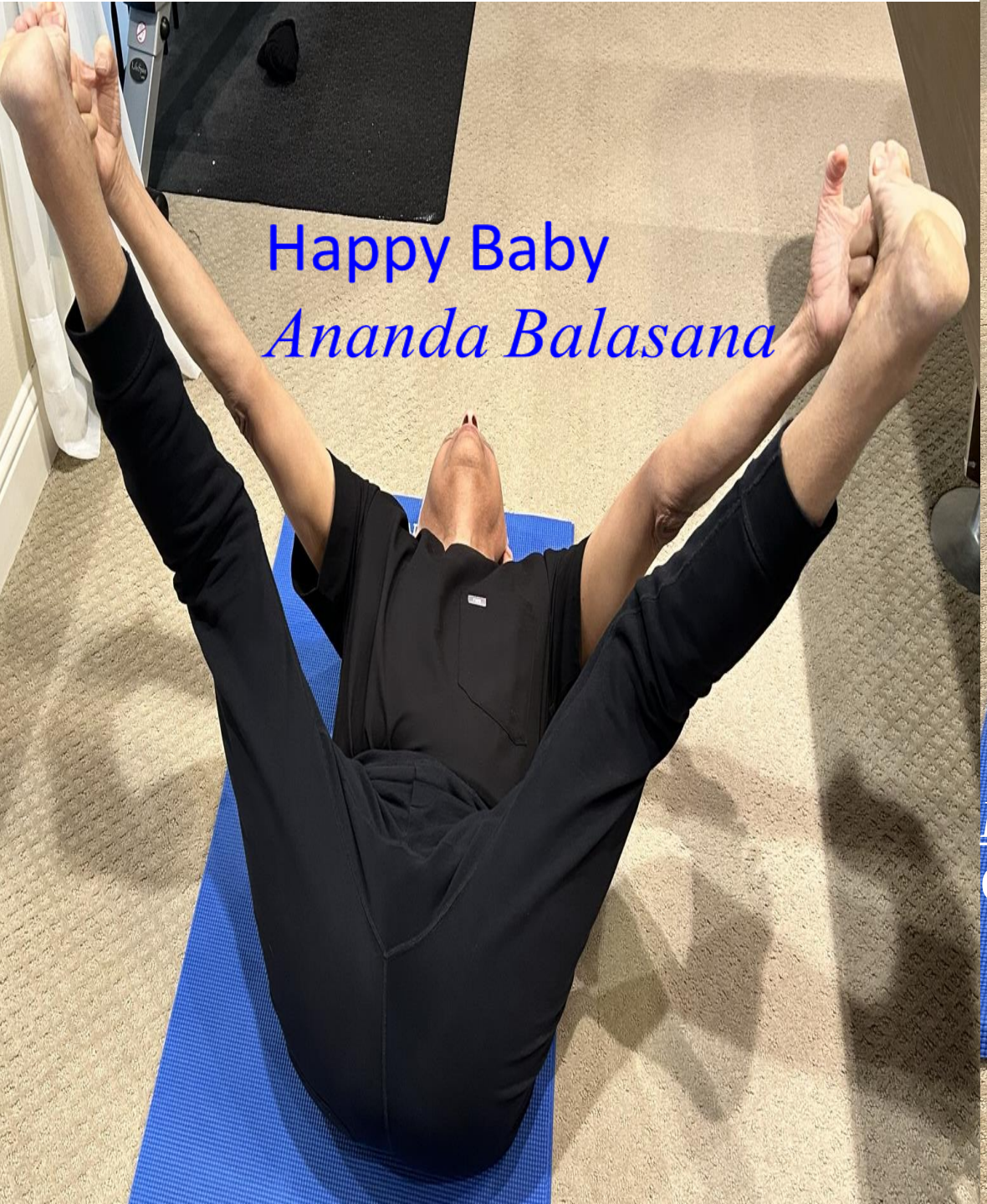
Hanumanasana, variation
Extended Leg Split, Lunge

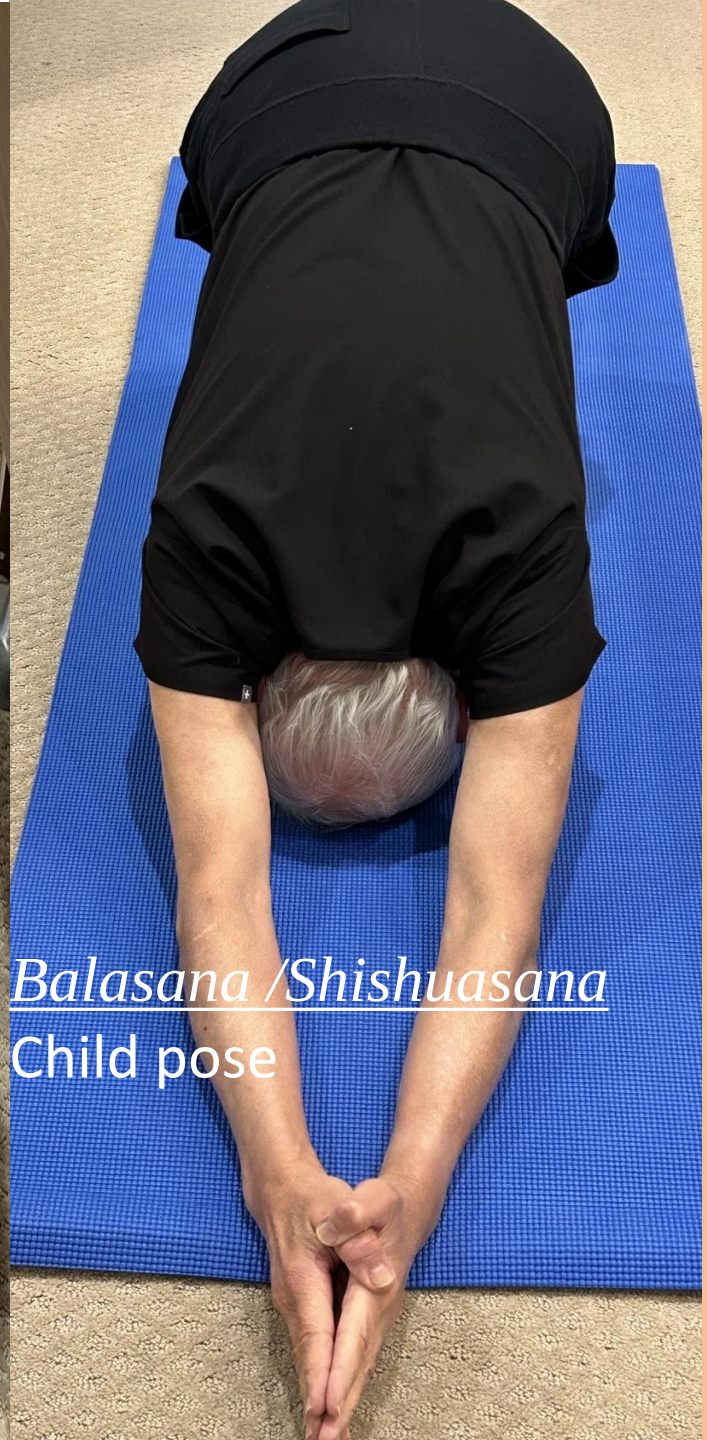
Utthita Ashwa Sanchalanasana

Pre-bed stretching improves sleep quality
Hold each stretch for at least 4 breaths

