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Awesome!

BREATHING LIFE INTO PERFORMANCE

REDUCED BREATHING FOR AWESOME SPORTS
PERFORMANCE

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Reduced Breathing for awesome sports performance

2 INTRODUCTION

In this paper I am going to show you how to use REDUCED BREATHING (RB) techniques to improve comfort during physical exercise and produce awesome results in competition.

My first real job, upon graduating from the University of Otago, was working in the physiotherapy department of Dunedin Hospital. Duties included morning rounds of the respiratory and vascular wards where my job was to slightly upend patients and gently percuss their chests to help clear their lungs of puss and sticky mucus that had built up overnight. The patients would gasp, choke, cough and splutter during this most unpleasant procedure, often producing gobs of sputum that were dutifully collected in pottles and delivered to the lab for analysis. It was always assumed that these people needed to breathe deeper and harder. Maybe they actually needed to breathe less and more calmly, rather than fighting and forcing?

Have you ever wondered why bilateral breathing every 3rd stroke in freestyle swimming is so superior to one-sided, every second stroke breathing? It's not just in the biomechanics – it's to do with the way air is fed into the lungs that is most important. Further, is it the humid air that enables an asthmatic to compete as a swimmer to Olympic level, or is it the reduced breathing that is the key factor? You may not know; but I do, that a one-sided swimmer (*a swimmer who breathes fast and shallow*) is much more likely to suffer a panic attack when in deep water, or when in the maelstrom of swimmers at the start of a triathlon. It's all to do with the breathing.

In all the exercise physiology research I have read, the focus has been on measuring and increasing peak lung flow – in other words, the rate at which an athlete can furiously pump huge volumes of air in and out of the lungs – the larger the volume – the better the performance has been the prevailing assumption for as long as I have known. I have since learned that the assumption that furiously pumping air in and out of the lungs improves oxygenation and, therefore, performance, is flawed and may actually cause the opposite – reduced tissue oxygenation!

Slow, calm breathing may be the key to *awesome* athletic performance

In addition to showing you a new way to breathe during exercise and how to practice this new approach to breathing (reduced breathing) during exercise, I am going to explain, as simply as possible, the physiology behind why reduced breathing - not increased breathing - is the key to increasing oxygenation at the cellular level during exercise.

While I have tinkered with various breathing techniques over many years, including reduced breathing during warmups, which I learned from my brother, Bruce, it was not until early 2015 when [Buteyko guru, Glenn White](#), generously invited me to attend his Buteyko breathing course, that most of the gaps in my understanding of breathing and performance were filled in. What I have written here is my interpretation

of Glen's teachings, merging his wisdom with my understanding about exercise physiology and sports conditioning. I also want to thank Professor Steve Stannard, Professor of Exercise Physiology at Massey University, for casting his expert eye over the drafts and suggesting improvements.

Awesome!

3 AN AWESOME STORY ABOUT BREATHING SUCCESS

My oldest daughter, Myra, was a severe asthmatic as a child. She no longer is. Her asthma was so bad that we resorted to sending her to school in the Cook Islands one winter because we could not bear any more her being so unwell. She was hospitalised on two occasions for acute asthma attacks and on one occasion, she was struggling so much to breathe, I feared she might die. It was a terrifying experience. It was when Myra was about the age of 12 that I first learned of Buteyko Breathing as a non-drugs treatment of asthma and other breathing disorders which, for obvious reasons, I became intensely interested in learning more about.

Buteyko courses were delivered by Russell and Jennifer Stark in New Zealand for several years early 1990s. The teaching of Buteyko breathing went very quiet when the Starks left New Zealand to open a practice in Brisbane. Things remained very much in limbo until recently when the method was picked up and championed by 2001 when one-time asthmatic, Glenn White returned from the UK to open his Buteyko practice in Auckland.



