INTENTIONAL BREATHING WITH EXERCISE

THE WHYS, HOWS, AND WHATS OF THE BREATHOGRAPHY TECHNIQUE

AJ FISHER MSC CSCS

1

THE POWER OF BREATH INTENTIONALITY

Intentionality of breath in tandem with movement is something that yogis are no novices at. The multi-component benefits of controlling breathing with movement has been recognized for millennia. Yet, outside the yoga studio, choreographing breathing in conjunction with fitness routines is less the norm...why is that?

Many believe that they should save their breath-work for their meditation practice, yoga, or focused breathing sessions because this is how intentional breathing is traditionally taught. Isolated breath-work while stationary is a wonderful method of improving autonomic nervous system, respiration, blood pressure, and alpha waves (flow state) in the brain. But what if you could accomplish your breath-work benefits in tandem with your movement protocols, inclusive of mobility, strength, and core, for maximum efficiency and efficacy?

Most of us have such little time to devote to our self-care each day. Can you imagine someone telling you that you needed to devote 3 hours per day to organized workouts for breath work, exercise, and cognition? It's just not feasible.

Certainly not for me! Therefore, I suggest for those busy individuals who would like to accomplish injury prevention, core strength, total body strength, respiratory strength, cognition enhancement, and nervous system balancing, to perform choreographed breathing in tandem with movement patterns intended to challenge the brain *while* strengthening the body, respiration, and nervous system.

Both my anecdotal and academic observations of individuals performing this technique show that intentional breathing during exercise not only increases core activation, but also focuses the mind. Mental focus aids in improving our skills of attention, which we can all benefit from in our modern world with it's nearly-constant deluge of stimulation and information. And choreographed breathing routines improve tolerance to carbon dioxide levels in the body, which directly correlates with lower stress levels, not only in the workout, but also in daily life.

I call my choreographed breathing routine *Breathography*. The core pillars of *Breathography* are the ZipUp Activation, Engaged Inhale, and Engaged Exhale. The exhale is performed on a "Blow", "Hiss", "Soft Shh", and "Loud Shh", with the flow of air gradually increasing in intensity, synergistically increasing activation of injury-preventing deep core muscles. Please visit HYPOXiX.fitness for more details on how to perform all components of the *Breathography* Breath Cycle.

In the next sections, you will learn why *Breathography* is a powerful method of injury prevention, cognition enhancement, respiratory strength, and accelerated results from your exercise routine!

2

BREATHOGRAPHY FOR INJURY PREVENTION

The core. What is it? For some, we only *sort* of feel it at best when we're doing our "core" exercises... and we are not 100% sure if we are activating the right muscles. You might even be a PT or trainer with a sophisticated level of knowledge about the body, but are looking for a unique and reliable tool to add to your toolbox. I have a solution for you! I've developed an interesting approach to "finding your core" for both the person who really has no idea what their core is *and* the experienced practitioner.

Breathography began with using my husband's Trombone "Breathalyzer" tool. This is a common device used by brass players for strengthening breath. While finishing my undergraduate degree, I dove deep into voluntary breath control during exercise, and the amount of research papers supporting higher levels of deep core activation when performing "resisted exhales" was fascinating to me. I was working with a client at the time who had a history of herniated discs and had just had a baby, so not only were we in our post-natal phase, but we were also searching out

methods to increase activation of the deep core. By blowing into this plastic tube cylinder for brass players, in which a ping-pong ball levitates when blown at the right intensity, my client and I were able to accomplish a higher level of core activation in our workouts. We did run into a problem however. After 3 weeks of sessions using the "Breathalyzer tool" the plastic tubes would fill with spit and the experience became very gross! We were about to seek out a replacement for the yucky tube device when the pandemic hit. This transitioned my clients and I to 100% remote sessions via computers for our personal training. As I dove into my graduate studies focusing on breath control and altitude training, I went into a mad scientist phase of spending 80% of my day in my basement studio teaching and experimenting with the intensity, frequency, tempo, and duration of the emerging breathing method that I now call *Breathography*.