Reversed Balanced Table-top

Ardha Purvottanasana





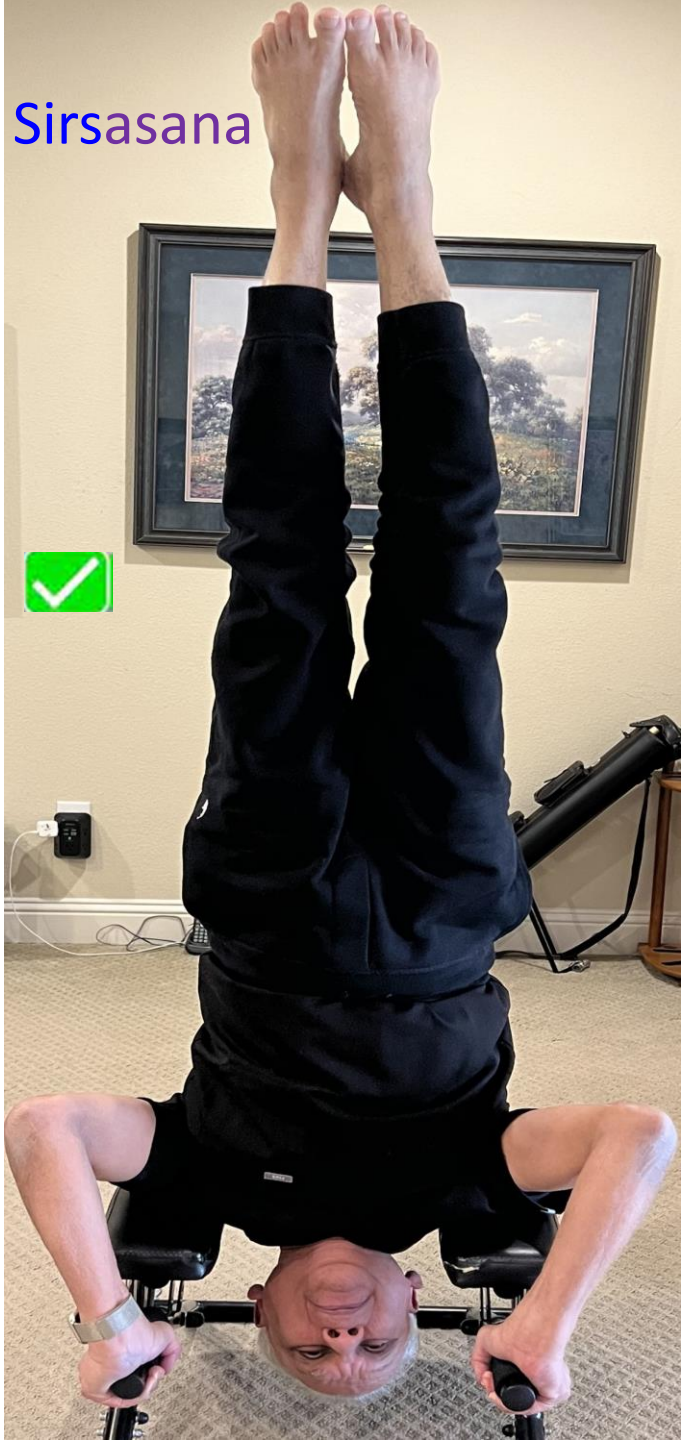
Grounding pose
Relaxes Mind-Body

→ Surrender body weight to gravity

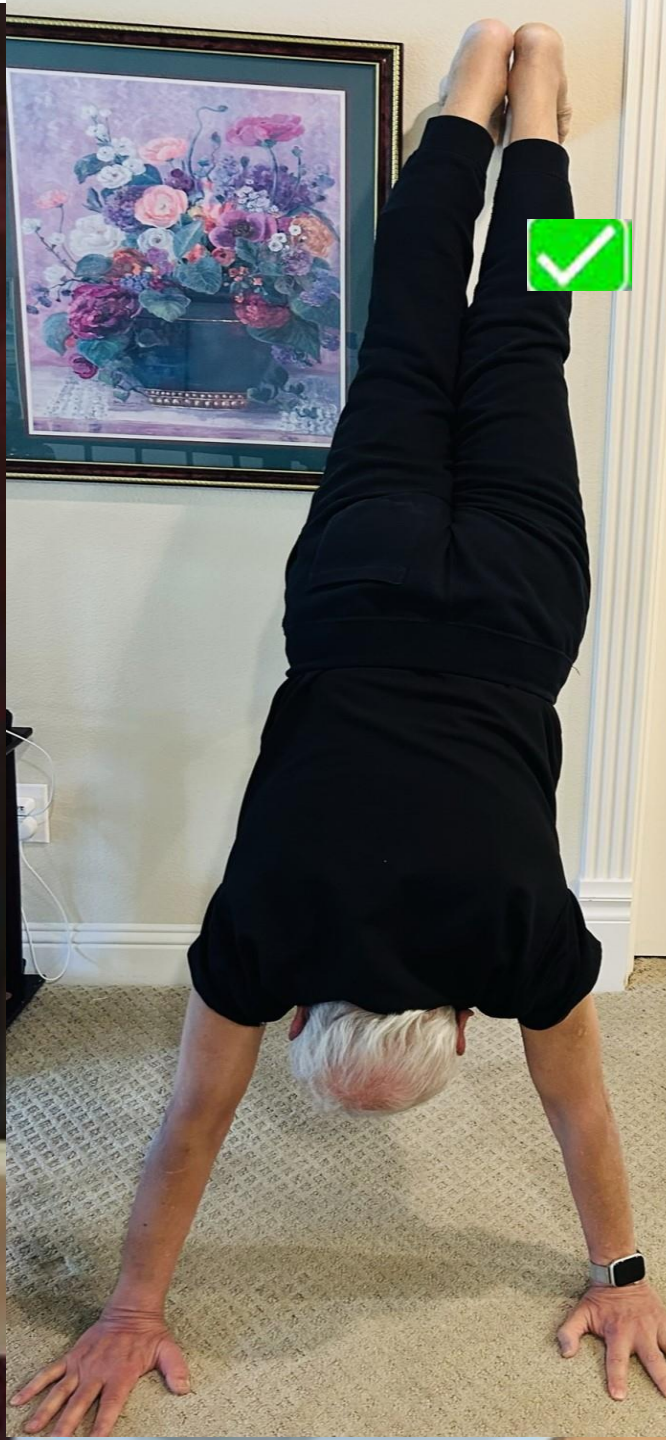
→ Pursed-lip Breathing (esp into back & bottom of lungs)

→ ↑PNS Calm Relax mind-body

→ Release tension back-hips

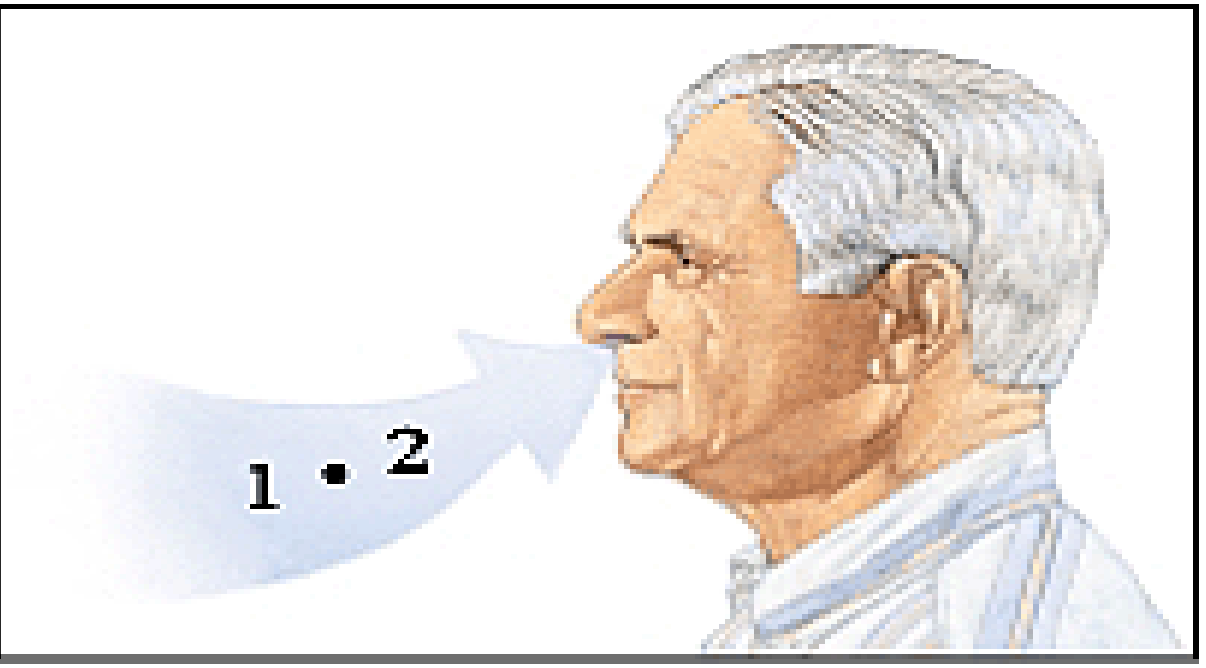

Sirsasana


Lengthen spine
Reverse direction
of gravity

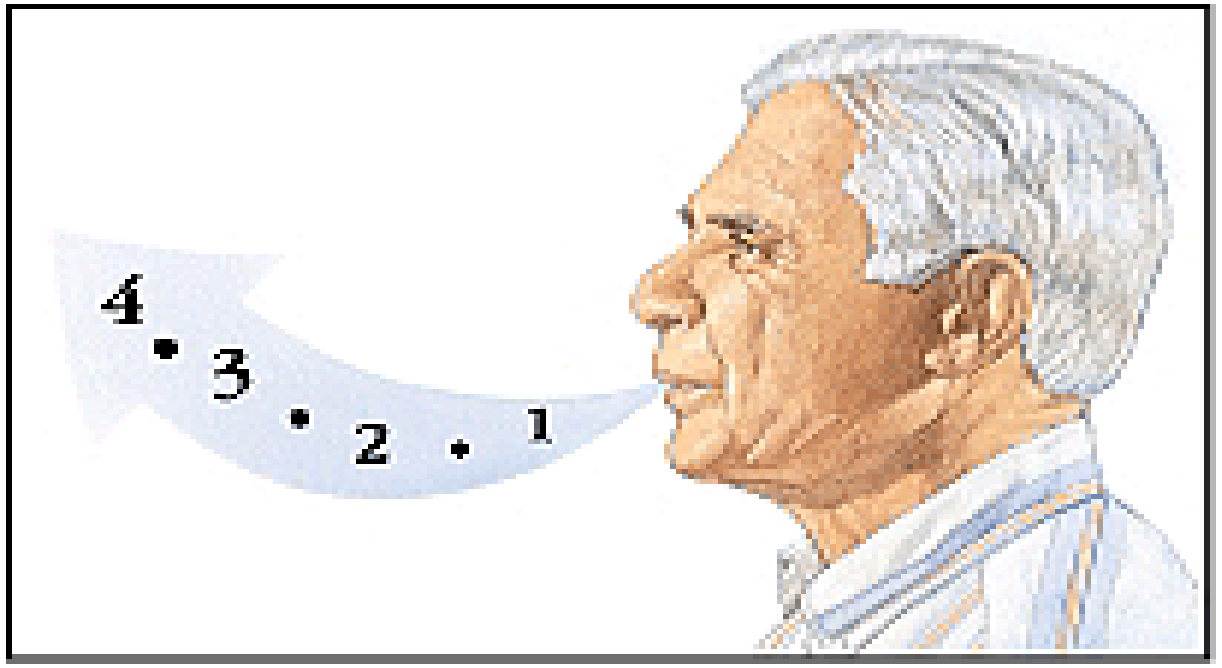


Pursed lip breathing

- Relieve SOB by slow RR →Keep airways open longer → ↓stress/anxiety
- ↑Gas exchange by expanding alveoli → ↑relaxation



