HARMONIOUS PERFORMANCE RESPIRATION

OM ALIVE-BREATHING-MOVEMENT-RELATIONSHIP

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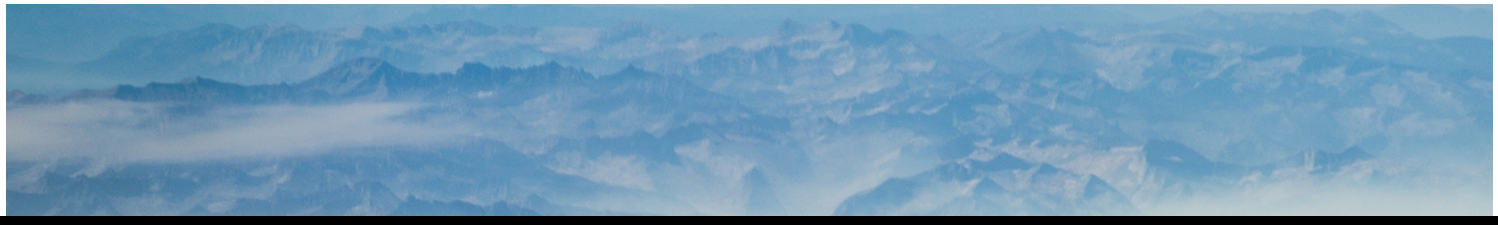
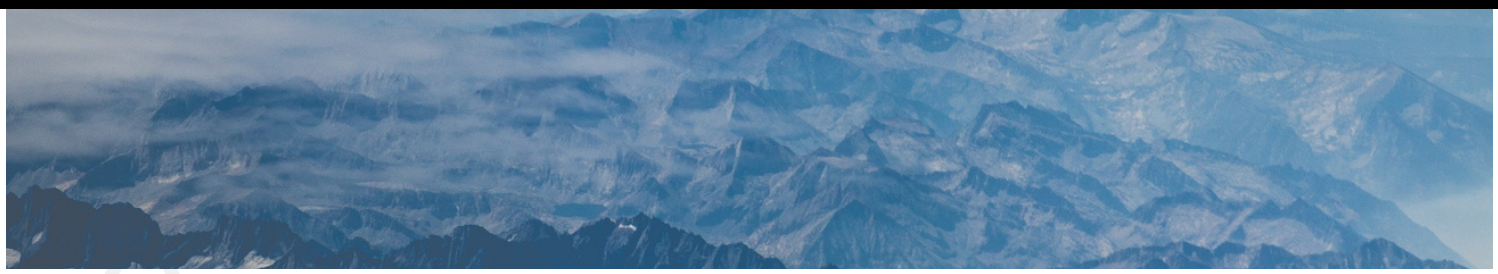


EXPLORING THE BREATH

JOURNEY INTO THE EXPERIENCE



The VO2max represents the maximum volume of oxygen that an aerobic organism can use per unit of time. In simple terms it is how much oxygen you consume during a maximal effort. This determination helps in performance programming. It is an index of lung capacity which is a key factor in performance in endurance events.
Improving your VO2max is a matter of planning and the numerous studies(1) on the subject mention that the physiological values (heart rate, breathing) indicate the modifications in the variations of effort and recovery intensities.
Thus a whole range of exercises contributes to diversify the forms of training to reach this objective. The training sessions will then consist of VMA (Maximum Aerobic Speed) sessions, splits, Limit Time, threshold work (SV1 & SV2), Fartlek, Interval Training (H.I.T.)2, running economy,...
Over the past 30 years VO2max has even been shown to be an important predictor of adverse health outcomes such as cardiovascular disease and all-cause mortality(3-4).

According to Scribban et al.(1) "despite the importance of identifying the optimal intensity of exercise training to improve VO2max, there is surprisingly little evidence available describing what that intensity or range of intensities might be."

This would be to say that identifying the optimal intensity at which an exercise should be maintained to improve VO2max remains too unclear. Moreover, each subject responds to these intensities in a different way.

