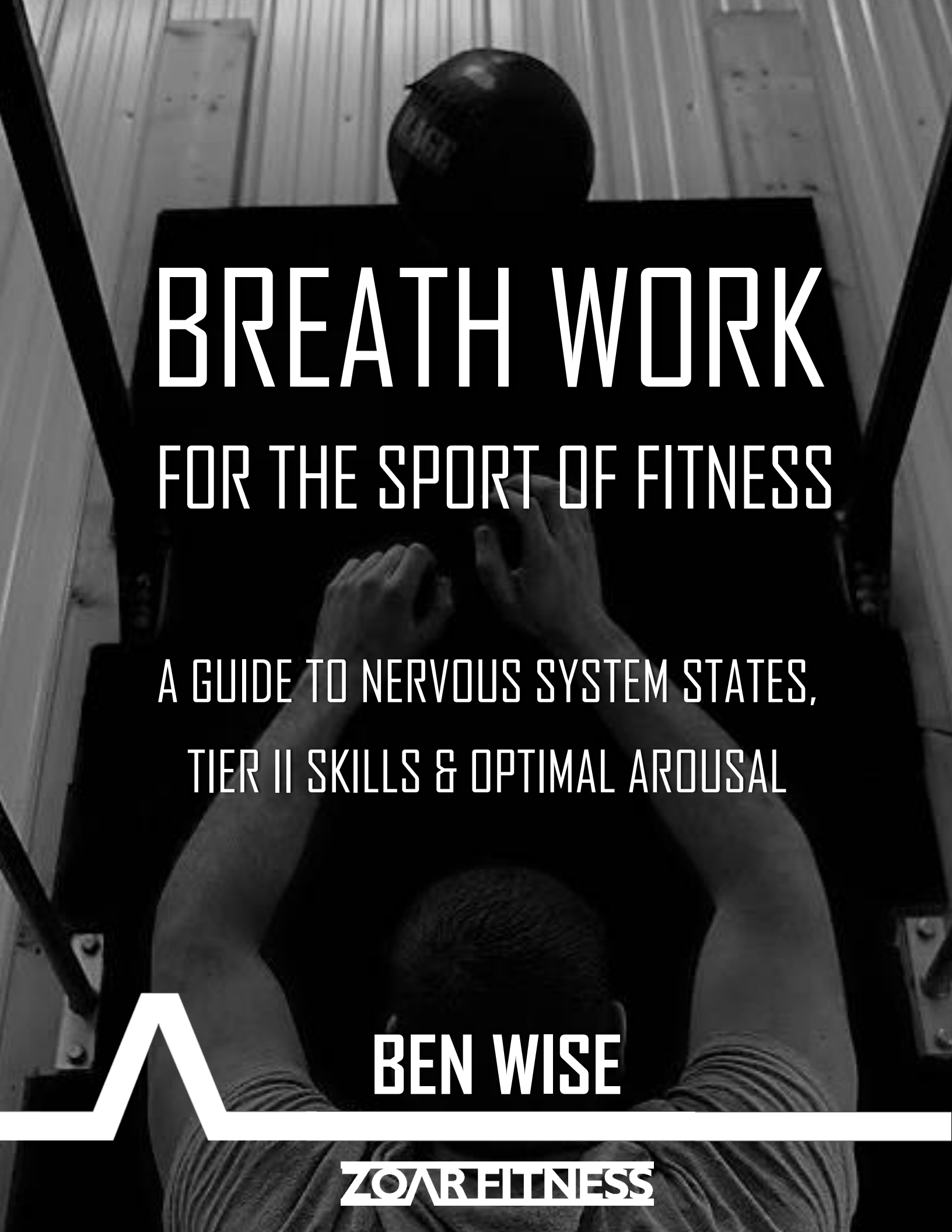


BREATH WORK

FOR THE SPORT OF FITNESS

A GUIDE TO NERVOUS SYSTEM STATES,
TIER II SKILLS & OPTIMAL AROUSAL

BEN WISE

ZOAR FITNESS

FOREWORD

"The key to success is self-confidence. The key to self-confidence is preparation."

-Arthur Ashe

Breathing is often the last thing on our mind. This is equally true inside and outside of our training endeavors. Life is busy, chaotic and demanding. Our training, with endless avenues for improvement, demands more and more of your precious time. Learning the movements required to compete in CrossFit or other functional fitness endeavors at your highest level is a monumental task on its own. Breathing often takes a back seat. Yet, I believe we all can recognize the value that mastering the breath would have for our performance, both in and out of the gym. Optimal breathing is a fundamentally natural yet incredibly rare skill to possess as an athlete.

The longer you are in an activity the more you recognize the value of details in their simplest form. This is a resource I wish I had available to me during the early years as an athlete. Performance anxiety and chronic stress altered my state and breath and I rarely performed at my best. My goal with this guide is to help more people perform closer to their genetic potential.

I want to provide both theory and application concurrently. One should not be present without the other. Theory without application is just an idea, like a goal without a plan. And application without theory is just foolish. Always know the why for every detail in your training. Even if you don't have research to back it up, you should still have a reason.

If you are using cold water immersion as part of your training, you should know exactly why you are doing it, even if it is based on feel or intuition. Theory and application must exist concurrently or remove the practice from your training.

The purpose of this guide is to make change. This change should occur both in thinking and in action. As your understanding of best practices morphs over time so should your honest best attempt at those best practice techniques. Habit lies at the heart of change. Therefore, habit lies in the heart of a champion.

By reading this you have already taken the first step in improving your breath, state and fitness. Consider ingesting this guide to be an investment. Consider it to be attacking your weaknesses. Consider it taking ahold of your life and showing you have control over its outcomes.

As you read, make the decision to commit to trying these techniques. Holding yourself accountable is the mark of a champion. Commit to learning and implementing daily. A few positional breathing drills or a parasympathetic breath work protocol can easily be tacked onto the front or tail end of your current program with little barrier to entry, time commitment or recovery deficit. Creating a daily practice reinforces desired behaviors. Champions don't need to be told to train, it is who they are, so they act according. To be a champion, you must behave like a champion.

Breath Work for the Sport of Fitness is written to CrossFit athletes and coaches. This doesn't mean that athletes in other disciplines couldn't benefit from the concepts because breathing is a universal skill.

TABLE OF CONTENTS

PART I
THE ART OF BREATH
[DEFINING INTANGIBLES]

BEYOND BREATH: ART IN MOTION

What is art? It's subjective. It's impossible to quantify. It's rarely agreed upon. Yet…it's almost universally recognized. Hand me a famous painting and I couldn't tell you what specifically made it great…yet I could tell you it was a world-class artist. I just had a gut feeling about it, a sense, something that set it apart.

For years, this is how I felt witnessing champions compete or perform in their respective discipline. I couldn't put my finger on exactly what they were doing differently, but they were on a completely different level.

I've spent my whole life silently watching high-performers. And it didn't matter the discipline…sport, business, music, theatre, or food. The top-performers, the champions in each field shared more characteristics in common than the runner-up performers did with those in their own field.

Champions are set apart for a reason. They have unique abilities.

In my years of observing, I noticed one of these unique abilities is the ability to have a soft, broad focus, coupled with an ability to be relaxed and fluid at maximal output.

Too intense and you will experience tunnel vision and chest breathing (the results of sympathetic nervous system activation). This compensation will most certainly ruin your performance in a long, grueling competition by draining your energy, making your impulsive and hazing your mental acuity.

Conversely, too relaxed and you'll won't be willing to do what it takes when the heat gets turned up. You will never show the "heart" and intensity required for greatness.

Learning to control your breathing starts with learning to control your arousal. Manipulating arousal and nervous system state requires a soft focus. This focus must be developed through patient practice.

The Painter vs. The Artist

Skill is a prerequisite to art.

An understanding of this fundamental truth is essential.

First, there is the painter. He spends his time putting lines, shapes and shades on a canvas. He is talented at what he does. His skills set him apart. People admire his perfectly straight lines, beautiful shapes and his unique pallet of perfectly blended colors. Yet he is not an artist and he has not created art. He has the skill, but lacks the vision, direction, purpose and intent. He lacks this second set of skills, which are essential to his ability to create art.

Then, there is the artist. He also spends his time putting lines, shapes and shades on a canvas. However, he doesn't think about what he does as lines, shapes or shades. He doesn't think about his techniques. Rather he directs his attention, his focus, on the overarching themes and feelings he longs to create. He has invested so deeply in his fundamental skills that the focus moves vertically to create something bigger and broader. The focus moves from painting to creating art.

Both the painter and the artist have mastered Tier I skills. That is, the *skills of the craft*.

Only the artist has mastered Tier II Skills - the skills needed to create art. For the athlete, this set of skills is what sets you apart from the competition. One of most important of Tier II skill is breathing.

The Breath is a Tier II Skill because you cannot simultaneously focus on movement cues and the breath. Focus is singular. It can jump from thing to thing (i.e. multi-tasking) but it can never diverge completely.

Remember, an athlete who must focus on a skill (e.g. double under timing) cannot also focus on breathing. You must learn to paint before you can create art. Do not try to rush an athlete to breath work in fatigued settings with high skill demand. Layer slowly.

The process moving from painting to creating art is not easy to define. There is no secret formula to follow or program to use.

However, I will provide practical examples and protocols and even sample workouts in Part III of this guide to remove as much of the veil of clouds possible.

Breath Work for the Sport of Fitness is first about defining intangibles. It's about quantifying the Tier II skills of regulating arousal, state and breathing. Then we systemically train it.

Training Vs. Competing

A common saying in the Navy Seals is...

“You don’t rise to the occasion, you sink to the level of your training. Train well.”

This guide focuses on training because as an athlete you get limited opportunities to compete. Training, not competing, is where changes need to be initiated. Competition is where that change is showcased.

A champion is crowned in competition but born in practice. Training allows for daily opportunities for growth while competition appearances are infrequent. Consequently, beginners are almost always better at practicing than competing. A mark of a veteran athlete is competing at a higher level than he or she is able to train. A veteran is tough in training yet tougher in competition.

However, training and competing have entirely different purposes. The goal of competing is to do your very best through maximizing your strengths and minimizing weaknesses. The athlete who exposes less weaknesses wins.

Training should be designed for the inverse. There is no need to work on your strengths most of the time. The daily goal should be to expose weaknesses and address them systematically. Create opportunities to challenge yourself in training and at rest using the protocols and techniques outlined in this guide. Some breath protocols can be prescribed to intentionally slow an athlete; therefore, they are not meant to be used in competition. Context matters.

As an athlete, you must relentlessly pursue growth in Tier I, movement-specific skills if you want to be a master of your breath and other Tier II skills. Again, it all comes back to time spent in intentional, mindful practice.

TIER I AND TIER II SKILLS

Tier I skills are your movement or activity-specific competencies. The painter is competent, possibly even expert with the skills and movement of painting. It takes years to develop the fine motor skills of technical brushing and gentle mixing a palate of colors to the exact shades desired. The painter has put in the hours of learning to perfect techniques like underpainting, blocking in, building textures and glazing. He has invested in his craft, learning proficiencies in mediums other than his own, in turn making his skills even sharper.

In CrossFit, a painter is a person who is proficient or even advanced in movements. He or she has taken the seemingly endless hours it takes to perfect the mechanics of an air squat, the turnover in a ring muscle-up, the long and smooth pull on the rower and the aggressive lock-out of a jerk. He or she has dissected every movement within his or her craft under a microscope and put the pieces back together every way possible, finding the most efficient means to an end.

Tier I skills cannot be overlooked, and their importance cannot be overstated. Many coaches try to work on Tier II skills with athletes who are still working on Tier I competencies. This ultimately leads to poor movement and an inability to execute on behalf of the athlete and frustration on behalf of the coach. The transition between Tier I and Tier II skills can be unclear because the pivot point will always be different for each movement and the athlete's preparedness to train and learn on a given day in a specific environment.

As a coach, I once cued an athlete, "Focus on your breathing during the walls balls in this workout. Exhale as you ascend out of the squat and throw the ball, and you should be able to get another full breath cycle while the ball is in the air. Then inhale as you catch the ball and descend in your squat." The athlete nodded and attempted to be coachable and breath as I had told her. However, instead of improving efficiency her movement got worse and she broke the work into several sets. This is a classic example of trying to progress an athlete too quickly.

The breath is a Tier II skill, especially as it relates to controlling the nervous system or manipulating it during complex movements. A coach must know what is appropriate for a given individual on a specific day.

After the workout, I tested the athlete and realized she couldn't hold the bottom of a medicine-ball goblet squat while breathing. She was forced to hold her breath because she had not mastered the position. Each time she would breathe midline integrity would be compromised and she would begin to round her back.

This is a classic example of an athlete who needed to spend more time on Tier I skills. Staying on Tier I skills now will accelerate Tier II learning when the time comes.

However, it would have been wrong to assume that because she needed work on Tier I competency for wall balls that she also needs the same amount of Tier I work on rowing, running or any other skill. It was

simply a point on the scatter plot of physiology.