Back in the early 1990s I learned some of the basic principles of Buteyko breathing and combined this with my growing understanding of allergens such as dust mite and cat dander to introduce a series of interventions that quickly had my daughter free of the need for asthma medication. This included extensive testing of the house for allergens and measures included ripping out all of the old carpets and drapes. Despite the house being colder, these measures worked. It did help that we were participants in the Otago Medical School's ground-breaking asthma research study that ran through the 1990's, which gave us some of the key clues with regards to the role of allergens.

I was intensely interested in finding an explanation as to why an asthmatic could swim in a pool that was laden with a chemical (chlorine) that is a lung irritant, yet get relief from asthma. I also wondered how an asthmatic could ride a bike without suffering an asthma attack, yet get an attack while running? This was the pattern for Myra, down to a "T". The answer, I figured, was in the way the swimmer and the cyclist breathe (*when coached well!*). When swimming correctly, breathing is a slow, controlled rhythm, using

the diaphragm - not the upper chest and neck muscles to breathe. The same happens when the arms are fixed to the handlebars while cycling. Breathing is actuated from the belly. When running, it is far too easy to breathe fast and shallow, using the upper chest muscles to ventilate the lungs. Breathing from the belly is not quite as natural while running and needs to be learned by many runners. Rapid, upper chest breathing has the same effect on the body and brain as what happens when blowing up party balloons – oxygen depletion - which is not pleasant and not good for everything from vision, concentration and balance – most people need to lie down by about the 5th balloon!

The attention to allergy elimination, diet and reduced breathing worked for Myra. By age 16, she was the New Zealand U21 mountain bike champion and went on to represent her country at the World Junior Mountain Bike Championships and, later represented the Cook Islands at the 2004 Commonwealth Games. All of this was achieved while being asthma and drugs-free and this continues today. Myra is currently living and training on the island of Rarotonga, with the intention of qualifying for the 2016 Olympic Games in mountain biking, representing the Cook Islands. This is an awesome goal.

As an aside, around 1994, Myra was invited to be the poster girl for the Asthma Foundation which we both agreed would be a great honour. What better role model could there be to represent young asthmatics and high-risk populations – glamorous, female, Polynesian, flash bikes, flashier lycra and excelling in the last sport an asthmatic should be involved in? As a final formality, she was invited to meet with the Board of Directors which she did. After the meeting I asked her how it went.

“Very well”, she said. “Until I was asked what medication I was taking to control my asthma”.

“What did you say?” I asked.

“Well, I told them that I had not taken any medication for a few years and now controlled my asthma through breathing and diet”. “And that was the end of the meeting.

Myra and I never heard another word from the Asthma Foundation.

Since then, the benefits of the Buteyko programme have been demonstrated in 8 published clinical trials. In addition the benefits of slow, controlled breathing (A basic principle of Buteyko breathing) have been demonstrated by clinically proven products, such as the Resperate blood pressure machine coming onto the market (*I have had one of these machines in my clinic for about 5 years – yes, it works; but Buteyko breathing is even better*).

FORTUNATELY, TIMES HAVE CHANGED SINCE THE 1990S AND THE ASTHMA FOUNDATION TODAY IS MORE INCLUSIVE. THERE ARE NOW ADVOCATES WITHIN THE ASTHMA FOUNDATION WORKING TO GET BUTEYKO INCLUDED. FOR EXAMPLE, GLENN WHITE PRESENTED AT THE FOUNDATION’S 2014 ANNUAL CONFERENCE AND HAS BEEN INVITED BACK TO RUN A BUTEYKO WORKSHOP AT THEIR 2015 CONFERENCE.

4 WHAT YOU WILL LEARN

- How to increase the availability of oxygen at the cellular level which will lead to:
 - Effortless breathing during moderate to extreme exercise.
 - Bringing on “Second wind” much sooner than usual during exercise.
 - Calmness and better decision-making.
 - Awesome performance and better recovery.

If you are a competitive swimmer in disciplines such as backstroke or butterfly, or a free diver, some of the techniques described in this paper, may already be somewhat familiar to you.

Smashing it!

