Sports Pharmacy

DECODING THE SCIENCE OF ELITE HUMAN PERFORMANCE

ISSUE 11 | MAY 2024

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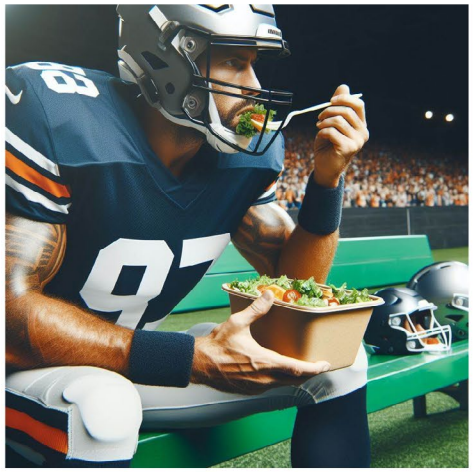
HEALTH & WELLNESS



Sharpening the Mind and Body while Injured!

Breathwork – It's More Th n Just a Fad!

Work Hard, Play Hard… And SLEEP HARD

Letter From the Editor

Dear Sports Pharmacy Magazine Subscribers,

Welcome to the latest issue of Sports Pharmacy Magazine. The theme of this issue is health and wellness. Join us as we explore a wide array of topics, ranging from breathing and sleep to resilience and exercising around injuries. We believe that promoting balance and clinical wellness is crucial in the pursuit of athletic excellence.

As part of our commitment to fostering a collaborative environment, I am also delighted to announce the launch of our new article submission portal on our website. This portal provides an opportunity for guest authors and industry experts to contribute their knowledge and expertise to our magazine. We are excited to receive submissions from pharmacists, dietitians, physicians, athletic trainers, and students. We hope our collaborative efforts will truly reflect the interdisciplinary vision of the Sports Pharmacy Network. We welcome your submissions and look forward to featuring your work in our upcoming issues.

I extend my sincere gratitude to our readers, contributors, and dedicated team for their continued support and commitment to excellence. Together, we strive to elevate the discourse surrounding sports pharmacy and empower individuals to achieve their goals while maintaining optimal health.

Thank you for joining us on this journey towards a healthier, more resilient sporting community.

Warm regards,

Kristal Potter, PharmD
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SPORTSRXNETWORK
DISPENSING THE SCIENCE OF ELITE HUMAN PERFORMANCE

Contents

Resilience is Necessary:

It's not about how hard you hit, it's about how much you can take and keep moving forward

By Muhammad Deen

Au t Ho R BIo :

Muhammad Deen is a sport & performance psychology consultant who specialises in allowing performers to get the best out of themselves. He does this by supporting performances to increase and stabilise performance, bolster robust well-being, and to allow ro promote character development along the way. He draws on his many experiences as a bank cashier, debt collector, private banking manager, teaching assistant, and consulting at the elite sporting level for the last 8 years to assist athletes and corporate performers. The highlight of his career was running the Olympic programme for Tokyo 2021 which resulted in an unexpected medal of which he was heavily involved in. In sport he works with development athletes up to the Olympic level, and in the corporate space he works with C-Suite executives in tech, academic medicine, and healthcare. He holds specialisms in Cognitive Behavioural Methods, Motivational Interviewing, and is expanding certifi ation in Biofeedback and Neurofeedback as he cares about providing holistic no-holes solutions for clients. He is a proud Muslim, husband, and father to three children below the age of 5.

If you're like me you may have had a little fuzzy feeling in your stomach as you saw Rocky shouting with pure love trying to get through to his son on the sidewalk in plain view of the public. There's a certain magic about Rocky too, a good-hearted soul who bumbled his way to fame and glory, but more so a character with so much sheer will that you couldn't help but root for him.

But it's not just a movie, or a character, it's real life. Life can be hard, really really hard, life can get impossible at times, life can break us down or rip us apart, and beat you down to your knees and keep you there – "if you let it". …If we let it? That means…we don't have to let it? That means…there's a choice.