CrossFit has made its mark on the fitness and sport world by its refusal to specialize. Each competition has the liberty to produce its own test of fitness because the execution of CrossFit's definition is open to interpretation. This freedom of expression encourages workout programming that provides athletes with novel experiences on game day.

Events that can incorporate novel experiences like Cyclocross, swimming and muscle-ups, open water swims, obstacle courses, and the like are extremely popular with fans and athletes alike. CrossFit also is famous for popularizing new equipment and implements like the pig, snail, roller, prone paddle board, pegboard and others. Consequently, CrossFit competitors must be constantly revisiting unperfected movements and learning new ones. Even for an elite athlete, this revisit moves them from execution of Tier II skills back to Tier I. This should be viewed as a positive. Think of this act as greasing the hinge that turns an athlete from Tier I to Tier II and back again. The more this hinge is used, the smoother the transition rides. A rolling stone gathers no moss.

An ability to access Tier II skills including the breath and arousal intra-workout mostly depends on Tier I competences. Move impeccably well, then begin to layer. A pyramid can only be as high as the base is wide. In the words of Greg Glassman, "Stick with the basics and when you feel you've mastered them, it's time to start all over again, begin anew, again with the basics, this time paying closer attention."

It is the job of both the athlete and the coach to accurately assess where the athlete's ability lies on each unique movement. This gets ever complicated as the layers of speed, load, and fatigue are added. There are countless combinations of movement pairings for workouts, especially with respect to load, time domain and rep schemes. And still this doesn't account for the most important variable, the athlete. It is the job of a coach and athlete to determine readiness to train on at least a daily basis based on several key factors not limited to back-to-back hard training days, soreness and inflammation, athlete's desire to train, overall daily mood, hormonal status, immune status, sleep quality and sleep quantity.

The depth of this rabbit hole cannot be overstated. Many talented athletes and coaches spend their whole careers searching in the caverns of movement training. However, once an athlete has reached the fourth and final stage of unconscious competence in their Tier I skills, he or she is best served by invested in the Tier II skills of breathing, arousal control, tension, feel, etc. Execution of Tier I skills is the difference between good and great. Execution of Tier II skills is the difference between great and gold. The difference between a talented painter and an expert artist.

Tier II skills are your higher order activities that apply universally across all movement pairings and time domains. The ability to regulate arousal, manipulate the breath and calm one's mind to put it all in practice. This is the transition from painting to creating art.

The artist has a deep understanding and working capability of painting, combined with a deep understanding what is necessary to create deeper meaning in a piece. These 'soft skills' are critical to the artist's success, yet when asked to define or explain the artistic process others will fail to understand what the artist means.

Often the artist will struggle to put what he does into words. How does he begin to

explain the gut-feeling and unconscious nature of identifying and creating the correct hue for a given piece of artwork? He does not think about the techniques of shading, rather on the 'feel' of the entire piece he is trying to create. The focus elevates from technique to feel, conscious to unconscious, Tier I to Tier II.

In CrossFit, an artist is an athlete who has advanced into unconscious competence in a given movement. This is the last stage in learning and what gives the athlete the ability to elevate from technique to feel, change focus and progress to the Tier II skills including the breath.

THE FOUR STAGES OF COMPETENCE

Stage 1: Unconscious Incompetence

Let's use the skill of double unders. Before you ever knew what CrossFit was you were unconscious of your incompetence. In other words, you had no awareness that you could not do double unders. It's possible you didn't even know what double unders were.

This doesn't just go with the overarching movements like double unders; it also applies to sub-movements. For example, you obviously know what running is and you complete the skill even if it isn't pretty, at a blistering pace or for a long time.

However, it is very likely that you are unconsciously incompetent of different sub-skills you need to be a great runner. Maybe you aren't aware of the orientation of your pelvis in space and that isn't allowing you to express your respiratory capacity. Maybe you aren't aware of how weaknesses in the lateral aspect of your hip contribute to the pain you experience with "flat feet." And the list goes on…

It's about constantly discovery.

It's the white belt mentality.

Never stop learning.

Always be a student of your movement.

Stage 2: Conscious Incompetence

Back to our Double Unders example. Eventually you jumped into a CrossFit workout that had double unders programmed. Very quickly you moved from being unaware of your incompetence to being conscious of it.

While your incompetence during Double Unders is obvious, other skills are much harder to discern if you are competent or not. For example…

How to you know if for a given position during a movement your joints are oriented correctly in space?

How do you know if you are breathing correctly?

How to you know if you are wasting energy due to mechanical respiratory inefficiencies?

The waters often get muddy when talking about sub-skills.

Stage 3: Conscious Competence

The final two stages typically are where people spend most of their time and energy. At this point you know you lack the skill so you work to develop it. In the case of double unders you do single unders, you spin wiffle ball rope handles to work on timing, you practice pogo hops, you work on timing using penguin hops and you attempt double unders.

Eventually you get to the point where when you are very focused and giving full effort you can complete double unders successfully. Congrats! You are now consciously competent.

However, to be more accurate, you are consciously competent in on a given day with given conditions (rested, low inflammation, unfatigued setting, correct rope length, etc.) Over time you will need to develop conscious competence in each setting, including adding the layers of speed, local and general fatigue and extremes of arousal.

Stage 4: Unconscious Competence

The final stage of competence most athletes never reach. Very few will put in the time and energy needed to reach stage four and 'master' a skill.

In this final stage, you no longer have to think about doing double unders while doing double unders. You just do them. Maybe you think about your next movement in the workout, or about your breathing, or about the clock, or maybe about what's for lunch…anything *except* double unders. The skill is now unconsciously competent.

Again, this isn't just about movements. It's about the finest points and details. It's about learning to breathe through a subtle brace during butterfly pull-ups with more diaphragm engagement. It's about reclaiming a hook grip and finding your hip without thinking while cycling snatches.

It's about the fostering unconscious competence in all the details.

It's about the pursuit of mastery.

In the Mind of an Elite Athlete

Often people watch a Mat Fraser or a Tia Toomey and ask...I wonder what they are thinking about when they are competing? The truth is most of the time they aren't thinking an awfully lot about anything. They are moving intently and completing the various movements and skills with controlled intensity, but focus is soft. It hovers there, but it isn't a hard focus. They are so competent in the movements that thinking about them will make things worse and performance will wane. Athlete's will call it being "in the zone." Psychologists will call it flow.

During certain movements or workouts, a single focus point can be helpful to a high-level athlete. Focusing on a singular performance statement or movement cue like "stay tight" help perpetuate flow.

In yoga, a "*flow* of consciousness" is a sought-after state because it is not obstructed by conscious thought. Thoughts are held at bay by focusing on the breath.

Not surprisingly, the best performance cues to enter and maintain flow involve the breath. For example, even the cue of "stay tight" refers to tension associated with the breath.

Athletes often get frustrated on something like double unders when they come out of stage four and regress to stage three because they aren't executing the movement properly and they feel the need to take over control and will their technique and timing back in alignment. This nearly always makes the situation worse and inevitably they are unable to fix an unconscious movement fault with conscious thought. It's a failure to understand this truth that causes people to get so frustrated motor learning and skill acquisition.

Conscious competence is intellectual while unconscious competence is instinctual.

Arriving at unconscious competence is the goal for the athlete. It allows for freedom. It allows you to move and relocate focus as you please. So what is the best way to promote unconscious competence?

Practice.

Conscious practice.

Conscious practice with a hard focus.

The more time you spend intently focused upon developing competence in an activity or skill, including the breath, the more you will be able to do it unconsciously as well.

Imagine your friend is a rider in the Tour de France. He spends hours every day on his bike. He focuses intently during his practice developing greater balance, power and efficiency. Now imagine the two of you decided to ride through the park. Who is going to have an easier time getting into flow and not have to think about navigating around benches, potholes and people?

The lesson here is that discipline in your training now will result in freedom down the road. The more time you spend studying and learning your craft, the easier you will be able to manipulate focus, breathing and arousal as you see fit in the heat of battle.

Be an expert in every single skill. Consider each skill or movement its own discipline. Take the time to learn it and master each of its parts and memorize its pieces. Be able to do it in multiple variations. Discipline your mind to focus now so you can create freedom.

Focus now. Flow later.

Tier I now. Tier II later.

Paint now. Create art later.

THE CONSCIOUS VS. UNCONSCIOUS BRAIN

People rarely understand and appreciate the power of their nervous system and the human brain. We often distinguish ourselves as human beings by the fact that our awareness and conscious mind is much more powerful than other species. After all, it one of the most important things that sets us apart. However, we rarely gain an appreciation in a positive sense about our unconscious brain and the power it possesses. Too often we try to be cerebral about things that should be instinctual. That is, we value stage three over stage four.

For example, we often trust that an app on our phone knows what macronutrient breakdown is best for our nutrition needs more than being in tune with the cravings of our body. Or we follow set and reps written by a coach thousands of miles away despite lack of sleep, abnormal stressors at work, and increased inflammation in our joints.

To develop an appreciation for our unconscious brain, we first must begin to develop an understanding of its power. For a moment, think about a person multi-tasking. Form an image in your mind of that person. Perhaps she is driving down the road, talking on the phone, shifting gears and eating her take-out. She isn't fully investing any of their brain power to any of those things. In fact, she probably isn't even thinking about more than one of those things at a time and attention is being pulled around moment-by-moment. Focus on the phone conversation is gets redirected to the road when the cue of the light turns to red and then glancing at the burger directing it towards their mouth, finally back to hearing what the person on the other line is saying.

The same is true for your conscious mind when you work out. You cannot focus on multiple things at once. You are either focusing on how much time is left in the workout, your breathing, your heels being on the ground, your grip on the bar or where someone else is relative to you in the workout. Your attention ping pong's around as you see fit – or more likely – as you have been trained. The less of those inputs (moments in time) must be directed to your movement, the more attention you can direct to the breath or other meaningful factors.

Whether you are aware of it or not, your unconscious brain is taking care countless processes automatically. We can thank the unconscious brain and autonomic control for allowing our mind to do higher order activities…like contemplating why we are competing in sport in the first place.

For a minute, appreciate the power of your mind, regardless of what you have been led to believe about it, and begin to value what it does. Even in this given moment, as you read the words on this page, your brain is doing countless unconscious tasks. To start, your two eyes are moving in perfect sync both directed toward a single focal point before simultaneously jumping to the next. The information they collect, the images of black and white specs on a page, in formulated in the brain and interpreted as words on a page. Just like you interpret the ink on this page, you can recognize a person's face or voice among thousands or even millions of others by comparing it to your memories of that person, at an accuracy and rate much faster than any supercomputer. Meanwhile, you are blinking periodically to lubricate the surface of your

eye, and your iris dilates your pupil as the light in your home dims. Your circadian rhythm, a daily cycle of hormones and neurotransmitters, begins a cascade of changes as night creeps closer and you begin to get drowsy. You lay back in your recliner and your heart and respiration rate slow as your horizontal body allows for a greater stroke volume per beat. Food from dinner is being digested, thanks to help from contractions of smooth muscle in your stomach and bile produced by your gallbladder from the rich meal you ate that was dense in fat. Your immune system works tirelessly to fight infection and interpret bacteria as helpful or harmful. The heat radiating from the nearby fireplace begins to increase your core temperature, so a greater percentage of blood is directed to run closer to the surface of your skin, allowing heat to radiate into the atmosphere. Protein synthesis increases, and your body repairs muscle fibers damaged in exercise earlier in the day.

The list could go on for pages and pages. And that is just for the functions that science has identified.

So…which brain is more powerful?

The conscious brain of the person in the car?

(or)

The unconscious brain of the person reading this book?

Still not convinced?

Contemplate the series of functions performed by the unconscious brain during a squat. Before you even pick up the bar, you vision picks up on the size and color of the bumper plates on either end and compares it to memories and experiences to determine how hard of a contraction will be needed to lift the bar out of the rack.

Even grasping the bar symmetrically on the knurls requires predicting the velocity of your hands moving through space to meet the bar. Once you un-rack the weight and begin to descend in the squat, the brain must calculate how much force to produce with each muscle in order to keep the bar perfectly balanced in space, not allowing you to fall forward or backwards. You reach the bottom on the squat and change directions, and a perfectly timed series of contractions between muscle groups and parts of individual muscles allow for the bar to gain speed and momentum. As you grind through the sticky point in your squat, the bar slows and you brain sends signals to fire more motor units, allowing for a greater percentage to the muscle belly to be harnessed. The bar accelerates once again, and you lock out your squat.

The whole time this happened, your conscious mind could only focus on one given cue at a time. Perhaps, “tight core” or “butt back” or “knees out.” This is why the conscious brain is the tip of the iceberg, which is the power of the unconscious brain.

A deep understanding of the power of the unconscious brain is needed to fully be aware of how reaching the final stage of competency, unconscious competency, is a game changer for an athlete.

And importantly, for our discussion on breath work as it applies to training for CrossFit, while conscious control and training of the breath is necessary, a master of the breath will not be able to articulate in language what he or she does.

A conscious awareness, control and manipulation of the breath is not the goal, it is a means to the end of unconscious competence.

COACHING TIER II SKILLS

I once overheard a conversation between an athlete and coach.