Using a combination of a metronome (to keep the rate at a maximum of 6 breaths per minute), very specific sounds for core activation (Blow, Hiss, Soft Shh, Loud Shh), and special cues that activated the correct muscles, it was like I was able to reach through the screen and touch the client on the other side. The breathing method's ability to engage the core and focus the mind during the workout was a surprisingly effective proxy to being physically in the room with my clients during this strange period of time.

The act of exhaling with intensity, while pulling the navel into the spine, "tricked" my clients into properly activating the transversus abdominis and the internal oblique muscles. The transversus abdominis in particular is a muscle with horizontal fibers that connects to the fascia of the low back. When this muscle tightens, it also tightens the thoracolumbar fascia, which assists in stabilizing the low

back. The lower back does not love shear forces or rotational movements. A proper contraction of the transversus abdominis in tandem with exercise aids in preventing excess movements and forces in the lumbar spine. Also, connecting with the muscles of the deep core while performing total body movements can aid in finding stability and "neutral" in the low-back, meaning the position in which the core muscles are at their greatest mechanical advantage. It also aids movements coming from the joints above and below the low back, the hips, and the mid-thoracic back. Your workouts will become more effective as you learn to transfer forces from the upper body through to the lower body, creating an intense contraction in your core.

In addition to the injury-preventative benefits of deep core activation, the *Breathography* technique also improves motor control as a result of the physiological effects of slowed breathing. Many studies have shown that alpha waves increase to a high level in conjunction with slow breathing, which is the state of brain electricity most conducive to a relaxed, yet productive flow state. Higher levels of focus and concentration trigger a cascade of positive changes. Read more on the cognitive benefits of performing *Breathography* in the following chapter.

3

ENHANCED COGNITION

Use it or lose it! The neuroplasticity of the brain improves with exercise, but is greatly enhanced in conjunction with breath-control. This is, in part, due to an increased alpha state that creates a calm and focused ground for learning (including motor learning). The brain-body does not learn well in a state of stress. When breathing slowly, the acetylcholine released not only aids in activating the parasympathetic nervous system (your CALM), but also has the ability to increase focus via its receptor connections in the brain. Can you believe that the breath has the ability to make these dramatic cognitive changes?! ...and all WHILE you are working on your strength and cardiovascular systems!

Cerebral Blood Flow (CBF) is increased as a consequence of the physiological shifts induced by the *Breathography* Breath Cycle. Two of the primary physiological shifts that produce both short-term and long-term physical and mental benefits are slight increases in carbon dioxide levels and decreases in blood oxygen (hypoxia). In the beginning levels of *Breathography*, the main driver of increased CBF is

the elevation of carbon dioxide. This is one of the reasons individuals with migraines respond positively to carbon dioxide therapy. Increased CBF aids in the birth of new neurons (neurogenesis) and increased ability to learn new skills (neuroplasticity).

In the more advanced levels of *Breathography*, in which Breath Retentions are used at the conclusion of the 8 Second Engaged Exhale, intermittent hypoxic breathing occurs. In other words, blood oxygen safely lowers by a similar percentage to what takes place during altitude training. When the blood oxygen lowers, interesting changes happen in the brain. Firstly, CBF increases in the same way that it does in response to increased carbon dioxide levels. Additionally, the HIF-1 (hypoxia inducible factor) that increases when the blood oxygen slightly lowers, increases the factor BDNF (Brain Derived Neurotrophic Factor) in the brain leading to an increase in the birth of new neurons. Cardiovascular exercise alone has also been shown to increase levels of BDNF. Imagine the high level of cognitive function that you will experience when combining ALL of the activities that increase BDNF at once; cardiovascular, strength, and breath-work! Incorporating *Breathography* into your total body routine three times a week will optimize your muscles and your mind!