Young John, a fictitious mountain-biker, went hard from the gun, hammering the steep uphill sections to gain a handy advantage early in the race. As the race progressed, he began to suffer episodes of loss of concentration, blurring vision and feeling dissociated – as if he was in a dream. Then he began to black out and was forced to stop and lie down. Recovering a little he resumed the race, blacking out yet again. He finished the race, somehow avoiding breaking his neck getting there!

Upon finishing, he collapsed, complaining of numbness and tingling in his limbs. His condition worsened and he began falling in and out of consciousness.

On examination by the paramedics, he was found to be very anxious, semi-conscious, shivering and shaking uncontrollably. His heart was racing and blood pressure was low. Breathing was fast and shallow. Eventually, he was transported to hospital by ambulance, where he remained for a few hours before being sent home, apparently well, although feeling very unsettled from the incident.

Follow-up examinations by a cardiologist and a neurologist found nothing amiss; however, as a precaution, he was placed on medication to “calm” his heart, plus an anti-anxiety drug. In my opinion, these medications are completely unnecessary, if only the causes of such incidents were better understood by all.

As you read this paper, you will realise that over-breathing, combined with hypoglycemia (*Low blood sugar*), are the most likely root causes of incidents like these and so easily prevented.

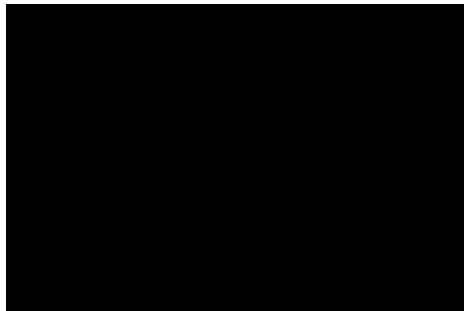
5 WHAT IS BUTEYKO BREATHING?

Buteyko breathing, or reduced breathing (RB) exercises are a management strategy for asthma as well as other conditions. The method takes its name from Ukrainian doctor, Konstantin Buteyko, who first formulated its principles during the 1950s.

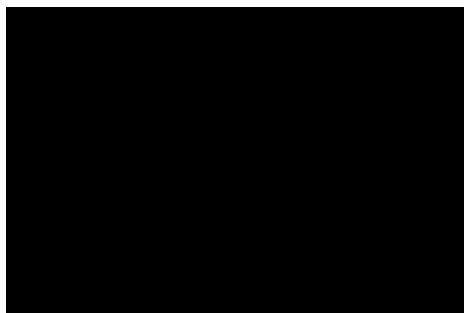
Buteyko breathing retrains the breathing pattern through repetitive breathing exercises to correct the hyperventilation, which may be a root cause of asthma and other conditions that are associated with hyperventilation (*over-breathing*). At the core of the Buteyko method is a series of breathing exercises that focus on nasal-breathing, breath-holding, reduced volume breathing and relaxation.”

There are many videos that can be found on sites such as YouTube. While most of these videos are “advertorials” you will still learn a lot from the explanations and visual demonstrations of Buteyko techniques. *Please bear in mind that no number of instructional videos will ever replace the instruction from a trained and expert Buteyko Practitioner such as Glenn White.*

Please take some time to watch the following videos and others:



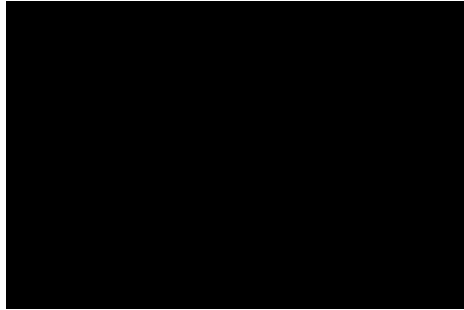
<https://youtu.be/fdnTvfooGn8>



https://youtu.be/0kyL_v21dQk

6 WHY HABITUALLY BREATHING THROUGH YOUR NOSE IS SO IMPORTANT

Your nose is not merely a pretty (or not so pretty) bump on your face; it is a complex organ that has several important functions to keep you healthy, including being a humidifier, warmer and filter. It also has a little known job of producing a potent signaling molecule called nitric oxide (NO) (more about this in a moment). Please watch this short video that explains the anatomy and function of the nose:



<https://youtu.be/ZUKyR6-Q3zE?list=PL8e6BzZpWW2oSON8xgPO4tCoawnM3CrVM>

The message is this:

*Breathe through your nose all the time,
other than when exercising intensely*

Please ensure this is encouraged with your children. I have the impression, and I am not alone in this, that there is a wide-spread epidemic of mouth breathing among children nowadays. This may be leading to a raft of health issues, such as chronic respiratory diseases, hyperactivity and may be the root cause of weak jaw and facial bone structure and tooth misalignment that may later require expensive orthodontic work.

6.1 THE NOSE AND NITRIC OXIDE (NO)

Have you ever wondered why you have sinuses? Lots of people think their sinuses are more trouble than good. How wrong they are!

Nasal breathing, or, more accurately, inspiration through the nose generates nitric oxide (NO) in the sinuses.

NO is a signaling molecule that exerts a key role in the vascular, immune and nervous systems. When inspiring through the nose, oxygen passes through the nasal sinus cavity and diffuses across the nasal epithelium, where it is used as a cofactor in Nitric Oxide Synthase (NOS) enzyme production of NO in cells.

As NO is produced and released, it has a relaxing effect on smooth muscle, including the lung bronchioles, blood vessels, and heart and digestive organs, including the stomach, intestines and bowel. NO is a

neurotransmitter and signaling molecule that also relaxes the mind. It is therefore hardly a surprise that breathing exercises are central to all forms of meditation.

As the nasal sinus generates NO and air is continually inhaled, NO enters the lungs where it diffuses into alveoli capillaries, causing vessel dilation for optimal O₂/CO₂ exchange. Good news for athletes.

Intentional reduced breathing through the nose has been shown in many studies to relieve stress and lower blood pressure. Much of this may be attributed to the NO-induced relaxation response as well as the increase in blood CO₂ (more about this in a moment).

This is all positive stuff for the athlete who is seeking the competitive edge.

7 HOW DOES REDUCED BREATHING (RB) APPLY TO SPORT?

The harder one exercises, the more one breathes and more oxygen is delivered to the cells. This is true, to a degree; but may not be the case if one breathes more than is required. Let me explain:

7.1 BREATHING AND CARBON DIOXIDE

Breathing rate and volume is regulated by carbon dioxide (CO₂) levels in the blood. Optimum levels of CO₂ are essential for maintaining the flow of oxygen to the cells. Over-breathing blows off CO₂ at a rate that is higher than CO₂ production which is a byproduct of cellular respiration.

It is claimed that breathing rates have increased over the last 50 or so years from as low as 6-8 breaths per minute to now being as many as 16-20 per minute. Various causes have been forwarded to explain this shift to more rapid breathing, including stress, lack of exercise, and overuse of stimulants such as caffeine and from promotion of deep breathing exercises for health.

CO₂ helps relax smooth muscles. Smooth muscles form the walls of blood vessels, intestines, lungs and bladder as well as the heart. When relaxed, these allow efficient function. Conversely, as CO₂ levels drop with over-breathing, smooth muscle will tense and may result in:

- Asthma.
- Heart flutters/palpitations.
- High blood pressure.
- Migraine.
- Vision disturbances.
- Reflux.
- Colic.
- Diarrhoea.
- Bladder urgency, loss of bladder control.

Over-breathing, such as when blowing up a balloon, has been shown to reduce oxygenation of the brain by as much as 40%! CO₂ deficit in the blood from over-breathing is called “hypocapnia”.

Other symptoms of hypocapnia include:

- Numbness.

- Tingling.
- Carpopedal spasms (twitching muscles).
- Diminished cardiac output.
- Anxiety.
- Confusion.
- Reduced oxygen release at the cellular level for respiration.
- Loss of consciousness.