Athlete: “Hey coach, I’ve been struggling with the turnover in my ring muscle-ups.”

Coach: “Yeah, your hands appeared a little slower than they could be.”

Athlete: “I’ve been practicing them fairly often, but that aspect doesn’t get much better.”

Coach: “Yeah, I’ve noticed that. You should add some supplemental work besides just the working variation of the movement to help you understand it better and improve your movement.”

Athlete: “What drills or focal points do you recommend that I try?”

Coach: “Come over here to the low rings. You can do this hand tracing drill, *demos*, and this banded hips to rings drill with a big ‘sit-up’ to really exaggerate the turnover. Over time, your turnover should get quicker and feel more natural.

Athlete: “Thanks Coach.”

This is a typical conversation to hear in CrossFit gyms around the world. Coaches understand how to teach movement. They know what X movement should look like and how to get an athlete to achieve some degree of competence with it.

In general, the CrossFit coach is comfortable with movement. However, too often the step between an athlete and their next level of performance is not a physical skill, rather a mental one. Here is the typical conversation between athlete and coach:

Athlete: “Hey coach, I keep gassing out too early in my first workout in competitions.”

Coach: “Yeah, I noticed you have a lot of nervous energy and you end up going out too hard.”

Athlete: “I really feel like I’m going out slowly. Really, I don’t think my pace is too fast, it’s just I’m so amped up to compete that I get drained. I keep getting more fit in practice, but I can never seem to hit my best times on competition day.”

Coach: “Yeah, I’ve noticed that. You just gotta keep working, the confidence and calm will come. It’s not something to get in your head about. Don’t worry about.”

Athlete: “Okay. Maybe it will get better with time… I hope.”

Coach: “I’m sure it will. Just keep plugging away, you’ll get there.”

Athlete: “Thanks Coach.”

All too often this conversation takes place around Tier II skills, such as arousal control. Coaches are equipped to handle athlete’s Tier I movement-specific (physiological) needs but fail to address their psychological limiters. The reality is, psychological limitations manifest as physiological limiters.

A good coach would never say, “Don’t worry about it, just keep practicing,” or “Ignore it and get out of your head” about a physical skill. Yet that is often the norm for a limitation in a mental skill, such as controlling arousal via the breath. Skimming over issues and totally failing to address the underlying issues is a travesty.

A coach and athlete need a plan with specific drills, techniques and habits to implement to maximize their potential of the mind-body unit. Physiological and psychological skills are different, like melody and harmony, but they work in unison to produce the symphony of performance.

Instead of avoiding Tier II skills entirely or treating them as “soft skills,” the coach and athlete need to have a clear image of what skills are needed and which ones the athlete is lacking. Only then can a comprehensive plan be created to bring up the limiters. This model should look the same as Tier I physical skills.

Part III of this guide provides the athlete and coach with tools as well as their practical applications. However, there is another layer of context needed to make the application of these tools effective. As you move through this guide, do not simply attempt to learn the various tools, but think at a higher level of how they can be synthesized into something larger.

How will the various breath work techniques be placed into an effective training model that meets the needs of a unique athlete?

How will you manipulate a training plan to account for both physiological and psychological elements for an athlete who is over-aroused when going into a competition?

If you are experiencing a pattern of performance anxiety, how should your personal plan change with respect to breath work in conjunction to and in absence of movement, mechanical and metabolic stress?

How will you adapt a training plan for an athlete whose personality and limitations always cause him to go ‘too hot out of the gate’ in a workout?

What breath work protocols synched with movement will you prescribe to an athlete who struggles to develop enough tension in a heavy workout to effectively brace her trunk while breathing heavily?

Answers to these questions are difficult even for experienced coaches and athletes. All a coach can do is create an environment where the athlete knows what he or she needs to do to increase the probability of a favorable outcome.

For example, a coach can’t promise to make an athlete stronger or more enduring. A coach can only point to the path that he or she believes will work for a given athlete based on their experiences. Great coaches can build an athlete’s confidence that they will have success on that path even if the coach has a degree of uncertainty. Belief about a program is as important as the program itself.

PART II
A CONTEXTUAL PRACTICE
[UNDERSTANDING PHYSIOLOGY]

AROUSAL

The most fundamental Tier II skill is regulating one's arousal at all times. Arousal is regulated through the breath.

In my experience, the reactions a person has before, during and after a difficult workout is like holding a magnifying glass to their everyday life.

Those athletes who struggle to regulate their arousal in the ebb and flow of "normal life" will find it nearly impossible to fine tune their arousal in as the intensity dial gets turned up.

Conversely, those people who are grounded in their identity and can control their arousal and nervous system states day-to-day and moment-by-moment, will also control their arousal in the moments when everything is on the line and pressure builds.

Controlling arousal is the difference between rising to meet a challenge and falling flat in defeat in the biggest moments of your career.

Breath work, at its core, is about regulating arousal to meet the demands of each moment optimally. To regulate your arousal at all times throughout your life, you must gain voluntary influence of your autonomic nervous system via the breath.

It is only with awareness, knowledge and application in practice that you can take the Tier II skill of the breath and arousal control to the level of unconscious competence.

To gain exclusivity to stage four - the greatest expression of regulating arousal - we must start at the beginning. We must start by gaining a deep understanding: the marriage of awareness and experience.

Relaxation & Arousal

Regulating arousal via the breath is about the ability to up-regulate and down-regulate. The twenty-first century norm, is a person who finds up-regulating rather easy and down-regulating particularly challenging. People try harder and harder to relax, only to find themselves carrying more and more tension and experiencing an inability to relax.

The reality is, you will never be successful when you try to relax; it is an impossible command to obey. Trying harder in a passive process only leads to frustration and failure. You must set yourself in an environment that allows relaxation to emerge.

Relaxation is not a process, it is a product.

If you wish to have the product of relaxation, you must commit to the process of setting up optimal scenarios that allow it to occur. Actively work on parts so the construction of the whole can occur as a passive process.

There are several tools you can do to encourage relaxation. Each one relies on manipulating an input, so the output can occur, turning excitement and arousal into

relaxation. The same advice for staving off anxiety can be used for winding down and going to bed or even meditation. Each of these requires lowering neural activity and increasing the parasympathetic state.

First, actively work to reduce things in your environment that provide inputs: turn off music, find a quiet space, silence and place electronics of sight. Work to replace stimulating activities with mundane, routine ones.

For relaxing before bedtime this could mean taking a shower, combing your hair, brushing your teeth, taking out contacts, reading a non-fiction book in dim light or listening to soft, slow instrumental music.

And the last, most impactful input for relaxation, is manipulating the breath. Work to slow your respiration rate. Make the exhale longer and slower than the inhale. Visualize letting go on each exhale.

Each of these techniques required work and an active approach. However, once initiated they require less and less effort, like pushing a boulder over the crest of a mountain.

The combined effect of these inputs gains momentum and soon you are relaxed. However, you did not actively work on being relaxed; you placed yourself in a position where relaxation became possible.

You focused on the process not the product.

Here lies the dichotomy of relaxation. Willing your way to relaxation does not work, yet you must work to place yourself in a situation where it can emerge organically. Understanding this idea is rudimentary in to developing the Tier II skill of regulating arousal.

UNDERSTANDING NERVOUS SYSTEMS STATES

The nervous system is our control center. The vast majority of our nervous system is unconscious and decentralized. In other words, the unconscious brain is much more powerful than are conscious one, and our body can offer and teach us more than conscious thought. Science and the western world is just beginning to recognize the power of people being able to recognize and identify their states and needs. When we are tuned in to our body, it allows access to abilities we never thought were possible: the ability to gain a degree of control over autonomic processes such as nervous system state, immune response, digestive function, metabolism, thermoregulation, energy production and metabolism.

Western medicine is just beginning to recognize the body's complexity in this matter. One such example is accepting that trauma is stored in the body, not just the brain. Processes that happen here are almost always unconscious...like blinking, heart rate regulation, ventilation rate, pupil dilation, blood redirection, and on and on.

Many top athletes have the ability to control normally autonomic processes in the body to a greater degree than their sub-elite peers.

Some athletes have a greater innate ability to regulate their nervous system, just like some people have an easier time recognizing, accepting, and ultimately altering their emotions than others. And just like it is widely recognized that emotional intelligence can be measured and trained to improve performance in the workplace, relationships and in athletics, the same is true for the autonomic nervous systems.

Once again, this is best trained via the breath.

Nervous System States

The autonomic nervous system has two sides, like a coin, the sympathetic nervous system and the parasympathetic nervous system. And like a coin, when one side is turned up the other is turned down. They are inverse of each other.

As an athlete, you need to know how to flip the coin. However, to be able to manipulate the coin, you must be able to recognize its different faces.

Recognition before Regulation.

Sympathetic Nervous System (SNS)

The SNS is commonly referred to as "Fight or Flight." Imagine you are resting peacefully under a Baobab tree in the middle of an African safari. Suddenly, a lion pounces out of the bush and begins charging you. Without even thinking, your SNS will upregulate and punch you into action. The coin of your nervous system has flipped, turning up your SNS. Neurotransmitters and hormones are ping ponging all over your body, getting you ready to fight or flight. When this side of the nervous system coin is turned up, a host of chain reactions happen in the body.

To start, energy metabolism and sensory processing are heightened, the digestive and immune systems are suppressed. Those systems won't serve you in your attempt to survive.

You become impulsive, a helpful mechanism for decisiveness when fractions of a second

can mean life or death. Your vision narrows, you stop producing saliva, your heartrate accelerates, the bronchi (lead to your lungs) dilate to allow more onboarding of oxygen, your liver mobilizes glycogen spiking your blood sugar and prepping the fuel and your capillaries and other blood vessels constrict to prevent a deadly bleed in the event of a wound.

Parasympathetic Nervous System (PNS)

The PNS is commonly referred to as your "Rest & Digest" state. Thanks to your SNS, you have escaped the deadly grasp of the lion and have reached the safety of your tribe. Danger is averted. You sit down and exhale a sigh of relief. Your SNS is down-regulated and your PNS is up-regulated. The coin is turned over once again. The recovery protocol is initiated across the systems of your body. Tissue repair, muscle synthesis, digestion, energy storage, production of anabolic hormones, immune and reproductive state; all come back online. The vision softens, breathing and heartrate slow, the contemplative nature of decision making returns, mood improves and the enjoyment of the complexities of socialization and speech return.

Life was much simpler when most the threats in our world were physical. In many ways the nature of CrossFit or any other physical practice makes accessing the nervous system much more feasible and tangible. The reality is only some of an athlete's stressors come from stressors in training. Fears, insecurities, accidents and arguments run deep in the code of all human beings and affect the state of our nervous system moment to moment.

An understanding of nervous systems must start with an understanding of human kind. The best coaches address an athlete as a person, holistically. The best athletes address themselves in the same manner, holistically. To specialize you must first be a generalist.

An understanding of nervous system states and how to manipulate them on command allows an athlete to experience freedom, from which elite performance can be incubated.

Learning & State

Like Tier I skills, Tier II skills can't be learned in a competitive environment. Such an environment is only useful for testing and revealing skill competency, not for skill development. Skill development only occurs in parasympathetic states while in an environment and culture of learning. Likewise, true unconscious competency can only be tested in sympathetic states, such as competition on the largest stage.

I once had an athlete who practiced her Handstand Walks nearly every day at the beginning of her training session. After a few weeks of practice, a pattern emerged. She would typically fail a few times right off the bat, and each time she would take a few seconds to reset and try again. Inevitably after a few attempts, she almost always could hit 20 or 25-foot unbroken walk before losing her balance. She would smile and look up to see if anyone saw her small victory.

However, when a benchmark workout with Handstand Walks can up in her training, she failed to string together more than five or ten feet at a time. Each time she fell over she released an audibly sigh and voiced her frustrations for the whole room to hear, knowing precious seconds were ticking by. At one point her frustration became overwhelming and she threw her headband which had worked its way off while she was

inverted. She ran her fingers through her hair and immediately kicked back up and began making attempts again. She continued plodding her way through the rest of the workout, one five-foot section of floor at a time. It was a painful 14 minutes and 32 seconds to watch.

A few weeks later the same workout resurfaced as a retest. However, I didn't let my athlete know this. Instead, I let her know that the piece was to be a warm-up and that we would begin the session once she made her way through the warm-up, not for time.

She was in a section of the gym by herself with the music low, no clock and no workout partners to go head-to-head with. Pretending I was on my phone texting, I started a stopwatch when she started the first length of her walk. I started doing mobility, pretending not to watch. She made her way through several larger sets of Handstand Walks. She lost her balance and fell over several times. When she did the expression on her face would not change. She would stand up, step back from the line and take a deep breath or two seemingly staring off into space. Then she would look back to the floor and kick-up again.

On her final set she simply kicked down and walked over to her shaker bottle to get a drink. She walked over to me, "What's next?" I showed her my stopwatch. It read, "11:17."

The moral of the story is the thing that made the change was her state. For an athlete who is still in the third stage of learning (working on becoming consciously competent), it is necessary for him or her to practice skills in a parasympathetic state.