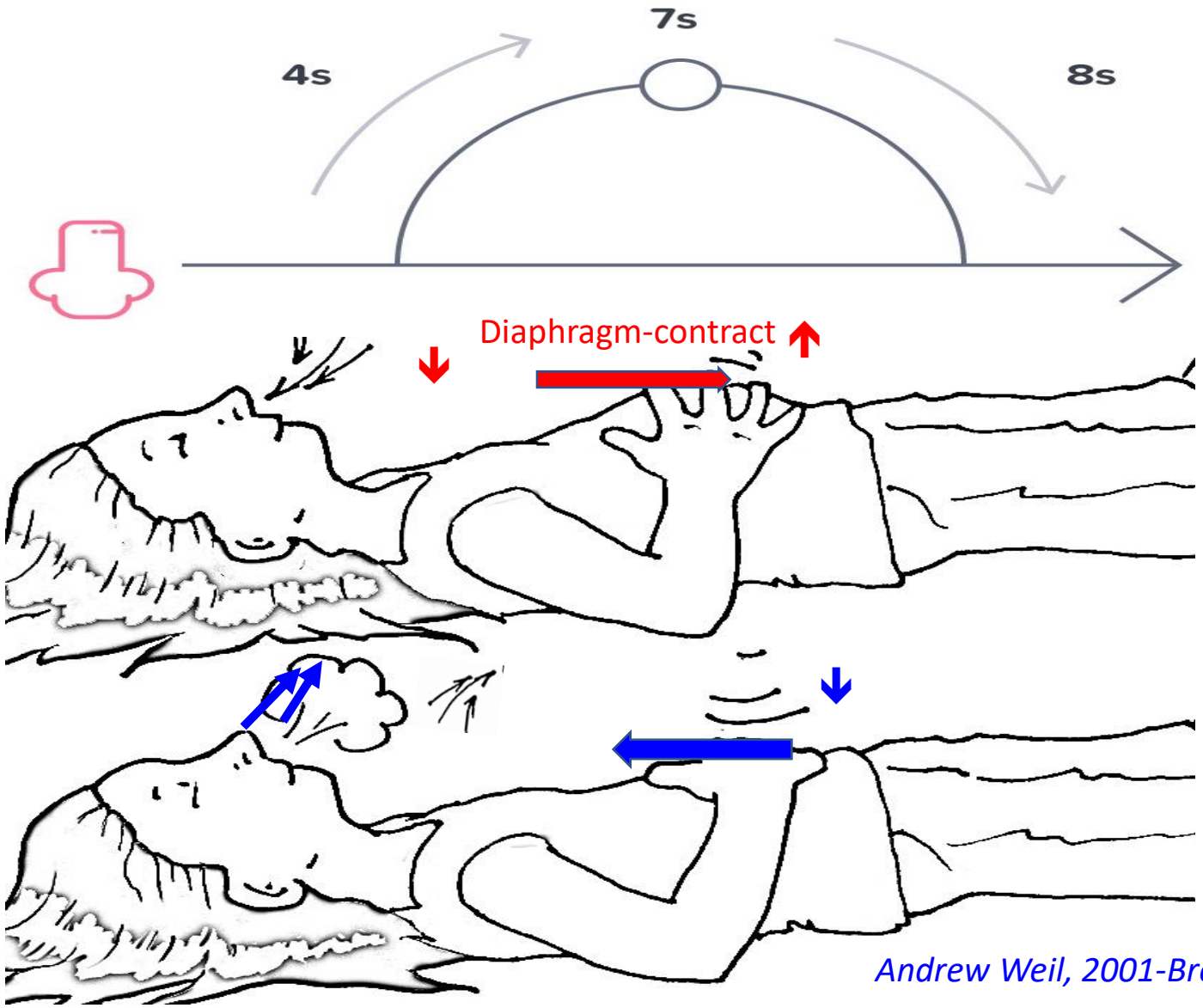
Inhale: Relax your neck and shoulder muscles. Inhale slowly through your nose for 2 counts.



Exhale: Pucker your lips as if you are going to blow out a candle. Exhale slowly and gently through your lips for 4 or more counts.

www.ncbi.nlm.nih.gov

Relaxing 4-7-8 Breath: ***Inhale*** *Calmness/Peace/Ease* ***Exhale*** *Release/Stress/Tension*



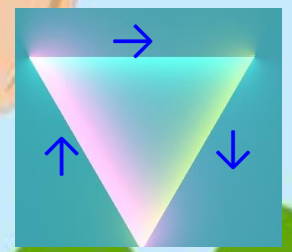
- Hand on belly, breath thru nose
- **Inhale**, count to 4, slow, push hand out, relax shoulders
- **Hold breath**, count to 7
- **Exhale**, count to 8, push belly in, relax jaw
- Repeat 5 times

