

BREATH LECTURE

Physiology of Breath

The primary function of Breath is to balance the Autonomic Nervous System.

The diaphragm functions in breathing

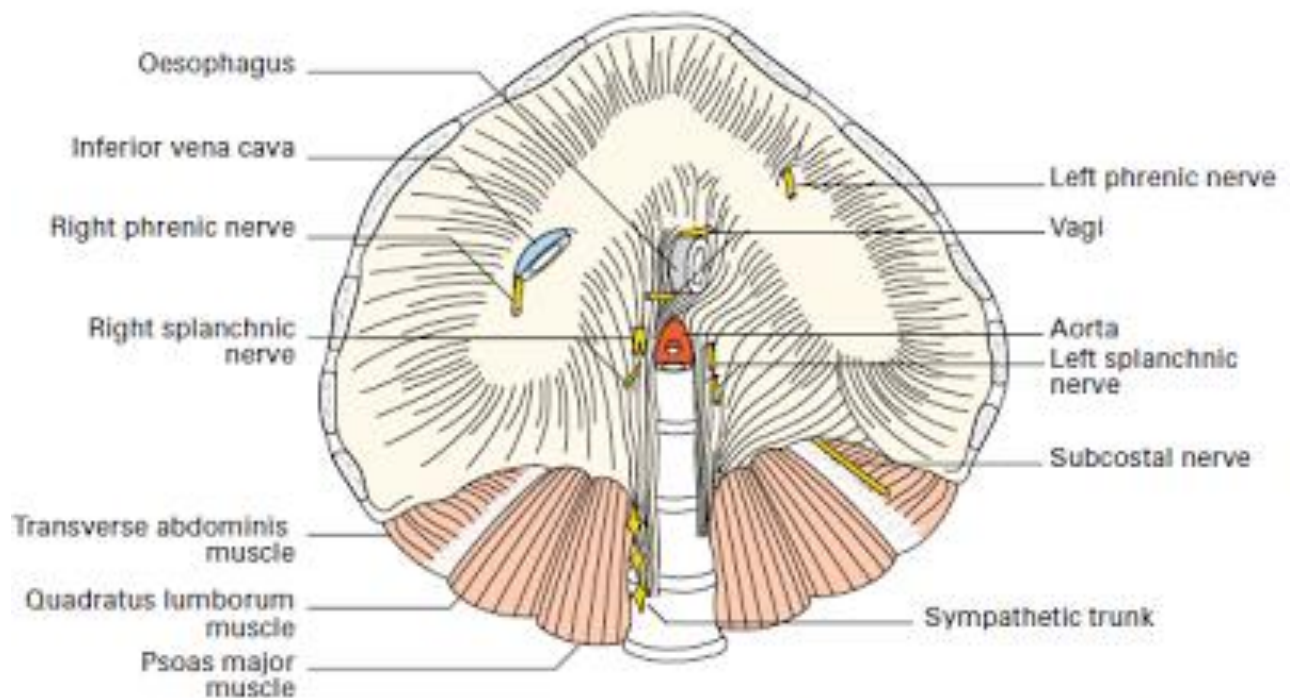
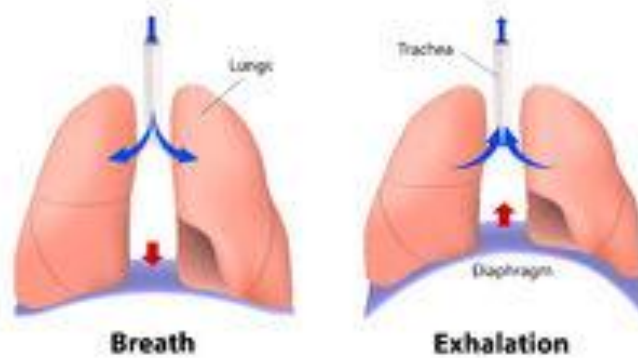


Fig. 10 The diaphragm— inferior aspect. The three major orifices, from above downwards, transmit the inferior vena cava, oesophagus and aorta.

The inhale is the contraction of the Diaphragm and the activation of the Sympathetic response of the Autonomic Nervous System. The exhale is the release of the diaphragm and the activation of the Parasympathetic response. The release of the Diaphragm also releases the constriction of the Vagus nerve causing the secretion of the neurotransmitter Acetylcholine (ACh). To balance the Autonomic Nervous System the duration of the inhale is a five count or exactly 6 seconds and the exhale is a five count or exactly 6 seconds in duration. This will work towards stabilization of an individual's Homeostasis in the cycle of how the Hypothalamus functions.

What is so important about Acetylcholine (ACh)?

Once you understand the importance of how Acetylcholine is in function you will stay focused on attaining it's secretion from the Vagus nerve with how you condition the Breath.