Competition is sympathetic. Practice is parasympathetic. Practice is relaxed, it is absent of strong emotion. It is an environment where mistakes are not avoided but encouraged.

Mistakes in practice (parasympathetic) are viewed from a solution-based mindset and allow for growth. Mistakes in competition (sympathetic) are viewed from a problem-based mindset and we hide our weaknesses to maximize our leaderboard placement and protect ourselves. Therefore, we only can learn and grow in a parasympathetic state, and we can only truly test in a "game-day," sympathetic environment.

This is due in part because we become more impulsive when the SNS is activated. We cannot take time for decisions when "fighting" or "flighting" from the lion. We must react in the moment based on our previous training. The same is true for competition. We cannot use our conscious mind to be competent in a sympathetic state. We can only rely on the unconscious. Therefore, if skills (Tier I or Tier II) are not in the fourth stage of competence (unconscious competence) then they will fall apart. This is what happened to my athlete working on double unders in a competitive environment.

THE BREATH, PAIN, & STATE

The breath. It is fundamental to life. It is both the first and last thing you will do on this earth.

Without food you will die in four weeks.

Without water you will die in four days.

Without air you will die in four minutes.

Few human experiences are scarier than being in a situation outside your control where you cannot breathe.

Falling through ice, riptides and waterboarding induce panic and illicit a strong "fight or flight" response. We gasp for air, become inefficient and impulsive. We will do whatever it takes to elude the situation and survive.

CrossFit is a lot like waterboarding. You get thrown into a frightening environment far outside your comfort zone and are immediately plunged into a state of pain and suffocation. You immediately become sympathetic and your body screams for you to escape. It is easy to panic, to escape the pain and fear, to go back to comfort.

However, CrossFit and waterboarding have one massive difference. With CrossFit, you are in control. You decide exactly how badly it is going to hurt. You can stop at any moment and the pain will subside. The feeling of suffocation will end and your breathing will return to normal. No one is forcing you to do it. You have volunteered to do this thing because you believe when you emerge on the other side of that pain it will be worth it.

When first doing painful exercise, people panic. It's a very natural thing to do. Your body doing what has kept humans alive for millennia before you. Avoid stress. work to stay comfortable. Survive.

However, at a certain point an athlete learns that they are in control of the pain they self-inflict.

Stacie Evano, one of my coaches, said it best, "Hard workouts are like grief: it never gets easier, you just find new ways to cope with it."

For many, pain becomes a catalyst to deal with their demons. For some, it is the pain of the past. For others, it is to escape the boredom, monotony and depression of everyday life. Still for others, it is a coping mechanism for the comforts and abundance of twenty-first century life. And for another group it is about finding their best self, a chance for self-discovery and growth. And finally - for a final group - it's not about winning or losing, it's about figuring out what you are capable of pushing through hard things when others cannot.

In the words of CrossFit Coach Evan Peikon,

"CrossFit is a pain sport, and with that comes a high level of distress. Those who've been around the block are accustomed to this distress in the same way a fighter is 'accustomed' to getting punched in the face - that is to say that the familiarity of experience in no way lessens it's blow or mitigates its physiological effects. It simply gives them a degree of composure in the face of an otherwise overwhelming stimulus and allows for dispassionate insight where a rookie would be in a rush of panic.

The biggest mistake rookies make is in thinking they need to squander this feeling of

panic, or suppress the feelings of fear they have on game day. In reality they should be used in our favor as they're the very things that allow us to perform to our potential. It's no wonder why sports psychology books which teach you to overcome fear, or become 'tougher', are so common place. But, the truth is they don't work. This level of 'toughness' can't be gifted, or received through a book, and it isn't an innate attribute like height or eye color. You need to practice being tough - to not bow to your inner coward. No athlete pushes through pain because they enjoy it for its own sake. They've just learned from hard lessons every time they did relent and were disgusted with themselves for having done so. They know that there is no refuge in mercy, and no other alternative - Nike said it best, 'Just do it'."

Pushing through pain can be an incredible teacher and can even be used as a tool to build character, but it goes against everything your brain is screaming at you in the middle of a workout. Going beyond certain thresholds and sustaining high output is possible for periods of time, but your unconscious recognizes the risks. Elite marathoners during summer events have been known to experience core temperatures up to 105 degrees Fahrenheit. A fever of that magnitude borderlines resulting in brain damage. Several CrossFit Games athletes have induced enough muscle damage that protein floods the blood and shuts down kidney function, a potentially life-threatening condition called Rhabdomyolysis. There is nothing safe about trying to lift more weight above your head than you ever have - going for a clean and jerk personal best. Likewise, there is nothing safe about contraction volume in the CrossFit workout "Murph" (1-Mile Run, 100 Pull-ups, 200 Push-ups, 300 Air Squats, 1-Mile Run). And those numbers don't account for the fact that you complete it as fast as possible, during the summer heat, in a weight vest.

During these moments, our brain will act as a "central governor" over our bodies and change the way we can express our capacity.

In other words, the strong sympathetic response we get during painful, challenging moments in competition should allow for the greatest expression of our capacity if we learn to recognize and embrace that state.

However, to be able to 'game' our autonomic nervous system, we must be able to understand how to manipulate our state.

The easiest way to do that: the breath.

AWARENESS OF THE BREATH: FUNDAMENTALS

In the words of Brian Mackenzie, “Breathing is the remote control of the brain.”

Breathing is one of our countless unconscious processes, but it is unique in the fact that without significant training, a person can make it a conscious action and use it to regulate the autonomic nervous system (SNS vs. PNS).

Despite building popularity is the fitness space in recent years, very few athletes really have a good handle on their breathing. And that goes for both inside and outside of the gym. Even if you held 100% focus on your breathing during training, an impossible and unworthy task, you would still be blissfully unaware for over 90% of your day.

In part, this is because “protocols” prescribed by coaches are often fundamentally flawed and random at best. And truthfully, many protocols will stunt an athlete’s athletic development. The athlete would have been better served leaving their breath unaltered – possibly a surprising claim coming from someone who has intentionally and extensively altered breath.

Holding to the principle of parasympathetic being a learning state, we must begin to draw awareness and manipulate the breath outside of the stressors of training.

Eventually, layers of sympathetic drive, tension and competition can be added once unconscious competence has been reached in the previous step.

To move out of stage one of competence, you must move from being unaware to being aware of your incompetence. Breathing is quite simple. Upon inhale, your musculature (intercostals, diagram and the muscles around the neck) pulls in opposing directions and expands the space in your torso, creating a negative pressure. Due to that negative pressure, air rushes into the body filling the lungs. The air molecules are simply moving to balance pressure gradients, like a ball rolling down a hill. In the same way, once this air reaches the alveoli (‘air sacs’) in the lungs it is in a higher concentration than the oxygen in your blood, so it diffuses across the air-blood barrier to balance the scales. The exact process happens with carbon dioxide as it leaves the cell and eventually the body.

Since carbon dioxide is a by-product of metabolism, the blood is rich with it as it passes through the pulmonary system, allowing for diffusion back into the air in your lungs. Your lungs empty this O^2-depleted, CO^2-rich air back into the atmosphere. This emptying can be accelerated by aid of a different set of intercostals (which compress and flatten the ribcage), as well as the abdominal muscles.

When the rate of this exchange of air (O^2 and CO^2) isn’t happening quick enough, your body will increase your ventilation rate (number of breaths per minute). This could be from a lack of O^2, a buildup of CO^2 or both. This process is reactive, not proactive.

It is important to note that at a certain point during progressively more challenging exercise, ventilation rate will no longer increase steadily; it will spike sharply. Athletes will complain of “losing their air” or “running out of gas.” Most think it is due to a lack of O^2. Rather, the sharp spike in respiratory rate is almost always due to your body trying to blow off excess CO^2.

Anatomical Dead Space

An important factor to bring awareness to when learning about the breath is dead space. Breathing does not equal respiration. Breathing is ventilation. Respiration is exchange of gases (O^2 and CO^2). The difference is dead space.

Imagine you just ordered a milkshake. The waitress brings it over and sits it in front of you, fresh off the blender. You pull out a straw, stick it in your milkshake and begin to suck. The milkshake is thick, your straw is thin; it's a sad combination. You must pull harder as you slowly watch the milkshake start its journey up the straw. In this moment, you are *very* aware of dead space.

The same thing happens with your body when it's trying to get oxygen. The "straw" from the analogy is your mouth, throat, trachea and bronchi. None of these structures allow for exchange of gas (respiration). An asthmatic is well aware that these structures are incapable of exchanging gases. Exchange only takes place when the air reaches the depths of your lungs to the smallest unit, the alveoli. This is why during an asthma attack, patients are told to breath at a slow tempo…a cue to breath deeper and overcome the dead space, as well as having PNS activating effects. An understanding of the implications of dead space is necessary for us to move into conscious incompetence for efficient breathing patterns.

Efficient breathing, in terms of dead space, means a smaller percentage of each breath is lost in tissue unable to exchange gas (mouth & trachea). Female athlete A has an anatomical dead space of 150mL. Each breath she takes essentially has a 150mL "Buy-In" to reach the alveoli and exchange gas. If she takes a shallow breath (300mL) that means that only 50% of her breath actually reached the lungs to exchange air. The other 50% (150mL) was unable to exchange gas because it was in the mouth and trachea. She was 50% efficient in that breath. If she takes a medium breath (600mL) her efficiency is over 75% efficient because 450mL reached the lungs. And finally, if she takes a deep breath (1200mL) she is over 87% efficient because over a liter of air reached the lungs.

With this limited information it may seem intuitive to take as big of breaths as possible (large tidal volume) to be as efficient as possible. Yet, if you attempt this in your next workout you will quickly fatigue your respiratory muscles.

Elastic Qualities at Work

For a moment, take the biggest inhale you can, filling your lungs as fully as possible. Then release that breath and exhale as fully as possible, trying to empty your lungs fully. Not easy, right? It took significant effort.

There is a reason we don't breathe very deeply all the time; if it was efficient to breathe deeply, we would already be doing it. Our bodies are wired to find ways to save energy, not waste it. There is a reason the couch is inviting while the assault bike is not.

It required significant strength – mechanical force – to take that breath, especially at the upper and lower limits. This is because at the top of your inhale, your expiratory muscles are stretched to the limit. It's like pulling back a sling shot; the further you get away from the set point in the center the harder it is to pull. When you released the tension, the elasticity results in a violent return to the set point. The high pressure combined with the elastic quality of the expiratory tissues takes over and pushes the air out.

However, once you reach the set point you had to work to wind up the "slingshot" once again, this time in the opposite direction. At full exhale, expiratory muscles are working harder than ever to pull against the stretch of the inspiratory muscles. Upon inhale, the elastic quality combined with the low pressure allows air to effortlessly rush into the lungs until the set point is reached again where neither set of tissues is on stretch.

The Breath: What is Efficient?

How do we justify the ideas of dead space with the elastic qualities of our respiratory muscles?

They are in opposition of each other.

More efficient breathing in terms of percent lost in dead space means breathing deeply. More efficient breathing in terms of not working too hard against the "slingshot" elastic qualities of our tissues means shallow breaths. What is most efficient? The truth is, you don't need to consciously know the answer. Your unconscious mind has known it your entire life.

When someone throws you a ball and you go to catch it, you don't (and shouldn't) take the time to analyze the initial velocity, acceleration due to gravity, spin speed, and air resistance to determine the exact trajectory. What a waste!

Even the most "uncoordinated" person can calculate where to move his or her hands to catch the ball much faster than any computer. And even the most athletic, professional baseball player couldn't tell you the answer to that math equation using the conscious mind.

The point is, even people who we think of as "inefficient" are – in reality – incredibly efficient. The left of the bell curve is still incredibly impressive. It's just as humans we have the habit of using the far right of the bell curve as the standard. Zooming in on the graph helps us separate create distinctions.

What are the implications of dead space versus elastic qualities for thinking about, focusing on, and programming workouts with the breath in mind?

Foremost, we need to have the awareness that our unconscious systems will always be

better at determining our need for the breath than our conscious mind.

In performance and competitive scenarios, one should not attempt to manipulate the breath dramatically in any way because you will ultimately leave performance on the table. Doing what feels natural when one is aware of the breath and in-tune with what natural breathing looks and feels like, is the best recipe for success in sport.

Two things to expand upon here:

One, there are lots of times where inefficiencies are okay because they are not performance scenarios, they are practice scenarios where the only outcome that matters is learning. Therefore, if you plan on manipulating breath with the goal of learning to improve movement and efficiency, you must work for instances of autonomic control.

In other words, learn to navigate your breath now (conscious competence) so you can be efficient without focus later (unconscious competence). Conscious improvements become unconscious competences so that you can take systems offline once again. Again, focus now, flow later.

Two, most athletes and coaches aren't aware and in-tune with how natural breathing looks and feels. Many athletes begin to play with manipulating their breath, only to find out they are reinforcing improper behaviors and motor patterns.

