

BREATHE WELL WITH EXERCISE: IMPROVE SPORTING PERFORMANCE

Anders Olsson wrote in his book 'Conscious Breathing':

“Breathing well when you exercise ensures that your energy production is efficient, while keeping the consumption of available energy low, so you will consequently achieve more with less effort. This leads to increased endurance and faster recovery.”¹

Health benefits from regular exercise are well known such as:

- Support of your cardiovascular system, protection from heart disease
- Stronger bones, protection against osteoporosis
- Improved sensitivity of your cells to insulin, protection from diabetes
- Improved ability to burn fat, protection against obesity
- Antidepressant effect
- Vitamin D if training outside

Despite this, a 2018 study carried out by World Health Organization found that up to 28% or more of the global adult population **don't exercise** - putting them at greater risk for diseases such as hypertension and diabetes.²

This is likely due to our sedentary and busy lifestyles, however whilst many of us need to begin or increase our exercise levels **what is less well known and understood is that we also need to breathe well with exercise** (as Olsson points out) or else it can be detrimental to our health.

If your normal (baseline) breathing is dysfunctional then it is likely you will take this poor breathing into your exercise routine. Breathing pattern disorders are common in the general population and in fact one study suggests that normal patterns of breathing are the exception rather than the rule.³

It is not hard to imagine therefore that with the greater demands that exercise places on the body, unhealthy breathing will be magnified.

When exercising, the cardiovascular, respiratory and muscular systems have to work harder, adapt and respond more rapidly than when at rest.



The muscles you are working need more oxygen, and at the same time they produce more carbon dioxide (CO₂). Increased CO₂ naturally stimulates breathing. So, the greater the intensity of exercise, the more your breathing will increase. During prolonged intensive exercise you may breathe 10 times more air per minute than at rest.⁴ You can however learn to lower your breathing rate during exercise with consistent practice.

So how do you know whether you are breathing well with exercise?

Some obvious signs you may be **breathing poorly** with exercise are:

- Open mouth breathing
- Upper thoracic (chest) dominance
- Shortness of breath even with light exercise
- Rapid breathing of more than 20 breaths/minute with mild to moderate exercise
- Feeling exhausted both during and afterwards
- Poor recovery time eg your pulse takes more than five minutes, or may even not recover to pre-exercise levels once you stop exercising
- Exercise-induced asthma
- Exercise-induced angina, elevated blood pressure
- Feeling lightheaded or dizzy within half an hour of finishing your workout
- Getting muscle cramps and /or lactic acid buildup in the muscles following exercise
- Sweating profusely
- Being excessively thirsty and having a dry mouth and/or throat
- Increased anxiety levels during the day
- Over-production of mucous, post nasal drip



If you recognize any of these signs, then it is time to have your breathing assessed.



How should you be breathing with exercise?

Healthy breathing during exercise is breathing in and out through the nose, using the diaphragm efficiently. Inhaling through the nose ensures the filtering, humidification and warming of the air. Exhaling through the nose also helps maintain hydration of the nasal tissues and sinuses.

Using the upper thoracic muscles to breathe taxes the body far more than diaphragm breathing because these chest muscles consume a lot more energy and fatigue easily. They are meant to be used in emergencies – when you are in ‘fight or flight’ mode – and are inefficient and not appropriate for simple exercise.

In other words when dysfunctional, **your breathing may well be putting a limiter on your sporting potential and performance!**



Take the ‘limiter off’ **with exercise** and you will be able to:

- nose breathe whilst exercising (however nasal breathing with swimming is challenging and will likely requires supervised instruction to master)
- maintain a breathing rate of up to 16 breaths per minute with light to moderate activity
- diaphragm breathe
- recover your pulse and breathing rate rapidly – within five minutes after light to moderate exercise
- drink less with exercise and reduce your thirst afterwards, sweat less
- improve your fitness or sporting performance more than when exercise is dysfunctional



But ... It’s impossible to jog, run or cycle with your mouth shut!?!

That is one of the most common things we hear clients say about exercise at the clinic.

It’s FALSE - it is possible and comfortable **when your baseline breathing pattern is right.**

The exception is explosive high intensity sprints eg in rugby or hockey. Players should however be able to recover quickly and be able to switch back to relaxed nose breathing

When you improve your baseline breathing enough you can:

- nose breathe and exercise all the way
- get by comfortably with a lot less air

CO₂ is Your Legal and All-Natural Performance Enhancer

Australian based Buteyko practitioner and physiotherapist, Tess Graham of BreatheAbility, talks in her book 'Relief from Anxiety and Panic'⁴ of having seen "breathing retraining produce phenomenal improvement in social exercisers, professional athletes and Olympic champions.... (So much so) that athletes have been asked by their coaches the reason for their sudden 'performance enhancement'...." It is in fact in large part due to an increased concentration of arterial CO₂ enabling this, by facilitating oxygen delivery and release to the working muscles (Bohr Effect^{5 & 6}).

(For more on this see the article on Chronic Hidden Hyperventilation.)



When your body develops a healthy tolerance for CO₂ and gets a CO₂ boost as a result of nasal and slower breathing at rest and with regular exercise, then it can also increase the body's pH buffer. The pH buffer is a clever and complicated way that the kidneys work hand in hand with the respiratory system to maintain a healthy arterial pH and homeostasis.⁷

The good news is that a high pH buffer prevents the buildup of lactic acid in muscles and so reduces the soreness that is usually experienced a day or two after a serious workout.

When breathing with exercise is nasal and arterial, CO₂ increases along with the increased muscle requirement for oxygen (O₂). It also results in the optimal release of nitric oxide (NO) and results in a drop in blood pressure. This is because both CO₂ and NO are powerful vasodilators – with ~150,000 km or blood vessels that is potential for a lot less tension. NO is also thought to offer a powerful immune boost⁸.