Andrew Weil, 2001-Breathing, Master Key to Self Healing

Intentional-Tolerable Breath-Hold

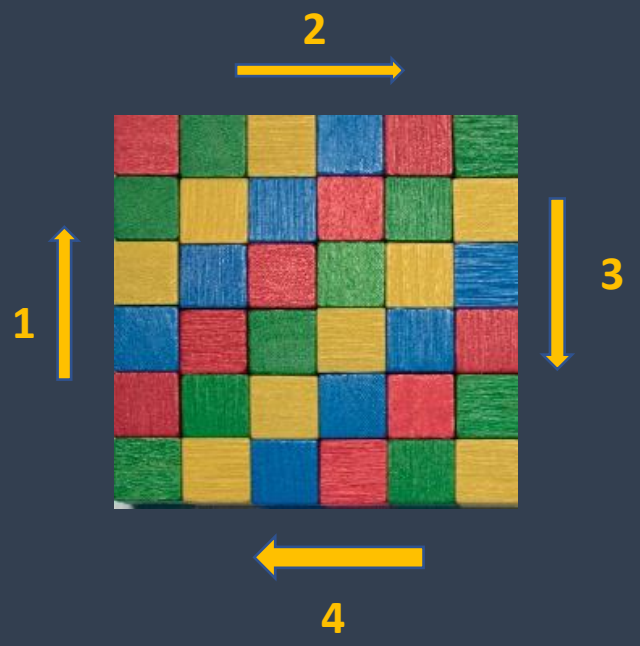
Inhale thru nose

Exhale thru nose



Box Breathing

Exhale-hold just
beyond comfort level



Patrick McKeown, O2 Advantage, Breathing Techniques for Health & Fitness

Alternate Nostril Breathing: ↑CO_2, *Nitric Oxide*

Close R Nostril with Thumb
↑**Inhale L**. Count 4

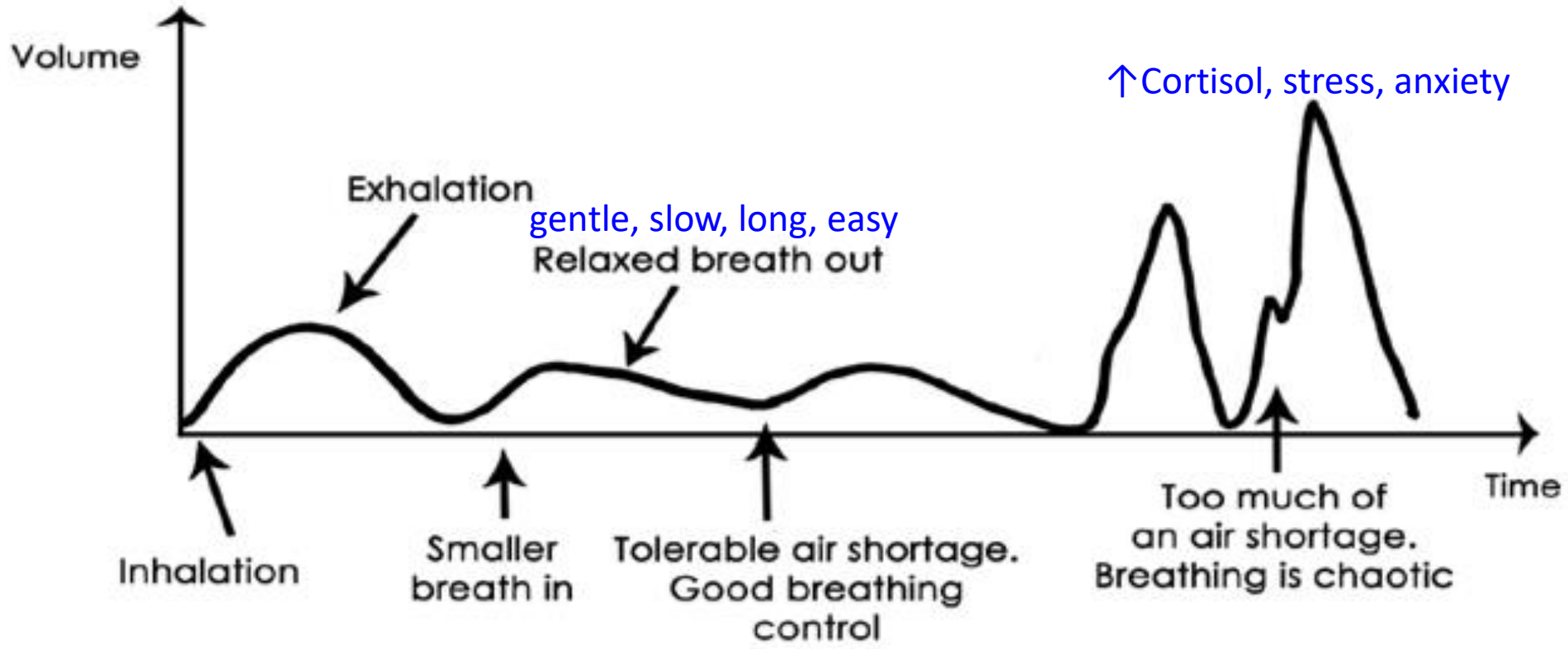
Close R & L Nostrils
HOLD. *Count 4*

Open R nostril-
↓**Exhale R.** Count 6

Chopra.com/how-to-practice-alternate-nostril-breathing

Breathe Light, Breathe Right

Decreased tidal volume. Subtle/Imperceptible Breathing → Good Health



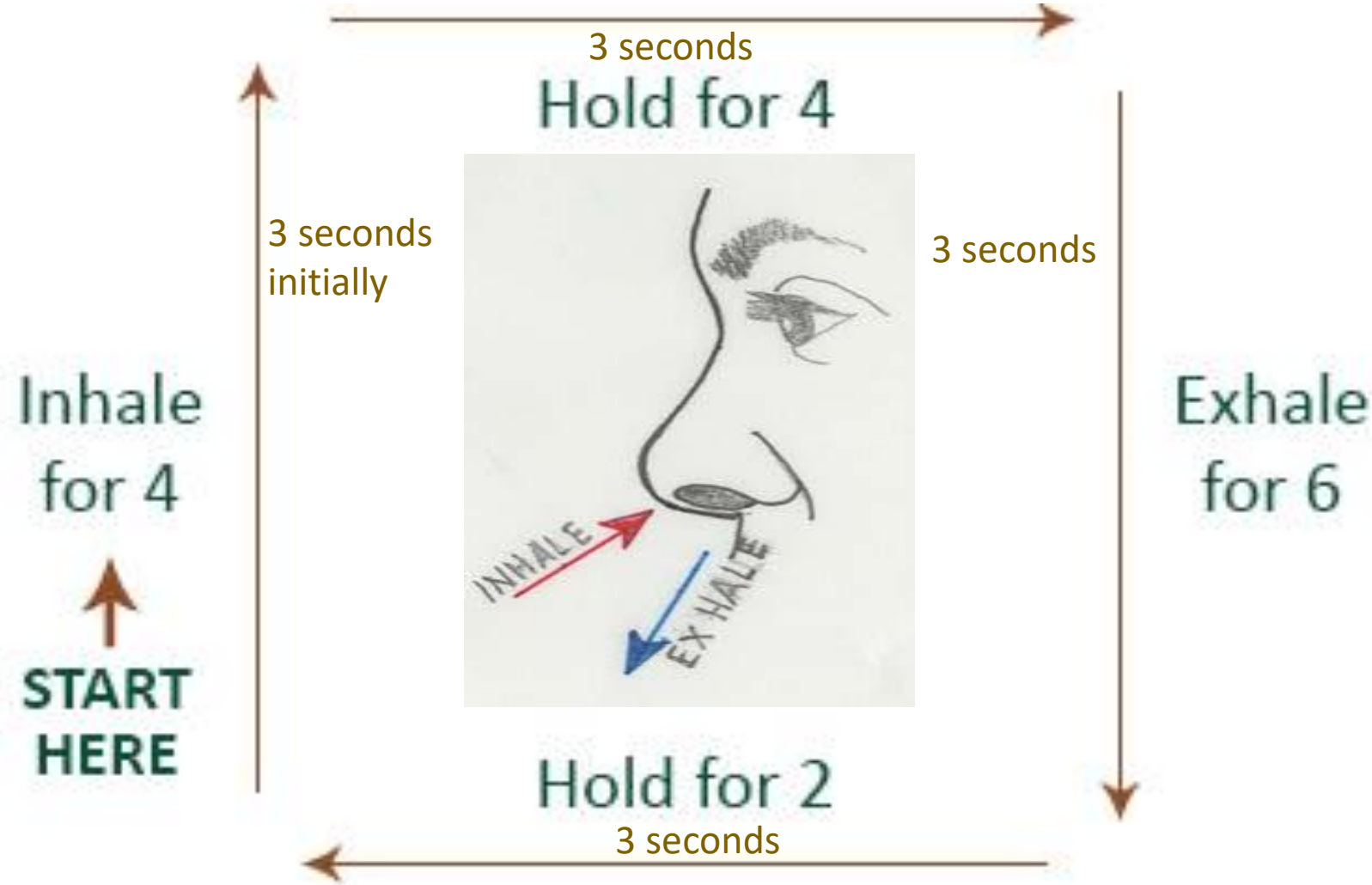
Efficient breathing at rest improves breathing during exercise & sleep