I had an athlete who always deadlifted with a rounded back; an improper motor pattern. I explained, "Each time you deadlift with a rounded back, you reinforce that pattern. Even if that pattern appears to be most efficient because it requires less energy and allows you to life a greater load, it ultimately jeopardizes your long-term growth if you don't take the time to stop and fix it." It would be a lie if I had told the athlete that stopping to work on fixing the fault would improve his performance in the short-term. In fact, when we worked on his deadlift with his new "proper" form, his working sets and maxes went down significantly. However, about twelve months later the movement was rebuilt and the athlete was stronger, more efficient, and experienced increased longevity.

The same is true for breath work. Manipulating breath might not make you better today. In fact, it may make you significantly worse. Protocols like nasal breathing *will* slow you down. But developing the right systems and patterns will allow for growth and development over the long term.

NATURAL BREATHING MOTOR PATTERNS

What does a natural breathing pattern look like? I have heard coaches describe "dysfunctional" breathing as chest breathing wherein diaphragmatic muscle activation is low and intercostal and scalene (neck) muscle activation is elevated. I agree with the premise but must also admit this explanation can be misleading. Remember the power of the unconscious – there must be a reason for this (dys)function.

In fact, chest breathing serves an important function; to perpetuate a sympathetic response because the person is freaking the f*** out. She is unable to cope with the stresses and anxiety of her life, so she ends up constantly in a sympathetic state.

This is great when she is trying to outrun the lion, but particularly unhelpful and even lethal over the long-term. This sympathetic breath pattern becomes cyclical, and contributes to performance anxiety, negative self-talk, visualizations with negative outcomes and most of all, an inability to upregulate the parasympathetic systems which facilitate recovery.

Let's rewind. Back before all the stress. Back before you had responsibilities of work and family, before you had appearances to maintain on social media, before you had a mortgage and car payment and before you gave a care about performance in the gym.

You were an infant.

In the words of Rachael Rifkin, "If you want to observe incredible breathing, watch a newborn. They naturally practice deep, or diaphragmatic, breathing by using the diaphragm, a muscle under the lungs, to pull air into the lungs. Visually, you'll see the belly expand and chest rise as they inhale air through the nose and into the lungs. As they exhale, the belly contracts."

Let me ask: When is the last time you heard of a baby suffering from a stressed-induced ulcer?

Never. With no stress, babies are in a constant state of growth and learning. The parasympathetic systems are in high gear, and the belly breathing helps perpetuate this state.

Belly breathing is both a cause and an effect of PNS activation. Chest breath is both a cause and an effect of SNS activation.

[Side bar: Did you ever notice how children learning to walk laugh when they fall down, where an adult learning to snatch grumbles and stress sighs with each failed attempt?]

The goal for a coach and the athlete should be to increase understanding of the autonomic nervous system to build recognition. Once an athlete possesses the skill to recognize their state quickly and accurately, they will be able to influence it greater. You can't directly exercise control over your autonomic nervous system, but you can greatly increase your ability to influence it.

You can't force your significant other to go to your favorite restaurant, but does that mean you have no degree of control over the situation? Certainly not.

For another analogy, think of the autonomic nervous system like an automatic car. Do you control when the car shifts? Most people would say no. But the reality is you have a lot more control over that shifting of gears than you realize. You know approximately when the car will shift gears as you

accelerate based on how hard you press on the gas pedal. If you want the car to rev to higher rpms before shifting, you step on the gas harder. If you want better gas mileage, a mild step on the gas will influence the car's programming to downshift sooner. If you accelerate to cruising speed and let your foot off the gas, you expect the car to downshift. If you hold your foot constant as the car begins to climb a steep hill, you expect it to bog down at first, followed by a downshift to offset the steep incline.

So, do you have control over the car?

So, do you have control over your autonomic nervous system and state?

Regulating Nervous Systems via the Breath

With time and practice, an athlete can regulate state: sympathetic versus parasympathetic. The most effective way and accessible way to do this is with the breath.

The goal is regulating your arousal, the ability to up-regulate or down-regulate. Activate the SNS to 'turn up,' and activate the PNS to 'turn down.' In any given moment, an athlete needs to know the answer to three questions:

1. What state am I in?
2. What state is best for my current needs?
3. How do I make up the difference?

Closing the gap between question one and three is a mark of a champion. Possessing a combined knowledge of what state you are in and what state you need to be in, in conjunction with the ability to make the change. Many athletes don't know what state they are in because they are distracted by the 'demands' of twenty-first century life. Rather than distracting oneself using phones, music or conversation; an athlete must put in the time to learn to recognize and manipulate state based on the demands of a given moment.

This applies to before, during and after both practice and competitive settings.

Inner dialogue should shift based on the answer to the three questions above.

Below are two examples of two athlete's inner dialogue surrounding the three questions of state. Note that over time this inner dialogue will be understood without the need for words or language. It will move from being intellectual to instinctual, stage three to stage four competency.

Inner Dialogue: Manipulating State

The inner dialogue of an athlete who struggles to maintain parasympathetic control. He or she must continuously combat the SNS and the "fight-or-flight response."

"I am several hours away from my next event, I need to relax and get some quality nutrition. I will slow my ventilation rate by allowing the exhale to be longer than the inhale, slowing my heart rate and dilating my peripheral blood vessels. I will draw the air down deep into my belly using my diaphragm. I will allow my shoulders to fall away from my ears and allow my vision to soften. To facilitate this, I need to find a quiet space or listen to soft, slow music."

"My heat will start in about five minutes. I am warmed and ready to go. The exertion of the warm-up helped me work out some of the jitters I had a hard time staving off. To perform my best, I need to be fluid and relaxed from the buzzer. Too intense in this workout and I will gas out quickly. Slow is

smooth, smooth is fast. Allow the workout to build. It's a longer time domain so there is plenty of time to increase the intensity the second half of the workout if I need to."

"It's last quarter of the workout. Metabolic pain is building, and breathing is becoming labored. Allow the breath to do what it wants; don't impose limiters on it. I knew it was going to hurt and I'm okay with it. I am in control of the pain. Okay, switch gears now. Pick it up. Home stretch."

"Alright, I just walked off the competition floor. The event went well. I'm starting to recover, I no longer have to mouth breath. Return to belly breathing drawing air in through my nose. Allow the shoulders to relax. Soften the focus and regain parasympathetic control."

***

The inner dialogue of an athlete who struggles to upregulate the sympathetic system in a time it is needed. He or she must be able to activate the SNS and the "fight-or-flight response" and then return to parasympathetic control.

"I about an hour before my event. It's not time to get ready yet, I don't want to be up-regulated too long or it will drain me. You have plenty of time. For now, I will stay relaxed and focus on slow, methodical breathing. No stimulants like caffeine, loud music, or a crowded room of fans."

"I have about twenty minutes to my heat. This event is short and heavy, so I need to build systemic tension throughout my body. I will do some of the positional holds for a few short rounds, building to a hard brace and maximal tension. I'll hit my warm-up lifts now. I can't be worried about pacing, think about being fast. Put the most power in the least amount of time."

"It's moments before the buzzer. I'll take a few super-ventilation breaths, where I inhale quickly and powerfully followed by letting the air out passively. I will do about five to ten back-to-back, helping me up-regulate and turn on the sympathetic system."

"It's a few minutes after my event. Things went well and I felt strong. I can still feel the 'high' of the cheers of the crowd when I hit my lift. My breathing is still rapid and relatively shallow. It's time to transition. I'll focus hard on my breathing, slowing it and breathing through my nose.

After my conscious effort and attention for a minute or two, I will be able to let go of my focus and put myself in an environment where recovery will be easily accessible between events."

For an athlete to take this level of ownership on manipulating state, he or she must be able to understand the role of each state in different types of events as well as tools to manipulate state.

During periods of rest and recovery, including the time before and after workouts, the athlete's goal should be to maximize the activation of the parasympathetic system. The same is true for long time domain workouts where endurance and efficiency are prioritized over strength and power. Lastly, individual athlete predisposition will play a large role. An easily excitable or an anxious athlete will need more parasympathetic inputs.

Conversely, athletes who are slow to be excited – call them mellow – often need more sympathetic inputs to be stimulated to their optimal level of arousal in the moments directly before an event. However, mellow athletes often perform their best at a lower level of arousal. In addition, max lifts and short, powerful, high-tension workouts will require more sympathetic drive for the athlete to reach an optimal state of arousal.

At the end of any workout, event or series of lifts the goal should be to return to a parasympathetic state as quickly as possible. This allows for digestion, recovery, healing and fertility.

Principles of time domain, tension requirements and relative loads can be used to determine what permutation of each state is optimal in a given moment.

An athlete's best-suited state and arousal are highly individualized and getting as close to possible to the mythical 'optimal' will be a journey that often takes an athlete's entire competitive career.

Experimenting with various tools and finding which works best is a critically important task that should be valued as highly as perfecting movement technique or developing fitness.

And truth be told, without the knowledge and ability to access your best state and level of arousal in a given moment, you will not be able to express fitness or strength to your potential. Precious adaptation currency, time and energy, should go into developing these tools.

Importantly, time spent learning these tools often improves recovery by acting as active rest and a form of mindfulness. And typically, athletes must spend more time developing down-regulatory tools so the PNS activation speeds recovery. Therefore, consider developing the tools in Part II as an investment: put in time and energy now to receive a high rate of return in the future.

Finding Your Optimal Level of Arousal: Beyond the Breath

The following is an excerpt from my eBook *The Anxious Athlete Solution*,

"Creatures of habit. Everyone is, but especially athletes. Each competitor has their way of preparing themselves for the competition floor and "getting in the zone." Going for a walk, listening to music, taping up wrists or thumbs, putting on wraps or sleeves, prayer or reflection, visualization and the list goes on and on.

Each athlete must find the preparation that allows them to perform at their best. And it shouldn't be overlooked. Consider pre-competition rituals to be the mental equivalent of a physical warmup. It is vital to the athlete. Without it, performance wanes and risks rise.

No two athletes should have an identical warm-up, right? The same holds true for pre-competition rituals. There is no set way. There is better and worse, but only you can determine what is optimal for *you*.

Think, what allows me to perform at my best?

Think about arousal as the intensity of your excitement for a moment.

On a scale from 1 to 10, a one would be low arousal, very relaxed and calm. A ten would be incredibly excited, hyped up and intense.

Take a moment to ask yourself, what is my optimal level of arousal to compete at?

There isn't a right answer here. I've worked with incredible athletes on both ends of the spectrum, one an eight and another a two. It's a matter of finding where you can be at your best.

Not every type of event will have the same optimal level of arousal. A sprint-style event might mean optimal is relocated one or two points higher and a very long event could land you two or three points lower than average.

Consider what you can do, including skill practice in your overall programming, that can allow you to find optimal on game day."

PART III
PRACTICAL APPLICATIONS (BREATH WORK PROTOCOLS)

BREATH WORK PROTOCOLS

Breath work protocols can be divided into three categories: down-regulation tools & up-regulation tools and movement tools. These tools act much like stimulants and depressants, as external inputs that change alertness, mood, heart rate, blood pressure, tension and excitement.

Note this by no means an exhaustive list. I have selected ten of the top protocols that I have found helpful when working with athletes and on a personal level.

Much like a selection of exercises, this list has many potential variations, only some of which I will outline. This guide is meant to spark thought and be a jumping off point rather than a mundane list of possibilities.

Each of these protocols can and often should be combined with other training modalities to be most effective. I provide many samples, which are ideas and possibilities, not gospel.

Much like exercises, these protocols are not special on their own but in combination with a desired stimulus within a comprehensive program. Each section will provide insight and perspective along the way designed to help evaluate overarching ideas and compose them into an effective training model.

Each of the ten protocols will build off the concepts presented before it. While layers are added as each of the tools are explained it does not mean that the first ones are simpler or in any way less effective than later ones.

Here are the ten breath work protocols we will review:

<u>Down-Regulatory Tools (PNS)</u>

1) Belly & Nasal Breathing
2) Pranayama Breathing
3) Box Breathing

<u>Up-Regulatory Tools (SNS)</u>

4) Apnea Breathing
5) Breath Holds & Pauses
6) Super Ventilation
7) Exposure to Stressors

<u>Movement Tools</u>

8) Respiratory Prep Work
9) Positional Breathing
10) Breath Ratios

BELLY & NASAL BREATHING

What?

A down-regulation protocol. Breathing through the nose by initiating the breath with the diaphragm. The belly should push out visibly before the chest expands or the shoulders rise. That basic sequence provides the correct order of inflation: belly, then chest, then shoulders. Breathing through the nose, specifically inhaling, allows for easier access to 'belly breathing.'

Why?

Belly and nasal breathing help an athlete stay calm prior to a competition, stay sustainable and relaxed during a long, low-intensity effort, and help return an athlete to a state of homeostasis after a workout quickly, which accelerates recovery.

Belly and nasal breathing are natural patterns. Think back to how a baby breathes. Walking around breathing up in your chest with your mouth hanging open isn't natural. The vast majority of the time (~98-99%) you should be nasal breathing. During sleep, your daily activities and chores, your desk job, etc. The one or two percent applies when you are in a high stress environment, such as maximal exercise.