Warning:

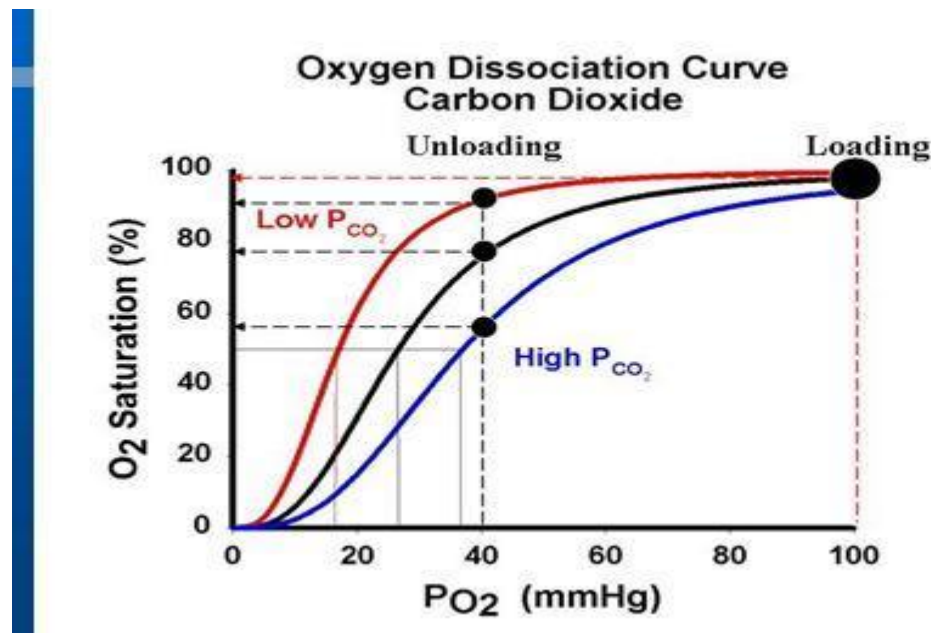
Hypocapnia is often induced prior to attempting extended breath-holding such as when free diving. Excessive over-breathing, or hyperventilating can result in loss of consciousness and should not be done by anybody other than the most experienced of divers, or anybody else for that matter, especially when around and in water.

7.2 WHY OVER-BREATHING CAUSES ILLNESS AND POOR PERFORMANCE

Subconscious (autonomic) breathing is controlled by the brain stem. As carbon dioxide levels increase in the blood, so is the stimulation of the brain stem to increase ventilation of the lungs. It would appear that our trend to over-breathe has caused a shift to the brain stem being reset for low levels of CO₂ as compared to that of our forefathers.

If CO₂ levels in the blood are too low CO₂ means each haemoglobin cell molecules in the red blood cells hold more strongly onto its their four oxygen molecules, with the consequence that less oxygen is delivered to the tissues.

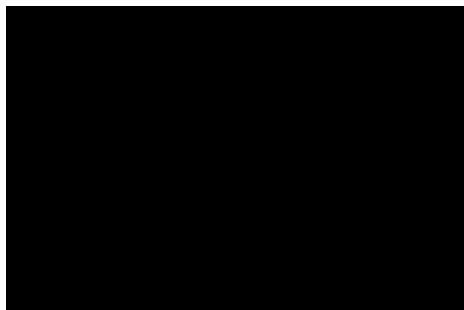
8 THE BOHR EFFECT – WHY BREATHING LESS (RB) IS MORE



In summary:

- Increased CO₂ levels lowers the PH of the blood.
- A lower PH causes the haemoglobin to more readily release its four oxygen molecules.
- A higher PH causes the haemoglobin to tenaciously hold onto its four oxygen molecules.
- This is known as the “Bohr Effect”.

RB, rather than over-breathing will increase the availability of oxygen for cellular respiration. This process is explained, in detail, in the following video:



<https://youtu.be/dHi9ctwDUnc>

Practicing RB may, over the long term, produce other beneficial effects that increases athletic performance, principally, the stimulation of the production of natural erythropoietin (EPO), which is the hormone that stimulates the production of more haemoglobin, plus resetting the brain stem to be comfortable with higher levels of CO₂. By the way, these are very similar to the benefits on oxygen uptake of living and training at altitude and various “hypoxic” training systems.