Merge breath with abdominal movements

Buteyko Method: Reverse Asthma, Rhinitis and Snoring, Patrick Mckeown, 2008

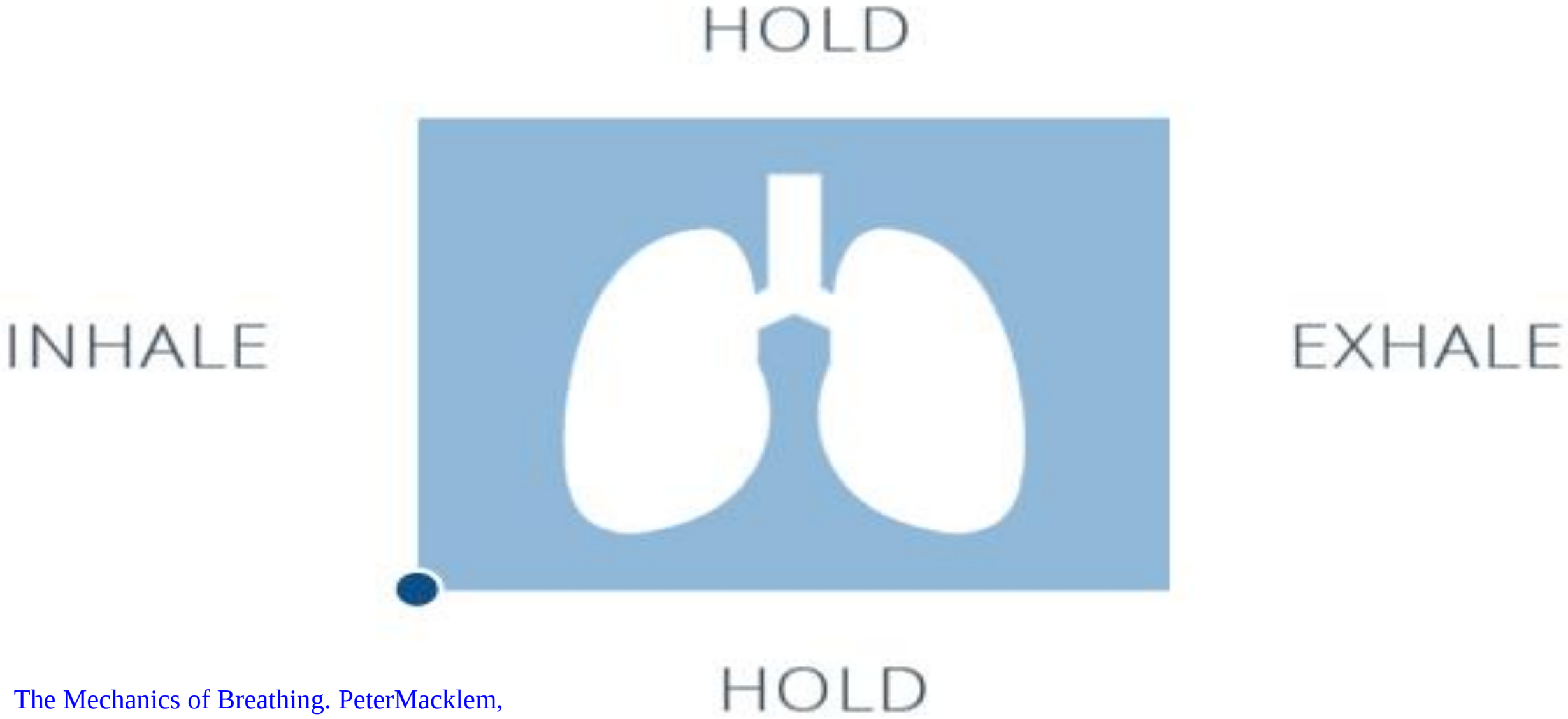
Box/Square/*Samvritti Pranayama*

Aware, Concentrate, Calm, Soothe, Relieve Stress



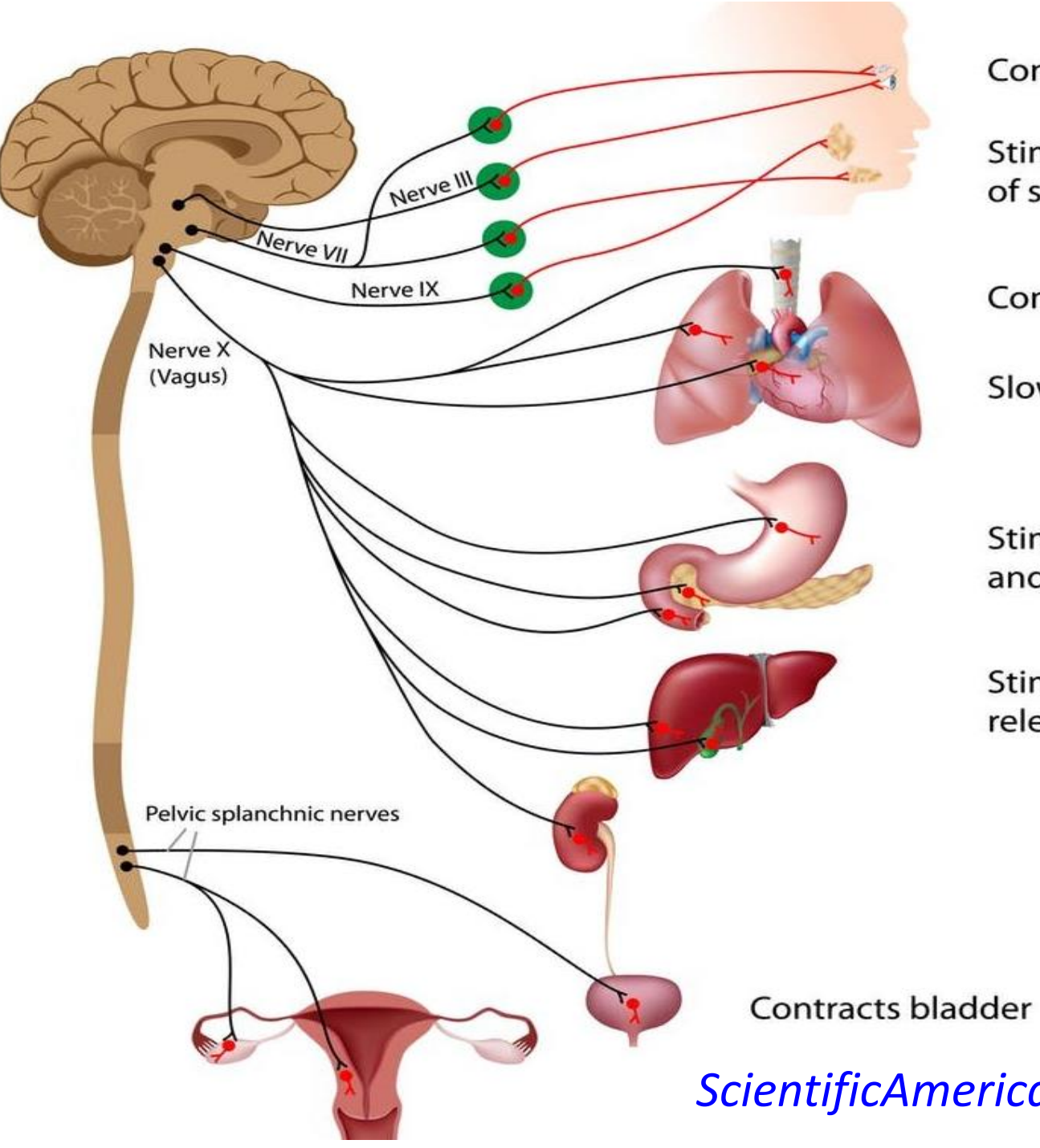
Healthline-box-breathing#slow-exhale

Visualize a square. Imagine traveling up one side on **inhale**, across top **hold**, down other side **exhale**, & across bottom, **hold (**i.e. ***exhale hold*****)**



The Mechanics of Breathing. PeterMacklem,
Am J of Respiratory & Critical Care Medicine

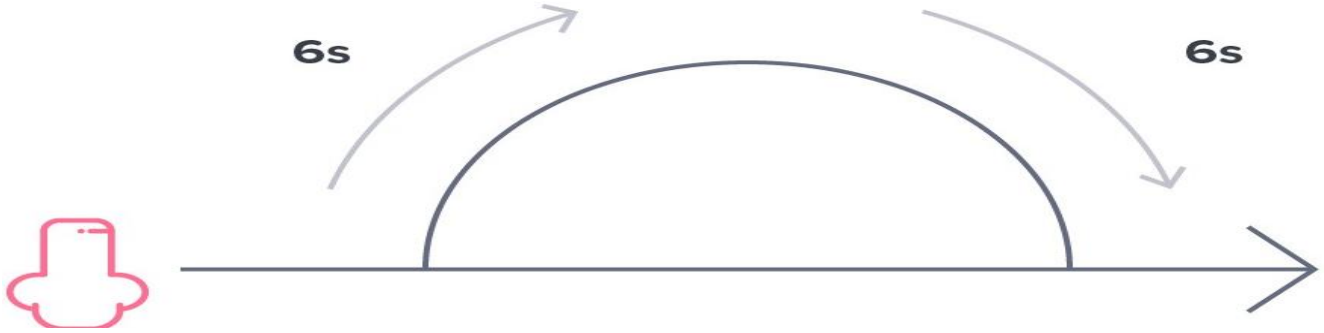
Parasympathetic Nervous System

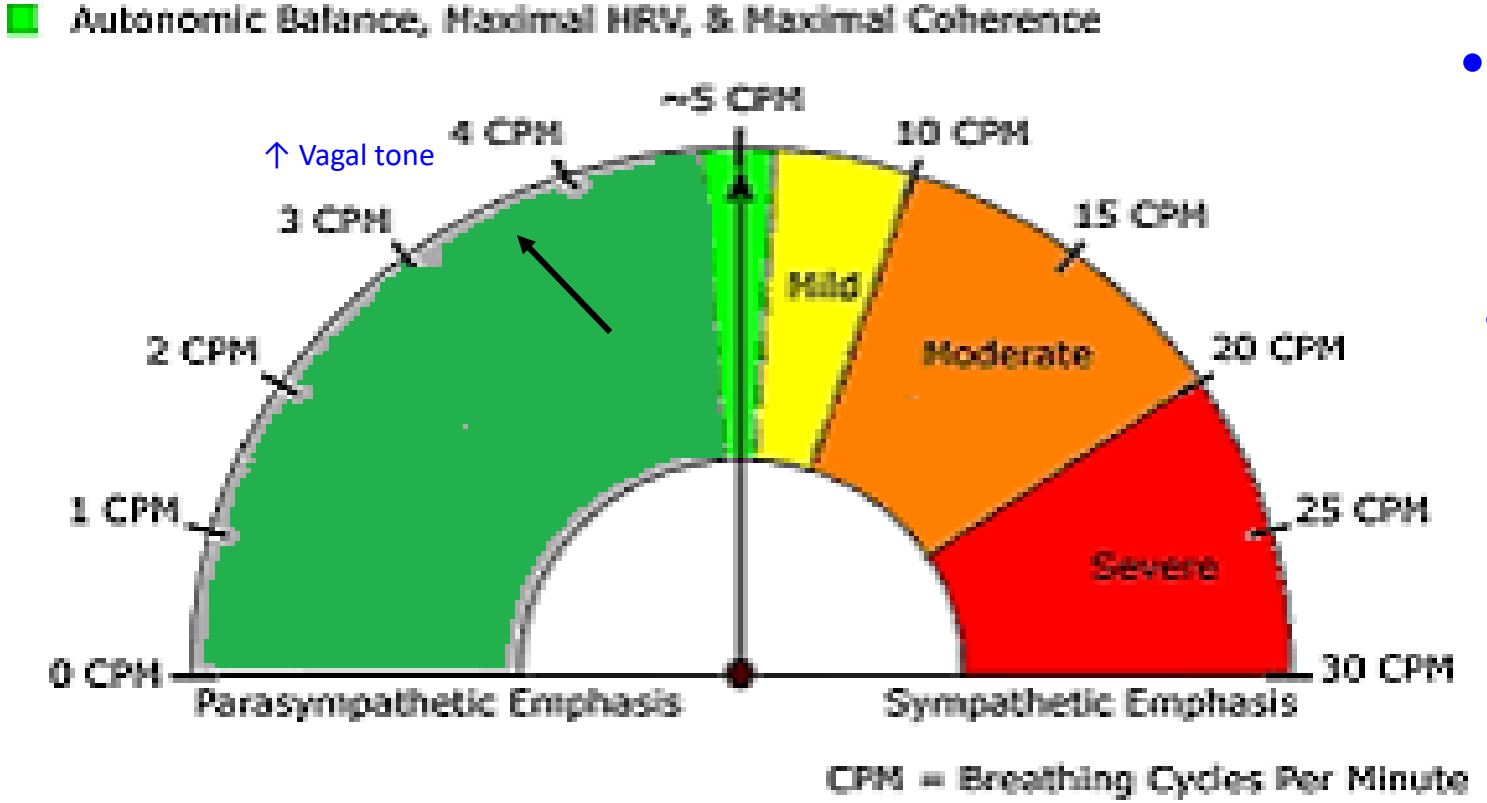


- Release acetylcholine, relax blood vessels ↓ peripheral resistance
- Relax/restore body to calm, composed state ↓ anxiety, stress, fear
- Activated by slow, relaxed diaphragmatic breathing, yoga, meditation, humming, cold shower

