

Summary of Breath- The New Science of a lost art by James Nester

We are the worst breathers in the animal kingdom!

50% of us habitual mouth breathers due to stress, pollution. Shape of face

Aerobic versus anaerobic respiration : anaerobic- energy from glucose and used back up when don't have enough oxygen

Aerobic 16x times more efficient than anaerobic (approx 180 - age = optimum heart rate exercise to stay in aerobic state)

Mouth breathing changes physical body including airways. It decreases pressure in the mouth and causes muscles to weaken. Nose breathing makes airways wider and breathing easier

25% of Americans over 30 have sleep apnea

Mouth breathing causes body to lose 40% more water so wake up during night thirsty . With chronic sleep apnea vasopressin is not secreted normally and we need to urinate during the night. Mayo clinic linked chronic insomnia with breathing problem

Mouth breathing linked to disturbance of O2 to part of brain linked with ADHD

“Breathing is most intimate connection to our surroundings” - we are literally breathing in and out space dust !

Nose clears air, heats it and moistens it for easier absorption

Much more subtle functions too. Eg anbn, right nostril awakes to greet sun, left nostril to the moon.

For example during full or new moon we all have same pattern, right nostril at dawn – ‘accelerator’, left nostril ‘brake’ at dusk.

Breathe right nostril to heat up body, mental clarity

Left nostril to calm, lower bp, lower temp,

Function of nose - turbinates covered in cells / mucus that moisten and warm breath as well as filtering particles. The cilia move the mucus through the nose

Mouth breathing leads to gum disease, cavities and bad breath too. Some dentists recommend taping mouth shut at night using small piece of surgical tape in middle of mouth !! Apparently lots of you tube videos discussing this idea 😊

Other benefits of nose breathing is that it boosts nitric oxide sixfold which plays a vital role in increasing circulation and delivering O2 to cells as well as affecting immune function , weight and mood.

Use it or lose it - nose breathing can get easier with practice

Gentle stretching to increase lung capacity- yoga exercises are good

“Greatest indicator of Life span is lung capacity” - Framingham study . Moderate exercise like walking boost lung size by up to 15%

Schroth used breathing exercises to improve scoliosis

Strough discovered that the key to breathing, lung expansion and longevity was the transformative power of full exhalation. He worked with emphysema patients - he suggested they were suffering not due to lack of air in but couldn't get stale air out

Blood does full circuit every minute, controlled by thoracic pump- inhale = blood into heart, exhale pump shoots blood into body and lungs . Pump powered by diaphragm . Most adults engage as little

as 10% of range of diaphragm= strains heart and increase blood pressure. Increasing breaths to 50-70% of diaphragms capacity eases stress on heart and body works more efficiently. Diaphragm sometimes called second heart.

Breathing coordination when amount of air that enters equals amount that leaves
Sprinters -should always exhale when gun goes! Athletes focused on exhale and improved performance

Slow breathing increases O₂ levels. We also need CO₂ to release O₂ from haemoglobin.

5-6 breaths per minute leads to greater blood flow to brain, greater coherence in body - heart, circulation and nervous system coordinated to peak efficiency. Rosary, sa ta, na, ma etc all set to 5.5 breaths per minute

We also have become over breathers – which overworks our systems.

Buteyko - worked with extending exhales as a way of reducing hypertension. He believed increasing CO₂ by breathing less could keep us fit and heal us too. No more than 6 breaths per minute at rest. Eg asthmatics, hypertension often breath 15 per minute. Zatopek took it one step further and used hypoventilation to become greatest runner of all time! This type of breath restriction also called hypoxia training. His methods are not universally accepted by medical profession,

In USA 8% of pop has asthma and they tend to over breath. Studies positive results by breathing less and increasing CO₂ levels to 5.5%

Over breathing and expelling too much CO₂ causes blood to become more alkaline. Body tries to correct , eg kidneys release bicarbonate in urine to help reduce alkaline levels= buffering. Constant buffering leaches body of essential minerals eg magnesium . Constant buffering also weakens bones as they try to compensate by dissolving mineral stores back into the blood.
(not all resp. illness implies low CO₂ some might have too high levels but they still have a breathing problem)

Generally mammals with lowest resting heart rate live longest and they tend to have slowest breath.

Perfect breath 5.5 litres per minute, 5.5 sec inhale 5.5 sec exhale

Anthropologists have discovered that since post industrialisation and processed foods, our mouths and facial bones shrank – causing dental disease and crooked teeth and obstructed airways. Not just lack of vitamins but lack of chewing.

Treatment for obstructed airways includes saline rinse, steroids, balloon sinuplasty, surgery

50% of us have chronically inflamed turbinates which makes it difficult to comfortably breath through the nose.

Men with necks bigger than 17 inch or women 16 inches much more likely to suffer airways obstruction. Not just overweight but body builders too.

For most people we can reverse the entropy in our airways and avoid the associated sleep apnea anxiety chronic resp probs- it involves expanding the too small mouth! Tooth extraction made problem worse- as made mouth smaller. Traditional orthodontics were making breathing probs worse.