Think about nasal breathing like drinking pure, filtered water. Mouth breathing, on the other hand, is like drinking water straight from a pond.

When you draw air in through your nose, the hair-like villi in your nose work as a filter to catch particles. As air passes through the nasal conchae it is moisturized and warmed. As air continues its journey, mucous catches many of the smaller particles. The nasal cavity is filled with nerve endings, some of which activate the parasympathetic branch of the nervous system via the vagus nerve.

As part of this reaction capillaries in peripheral tissues dilate, allowing more blood to reach limbs and increases the body's ability to lose heat through radiation and evaporation. This is aided by the nitrogen oxide produced from the sinuses, which dilates the blood vessels in the alveoli of the lungs. This vasodilation can increase oxygen uptake significantly, increasing efficiency of oxygen uptake per breath.

However, in terms of maximum ventilation rate mouth breathing far exceeds nasal breathing. It's like trying to drink out of a fire hose. This is why you will never be able to match your mouth breathing top performance while nasal breathing. The goal isn't maximum capacity while nasal breathing, it's about closing the performance gap between the two. It's like lactate threshold and V^{02} max with respect that the two markers will never be the same, but many benefits come from the distance of the gap being narrowed.

It's not just about physiology, it's also about learning. An athlete must be able to control their body as a system and know how it responds to different stressors.

Most athletes aren't "literate" nasal breathers: They don't understand it as a tool.

In my experience as both an athlete and a coach, most people start moving and immediately start mouth breathing. Even when the metabolic demands of a workout as low, the mouth starts hanging wide open. It's simple. Are you mouth breathing in your warm-up? Warm-ups are not maximal. Shut your mouth.

Breathing this way is a dysfunctional motor pattern. No different than a butt wink in your squat, early pull in your clean or heel strike in your run gait. Dysfunctional motor patterns need to be fixed or there will be consequences. The consequences might be subtle and take place years down the road, or they might take you out of commission for a season of time.

You can probably be an elite CrossFit athlete and heel strike when you run. There is evidence of that. You can also probably be a CrossFit Games competitor and always mouth breath during exercise. It is the difference between acceptable and optimal.

Good athletes spend the time it takes for the 1% improvement.

Gold athletes spend the time it takes for the .1% improvement.

Practical Applications

Learn to develop gears with your breathing based on pacing and time domain just like you develop gears during exercise.

Developing skills with different types of breathing takes time and intentional practice. If you program workouts for building running capacity, why not program for nasal and belly breathing capacity?

Sample Workout #1
5 Rounds, Each for Max Time
[Maintain Nasal As Long As Possible]
-Start at 300/200 watts on Assault Bike and increase by 50 watts every 30s until you break to mouth breathing
--Rest 2:30 between rounds--
Recover back to Nasal Breathing as quickly as possible during rest

Sample Workout #2
Row 2k @ Max Nasal Breathing Effort
(Proficient nasal breathers will be within 90% of their 2k Personal Record)

Sample Workout #3
5 Rounds for Time
-200m Run (Hard, Mouth Breathing)
-300m Ski (Recovery Pace, Nasal Breathing)

Sample Workout #4
Recovery Day (Nasal Breathing Only)
AMRAP 20 (60% Effort)
-20 Wall Ball 12/8lbs
-18 Ring Rows
-15 Russian Kettlebell Swings 44/26lbs
-12 Walking Lunges

nasal breathing keeps you parasympathetic during your recovery day

Centering Breath

What?

A variation of belly and nasal breathing, which is a down-regulation protocol. A centering breath is a long, relaxing breath that you take in the minutes or moments before a workout. It is a 6 second inhale, 2 second hold and a 7 second exhale, for a total of 15 seconds.

Why?

Using a centering breath to come down to your optimal level of arousal will allow you to become laser-focused, lower perceived level of exertion during the workout and allow more use of fat as a substrate at low levels of intensity.

All the reasons why belly and nasal breathing are parasympathetic inputs also apply to the centering breath.

Practical Applications

Take your centering breath when you feel a stress response beginning to creep up in the moments before the start of a workout. Notice how your breathing dictates how you feel before a workout, not just during it.

A centering breath is particularly effective when standard belly and nasal breathing isn't transporting you to your optimal level of arousal.

If you realize your level of arousal is still elevated above optimal with only moments before the start of a workout, collecting yourself and taking a centering breath can be enough to bring everything back into focus.

A certain kind of workout is more likely to evoke the above scenario. Specifically, metabolically painful workouts with a medium time domain. Many benchmark workouts fit the bill. For example, "Fran," "Helen" and "Jackie."

When you feel yourself beginning to spiral (becoming anxious and sympathetic) in the moments before a metabolically painful workout, take a centering breath (6-2-7) about one minute before the start of your workout.

If you fail to meet the 6-second inhale, 2-second hold and 7-second exhale, repeat until you do so successfully.

This protocol doesn't just apply to calming yourself to workout scenarios. An athlete must learn to control their nervous system state at all times, even if that is a completely different type of stressful scenario, like an interview or public speaking. This concept transcends CrossFit and movement.

PRANAYAMA BREATHING

What?

A down-regulation protocol. Pranayama is composition of two words: prana meaning breath or life force, and ayama meaning to restrain or control. Therefore, pranayama is simply a controlling the breath. It is a common practice in yoga.

There are several different types of pranayama breathing. Several of these types involve a critical component: an exhale with a longer duration than the inhale. A common example would be a 1:2 inhale to exhale ratio. For example, inhaling for four seconds and exhaling for eight seconds.

Why?

The elongated exhale provides a calming effect. Once again, a cascade of effects allows the PNS to be turned on. Stress is lowered, and recovery and creativity emerge.

Humming, chanting or singing can be added to the exhale. This is one of several reasons why song can be used as a tool to alter mood. The vibrations caused from the vocal chords can also have beneficial physiological effect.

Many guided meditations will use pranayama breathing to encourage a person to be present in a moment and bring about a relaxing effect.

Practical Applications

Pranayama is particular useful for reducing both chronic and acute stress throughout the day. The goal is to bring awareness to the breath outside of performance scenarios (in ordinary life) to have carryover to breathing mechanics at all times, including training and competing.

<u>Sample Protocols</u>

(outside training, before or after a session)

6 Minutes (or) 4 Minutes

-3s Inhale -5s Inhale

-6s Exhale -10s Exhale

The goal is to focus only on breathing. Shutting the eyes is helpful. There are several apps that will play tones as cues for inhales and exhales, so an athlete does not need to look at a clock.

The goal is learning and to shift physiology. Once those goals have been met, move on. Contrary to many movement-based protocols, as an athlete advances, he or she does less.

Think of it as recovery time (time between intervals) rather than working time. A more advanced athlete needs less recovery time to do the same thing.

For pranayama applications, as soon as an athlete shifts from sympathetic to parasympathetic the goal has been reached. For beginners, this shift might take five or ten minutes. For an advanced athlete, the shift might be able to happen in a single intentional breath.

The same concept can be observed with monks entering meditation versus the lay man attempting to do the same. The former can achieve a shift in state within several seconds almost regardless of the environment, where the latter will take long periods to begin the shift and the process will be heavily dependent on the environment in which they find themselves.

BOX BREATHING

What?

A down-regulation protocol.

Left side of the box: Inhale

Top side of the box: Hold Inhale

Right side of the box: Exhale

Bottom of the box: Pause Exhale

Why?

Once again, it is about learning to control the breath, outside of practice or performance scenarios.

Box breathing is most commonly used to facilitate down-regulation and bring about a state of rest and recovery.

However, it can also be used to create artificial stress, just like all the up-regulatory protocols. Rather than the goal being a stressed state, the goal is for the athlete to place a wedge between that stress and their reaction to it on a physiological and psychological level.

Exercising control over your hard-wired response to stress is a skill that needs to be developed. This is most applicable to exercise and performance in CrossFit.

Practical Applications

<u>Sample Protocol #1</u>

For all experience levels: Restorative, PNS

-3:3:3:3 (12s per Breath Cycle)

<u>Sample Protocol #2</u>

For Beginners: Stressful

For Advanced: Restorative, PNS

-6:6:6:6 (24s per Breath Cycle)

<u>Sample Protocol #3</u>

For Beginners: Unable to complete

For Advanced: Stressful & Dependent on Environment to complete with success

-10:10:10:10 (40s per Breath Cycle)

***

The pivot point between restorative and stressful can be a fine line. Often athletes and coaches believe they are completing and prescribing a down-regulatory protocol, but in fact the protocols are too challenging for the athlete and they provide an additional stressor, meaning by definition it is up-regulatory. This can happen quickly and be disguised during pranayama breathing and box breathing. Often in other protocols such programming errors are obvious because the athlete simply will be unable to complete them. When writing programs meant to be parasympathetic, be very careful when using specific seconds for inhale and exhales or sides of the box: inhales, holds, exhales and pauses. Too long and the body will long for more air and too short and it can become a super-ventilation technique, both which are stressful. These can also be effective tools for stress inoculation, they just aren't restorative in the short term.

APNEA BREATHING

What?

A up-regulation protocol.

Unlike the next section, *Breath Holds & Pauses*, Apnea Breathing is executed in absence of movement training.

A breath hold is executed on the inhale.

A breath pause is executed on the exhale.

The more advanced the athlete the more he or she will be able to extend a single breath.

Apnea Breathing is meant to be a series of holds and pauses, executed cyclically in regular durations, not in isolation (one at a time).

Why?

It is meant to be stressful and challenge the limits of the athlete's mind and physiology.

The goal is composure and confidence in the face of the limits of their physiology.

Calm in Chaos.

Practical Applications

<u>Sample Protocol #1 (Beginner)</u>

Every 20s, x 15 Rounds

-2s Inhale, 8s Hold

-5s Exhale, 5s Pause

<u>Sample Protocol #2 (Intermediate)</u>

Every 30s, x 15 Rounds

-5s Inhale, 10s Hold

-5s Exhale, 10s Pause

<u>Sample Protocol #2 (Advanced)</u>

Every 30s, x 20 Rounds

-5s Inhale, 10s Hold

-5s Exhale, 10s Pause

Allow the stimulus to build while minimizing effort.

***

These are basic samples, which do not show the variety, complexity or creativity potential.

Slowly transitioning into easy activity is another great way to use Apnea Breathing. Go for a walk an initiate a sequence: one step inhale, three steps hold, two steps exhale, three steps pause. Or hold an easy 150 watts on the Assault Bike and find you minimum sustainable ventilation rate (breaths per minute.)

During my commute as my time as a teacher, I would regularly complete apnea protocols on the freeway. My favorite protocol was…

Every Mile on the Mile: One Breath

.0-.1 | Inhale .1-.7 | Hold .7-.9 | Exhale .9-.0 | Pause

Zoar Fitness strongly discourages breath retention or super-ventilation during driving, pool training or any other environment where passing out could result in injury or death. There have been several recorded deaths from the Wim Hof Method performed alone in pools. I personally have passed out during breath retentions post super-ventilation. Don't do it.

SUPER-VENTILATION

What?

Super-ventilation is a way to describe breathing more than you need to intentionally. The key distinction between hyper-ventilation and super-ventilation the former is unintentional while the latter is knowingly self-induced. The Wim Hof Method is the most popular super-ventilation technique, which is combined with breath retentions.

The Wim Hof Method is most often described as three to five rounds of 30-50 super-ventilation breaths (fast, deep intentional inhale followed by a passive exhale) directly into a maximal breath retention (on a passive exhale). This is often combined with an intentional exposure to stressors, such as cold-water immersion.

When I refer to super-ventilation, I am talking about the breath technique, not the Wim Hof Method.

Why?

Many athletes and non-athletes alike have been using the Wim Hof Method to improve mood, thermoregulation, the stress response, immune status and focus.

In my experience with the Wim Hof Method, there is a dramatic physiological and psychological shift that occurs during the practice and carries momentum throughout the day.

However, I believe the biggest benefit to any super-ventilation technique, including the Wim Hof Method, is with learning to develop awareness and exercise a degree of control over the autonomic nervous system.

Super-ventilation almost immediately activates the SNS. Working to counter, harness and stay composed through the stress response can have massive benefit to athletes who struggle to down-regulate due to performance anxiety.

It can also help athletes who struggle to up-regulate to get to their optimal level of arousal. A few super-ventilation breaths in the moments before a high-tension workout or max lift can help shift the athlete into a more sympathetic state. It is the same reason why a powerlifter would use an ammonia tablet before a big lift.

The biggest difference for an athlete who needs to down-regulate versus the athlete who needs to up-regulate is timing.

Practical Applications

The anxious athlete will perform techniques and induce a sympathetic state outside the pressures of competition. A morning routine on practice days would be appropriate.

<u>Sample Protocol</u> [4 Rounds]
-40 Super-ventilation Breaths
-Max Breath Hold on Pause

The mellow athlete would complete super-ventilation breaths directly before key times in practice or competition scenarios.