ScientificAmerican.com/proper-breathing -brings-better-health

Coherent Breathing ↓ Stress, Anxiety

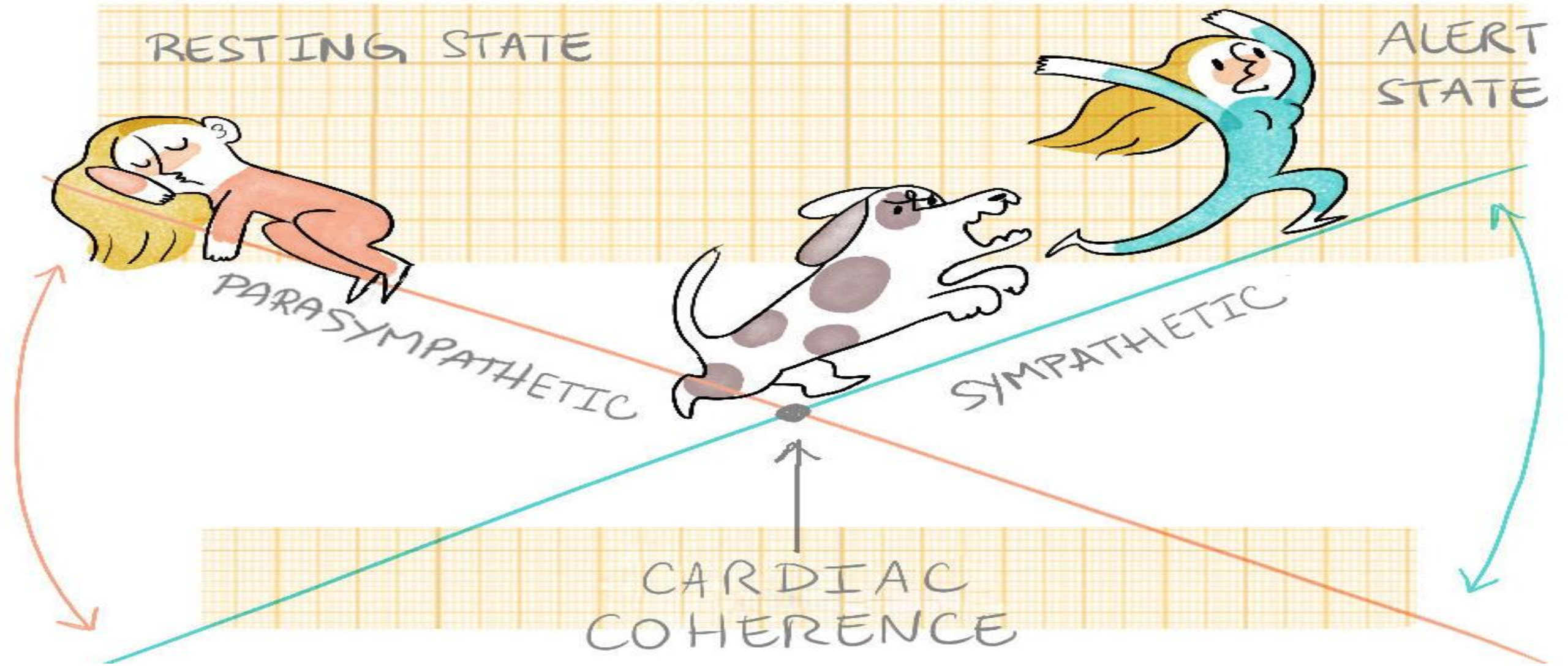




- Ideal: 5 breaths/minute but often people breathe >3x faster
- Lower RR ↑vagal tone, lower HR
- ↑ Relaxation response, Gamma-aminobutyric acid (GABA) levels, Heart Rate Variability

The Healing Power of the Breath-Drs. Richard Brown & Patricia Gerbarg, 2014

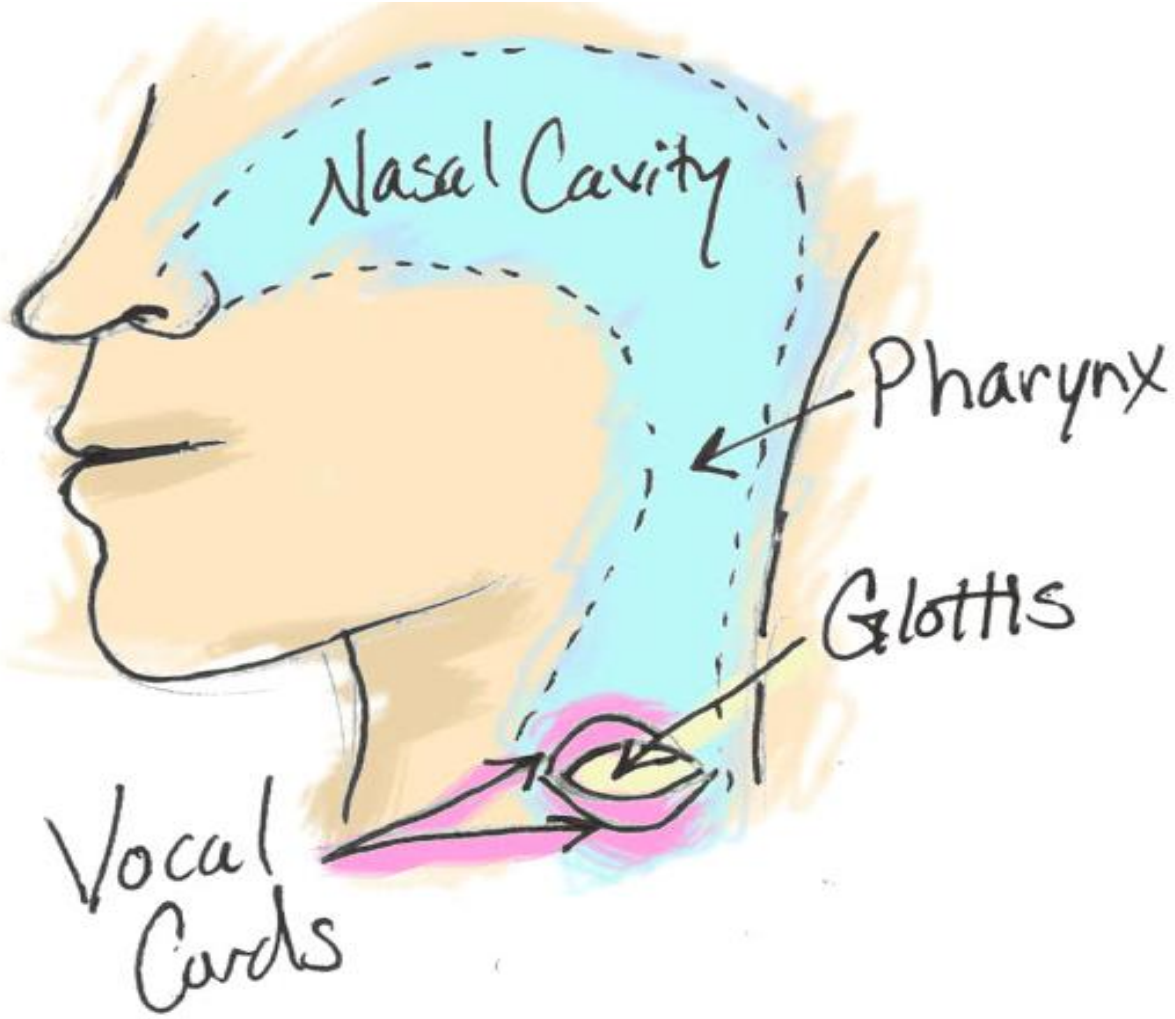
Cardiac Coherence Exercises → 6-sec-Inhale then 6-sec-Exhale (12-sec RR)
Biofeedback device helps to slow breath, lowers HR



Rollin McCraty, Cardiac coherence, self-regulation, autonomic stability, psychosocial well-being, Frontiers in psychology, 2014

Ujjayi: Ocean/Hissing-Sound Breathing

Vagal stimulation from somatosensory afferent in glottis, pharynx, larynx



- Initially, with mouth open **Exhale** to *fog a mirror,* whisper *ahhh*. Close mouth → **E*xhale thru nose***. Constrict throat. Feel resistance/vibration (oscillation of air column in oropharynx)

- **Inhale**: maintain throat constriction against airway resistance → Barely audible, slow-long breath

https://www.healthline.com/health/fitness-exercise/ujjayi-breathing

Bhramari (Humming Bee) *Pranayama*

- **Inhale** thru nose
- Prolonged **Exhale** thru nostrils w/ humming sound - ***'mmm'*** from throat

- Press & release ear flaps w/ fingers, focus inwards on humming ↑vibration
- Oscillates airflow in nostrils/larynx wall ↑Nitric oxide x15

- Soothes nervous system ↑vagal tone
- Ventilate sinuses with mechanical cleaning, anti-inflammatory effects

Eddie Weitzberg, Jon Lundberg: Humming Greatly increases Nasal Nitric Oxide

Between yoga, pilates, therapy, massage, and meditation, I hardly have any time for myself.