Psychological resilience is defined as ***" a set of flexible cognitive, behavioural and emotional responses to acute or chronic adversities which can be unusual or commonplace. These responses can be learned and are within the grasp of everyone; resilience is not a rare quality given to a chosen few. While many factors affect the development of resilience, the most important one is the attitude you adopt to deal with adversity. Therefore, attitude is the heart of resilience."***[1]

In my training as a psychologist specialising in human performance the above is a paragraph I'd have to refer to constantly and that has stayed with me until this day. It highlights my chosen mode of psychological coaching called Rational Emotive Behaviour Therapy (REBT), which is a form of cognitive-behavioural therapy.[2,3,4] I help clients to see how they respond to adversity and how they overcome challenges by changing their responses. Whoever can learn to stretch their resilience, to have more advantageous cognition (thoughts), behaviours (actions) and emotions (feelings) which can be trained to be present and even amplified during small adversities, bigger adversities, or longer adversities will enhance their capacity for success.

The field of research and practice of resilience has exploded since 2011and formed the focal point of my own MSc research and subsequent PhD level work I'd undertaken.[2,4,6] In the research which helped move resilience along the way, Sarkar interviewed a number of hyper-elite athletes to investigate what made them so successful.[1] What was that hidden and unspoken element which was commonly shared amongst people who had achieved such exceptional outcomes, such as World championships or Olympic Gold medals. Thus, what was left after deep-diving through their stories and experiences in life was a clear understanding that these individuals grew their ability to have flexible cognitive, behavioural, and emotional responses to acute and chronic adversities, also known as resilience.

> *Whoever can learn to stretch their resilience, to have more advantageous cognition (thoughts), behaviours (actions) and emotions (feelings) which can be trained to be present and even amplified during small adversities, bigger adversities, or longer adversities will enhance their capacity for success.*

Any quick look towards the people we consider heroes and role models, in whatever domain, ***will*** have shown exceptional resilience and no matter how turbulent their journey, they were successful along the way in their own right. Because whether we like it or not, ***adversity is coming, and can come in troves.***

If we're using the expert paradigms for a best-practice models, which means we're looking up to the best of the best and wanting to follow suit in our own way, then we need to know how resilience can be shown, and work towards instilling it in ourselves and those we care about for better responses to life adversities, to get better performances and results, better well-being, and the take full advantage of character-building opportunities for personal growth.

Measuring Resilience

How do we build resilience for gains in performance, mental health, and personality development? This is a moment to look inwards. Let's start with a few of quick questions;

- *How important is it on a scale from 1 to 100, with 100 being the most important thing and 1 not important nothing at all?*
- *How much time in the last two weeks has been spent on deliberately building resilience?*
- *How would I score how resilient I have been in the last 2 weeks from 1 to10?*

The answers to these questions will shed some light on gaps in resilience training. I've been practicing with elite athletes for about 8 years now, and in those first conversations when I meet them; the answers normally go along the lines of 80-95% (which is really high!) and literally no time being spent on building it with a self-score for resilience between 2-6 (not that high). Using logic and progression, these questions put a torch light on our own relationship with resilience and highlight that we can be doing something about it right now.

Building Resilience

Self-awareness: We can't work on what we don't acknowledge we are lacking. Self-awareness is built on reflection (the ability to look at oneself, like a reflection in a mirror) and we need to zone in on how resilient we have been, especially in our thoughts, our emotions, and our actions when adversity hits. The questions above are a first step, and better reflections lead to better insights and decisions to become more resilient.

The ABC's: Rational Emotive Behaviour Therapy is my go-to form of Cognitive Behavioural Therapy because it's simple and slick. REBT uses an ABC model (adversity, beliefs, and consequences), where it posits that beliefs about adversities ***create*** our consequences in emotions, thoughts and behaviours. We'd want to really challenge and attack those beliefs we have when adversity strikes to make sure they're working for us and not against us. The next time a mistake is made in the field (adversity) and the athletes believes that they must "never ever make mistakes like these because it's not acceptable under any circumstances" (unhelpful non-resilience belief), then it's no wonder that the they could become desperate rather than calculated, overly intense rather than precisely aggressive, and probably more likely to make another mistake and have a harder time rebounding quickly (low-resilience consequences). If those beliefs change to "that was bad, I can make this situation right, it's not the end of the world and definitely not the end of the game", then

we're more likely to feel an air of optimism, a spurt of energy, and a quicker recovery back in to the game place (high-resilience consequences). Choosing our beliefs and working towards them is the heart of how we become more resilient in real time.[1,4]