<u>Sample Workout #1</u>
Every 2 Minutes, x 6 Sets, 12 Minutes
-8 Super-ventilation Breaths (Then rest 5s)
-Hang Snatch + Snatch + Overhead Squat

<u>Sample Workout #2</u>
EMOM 8:00
-6 Super-ventilation Breaths
-2 Deadlifts **drop & reset**

<u>Sample Workout #3</u>
3 Sets | 30 Super-ventilation Breaths into…
-800/600+ Watts Bike Erg (Max Time)

INTENTIONAL EXPOSURE TO STRESSORS

What?

Getting cold, hot, hungry, etc. in systematic and seasonal ways.

Don't prevent nature from doing its thing,

Turn off the A/C or heat in cars & homes

Take off the jacket and place it in the back seat of your vehicle for emergencies only.

Turn off the hot water for showers.

Don't eat a certain thing or at a particular time just because it's a cultural norm.

Turn off music and workout in silence to build awareness (or) turn up the noise and work to control the nervous system reaction. The one you find most uncomfortable will have the biggest benefit.

Even positions can be intentional stressors, just think of mobility training.

When you are exposed to a stressor, pay close attention to how your body reacts and eventually begin to exercise control over it.

Why?

As a person who trains, you regularly and intentionally expose yourself to stressors in a systematic way.

Training would be considered an intentional exposure to a stressor.

However, that is where many athletes stop. They simply go back to their day job or climate-controlled house and call it a day.

However, many people are now beginning to recognize how modern life has once again failed to allow our physiology to blossom.

We can gain real benefit from exposing ourselves to stressors besides training. Exposure to stressors isn't just about adapting our physiology, it's also about reclaiming feel and learning to influence the nervous system.

Strong inputs to the nervous systems are revealed in abrupt changes in the breath. Abrupt changes in the breath act abrupt changes on nervous system state. Protocols should be designed to help athletes realize it is a two-way street.

Practical Applications

<u>Protocol #1: Cold Shower</u>
0:00-2:00 | Normal Shower (clean yourself)
2:00-3:00 | Warm Water + Super-ventilation
3:00-4:00 | Cold Water + Super-ventilation
4:00-6:00 | Cold Water + Pranayama

Beginning at minute four, work to regain parasympathetic control, specifically on the exhales. Work to elongate the exhale of your breath, relaxing your shoulders and accepting your environment.

You are acting on your environment, it is not acting on you. Foster that mindset.

<u>Protocol #2: Contrast Method</u>
3 Rounds (Alternating)
-Ice Bath (Cold)
-Sauna (Hot)
Beginner: Less temperature extremes, combined with pranayama breathing
Advanced: Extreme temperature changes, combined with apnea breathing

<u>Protocol #3: Environmental Exposure</u>
It's cold. It's windy. It's precipitating.
Go for a run or walk shirtless or in a light jacket. Make the conditions your challenge rather than the metabolic discomfort.

Use what is available to you. I regularly ran from my house to a creek in the peak of winter, jumped in and ran home. It was twenty-minute routine that I executed in only shorts on my recovery days out of the gym.

BREATH HOLDS & PAUSES

What?

Apnea Breathing Variations During Training

Think of Punnett square with four quadrants:

Low Prime Mover Output Low Respiratory Output	Low Prime Mover Output High Respiratory Output
High Prime Mover Output Low Respiratory Output	High Prime Mover Output High Respiratory Output

The first and fourth quadrants (low/low) and (high/high) are most common in daily life. Work from respiratory musculature and that of other skeletal muscle is usually highly correlated.

Think about going from seated, to walking, to running and finally to sprinting. Respiration and work from the prime movers consistently increase throughout the transitions.

Typically, athletes hit quadrants one and four regularly during training.

However, in functional fitness (mixed modal sports), including CrossFit, quadrants two and three become increasingly important for athletic success.

Breath Holds & Pauses in training will focus on quadrants two and three: Low Prime Mover Output, High Respiratory Output (and) High Prime Mover Output, Low Respiratory Output.

Why?

For one, it's the concept of lowest hanging fruit. Athletes do very little (intentional) quadrant two or three training compared to one and four so it is much easier to improve in these arenas.

Two, quadrant one (low/low) isn't an effective training model and quadrant four (high/high) is very costly in terms of adaptation currency. Now, obviously I'm painting a black and white portrait when grayscale would be more accurate, but you get the point.

Increased demands of quadrants two and three in CrossFit, reveal the activity/movement/load-specific nature of the breath.

Quadrant three is a breath hold during high output work. This might seem counter-intuitive to the runner or cyclist, but to the weightlifter or powerlifter this is second nature.

It's called the Valsalva Maneuver: holding the breath to create tension and rigidity in the core. In other words, it's a brace.

It's extremely common to have a series of short breath holds in the midst of high-intensity work, if that work is something like…

4 Rounds for Time
-40 Double Unders
-14/10 Calorie Row
-4 Squat Cleans 225/155lbs

The same thing, for most athletes, will happen during the benchmark workout "Amanda"...

For Time 9-7-5
-Ring Muscle-Up
-Squat Snatch 135/95lbs

A short breath hold, even if it is for a fraction of a second during a time of high core tension is often helpful to maintain movement quality.

This brings us to the relevance of quadrant three, low prime mover work during times of high respiratory work.

For the CrossFit athlete, this looks like breaks in a set and transitions between elements.

In the first workout (DU-Row-Clean) I described, even an advanced athlete would drop the clean and take a breath or two unloaded before doing their next rep.

De-tensioning, stopping work to rest and "catching your breath" is a very sport-specific skill in CrossFit.

During "Amanda" how long is work being completed (actually do a muscle-up or snatch)? Half the time? Maybe less. Certainly it depends on the fitness level of the athlete, but even the best athletes will spend significant time in rest depending on the workout factors of load, movements and duration.

Note: The most sport-specific retention is a breath hold, but you can also prescribe work during a pause or exhale for an added challenge. With little gas in the lungs, less diffusion happens and the effects of withdraw are felt quicker and are much more intense.

A personal favorite technique is going directly from a near max pause into a max hold. Rather than "waiting around" for your breath retention to become challenging, it happens quickly. Transitioning from the pause directly into the hold gives you new life for a short time but almost immediately requires focus and discipline to maintain after a near maximal pause. This is a great technique to move the needle for athletes who are more adept to breath training.

Practical Applications

Insert maximal breath (simulating recovery) during period of low work (and/or) Insert breath holds into periods of high output.

Sample Workout #1
Every 90s, x 7 Sets, 10:30
-Max Calorie Row (During Breath Hold)

Sample Workout #2
E2M, x 4 Sets, 8:00
-15s Assault Bike Sprint (During Pause)

Sample Workout #3
AMRAP 6
-Max Double Unders
(Can only work during breath hold)

Sample Workout #4
4 Rounds, for Distance & Recovery Time
-Max Distance Prowler Push (During Pause)
-8 Belly Breaths
-Max Distance Run (During Hold)
ASAP return to nasal breathing
-Rest 2:00 between Rounds-

Sample Workout #5
5 Rounds, for Max Time in Static Hug
-10 Jumping Switch Lunges (During Pause)
-10 Jumping Switch Lunges (During Hold)
…immediately into…
-Max Time Static Sandbag Hug 150/100lbs
3:00 Ski Erg Recovery between Rounds
(Damper 1, slower than 2:30/500m)

This is just beginning to scratch the surface of what can be done with breath work in sport-specific avenues within CrossFit. Even for advanced athletes, these workouts can be incredibly challenging mentally and physically.

Only prescribe protocols that are appropriately challenging for your athlete. Remaining relaxed during breath training, even at high output, is crucial to success. Remember, the goal is calm in chaos. If your athlete is incapable of remaining relaxed, it is inappropriate.

POSITIONAL BREATHING

What?

Get in a position that challenges the breath and demand quality breathing of the athlete.

Just like any other piece, it should be appropriately demanding of the athlete.

You might have the same position-induced breathing limitation as another athlete, but you shouldn't address the issue in the same manner as them if your fitness and strength levels are at different places.

Write workouts that you struggle to maintain but can complete. Just because you can complete a piece does not mean you can do it with the correct breathing mechanics.

Once you express ownership of a position, begin to add the layers of load and fatigue.

Why?

"If you cannot breathe in a position, you do not own it." –Kelly Starrett

Learn the relationship that core orientation, mobility, stability and torque have on the breath. A few positional breathing progressions could serve as a quick breath / mobility screen for a CrossFit athlete.

-Front Plank, FLR Hold, Side Plank, Planch
-Parallel Bar Hold, Bar Muscle-Up Support, Ring Muscle-Up Support
-Med-Ball / Barbell / Dumbbell Front Rack
-Back Squat, Front Squat, Overhead Squat
-Setup in Clean & Snatch (Barbells & DBs)
-Wall-Facing Handstand Hold, Freestanding
-L-Sit Raise, L-Sit on Parallette, Manna
-Sandbag Hug (Static or Walking)

Often a limit in capacity in a movement or a breakdown in technique with fatigue shows a positional limitation, not a metabolic one.

Do not just blindly prescribe positional training. First run a quick assessment to determine where the athlete can and cannot breathe naturally (access to belly & nasal).

Practical Applications

These sample workouts are not written in any formal order. Two athletes with similar fitness levels could find one easy and be unable to complete another. A deep familiarity with your limitations are needed to write workouts like this effectively…

<u>Sample Workout #1</u>
Alternating EMOM 15 (5 Rounds)
1) 40s Front Lever Ring Hold on Low Rings
2) 40s Active Hang from Pull-Up Bar
3) 40s Front Rack Hold 185/125lbs

<u>Sample Workout #2</u>
Every 2 Minutes, x 4 Sets, 8:00
-10/8 Calorie Ski Erg Sprint
-15s Ring Support Hold
-15s Ring Dip Hold

<u>Sample Workout #3</u>
Every 3 Minutes, x 3 Sets, 9:00
-3 Snatch 185/125lbs
**3 Belly Breaths in tension in setup
**3 Belly Breaths in catch (OHS)
**3 Belly Breaths after recovery (Standing)

<u>Sample Workout #3</u>
5 Rounds for Time
-8 Burpee Box Jump Overs 24/20"
-20s L-Sit Parallette Hold
-200' Sandbag Hug Walk 150/100lbs
Rest 30 Belly Breaths between rounds

<u>Sample Workout #4</u>
Back Squat (5x5)
-Rest 2:00 in Passive Squat between sets

RESPIRATORY WARM-UP

What?

Prepare your physiology for the demands of a workout session or competition.

An effective warm-up can include restricting the breath by using nasal breathing, a device, or creating pressure and tension through a brace.

Note that devices that have been branded as altitude trainers, while misinformed, perform excellently at restricting the breath to increase the demand of the respiratory musculature.

It is easy to under or overtax the respiratory musculature during a warm-up, which is always the case with movement preparation. Try to hone in on what is optimal based on testing in practice scenarios as it is easy to make an athlete perform worse than they would have without such a warm-up.

Remember, optimization is the only thing that matters in testing. The only thing that matters in training is adaptation. You do not – and should not – optimize for training. An aggressive respiratory protocol might be put in place to intentionally pre-fatigue the respiratory muscles before a piece of a workout.

Nasal breathing or restriction with a device can also be executed at the end of a session to get additional respiratory work while keeping the power output of the prime movers low. Think of it as doing bicep curls after you do Pull-Ups; it's the accessory work equivalent for the breath. Keep in mind, this is most effective when dealing with a respiratory limiter, just like bicep curls are most effective at helping an athlete who has weak elbow flexion. Fancy doesn't equal effective.

Why?

The goal is to be as ready as possible for specific type of workout.

General warm-up guidelines apply equally well to respiratory warm-ups.

For example, different workouts will require different types of respiratory warm-ups. You should not warm-up the same way for a high-tension, short-duration workout the way you would a low-tension, long-duration workout.

The breath is used to facilitate any number of factors, no limited to focus, the aerobic energy system and systemic tension.

Practical Applications

<u>Sample #1:</u> (Low-Tension, High-Duration)
[Warm-Up for CrossFit Open Workout 19.1]
AMRAP 15
-19 Calorie Row
-19 Wall Ball 20/14lbs

A) Aerobic Warm-up

12:00 Assault Bike (nasal breathing only)
hold between 140-180 watts

B) Positional Warm-up

3 Rounds
-0:30 Med-Ball Front Squat Hold 20/14lbs
-0:30 Overhead Plate Hold 45/25lbs
Wear training mask, Belly Breaths

C) Rehearsal
3 Rounds, at Workout Pace
-9-6-3 Calorie Row
-9-6-3 Wall Ball 20/14lbs
10 Belly Breaths between Rounds

D) TEST

Complete the Workout

Sample #2: (High-Tension, Short-Duration)
[Warm-Up for CrossFit Total]
3 Attempts to find a Max Lift in…
-Back Squat
-Strict Press
-Deadlift

A) Aerobic Warm-up

AMRAP 10:00 (50%)
-10/7 Calorie Assault Bike
-10 Air Squats
-10 RDL (empty barbell)
-10 Push-Ups
(nasal breathing only throughout)

B) Mobility
3 Rounds, Not for Time
-5 Breaths Elevated Cat Pose (overhead)
-5 Breaths Banded Front Rack Stretch
-5 Breaths Goblet Squat Hold 35/25lbs
-10 Banded Good AMs (1 Rep / Breath)
maintain awareness of breath in each position, orient hips and core so you can access the belly in each position

B) Tensioning / CNS Wake

3 Rounds
-3 Jump Squats (max height)
-3 Bounding Broad Jumps
-6 Plyo Push-ups
-6 Bird Dogs (Keep Brace, Max Tension)
-6 Dead Bugs (Keep Brace, Max Tension)
work for diaphragmatic breathing through the brace

C) TEST
Back Squat
-5 Reps Empty Barbell
-3 Reps at 50% & 60%
-2 Reps at 70% & 80%
-1 Rep at 90%
-Attempt 1, 2 & 3

D) Repeat for Strict Press

E) Repeat for Deadlift

BREATH RATIOS

What?