Nevertheless, it is certainly important to determine a VO2max in order to segment the intensities at which the exercise sessions will provide quality in execution and programming.

However, the main characteristic of VO2max is a measure of aerobic capacity. It involves breathing in a fringe and gas exchange ratio at its peak. Namely, the test that measures VO2max ends when the subject can no longer breathe efficiently and must stop.
But does this measure identify the quality of the subject's breathing? Actually, there is nothing in this test that identifies the quality of breathing. On the contrary, the increment of the speeds makes most of the subjects enter very quickly in saturations of oxygen use which prevent the maintenance of a more efficient breathing.

In sports, the determinants of performance are clearly identified. Tucker et al.(5) mention that in sport science, elite performance is considered to be the result of training and genetic factors. However, the question of whether champions are born or made remains of great interest.

The authors conclude that while deliberate training and other environmental factors are critical to elite performance, they alone cannot produce an elite athlete. Rather, individual performance thresholds are determined by our genetic makeup, and training can be defined as the process by which genetic potential is realized. Although the specific details are currently unknown, the current scientific literature clearly indicates that both the acquired and the natural are involved in determining elite sport performance.
In conclusion, elite sport performance is the result of the interaction between genetic factors and training, so both talent identification and management systems to facilitate optimal training are critical to sport success.

However, a surprising paradox remains: how can VO2max be improved by taking breathing for granted from birth?

There are training programs for strength, nutrition,... what about breathing training? This is the only factor that is not specifically trained. The adaptation to effort considers that breathing improves regardless. Does it?

Certainly, in the measurement of VO2max oxygen (O2) and carbon dioxide (CO2) are the main markers.
Now, do they describe whether the subject is breathing using the diaphragm correctly? Does the air accumulate rapidly at the top of the lungs for short, inefficient breathing? Is breathing exclusively through the nose?
How is it possible to make a more efficient use of muscular oxygen in sports and in everyday life?

The art of breathing (Pranayama) has been known for thousands of years. It has even contributed to build the fundamentals of some martial arts practices by spreading in the schools of traditions.

Today, breathing is a subject of interest in many fields (Yoga, Sport & Performance; Psychology, Stress, Trauma, Anxiety,...).

Many authors and practitioners have become experts in exploring the effects of the breath on our physiological and mental functions. Wim Hof (The Iceman) with his ice baths, his breathing and his determination has relied on scientific research that validates the three pillars of his method to reduce stress, increase recovery, increase energy, strengthen the immune system and improve sports performance.

Patrick McKeown (Oxygen Advantage) devotes his practice to improving breathing efficiency through exercises that promote functional breathing and a simulation of high-altitude training. In short, it is possible to conserve energy for longer periods of time without becoming breathless from the effort, to recover more quickly after training, and to be more efficient.
I have been fortunate to be fully immersed in the practice of many forms of breathing, notably with Stig Severinsen (Breatheology). Dan Brulé supports the book I wrote (Les Contes Soufflés) which offers 32 stories (plus variations) to teach children to breathe and find more appropriate solutions in stressful situations. These exercises combine imagination, creativity and practice to remove anxiety, fears and difficulties from situations that children and later adults will face.
Among the dear people I have met in this field of breathing is Dr. K.R.I. Jaggadish. An Indian physician, he has dedicated his life to helping others in a simple and humble way. He advocates the values of the ancient Greek physician Hippocrates by educating his patients to
that their food becomes their first medicine.

His quasi-monastic life is dedicated to a daily yoga practice to receive patients and treat them with a permanent smile of love on a radiant and flawless face. He welcomes each one as a solemn reception to come in confidence. Jag doesn't care about his job but about giving the other person what he would like to receive. His love is felt and shared.

You think that reading these lines that I move away from the initial subject. For those who only rely on numbers and data, certainly. At the same time, that's not what I'm interested in, so let's move on.
Correction: I'm going to use a number here to get my point across.