4

ACCELERATE RESPIRATION & TOTAL BODY RESULTS

FEV, forced expiratory volume, is the force at which you can exhale, and it declines naturally as we age. FEV is a direct representation of our respiratory and total body health. It declines primarily because we do not work on it. Because FEV is representative of respiration health and our biological age, this is something that should be prioritized in every person's wellness program. FEV can be strengthened by performing forced exhalation exercises ... simple, right? Yes, in theory, but in practice, forced exhalation exercises are not practically performed during a normal day of work/kids/responsibilities. We make time for the minimum amount of exercise, but not the breathing exercises that could help to prevent respiratory decline. I have a solution: perform the 8-Second Engaged Exhale in which the final 4 seconds is a "forced" exhale. I've had many clients test their FEV before and after my breath-work programs, especially asthma patients, and I've seen significantly improved FEV.

Additionally, lung capacity has been shown by the Framingham Study to be the number one marker of longevity.

Lung capacity also declines with age if it is not actively worked on. Cardiovascular exercise helps with lung capacity, but adding-in breath-work increases lung capacity even more. The combination of the Engaged Exhale and the Engaged Inhale improves lung capacity and hence longevity.

Who doesn't want accelerated exercise results? We are all so busy it can be difficult to fit in our minimum dose of exercise throughout the week for maintaining health and wellness. Many of us cannot fathom getting 60 minute total-body sessions in four times per week, but for most, that's what is necessary to see and feel positive changes. What's the solution? There are modalities such as high intensity exercise, that have been shown to make exercise routines more efficient, but the problem is that they work for some yet don't work for others. This is due to the required intensity and resulting injury-prone nature of these programs. Interestingly, hypoventilation (slow breathing) in conjunction with exercise has been shown to increase effectiveness of workouts at lower levels of intensity and impact. This is due to increased levels of lactate and carbon dioxide, and lower blood pH. These are the same shifts that happen in the body in traditional high intensity training. As the body is exposed to these stressors, it adapts positively. Studies have shown that muscle buffering capacity and performance is improved when slowing breathing while training strength and cardiovascular routines. This opens up a whole new world of "high intensity, low impact training". This is wonderful for the athlete who does not want to become deconditioned, but needs a break for their body, the person who has a history of injury, or any general exerciser who would like to get results without adding extra compression to their joints and tissues. The high intensity, low-impact

workouts that result from the *Breathography* Technique are designed to maximize results without burning out the body.

Let's try it together. Stare at a stopwatch or set a metronome to 60 bpms. Inhale 2 seconds, exhale 8 seconds. TWO seconds on a *Blow*, two Seconds on a *Hiss*, two Seconds on *Soft Shh*, and two Seconds on *Loud Shh*. While performing this breathing pattern pull your navel in and the pelvic floor up. Squat up and down as you do this, one second per movement (you will end up performing 4 squats on one Engaged Exhale Cycle). Repeat this three times in a row. Imagine you are loosening a ribbon around your waist as you exhale with intensity. (check out *Ab-Ribbon* to maximize your core workouts!) You may find that you experience a little more heaviness in your legs than you normally would performing these body weight squats. That's the carbon dioxide, lactate, and rapid change in blood pH in response to the breathing. The body responds and adapts!

Many studies show that hypoxic training in altitude chambers increases recruitment of type ii fast twitch muscle fibers and accelerates fat loss and muscle gain from workouts. The more advanced levels of *Breathography* put you in light hypoxia as you perform your workouts. Anecdotally speaking, I have observed outstanding results in the areas of strength-gain and fat-loss in practitioners of my online HYPOXiX programs.

In conclusion, start slow. Begin to add an 8 Second Engaged Exhalation to some easy, basic routines. When you are able to accomplish this with control (1-2 weeks of practice), move on to adding Breath Retentions and more intense movements. It's ideal to build gradually into these more advanced techniques. The 8 Second Exhale of *Breathography* can change your life by optimizing mind and

body to more effectively engage with the world around you, and the core inside of you!

For more information visit HYPOXiX.fitness to learn *Breathography* and discover HYPOXiX workouts IN HYPOXiX.studio to help you *Achieve Inner Altitude*!