How you breathe during exercise and immediately afterwards is key to staying healthy with exercise and the biggest key is nose breathing all the way.

Sadly, many elite athletes are not the best examples of breathing well during exercise or at rest for that matter.

Athletes suffer more than their fair share of respiratory illnesses from burnout, anxiety, fatigue and immune dysfunction due to pushing their bodies to the limit – having an Olympic gold medal



Exhausted athletes: May 2021 London Olympics

medal does not necessarily mean optimal breathing or health and we have sadly seen the result of this with the death of an elite New Zealand athlete in August 2021 from RED-S syndrome.

RED-S syndrome means Relative Energy Deficiency Syndrome, referring to the inability to continue competing at a required level through lack of energy. Whilst the focus has largely been on insufficient calorific and nutrient input, breathing efficiently and adaptively offers a natural tool to aid in prevention of RED-S.



Called up to the All Blacks in his first Super Rugby season in 2015, Nehe Milner-Skudder spoke later of becoming 'super-pumped' to do the haka before the game. Straight after performing the haka, he mentioned in an interview becoming light-headed and dizzy and thought he'd gone too hard and worried he might not have the energy to play his first game.

Why did this happen? One possibility is that Milner-Skudder would likely have had some anxiety before his first game which would have pushed up his breathing rate and volume to begin with. Performing the haka full force would have caused him to hyperventilate causing a drop in oxygen being released to the brain, heart (the big O₂ munchers) and other muscles of the body.^{5 & 6}

Gradually there is more emphasis being put on breathing well however there are many different ideas on what this is and different methods being trumpeted.

The Buteyko breathing method is grounded in science and based on the work of Ukrainian born Professor Konstantin Buteyko.⁹

In fact, breathing functionally can make a huge difference in athletic performance. According to the Alabama Nasal and Sinus Center citing research published by Dr. Mitch Lomax, (Senior Lecturer in Sport and Exercise Science and Respiratory Health at University of Portsmouth, UK), proper breathing during the warmup phase and during exercise can improve performance by up to 15 percent.¹⁰

Australian Buteyko practitioner, Brian Firth, pointed out to his colleagues in 2019 that prior to the retirement of tennis champs Ashleigh Barty (world No. 1 & 2019 WTA Champions Champion) and Roger Federer, they had something in common.



You may not have noticed however neither of them grunt on every point they and both play with their mouths closed most of the time.

To recap: The benefits of breathing well with exercise?

- Improve fitness and enjoyment
- Exercise more safely, lower heart rate for same intensity
- Improve and recondition your breathing faster - improving any one pillar of health supports others
- Reduce symptoms of dysfunctional breathing faster eg snoring
- Lower lactic acid buildup and eliminate faster, less cramping and muscle soreness
- Less dehydration and need for fluids

- Improve endurance

If you do the opposite – pushing your breathing and blood chemistry further from normal with exercise then you will worsen your baseline breathing pattern.

In case you're still not convinced:

Exercise is very useful in discharging the adrenaline-mediated fight or flight response that is so closely tied to a pattern of over-breathing.

When stressed and over breathing your body is geared up for exercise. Did you know that when you do something active even if just a brisk walk you can use up some of the excess adrenaline and glucose in your bloodstream, reducing the likelihood of stress-related diseases?

How you breathe during exercise and immediately afterwards is key to staying healthy with exercise and the biggest key is nose breathing all the way.



Learn how by booking your breathing assessment and course today.

IMPORTANT NOTE: GET CHECKED

If you have a sedentary lifestyle, are unfit and over 40, or suffer from chronic health problems such as asthma, heart disease, COPD, diabetes, or obesity, CFS, anxiety or mental health issues, you should consult your doctor before beginning or changing an exercise programme.

If you have been ill or inactive for some time, it is even more important to start slowly and build up at a comfortable rate.

Do you know how far or how fast you can walk or run whilst nose breathing?

Time to check this out. Have a breathing assessment so you know your starting point.

If your assessment shows you would benefit from learning to breathe well both with activities of daily living and with exercise you can attend a breathing course.

The courses run at **Breathe Free Clinic** take you through an incremental programme to first improve dysfunctional baseline breathing and then build it into whatever exercise suits you and your lifestyle.



TOP TIPS SO YOU CAN START TO ADD HEALTHY BREATHING INTO YOUR EXERCISE REGIME:

BREATHING STRATEGIES TO BOOST FITNESS

For physical exercise

Improve	Improve your baseline breathing first	
Choose	Mild to moderate aerobic continuous motion type exercise	
Start	At a slower pace (initially) than normal	
Pace	Pace yourself so that you can breathe through your nose	
Keep	Keep your shoulders down and relax your belly	
Breathe	Breathe diaphragmatically	




BREATHING STRATEGIES TO BOOST FITNESS

For physical exercise

Allow	Your body to relax as you build up your pace	
Allow	Deeper fuller breaths as your need increases	
Don't	Strain, find your natural rhythm	
Gradually	Increase your pace/gradient as your comfort and nose and fitness allows	
Control	Your breathing during warm-down and recovery	
Remember	Go slow first to be faster later	





TYPICAL HEART RATE CHANGES WITH BREATHING RETRAINING

	BEFORE	DAY FIVE
• Average heart rate at rest	78	63 (19% reduction)
• Average heart rate after five-minute medium pace walk	91	67 (26% reduction)
• Heart rate 60 secs after 400m sprint (elite athlete)	130	70 (46% reduction)

Tess Graham: Relief from Anxiety and Panic p150 Publ. 2017

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