Correct oral posture can improve airways obstruction without need for orthodontics = lips together, teeth lightly touching, tongue on roof of mouth. J shaped spine. Exercise called “ mewing” is believed to help expand upper palate - see videos on you tube.

The bone in the centre of the face, maxilla, can grow even into 70's, by engaging the masseter(!) by chewing which releases stem cells. Chewing starts in infancy with breastfeeding- longer breast feeding = less crooked teeth, snoring and sleep apnea.

Breathing + techniques (these are more extreme breathing techniques that if used consciously are believed to help reset the body and bring many positive benefits)

Nb- many nerves connecting to parasympathetic nervous system (PSN) are located in lower lobes of lungs. Slower and deeper we breath in and importantly breath out stimulates a PSN response.

Sympathetic nervous system (SNS) nerves are more profuse in top of lungs . It takes a second to switch on SNS but returning to state of relaxation can take an hour.

Vagus nerve turns organs on and off in response to stress eg fainting -but slow breathing stimulates the vagus nerve- breathing fast and heavy causes vagus response to put us in a stressed state.

Tummo breath or breath of fire (wim hof)- Wim Hof has loads of you tube videos describing his method and bookd

Conscious extreme breathing. Can control heart rate, temperature and immune response and stimulate SNS

Holotropic breathing

Extreme version of tummo breathing

When we breath heavily we exhale too much CO2 which decreases circulation, esp. in the brain. Few mins of over breathing can decrease blood flow to the brain by 40%., generally in frontal lobes of brain- can lead to hallucinations. Ph imbalance sends distress signals even tricking body into thinking its dying= death and rebirth experiences in holotropic breathwork

Chemoreceptors determine how fast and often we breathe by measuring CO2 in blood. Too fast and not enough CO2 , too slowly and have too much. They stimulate suffocating feeling when you hold breath. They can become more adaptable eg extreme athletes. They can also induce panic attacks even without the influence of the amygdala that perceives danger. This implies that fears are not just a mental issue but can have a physical manifestation from a more ancient part of the brain - chemoreceptors . Proposed that 1 way of treating anxiety sufferers is too teach them not to panic when CO2 levels increase by holding the breath. CO2 therapy has been also used for cardio vascular health, weight loss and immune function.

Most anxiety sufferers have the worst breathing habits. People with anorexia, panic disorders have low CO2 levels and a much greater fear of holding breath. They over breath and become hypersensitized to CO2 and panic if they sense a rise in CO2. They are anxious because over breathing over breathing because they are anxious!

Studies have shown slowing breath to increase CO2 can blunt asthma attacks. Take a deep breath is not a useful instruction, hold your breath is much better.

Prana- life force energy. Most powerful way to enhance it is by breathing!

Experiments done in the 1970;s on Rama who could control his vital functions using the breath. He suggested removing the pause between inhale and exhale and doubling length of the exhale. Szent Gyorgyi- Hungarian scientist tried to make sense of prana and described the need for slow breathing through the nose so that our cells have the maximum amount of electron reactivity and the ability to attract O2 which stop cells breaking down.

Pranayama techniques have been used for thousands of years to control and distribute prana. They give us the means to stretch out lings, boost blood flow, balance our minds/bodies, sleep better etc

Breathing techniques are best suited as preventative maintenance, a way to retain balance in the body. Breathing is a missing pillar of health. "If I had to limit my advice on healthier living to just one tip, it would be simply to learn to breath better" Dr Andrew Weil

Summary

Shut you mouth when you breath! Mouth breathing should only be a back up system. The body is not designed to process raw air day in day out.

Breath through the nose- reduces snoring, sleep apnea, increases athletic performance, reduces sinus infections

Exhale longer and fully- moves the diaphragm and stimulates PNS

Chew more- eat rougher, rawer foods that require chewing to stimulate bone growth in faceand improve ability to breath

Breathe more on occasion using breathing techniques like \Wim Hof to stress the body on purpose so that it can properly function for the rest of the day

Maybe hold your breath on occasion to promote chromoreceptor flexibility- studies being conducted on this

The perfect breath- inhale 5.5 secs, exhale 5.5 secs so 5.5 breaths pr minute with 5.5 litres of air- there are apps to help promote this

He has a website called mrjamesnestor.com/breath with videos etc

Breathing methods

Alternate Nostril Breath- calming. Improves lung function, lowers bp, heart rate

Breathing coordination – gets diaphragm moving and increases respiratory efficiency. Involves extended exhale www.breathingcoodination.ch/training

Coherent breathing- puts heart lungs and circulation into coherent state. Inhale 5.5 secs, no pause exhale 5.5 secs no pause- breath feels circular, apps – paced breathing or my cardiac coherence

Buteyko breathing training the body to breath in line with metabolic needs, for most of us that means breathing less. www.consciousbreathing.com

Tummo breathing- 2 forms. 1 stimulates SNS or one that triggers PSN.

Yoga breathing – 3 part breath

Box breathing- to calm and focus