- 1 ACh is a Neurotransmitter – a chemical messenger that helps carry signals across the nerve synapse
- 2 ACh is the most abundant neurotransmitter as it is in both the CNS and Peripheral Nervous System
- 3 ACh has both excitory and inhibitory functions which means it can both speed up and slow down
- 4 ACh in the CNS is primarily excitatory (speeding up) for memory, learning and neuroplasticity(the ability of the Brain to create new connections as well as eliminate old ones) ACh facilitates Synaptic Pruning
- 5 ACh performs as a neurotransmitter in all neuromuscular connections:

Smooth muscle is an involuntary non-striated muscle. Smooth muscle cells are found in the walls of hollow organs, including the stomach, intestines, urinary bladder and uterus, and in the walls of passageways, such as the arteries and veins of the circulatory system, and the tracts of the respiratory, urinary, and reproductive systems. These cells are also present in the eyes and are able to change the size of the iris and alter the shape of the lens. In the skin, smooth muscle cells cause hair to stand erect in response to cold temperature

Skeletal muscle is one of three major muscle types, the others being cardiac muscle and smooth muscle. It is a form of striated muscle tissue which is under the voluntary control of the somatic nervous system. Most skeletal muscles are attached to bones by bundles of collagen fibers known as tendons.

Muscle fibers are in turn composed of myofibrils. The myofibrils are composed of actin and myosin filaments, repeated in units called sarcomeres, which are the basic functional units of the muscle fiber. The sarcomere is responsible for the striated appearance of skeletal muscle, and forms the basic machinery necessary for muscle contraction.

Ach stimulates all muscle contractions thus impacting all behaviour.

- 6 ACh responsible for decreasing the force by which the cardiac muscles contract. While heart rhythm is regulated entirely by the sinoatrial node under normal conditions, heart rate is regulated by sympathetic and parasympathetic input to the sinoatrial node. The accelerans nerve provides sympathetic input to the heart by releasing norepinephrine onto the cells of the sinoatrial node (SA node), and the vagus nerve provides parasympathetic input to the heart by releasing acetylcholine onto sinoatrial node cells. Therefore, stimulation of the accelerans nerve increases heart rate, while stimulation of the vagus nerve decreases
- 7 Foods that provide Choline to build ACh are first and foremost Eggs, then Meat and Fish followed by Whole Grains, next you have Vegetables, Fruit and Milk and Milk products with Fats and Oils providing the least amount.
- 8 You can supplement with B1, B6 and B12 for synthesis of ACh and Gingko Biloba for stimulating the Brain to absorb ACh for memory, learning and Neuroplasticity.

Five things that block ACh

- 1 Atropine – a medication for the heart
- 2 Anti-Cholinergic Medication – Bronchi Dilators for Asthma and COPD
- 3 Botox – a medication to suppress the muscle contractions in a localized area
- 4 Neurotoxins – found in reptiles, spiders and insects
- 5 Myasthenia Gravis – Autoimmune disease

Wim Hof

1. Get comfortable

Find a comfortable place to do your breathing exercises where you won't be disturbed. You can sit or lie on your back, but do not do this exercise whilst driving or standing up.

2. Do 30-40 power Breaths

Once you're comfortable, you can start to breathe in and out 30 times. This is essentially deep breathing at a steady pace in and out through the mouth. Inhale fully but don't exhale all the way out. As you inhale you should feel your belly rise and on the exhale, you should feel your belly fall. It may feel a bit like you are hyperventilating, but you are in control. Like me, you may also feel a tingling or lightheaded sensation throughout your whole body, when you do this for the first time. This is perfectly normal.

3. Hold your Breath

After doing 30-40 Wim Hof power breaths, empty your lungs of air and retain the breath for as long as you can without force. During the retention, I found it relaxing to close my eyes and focus on the space between my eyes. Just remember to set a stopwatch if you're interested in recording your results. You might want to see how you progress with the breath retentions if you plan to do this regularly over a set period of time.

4. Breathe in for 10 seconds

After the breath retention, take a deep breath in and hold it for a further 10-15 seconds, before exhaling.

5. Repeat steps 1-4

Repeat the whole process for another three rounds. Remember to record your times down, so you can track your progression.

6. Meditate after 4 rounds of power breathing

After the power breaths, you can then go into your regular practise of meditation or meditate for five minutes if you're a complete beginner by closing your eyes, bringing your awareness to your breath and focusing on the space between your eyes.

Lateral Intercostal Breath Training

Strengthen the individual for their lifestyle

What is a Lateral Intercostal Breath?

How do we cue our clients for this?

What tempo should we use when first learning?

Is a five count inhale and exhale available for all individuals?

How do we modify?

-BREATH - MATTERS -