Irony of Timetable & Schedule

- Places to go
- Things to do

- People to meet
- Much to eat

- Lots to drink
- Ideas to think

- Learn to let go
- Free from ego

Yoga Nidra Stages

ANAHATA
YOGA RETREAT | NEW ZEALAND

3. Body Rotation

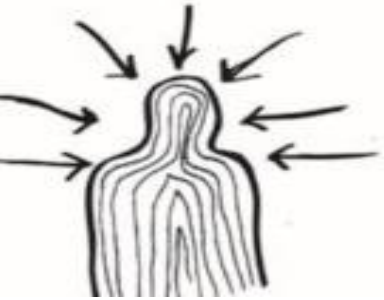
4. Breath Awareness

5. Feelings / Sensations

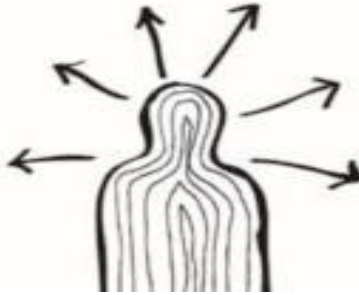
6. Visualisations

2. Sankalpa (Intention)

7. Sankalpa (Intention)



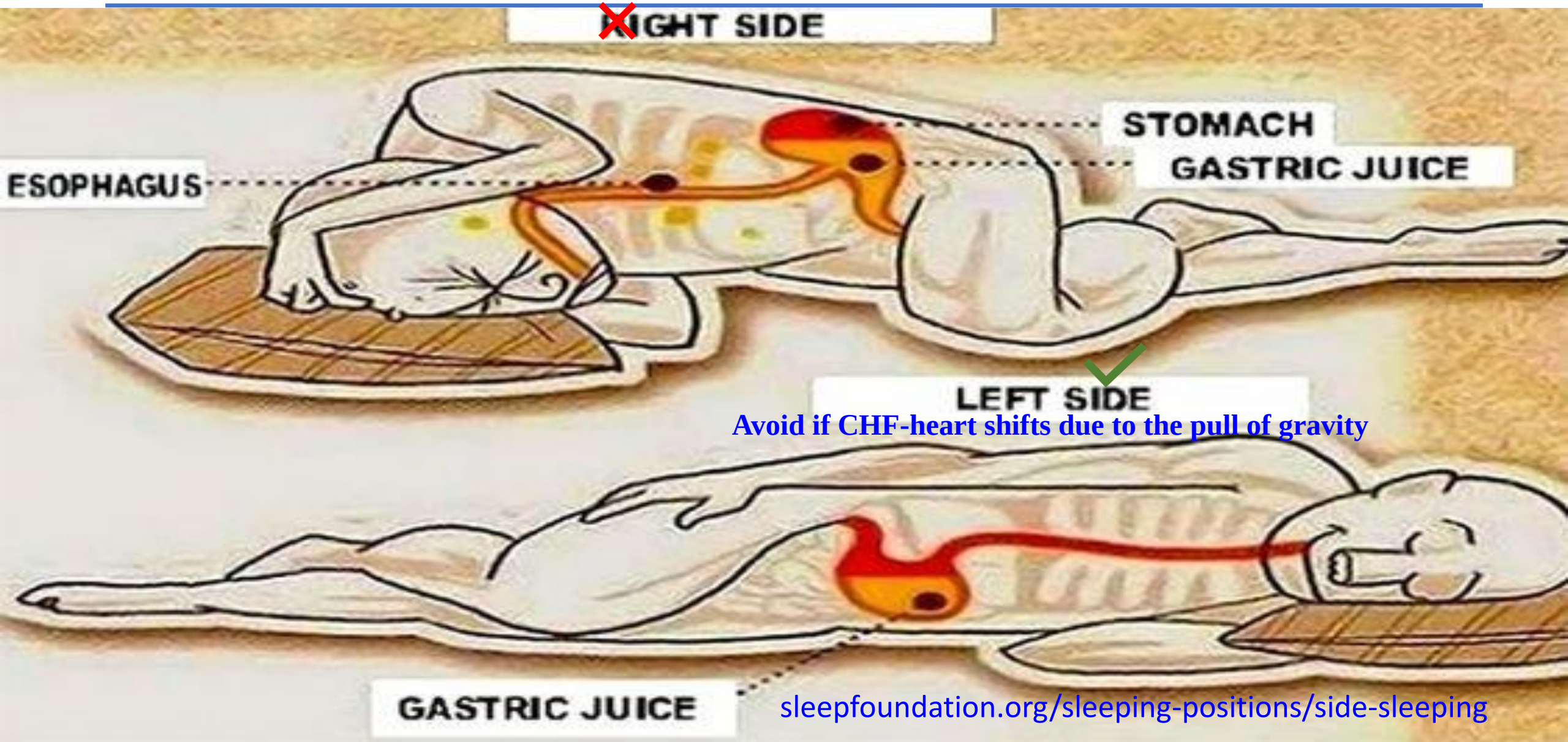
1. Internalisation



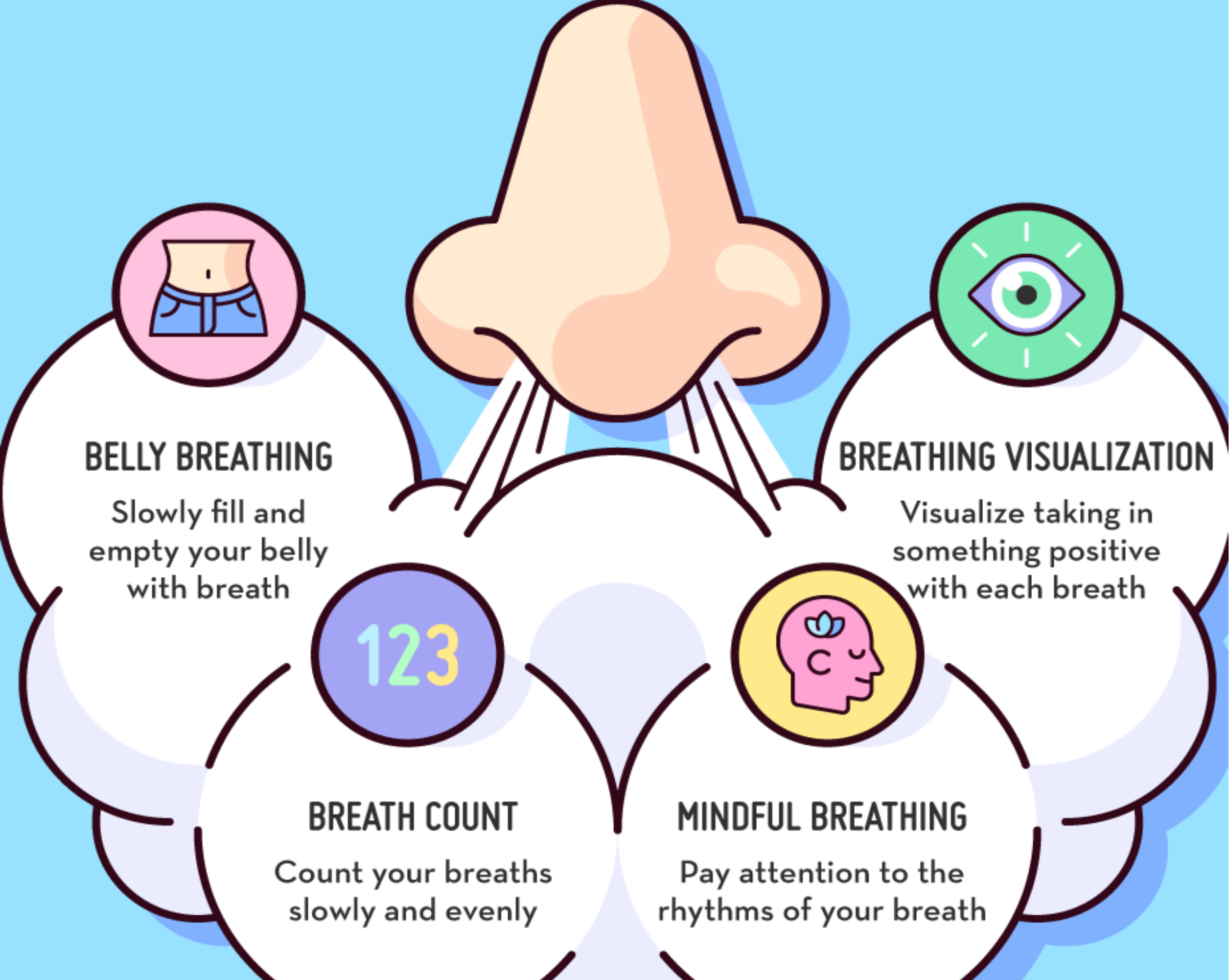
8. Externalisation

Left lateral helps Digestion, Acidity, Heartburn

Right Lateral helps Heart pulsations drive CSF into Brain



sleepfoundation.org/sleeping-positions/side-sleeping



Breathe Easy
Stress Less

LSD-Breathe thru Nose
Relax Body-Mind
Relieve Anxiety → Restful Sleep

Focus attention on breath → settle mind, restore calm

Effectiveness of diaphragmatic breathing relaxation training for improving sleep quality, J Sleep, 2021

Breathtaking View of Ocean on Moonlit Night

Feel the Stillness around you

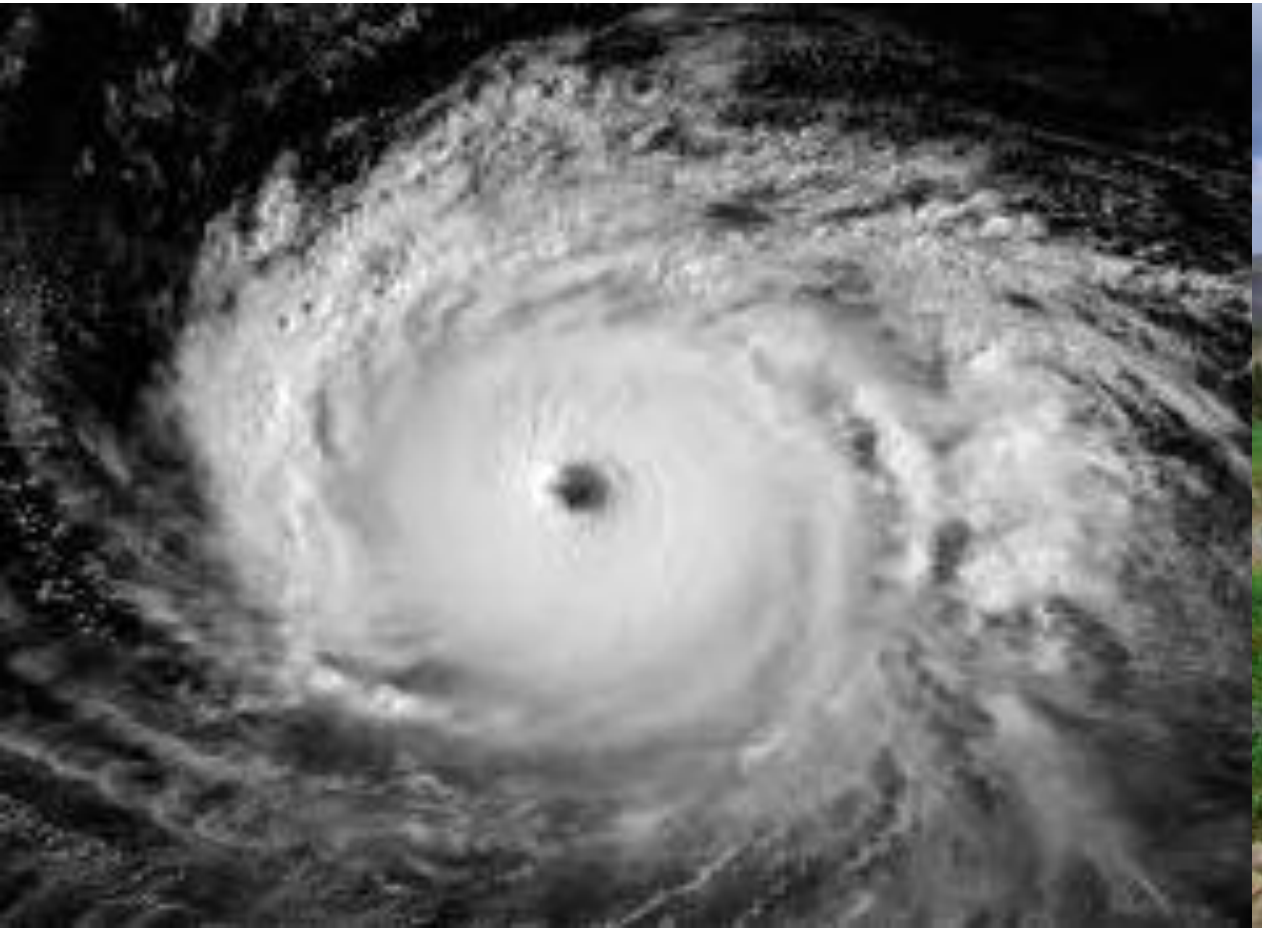
- W/ each relaxing breath imagine yourself in the ocean of divinity
- Soothing moonlight guides into deep rejuvenation & healing
- Visual Imagery creates positive affirmations
- ***Be the stillness**: Let the waters settle, and you will see the moon and the stars mirrored in your own being* — Rumi