As a function of age, VO2max decreases. This trend is marked by a continuous linear downward curve over time regardless of age or gender (6). Increasing VO2max is possible with training but only for 5-15% on average despite intensive training (7). Even though this value is largely defined by genetic allocation and if you are not satisfied with your result you can always blame your parents.
The question is: If breathing is modified to improve oxygenation at rest and during exercise, what will be the impact on VO2max over time? Furthermore, if you improve your breathing to adapt to the effort you contribute to modify your patterns and references.

In short, you transform your adaptation dynamics to training by integrating new sequences. In this way, you enrich your reference system through the experience of new techniques.
Example: when you repeat a sustained effort for a long time, your breathing accelerates and breathlessness quickly appears, often putting an end to the exercise.

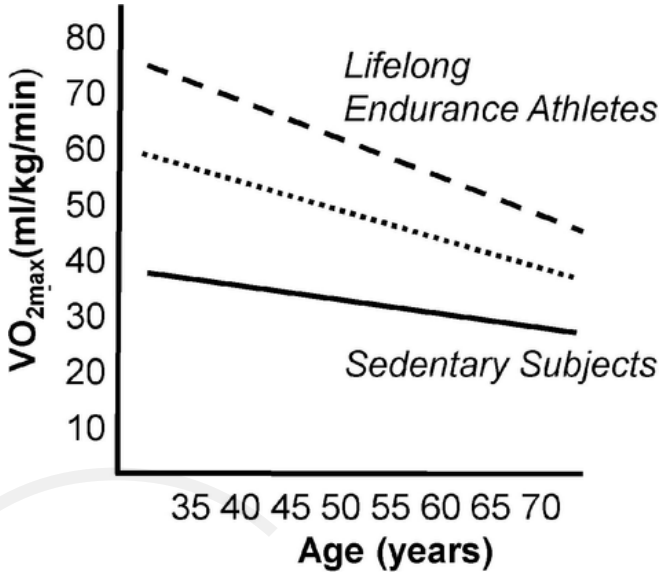


FIGURE 1: AGE-RELATED DECLINE IN MAXIMAL OXYGEN CONSUMPTION (VO2MAX) IN ENDURANCE-TRAINED MALE (- - -) AND FEMALE (...) ATHLETES COMPARED WITH SEDENTARY CONTROL SUBJECTS (—).

Notice how you have your mouth to breathe more and how long your time to return to near-normal breathing is.

Are you familiar with the Bohr effect? Christian Bohr, a Danish physiologist, was the first in 1904 to describe a phenomenon that can be explained simply by the fact that the more CO2 accumulated in the body, the better the distribution of oxygen to the muscles. Our body's tolerance to CO2 provides more efficient cellular oxygenation, placing less stress on the heart and lungs during exercise. By practicing breathing exclusively through the nose, many physiological benefits are corrected during sports practice but also outside. In particular, it has been shown by Dallam et al(8) that the ability of recreational runners to use exclusive nasal breathing does not result in a loss of VO2max and increases physiological economy and VE/VO2 after a prolonged period of training.

I prepared a cyclist for an extreme event(9) in Corsica which consists of cycling a 1000 kilometer loop, 18000 D+, unassisted and self-supported over a maximum time window of 5 days.
The preparation for such a long event covers a multitude of parameters. And even taking all these factors into account, there is no guarantee of the result.
The choice of nutrition was the basis for the energy intake. To optimize access to a source of energy for training and competition and to speed up the recovery phase, high quality fruit and vegetable nutrition raises your game at all levels. The benefits of fruit and vegetable nutrition provide optimal fuel, increase blood flow, make muscles more efficient by accelerating recovery while reducing inflammation. These benefits are not just for athletes, but for anyone who wants to feel better and perform better in all aspects of their life.
Carbohydrates, which come primarily from plants, are the optimal fuel for muscle. And plants are the exclusive provider for staying sharp, responsive and focused during intense workouts and competition(10).