A conceptual model for teaching and bringing awareness to optimal breath patterns in CrossFit movements.

When learned, it will accelerate learning new movements ("athleticism") and increase sustainability through fatigue (efficiency).

Breath ratios are simply the number of breaths you take per movement.

For example, a common movement-to-breath ratio on pull-ups is 1:1. That is 1 pull-up per breath (inhale on descent & exhale on ascent).

Why?

One of the reasons why mixed modal activities are so challenging is because each movement in CrossFit has its own breathing demands. The demands on the breath for a front squat are not the same as the power snatch, are not the same the assault bike, are not the same as pull-ups.

Athletes still working to master the various movements of CrossFit will struggle to breath and move at the same time. In other words, focusing on the breath while doing a movement requires unconscious competence or the movement will break down when the focus turns to the breath.

This lack of dependence of consciousness for competence is evident when an athlete must rest by stopping the given movement, rather than moving and breathing simultaneously, a common problem for weightlifting and gymnastic movements especially, which are not infinite scalable like monostructural movements.

This is exactly what is going on when an athlete drops a bar or a set of dumbbells even though the weight is light and there should be little accumulated local (muscular) fatigue. They are simply incapable of breathing efficiently while moving efficiently.

Understand that positioning, mobility, comfort, speed and load will all have an impact on the way a person breathes during a given movement.

Let's look at speed. The speed at which you execute a movement usually changes based on the duration of a workout.

Monostructural exercises, call them cyclical or "cardio," will change speed based on the duration of the workout: biking, running, rowing, skiing, swimming, sleds, and to a degree, double unders and burpees.

Gymnastic and weightlifting exercises will have very little speed change based on the duration of the workout, although the time between reps may get longer the actual rep speed should not slow dramatically. These include: pull-ups, chest-to-bar, toes-to-bar, muscle-ups, cleans, snatches, deadlifts, squats, box jumps, thrusters, etc.

Notice that speed can easily and dramatically be changed during cyclical activities where gymnastics and weightlifting cannot be slowed dramatically. If you try to dramatically slow down a pull-up, muscle-up, clean, snatch or box jump you will only make the movement more difficult, if not impossible. Rather, you must take longer rest between reps or rest in a position of high stability (top of a bar muscle-up, the lockout of a thruster, on top of the box in the box jump).

Understanding how to make each movement more efficient and sustainable via the breath will allow you express your capacity. The

easiest way to do that in my experience is through an understanding of breath ratios.

Breathing is often more difficult on gymnastic and weightlifting movements because they are complex and often require more mobility, tension and bracing. Anyone who has ever deadlifted heavy in the middle of breathing heavy understands this thoroughly. However, for breath ratios gymnastic and weightlifting movements are simpler than cyclical activities because they have less options for speed of execution.

Because weightlifting and gymnastics movements cannot be easily slowed down they will almost always have breath ratios of 1:1. This is even true on barbell movements when cycling. The only exception is when a pause is added in a position of high support. Think about breathing between the clean and the jerk in weightlifting.

An easy illustration of this mental model is the thruster. Taking more than one breath during the moving part of a thruster will almost always cause movement breakdown. Therefore, as pacing or fatigue play a larger role an athlete is best served by breathing in the support position locked out overhead (versus the front rack).

High level athletes during fatigue/pacing will increase the breath ratio in the thruster by taking an extra full breath cycle (inhale & exhale) at lockout and then another inhale during the lower, followed by the exhale on the raise. The moving part of the thruster is executed with a similar speed yet twice as many breaths are taken. While efficiency wanes slightly with this technique, it allows for sustainability.

Now, let's take the bar muscle-up. The only logical places for extra breaths in the muscle-up are locked out in the support position or on the ground, resting. Both have their place in a workout depending on the length of workout, total muscle-up volume, density of reps and athlete experience level.

Cyclical movements can be sped or slowed dramatically so there are almost endless options for breath ratios. While less complicated to be proficient at these movements, they allow a higher percentage of the exercising population to express their power output on them, which makes them have a unique challenge to the breath. Although there are lots of breath ratio options, to express power (work) optimally there will always be an organized cadence and rhythm to the breath.

For example, on a bike the power phase of the stroke (1 O'clock to 4 O'clock) is where you want to initiate an exhale. Initiation of an exhale at any other point in the movement will result in a loss of rhythm, efficiency and power. However, even following these guidelines there are lots of options.

Say athlete #1 is pedaling at a fast cadence (>100 rpm), a slow pace (8-10 mph) and a low effort (30%). She could easily maintain a movement-to-breath ratio well over 4:1 (4 right leg pedals for a single breath).

Say athlete #2 is pedaling at a slow cadence (<60 rpm), a fast pace (25-30 mph) and a high effort (95%). He could struggle to maintain a movement-to-breath ratio of 1:2 (an exhale for each time either foot initiates a push).

The two athletes on the same movement expressed breathing ratios 8x apart. Keep in mind this goes for cyclical movements only.

Other cyclical movements, like rowing and double unders have less breath ratio options. When rowing, the only practical options are 1:1 or 1:2 movement-to-breath ratios. At sustainable paces, it is almost always going to be 1:1 (an inhale during the recovery and an exhale during the drive). Only under high metabolic fatigue will an athlete need to transition to 1:2 (a full breath cycle during the recovery and another full cycle in the drive).

The end goal of understanding breath ratios is to make mastery of any movement easier. If you understand the principles applied then when you learn to do a new movement, say handstand walks, then you

can keep the same 'script' and 'run a new program.'

In the case of a handstand walk you will remind yourself, "Every time my right hand hits the floor I must initiate an exhale." This rhythm your breath creates will make mastering the new movement easier. Once you have mastered the movement, you can play around with changing the breath ratio away from the original 1:1 ratio described.

Basically, the idea of breath ratios is to understand how to program breath. Once you learn to program breath ratios, running the program makes everything else strategic and accelerates the learning process.

Practical Applications

[Written as Slowest Sustainable Breath Rate to Fastest Rate at Maximal]

Running 6:1 to 1:1 (per right foot strike)

Cycling 6:1 to 1:2 (per right foot pedal)

Rowing 1:1 to 1:2 (per catch)

Swimming 4:1 to 1:2 (per right hand entry)

Double Unders 4:1 to 2:1 (per jump)

Ski Erg 1:1 (per initiation of pull) (1:2 only when clearing high levels of fatigue at slow pace)

Burpees 2:1 to 1:1 (anything slower is inefficient)

Wall-ball 1:1 to 1:2 (if you speed the breath more than 1:2 it means you are better served resting)

Box Jumps 1:1 (unless resting on top of box, then 1:2 or more)

Pull-ups & Chest-to-Bar 1:1

Toes-to-Bar 1:1

Muscle-ups 1:1 (unless rest in support, only advisable on bar muscle-up, not ring)

Handstand Push-ups (1:1 if cycling quickly, 1:2 if resting in lockout)

Handstand Walks (2:1 or 1:1 per right hand strike)

Cleans (1:1 if cycling quickly, 1:2 if resting in front rack)

Clean & Jerk (1:1 if cycling quickly, 1:2 if resting in lockout or if breath between clean & the jerk)

Snatches (1:1 if cycling quickly, 1:2 if you take another breath cycle in the lockout)

Thrusters (1:1 if cycling quickly, 1:2 if you take another breath cycle in the lockout)

Shoulder-to-Overhead (1:1 if cycling quickly, 1:2 if you take another breath cycle in the lockout)

Deadlift (1:1 if cycling quickly, 1:2 if you take another breath cycle in the lockout)

Squats (1:1 if cycling quickly, 1:2 or more if you take another breath cycle in the lockout)

Lunges (2:1 or 1:1 if you swing the foot through quickly, 1:1 or 1:2 if "wedding walking")

THE ROAD AHEAD

Think of yourself as a little boy or girl who was just gifted a new tool set from mom or dad for the first time. Surely, you took the screw driver and used it to punch holes in the drywall instead of tightening the loose hinges on the kitchen door. You didn't understand the socket wrench, so you never use it for anything, and the hammer you thought you understood perfectly and you used it for everything.

This is a lot like conceptual and training tools, including the ones taught in this guide. As a coach or self-coach, it is easy to allow your latest research, training tools or toys to infect your programming. I encourage you to use yourself as the guinea pig before experimenting on your clients or athletes. If you are self-coached, proceed with caution if you are a competitive athlete. If you are not actively competing, but you are training to be healthy and the best version of yourself – then by all means – experiment.

Imagine you just learned about strength training for the first time. You would likely want to do all of it so you could get strong right away. At some point you realized getting strong takes decades not weeks or months. Have some perspective, take the same approach for the breath.

Be patient, understanding and enter each piece with a sense of curiosity rather than anxiety.

It is now your job to take the information you've gleaned and put it together into something useful. Develop your own protocols because the one's in the guide are not special. They have been simply a means of teaching the content in a way that is digestible. Feel free to take these mental modals and blur the lines, delete sections, cut & paste and manipulate the tools as you see fit.

Just like these is no ideal training model, there is no ideal form of breath work.

However, never stop chasing the mythical 'optimal' in the pursuit of perfection.

ABOUT THE AUTHOR

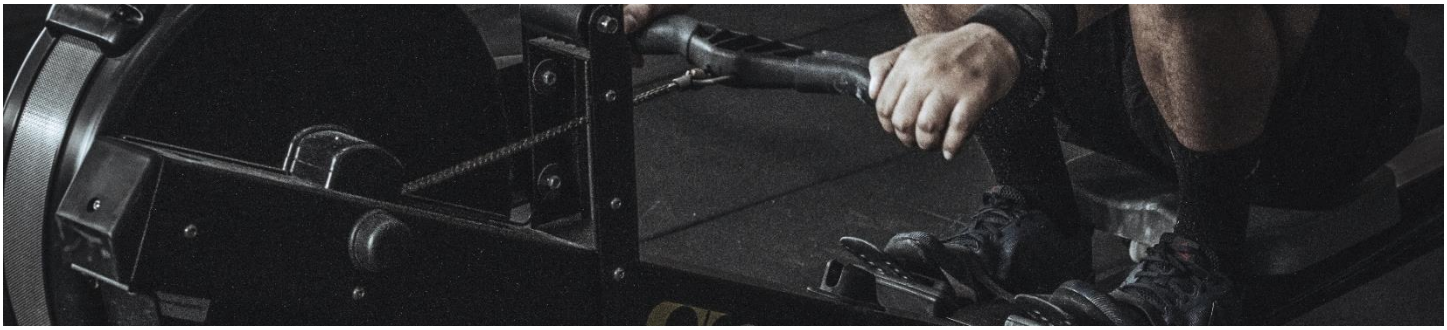
Ben Wise (BA, CSCS, CF-L1) | Owner ZOAR Fitness

@ben.wise @my.workout.log @zoarfitness zoarfitness.com

"For instructors the desired response is learning. This should be evident not just in how you teach but in who you are."

Ben is a health & fitness coach, CrossFit Competitor and business owner. Ben has always been drawn to a physical practice. Growing up he played an array of sports (including wrestling, soccer, and track), but soon he came to the realization that he enjoyed training just as much as competing. After his college sports career ended, Ben dove head first into the functional fitness world and began competing in CrossFit. Tinkering with every training modality, implement, and method he could get his hands on became a daily muse. Pushing the body and mind to new limits brought about immense learning, often through experimentation and play. Despite his personal accomplishments, Ben has been fortunate to enlist the help of countless coaches, teachers and mentors. Curiosity drives his flywheel and allows for a continually deeper understanding.

"My goal with Zoar Fitness is to provide you guidance for CrossFit movements to improve your capacity. I started Zoar Fitness as a way to create a window for others to see into my mind. I eat, sleep and breathe fitness. In the words of Graham Duncan, 'Everyone's genius is right next to their dysfunction.' For me, training for CrossFit is a script that never stops running in my mind. I noticed early on that the way I think about movement and training is different from other people. My goal with Zoar is to share my knowledge and experience with athletes and coaches to elevate the level of movement in our community. I love to move, develop new skills and see people I care about succeed."



COPYWRITE INFORMATION

Zoar Fitness
Trains out of Williamsport, PA
ben@zoarfitness.com
@zoarfitness (Facebook, Instagram)
https://zoarfitness.com

Author | Ben Wise, Owner

This published work is only available as an eBook.