Calm Ocean Waves Bring Relaxation

- RR: Progressive muscle relaxation→ Hypo-metabolic physiological state
- Calmness creates +ve feelings
- Diverts attention from –ve thoughts

↑vagal tone

Turbulence → **Breath-centric** → Tranquility



↓Distraction, Stress, Tension

↑Focus, Calm, Awareness

Health.harvard.edu/mind-and-mood/relaxation-techniques-breath-control-helps-quell-errant-stress-response

Yoga Therapy in Practice

Yoga as the "Next Wave" of Therapeutic Modalities For Treatment of Insomnia

Sarah L. Kennedy, PhD

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"Yoga practice is well suited to complement existing therapies and to address sleep problems in a more holistic way."

"Yoga teachers and practitioners have long touted the positive effects of yoga and meditation on sleep…improvements in sleep are among the first (and often most valued) changes observed by new practitioners (Cimini, 2010). Yoga is already one of the top five alternative medicine interventions for insomnia, based on consumer surveys…"

DOI: 10.7860/JCDR/2018/30296.11303

Original Article

Physiotherapy Section

Yoga Based Lifestyle Program in Improving Quality of Life after Coronary Artery Bypass Graft (CABG) Surgery: A Randomised Controlled Trial

AMARAVATHI ERABALLI[1], NAGARATHNA RAGHURAM[2], NAGENDRA HONGASANDRA RAMARAO[3], BALARAM PRADHAN[4], PARACHURI VENKATESHWARA RAO[5]

ABSTRACT

Introduction: The Quality of Life (QOL) after Coronary Artery Bypass Grafting (CABG) is an important contributor to morbidity and mortality. The addition of Yoga Based Lifestyle Program (YLSP) to conventional cardiac rehabilitation has found useful and effective in improving ejection fraction and reducing risk factor profiles.

Aim: The aim of the present study was to evaluate the effect of add-on YLSP to conventional post-CABG rehabilitation and to compare the changes of QOL.

Materials and Methods: A total of 300 patients posted for elective CABG at Narayana Hrudayalaya Super Specialty Hospital, Bengaluru, India were randomised into two groups (150 each) i.e., Conventional Lifestyle Program (CLSP) and YLSP. Data on CLSP (95) and YLSP (102) was available for analysis at one year follow up. The YLSP Group practiced integrated yoga module including Yama, Niyama, Anasa, Pranayama and Meditation as an add-on to conventional lifestyle advice. Assessments were done before and one year after CABG on World Health Organization Quality of Life- Brief form questionnaire (WHOQOL-BREF) with four domains viz., 'Physical Health', 'Mental Health', 'Social relationships' and 'Environmental health'. As the data was not normally distributed, the non-parametric tests viz., Mann-Whitney Test and Wilcoxon signed ranks test for between group and within group comparisons were applied.

Results: In YLSP group, significant ($p<0.001$; Wilcoxon's test) improvements were found within group after one year in all domains of WHOQOL-BREF, while there was significant improvement ($p<0.05$; Wilcoxon's test) only in the Social health domain, in the control (CLSP) group. There was significant differences between groups ($p<0.05$; Mann-Whitney test) in all domains with better improvement in the YLSP Group.

Conclusion: Addition of integrated yoga program to conventional post-CABG rehabilitation leads to better improvement in all domains of quality of life after coronary artery bypass surgery.

> Nihon Jibiinkoka Gakkai Kaiho. 2015 Jan;118(1):53-61. doi: 10.3950/jibiinkoka.118.53.

[Pursed Lips Inspiration for Vocal Cord Dysfunction]

[Article in Japanese]

Yumiko Maruyama, Yayoi Tsukada, Nobuyuki Hirai, Yosuke Nakanishi, Tomokazu Yoshizaki

PMID: 26333273 DOI: 10.3950/jibiinkoka.118.53

Abstract

Paradoxical vocal cord motion (PVCM) during vocal cord dysfunction (VCD) generally occurs spasmodically and transiently. After we had experienced 36 cases of VCD and successfully treated with conservative treatment including "pursed lips inspiration" method, we experienced a boy who had persistent PVCM. It was observed his PVCM vanished when he breathed in through pursed lips, while it appeared again when he stopped pursed lips inspiration. An airway reflex has been reported where the negative pressure in the subglottic space resulting from the inspiratory effort against a narrowed glottis activates the vocal cord adductor. VCD is considered to have both acceleration of laryngeal closure reflex against airway stimuli and active adductive movement of vocal cords against negative pressure in the subglottic space as underlying factors. The pursed lips inspiration method enables VCD patients not only to accomplish slow and light breathing but also to decrease the difference in the pressure between the supra--and subglottic space by occluding the nasal cavity and voluntary puckering up of the mouth which generate negative pressure in the

Effect of voluntary respiratory efforts on breath-holding time

I Mitrouska[1], M Tsoumakidou, G Prinianakis, J Milic-Emili, N M Siafakas

- PMID: 17324641. DOI: 10.1016/j.resp.2007.01.014

Introduction: Near the end of a maximal voluntary breath-hold, re-inhalation of the expired gas allows an additional breath-holding period, indicating that the breaking point does not depend solely on chemical drive. We hypothesized that afferents from respiratory muscle and/or chest wall are significant in breath-holding.

Methods: Nineteen normal adults breathed room air through a mouthpiece connected to a pneumotachograph and were instructed to breath-hold with and without voluntary regular respiratory efforts against an occluded airway.

Results: Fifty-one trials with and 53 without respiratory efforts were analyzed. The mean number of efforts per minute was 19+/-2.3, and the mean lowest airway pressure (P(aw)) was 16.6+/-5.4 cmH(2)O. Breath-holding time (BHT) did not differ without (33.0+/-18.2 s) and with (29.3+/-12.3 s) efforts. In five patients arterial blood gasses were measured before and at the end of breath-holding and they did not differ between trials without and with efforts, indicating similar chemical drive. Our results suggest that afferents from respiratory muscle and/or chest wall are not the major determinants of BHT.

> Int J Yoga. 2009 Jan;2(1):22-5. doi: 10.4103/0973-6131.53838.

The effect of various breathing exercises (pranayama) in patients with bronchial asthma of mild to moderate severity

Tarun Saxena [1], Manjari Saxena

Affiliations + expand

PMID: 21234211 PMCID: PMC3017963 DOI: 10.4103/0973-6131.53838

Free PMC article

Abstract

Background/aim: The incidence of bronchial asthma is on increase. Chemotherapy is helpful during early course of the disease, but later on morbidity and mortality increases. The efficacy of yoga therapy though appreciated is yet to be defined and modified.

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Immediate Effects of Yoga Breathing with Intermittent Breath Holding on Response Inhibition among Healthy Volunteers

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Abstract

Background: There is very little evidence available on the effects of yoga-based breathing practices on response inhibition. The current study used stop-signal paradigm to assess the effects of yoga breathing with intermittent breath holding (YBH) on response inhibition among healthy volunteers.

Materials and methods: Thirty-six healthy volunteers (17 males + 19 females), with mean age of 20.31 ± 3.48 years from a university, were recruited in a within-subject repeated measures (RM) design. The recordings for stop signal task were performed on three different days for baseline, post-YBH, and post yogic breath awareness (YBA) sessions. Stop-signal reaction time (SSRT), mean reaction time to go stimuli (go RT), and the probability of responding on-stop signal trials (p [r/s]) were analyzed for 36 volunteers using RM analysis of variance.

Fault	Cure
Mouth breathing	Nose breathing encourages slow, diaphragmatic breathing ↑Nitric Oxide
Heavy breathing	*Breathe light to breathe right* Blood/saturation O_2 SaO_2 98% Safe level is >88%.
Only automatic breathing	Breathing with awareness activates brain networks → improves mind, body, emotions → **Relaxation**
Not varying breathing techniques	Various types of breathing train body differently: *Long exhale ↓HR ↑relaxation* Pursed lip breathing helps control *SOB*
Hyperventilate	CO_2 vasodilator, stimulates the respiratory center, ↑O_2 uptake. *Less is more*
Fast and shallow breathing	*Slow down*, Short Breath-hold ↑lung capacity/health Better O_2 & CO_2 exchange↑organs functioning
Not using breathing to feel better	Efficient Breathing ↓Sympathetic activity ↑Vagal tone

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