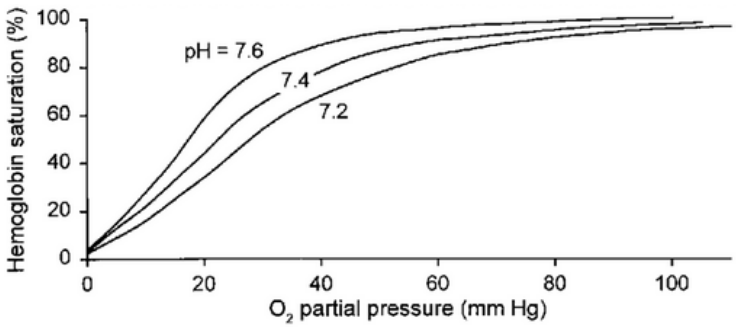


FIGURE 2: HEMOGLOBIN-OXYGEN DISSOCIATION CURVE AND BOHR EFFECT. HYPERVENTILATION RESULTS IN A LEFTWARD SHIFT OF THE CURVE AND A STRONGER AFFINITY OF OXYGEN (O2) FOR HEMOGLOBIN. UNDER CERTAIN CONDITIONS, THIS CAN LEAD TO A REDUCTION IN O2 RELEASE TO THE TISSUES.

Increasing blood flow is another cornerstone in optimizing performance. Blood is a major contributor to this process as it carries oxygen and vital nutrients to our muscles, brain and other organs to ensure proper function and waste removal(11).
The effects of an animal-based meal(12) rapidly increases blood thickness and slows the flow of oxygen and nutrients to the muscles used during exercise(13). The opposite effect is observed in people who eat mainly fruits and vegetables: the blood flow remains fluid and flows rapidly to its destinations(14).
In an event where a constant supply of energy must guarantee the "motor" function, the consequences of a bottleneck in the arteries, preventing them from opening completely to ensure better blood circulation, would harm the athlete. Dominguez and al.(15). have shown that two hours after eating a heavy meal of animal origin, the arteries can narrow by 40% causing a traffic jam. While the vegetable meal with equal calories allows the arteries to open freely for a quick and easy transit.
Thus, to guarantee a more efficient oxygenation, the nutritional choice favors this good functioning.
However, this factor should not be isolated in the choice of training exercises. It is associated with the quality of breathing and not only with the adaptation of efforts.

Once again, breathing techniques are only rarely introduced into the training program. However, there is evidence that proper diaphragmatic breathing protects athletes from the long-term detrimental effects of free radicals. Martarelli et al(16) showed that fundamental breathing in Pranayama practice increased antioxidant defense status in athletes after intensive exercise. These effects correlate with the concomitant decrease in cortisol and increase in melatonin. The consequence is observed with a lower level of oxidative stress, suggesting that proper breathing modifies the adverse consequences and inflammation.

How did we miss this obvious fact? The common thread in all these performance factors is breathing. The subtle links it builds generate patterns. They are built from the earliest age during motor development through play. The child plays with a ball, a soap bubble, a pet, a brother or sister,... Without realizing it, these games participate in the development of the respiratory system. It is to them that we refer when we later practice a sport activity. As soon as the effort increases, our organism dives into this system of references to look for an answer. Unfortunately, we have not been taught how to adapt our breathing to variations. We do not have a fine gradation of breathing patterns.

Our range in these patterns is much poorer than we think. Our ego plays with an almost arrogant comfort and confidence that we know how to breathe correctly. Yet as soon as the intensity of the exercise rises a saturation threshold quickly exposes us to stopping to catch our breath.
Exploring breathing techniques gives us a better understanding of how our body works. We build new patterns that will be recognized in the situations we encounter. Thus a more appropriate response will be offered to us thanks to a richer panoply of breathing patterns. Taking our childhood breathing for granted is no longer enough, it is necessary to follow and adapt our evolution in order to live in unity and for this we must constantly practice and develop discipline if we choose to live in harmony.

EXPLORE THE EFFECTS OF BREATHING TECHNIQUES IN YOUR LIFE

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