Recovery: Cars don't drive well on empty tanks and neither do humans. Try doing a cognitive performance test on 7.5 hours of sleep vs 3 hours of sleep to see how much of a difference a good night's sleep makes. An ideal night of deep restorative recovery, a dream or two, waking up feeling fresh vs waking up feeling groggy and desperately wanting to get to bed again, craving the caffeine fix to mask the bare minimum sleep we've been getting just to survive, and not to thrive. I cannot express how many athletes and corporate performers are under-sleeping, under-recovering, and have borderline technology addictions getting in the way of syncing their circadian rhythms to have energy peaks and troughs when they need them. They have higher cortisol spikes and much less heart rate variability during the day too with poor sleep so they're more likely to be over-emotional throughout the day. The Sleep Charity © makes one of the best sleep diary templates to get an instant move on getting better with sleep.[5] Nutrition, supplements, environmental cleanliness, and ensuring relationships with significant others are in the best place possible are cornerstones to recovery which cannot be ignored as well, consult the relative professionals if you need assistance with optimizing recovery strategies.

Stretching the heart and mind: Resilience can't be built idly. It can't be targeted in any meaningful way without carefully exposing ourselves (and I mean carefully) to challenging situations which will test our metal. To stretch our hearts (will power, determination, courage, stress endurance) and our minds (decision-making, reactions, visual scanning and perceptual skills, motor control) we start with personally challenging situations, we want to increase these in difficulty by 5% as a bare minimum and we want a 70% success rate before going to a higher level.

How to Test Your Limits and Carefully Strategize Your Resilience Gains

1) Pick a challenging situation for yourself or the individual you're coaching (e.g. public speaking and certain forms of technical training can be good places to start)
2) Identify what the measures of success are with these specific situations; is it getting through to the end? Feeling comfortable and confident the whole way through? A specific score to be achieved on a performance task? Whatever it is, 70% is the ideal minimum to achieve (e.g. 7 minutes of solid presentation of 10 minute trial run).
3) If 70% wasn't achieved, keep repeating at that difficulty until it is achieved so as not to overwhelm the resilience training protocol. We want confidence in facing challenges so getting used to consistent success is key when facing challenging situations.
4) Once the 70% is achieved, plan to make another 5% increase in difficulty and repeat all over again – it gets exciting if we start doing hard things well and it's a nice increment to build on!

Conclusion

If there's one thing I've learned from working with elite performers, it's that we all have the potential to be more resilient. Psychological growth and moving forward in life can be really hard, confusing, and altogether overwhelming and stressful. Prioritizing our resilience as a cornerstone for performance, health, and development, demystifies the process and creates a way forward. The guide above allows us to make some initial changes and move towards a more purposefully resilient life. And with a bit more resilience…who knows what we will achieve?

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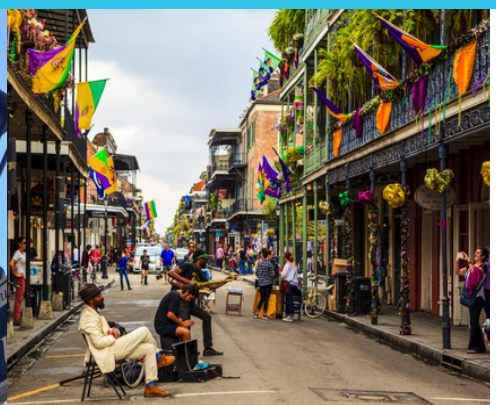

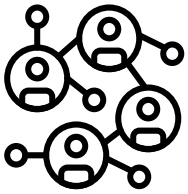

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DISPENSING THE SCIENCE OF ELITE HUMAN PERFORMANCE

Q&A

An interview with Dr. Robert Weil

Enhancing ATHLETE WELL-BEING

The Importance of Sports Podiatry for Athletes

In the realm of sports medicine, the pursuit of peak performance is a delicate balance with injury prevention. Yet, one crucial aspect often escapes the spotlight-foot care and ankle strengthening. According to the American Academy of Podiatric Sports Medicine, a staggering 25% of all athletic injuries involve the feet.[1]

Join us in an enlightening conversation with the esteemed Dr. Robert Weil, a sports podiatrist who has treated the world's greatest athletes for the last half-century. He is the co-author of best selling "#HeySportsParents" and was inducted into the prestigious National Fitness Hall of Fame in 2019. Together, we will unravel the importance of foot care and ankle strengthening for athletes—a cornerstone in the edifice of their holistic health.

Jessica Beal-Stahl, PharmD: Today, I have the pleasure of sitting with Dr. Robert Weil, a renowned sports podiatrist who focuses on orthotics therapy, and foot and ankle strengthening is his specialty to prevent injury and enhance performance.
Dr. Robert Weil: Thank you for having me. When it comes to athletes, foot care, shoes, foot ankle strengthening and balance exercises are not just important, they are paramount for peak performance and injury prevention. It's essential to shed light on the crucial role of foot health in sports.