What RB translates into for the athlete is:

- More efficient delivery of oxygen to tissues which means
 - “Second Wind” kicks in much sooner more about this later).
 - Higher work output is accomplished with lower heart rate and effort.
 - Reduced lactic acid accumulation in muscle tissue due to better delivery of oxygen.
 - More efficient use of limited glycogen resources, thus avoiding catastrophic drops in blood sugar (hypoglycemia) during intense and prolonged competition.
 - Less dehydration due to reduced water loss from open mouth breathing.
 - Nil gasping for air – far more efficient, relaxed breathing.
 - Better decision making, less anxiety, clear head. Far less likely to panic and make mistakes.

“IF YOU HYPERVENTILATE DURING STRENUOUS EXERCISE, THE ENERGYCOST OF THE ARTIFICIALLY HIGH WORK OF THE BREATHING MUSCLES REDUCES THE AVAILABLE BLOOD FLOW TO THE EXERCISING MUSCLES BECAUSE THERE IS ONLY SO MUCH BLOOD THAT CAN GO AROUND. BASICALLY, IT MEANS YOU WILL “MAX OUT” AT A LOWER INTENSITY.”

Steve Stannard, Professor of Exercise Physiology at Massey University

9 HOW TO BREATHE BETTER DURING EXERCISE

The first step to efficient breathing (RB) is to break old breathing habits, especially if it involves habitual mouth breathing, and also to reset the brain stem so that higher blood levels of CO₂ are the comfortable norm.

9.1 GET STARTED WITH HABITUAL NOSE BREATHING

- Breathe through your nose – all the time, other than during extreme exercise.
 - Comfortably, even during exercise.
 - If you are monitoring heart rate, your goal is to be able to breathe through your nose at heart rates of up to about 130 beats per minute (I find I can breathe comfortably through my nose at this kind of heartrate, so long as I concentrate on doing so).
- Breathe gently, slow and more shallow than deep (Deep and fast breathing blows off CO₂ too much).
- Breathe from your belly (diaphragm) – not your upper chest.
- By contrast, the less you breathe through your nose, the more likely it is for your nose to block (recall the function of NO for relaxing smooth muscle). As nasal breathing gets more difficult, mouth breathing becomes the norm, including during sleep, contributing to sleep disorders like snoring. It's a vicious cycle of nose blockage that must be broken (unblocked).

“IT WILL NOT ALWAYS BE POSSIBLE TO MAINTAIN NASAL AND DIAPHRAGMATIC BREATHING PATTERNS WHEN PERFORMING AT MAXIMAL EXERTION. HIGH VOLUME NASAL BREATHING CAN BE QUITE HARD ON THE NASAL MUCOSA AND CAN TRIGGER HEADACHES OR NOSE BLEEDS

YOU MAY NEED TO SHIFT TO MOUTH BREATHING FOR SHORT PERIODS IN CERTAIN SPORTS WHERE SHORT DURATION HIGH LEVELS OF EXERTION ARE REQUIRED.

HOWEVER, ATHLETES SHOULD ALWAYS STRIVE TO RETURN TO SLOW, LOW VOLUME NASAL AND DIAPHRAGMATIC BREATHING WHENEVER POSSIBLE I.E. WHEN PACE COMES OFF AND BREAKS IN PLAY.

YOU SHOULD ALSO PRACTISE BREATHING IN THIS WAY TO HELP SLOW HEART AND BREATHING RATE DOWN DURING WARM DOWN. THIS MAY FEEL UNCOMFORTABLE BUT BREATHING IN THIS WAY IS ACTUALLY BOOSTING CELLULAR OXYGEN, SPEEDING RECOVERY AND HELPS REDUCE LACTIC ACID ACCUMULATION.”

Glenn White

10 REMEMBER.

10.1 BECOME USED TO FEELING A LITTLE BIT OF “AIR HUNGER”

The purpose is to reset your brainstem, so that you feel comfortable with higher overall levels of CO₂ in your blood and, therefore, better oxygenation.