Absolutely, I think it is an overlooked and underappreciated area for many athletes. First, I believe it's crucial to understand why proper foot care is vital for athletes. Your insights, Dr. Weil, would be greatly appreciated.
Proper foot care is not just hygiene practice; it's the very foundation of an athlete's overall well-being and performance. It involves regular foot washing and drying, keeping toenails trimmed, and promptly addressing any foot issues. By integrating podiatry into their routine, athletes can ensure comprehensive foot care, a key element for maintaining peak performance and preventing injuries.

Moving on to footwear, as most know, wearing appropriate athletic shoes can significantly enhance an athlete's performance. Research has shown that proper footwear can improve biomechanics, provide better stability, and optimize energy transfer during movement. According to a study published in the Journal of Sports Sciences, athletes who wore proper shoes experienced improved running economy and reduced muscle fatigue.[2] So, how essential are proper fit shoes for athletes?
Shoes are paramount. Athletes require shoes that provide optimal support & stability for their specific sport or activity. The right shoes can help prevent injuries & enhance performance by offering proper cushioning, arch support, and shock absorption. They should comfortably

The outsole provides stability and traction, critical in sports involving quick direction changes or varied terrain. It's an often-overlooked aspect that directly impacts an athlete's ability to maneuver safely and effectively.

accommodate any prescription orthotics when indicated. A proper fit is crucial, allowing natural movement while ensuring a snug, secure fit to prevent slippage or rubbing that can lead to blisters. Breathability and moisture management are essential. Athletes often engage in rigorous physical activity, leading to increased perspiration. Therefore, their footwear, including socks, should offer breathability and moisture-wicking properties to keep feet dry and reduce odor & blisters.

The outsole of athletic shoes plays a significant role, forming your crucial link with the ground. The importance of the outsole is often overshadowed by the advancements in midsole foams and cushioning technology, but it should not be overlooked. Could you elaborate on the importance of stability and traction?
The outsole provides stability and traction, critical in sports involving quick direction changes or varied terrain. It's an often-overlooked aspect that directly impacts an athlete's ability to maneuver safely and effectively.

Very insightful; while not a runner myself, I recall reading that, for example, during the 2023 Boston Marathon, which had heavy rains, Adidas swept the men's podium; some claim, in part, due to their superior outsole performance.[3] Shock absorption and cushioning also play crucial roles. How do these affect an athlete's performance?
One of the primary functions of cushioning in running shoes is to absorb the impact forces generated during running. Your feet experience a significant impact in sports, which can stress your joints and muscles. Proper cushioning helps to distribute and dissipate these forces, reducing the risk of injuries and minimizing discomfort. Athletic footwear should provide adequate shock absorption and cushioning to reduce this impact and support the athlete's performance.

The importance and various aspects of shoes are insightful. Shoes provide us impact absorption energy return, stability, support, and protection, allowing for athletic durability. You also focus on ankle strengthening and support in your work with athletes. Raise your hand if you are reading this and have experienced at least one twisted ankle; I know I have, and I went a step further and dislocated mine playing volleyball. Ankle support and balance work are highlighted in your criteria. Can you elaborate on their significance?
Depending on the sport, athletes may need additional support through high-top shoes, braces, or taping to reduce the risk of sprains. All athletes should engage in routine foot and ankle strengthening, balance, and stability exercises regardless of sport. These elements are mandatory for injury prevention and overall athletic performance. Balance and stability exercises are mandatory!

Moving on to biomechanical considerations, how does foot-ankle alignment impact athletes?
Biomechanics are critical. Athletes must be aware of their foot-ankle alignment to prevent injuries and enhance performance. Different sports have distinct lower extremity demands; issues like excessive foot pronation or supination can lead to overuse problems. Evaluation by a sports podiatrist is wise, especially if there's a history of problems like plantar fasciitis, ankle issues, shin splints, or knee problems. Custom orthotics often play a significant role in providing the necessary support and alignment.

Just like our bodies, our feet come in all shapes and sizes. There isn't one shoe that works for all athletes, and we hope Dr. Robert Weil's insight gives you items to consider when trying to find the right shoe for your training or sport.