- Whenever you are aware, during the day, slow your breathing rate and depth to the point where you feel a slight urge to breathe faster and deeper. Hold your breathing at that point of “air hunger” by regulating your breathing rate and depth. Do this for about 10 minutes at a time, all the while breathing through your nose.
- With practice, you will be astonished at how little you need to breathe to comfortably supply oxygen to your cells. This is because higher CO₂ levels mean more oxygen is released from the haemoglobin at the cellular level and nose breathing facilitating the production of NO.
- When you go to bed, lie on your back and practice the following for ten minutes:
 - Relax your jaw, neck, chest, belly, arms and legs.
 - Progressively reduce your breathing. Imagine having a down feather stuck on your upper lip and you are trying not to make it flutter.
 - After a few minutes:
 - Take 4-5 slow, shallow breaths through the nose then:
 - Hold for 5-10 relaxed seconds on the outbreath then:
 - Take 4-5 tiny breaths then repeat 5-10 seconds of breath hold.
 - Continue this cycle of slight breathing with a short relaxed breath hold for about 10 minutes in total, all the while experiencing a slight air hunger, then it is time to go to sleep.

As a matter of interest, this breathing exercise may be effective at alleviating restless legs syndrome.

10.2 NASAL BREATHING DURING EXERCISE

Get into the habit of breathing through the nose while exercising. With practice it is possible to breathe continuously through the nose at intensities of exercise equivalent to about 130 beats per minutes, if not higher. While a slight air hunger may be felt, this will be increasingly tolerable as the practice sessions mount up.

One thing that you will learn from habitual nose breathing during exercise, is to be more even and efficient with the way you expend energy. This will translate into being a smoother and more economical athlete.

10.3 USING NASAL AND BRIEF BREATH HOLDS (BBH) DURING YOUR PRE-COMPETITION WARMUP

I am indebted to my brother, Bruce, a keen free diver, for reminding me of the benefits of breath-holding prior to competition. This is a technique used by divers and competitive swimmers, particularly in backstroke, butterfly, breaststroke and underwater hockey, where the swimmer may remain underwater for extended periods. What I am about to describe is the opposite of hyperventilation, by the way.

In addition to optimising the Bohr Effect, BBH may mobilise haemoglobin reserves that are held in the liver and spleen. It is this release of haemoglobin in response to exercise stress, which may, in part, explain

the phenomenon of the “second wind” which may be felt as a lift in energy, performance and “spirit” about half an hour or longer into the competition. BBH combined with a smart, carefully timed warmup, may bring on the second wind sooner, if not from the very moment the gun fires.

Putting BBH to good use during your pre-competition warmup is actually very simple. Here’s what you need to do:

I am assuming you have a warmup routine before competition that you have practiced over and over again in training (*wise athletes know to do a minimum warmup as part of their training for injury prevention as well as to have it an ingrained habit that can be an almost subconscious ritual to be performed pre-competition*). A warmup routine begins at least half an hour before the gun fires, beginning with gentle stretching and relevant, sports-specific exercise that builds to a brief intense crescendo, finishing with relaxing exercise and mental rehearsal for what is about to come. As a general rule of thumb, the duration of the workout is determined by:

- **The intensity and duration of the event.** For example, if the event is over and done within a minute or two, such as sprint, or 800 meter race, then the warmup may be quite long and more intense. If it is a long event like an Iron Man triathlon, the warmup may be minimal, not more than stretching and warming up for the first stage only (*in this case, the swim*). If the event is longer than an hour and not a *to-the-death* scramble at the start, I’ll use the first 10-20 minutes of the event to warm into it.
- **The ambient temperature.** Generally speaking, the colder the weather, the longer the warmup needed to bring body temperature to optimum (*internal core temperature sufficient to produce a mild sweating*). If the weather is hot then the warmup may be quite brief. What one is wearing has an obvious influence, but be aware that warmup can be entirely compromised if it is followed up by a lengthy period of waiting around on the start line, stripped off, waiting for the action to begin.
- **Your level of fitness.** If you are unfit, then it is wise to warmup; but not for any longer than need be to ensure you do not pull a muscle moments after the gun fires! Too long a warmup may result in a fatigued athlete standing on the start line. The fitter the athlete, the longer and more thorough the warmup can be.

10.3.1 How to incorporate BBH into your warmup

This is really simple to do as you work your way through your regular warmup routine, all the while breathing through your nose.

Begin with a BBH at the start of your warmup. You need to start early because you want the “second wind” to already be with you at the start of competition – not the end.

- One breath in, then breathe partially out, then hold your breath while you begin your warmup which may be an activity like an easy jog.
- Hold until you feel the urge to gasp for air. The hold may be for as little as five seconds as compared to 20 or more seconds when resting. The more intense you are exercising, the briefer the BBH.

Warning: This is a Brief Breath Hold – It is not a breath-holding competition!

- Inhale through the nose (*you want to enhance NO production as well*) as normally as possible, but do not gasp and don't hyperventilate, despite the urge, when letting go the BBH.
- Continue with your warmup routine for another minute or two, then repeat the BBH, brief though it may be.
- Repeat the BBH every few minutes until you have done a dozen or so BBH over 20-30 minutes.
- Continue with your warmup, all the while breathing through your nose.
- Do a few more BBHs even after your warmup has finished and up to five minutes before the real action begins.
- Breathe through your nose as much as is comfortably possible during the event, mouth breathing at any time the intensity demands the switch.

10.3.2 Here's a thought or two:

The athlete who wins is not necessarily always the one with the most talent or the biggest heart; who wins may come down to who has been more efficient at expending their limited reserves of energy, especially their muscle glycogen and lactate buffering reserves. This begins before the contest with the warmup and getting their second wind early in the game. It is usual for the warmup to increase in intensity to the point where there are one or more bursts of high intensity exercise. The intended effect of this strikes me as being remarkably like what is being done with BBH! The difference with BBH is there is little or no depletion of glycogen reserves.

While BBH is not a replacement for the warmup, its use may mean that it is possible to save some energy during the warmup while enhancing overall performance.

QUALIFIER FOR BBH INSTRUCTION

"ASSUMING YOUR AUDIENCE MAY BE ATHLETES AND THEY ARE PRONE TO PUSH THEMSELVES: PUSHING THE BBH WHICH MOST ATHLETES WILL DO, CAN POTENTIALLY TRIGGER A HYPERVENTILATION ATTACK"

Glenn White

11 SOME FINAL HELPFUL TIPS

- 11.1 If your nose is blocked, try doing the BBH exercise. This is remarkably effective at relaxing the nasal passages, allowing air to pass freely.
- 11.2 Practice reduced breathing for about 10 minutes while lying in bed, then go to sleep.

If you wish to take the advice in this paper to the next level, consider consulting [Buteyko Guru, Glenn White](#). His breathing courses are highly recommended, especially if you have medical issues such as asthma, sleep apnoea and emphysema.

If you are struggling with complex health issues, for which there seems to be no satisfactory, lasting solution, you might benefit from the services of an experienced Health Sleuth, such as myself, who can help unravel the root causes and devise “healthy” interventions.

[Send me an email here](#).

Remember these:

High muscle temperatures, low PH and high CO2 all serve to encourage haemoglobin to release their oxygen molecules to the cells.

Breathing through the nose facilitates the production of NO which relaxes smooth muscle, improving blood flow and oxygenation.

A further benefit is the intense increase in CO2 from reduced breathing may encourage the release of reserves of haemoglobin that are stored within the liver and spleen. This all translates to improved physical performance.

In addition, regular practice of reduced breathing may encourage the production of erythropoietin (EPO), the hormone that stimulates the production of haemoglobin. This is a long term benefit that may be similar to that obtained from altitude training, or other forms of “hypoxic” training which are often expensive, inconvenient and some may not even work.

Awesome!