The human foot has three arches: medial longitudinal, lateral longitudinal, and anterior transverse arch. We couldn't stand, walk, run, or jump without them. Arches matter because they help with weight distribution, shock absorption, and propulsion (they provide energy to push us to the next step). During the shock absorption and propulsion, the arch acts as a springboard. This springboard allows the middle of the foot to spread and close. Proper arch support is crucial for all sports and all athletes to distribute weight properly and reduce strain on feet, ankles, knees, and back. Flat feet and high arches especially need proper support. Custom orthotics are often used to increase support and alignment.

Knowing your arch type can help you choose shoes or determine if you need additional support. "The more the merrier" can't be applied to arch support. Is there anything else you want to add about shoes and biomechanics? Shoe flexibility is important to allow all movement essential for your sport. Also, pay attention to the weight of the shoes, which can impact speed and quickness. Is there anything else you want to add about shoes and biomechanics? Shoe flexibility is important to allow all movement essential for your sport. Also, pay attention to the weight of the shoes, which can impact speed and quickness. Finally, athletic shoes are subjected to significant wear and tear, so durability is essential. You should invest in high-quality brand-name shoes that can withstand the demands of your training and sport.

In summary, what advice would you give athletes to prioritize their foot health? Athletes should prioritize proper foot care, invest in supportive and properly fitting footwear tailored to their sport, and routinely strengthen their feet and ankles while focusing on balance and stability. This is key for athletes of all ages and levels. Proper technique is always crucial. Good luck to all athletes out there. And remember, foot health, shoes, balance, and strengthening are key!

Improving athletic performance is a never-ending endeavor. We are always looking for new training methods that can help us jump higher, run faster, and compete at a higher level. Just like our bodies, our feet come in all shapes and sizes. There isn't one shoe that works for all athletes, and we hope Dr. Robert Weil's insight gives you items to consider when trying to find the right shoe for your training or sport.

DR. ROBERT WEIL BIO:

Dr. Bob Weil, a Sports Podiatrist for half a century, has treated some of the world's great athletes in all sports at all ages & levels. Orthotics therapy and foot-ankle strengthening are his specialty to prevent injury and enhance performance. A 2019 inductee in the prestigious National Fitness Hall of Fame, co-author of the best-selling "Hey Sports Parents" and numerous journal, magazine and newspaper articles. He is also celebrating over 4 decades on the radio "The Sports Doctor", found at bbsradio.com/thesportsdoctor

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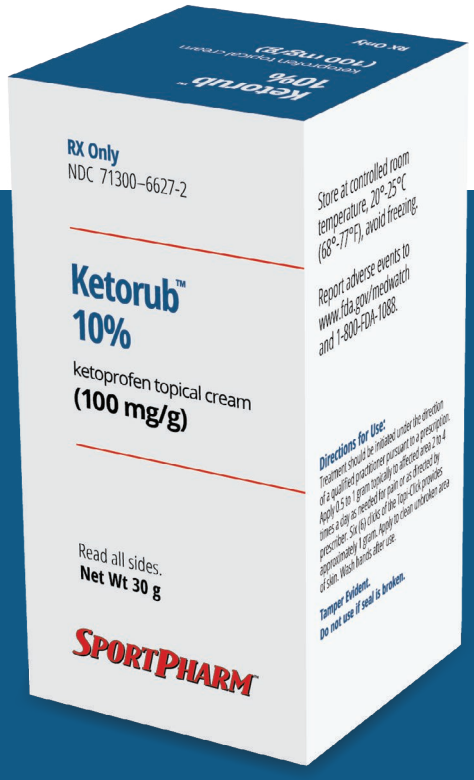

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Sharpening the Mind and Body while Injured!

By Korey Van Wyk MS, CSCS, Pn2

Au t Ho R BIo :

Korey Van Wyk is an educator and sports performance coach who has spent the last decade of his career bridging the gap between science and practice. As a former professor of kinesiology and collegiate strength coach, he spent every day connecting the classroom and the weight room. Now as an acquisitions editor who has worked with companies such as Human Kinetics and Cognella, Korey helps create world-class educational products for trainers and coaches. With degrees in exercise science and nutrition, Korey is an experienced presenter on all aspects of nutrition and human performance.

While there are numerous health and performance benefits to working out regularly or training hard to improve at your sport, injuries are part of almost everyone's journey. While they may not always be severe, they can disrupt training and daily life significantly. When this happens, it can be very frustrating and easily derail us mentally and physically. Learning how to navigate these situations is an essential aspect of fostering long-term training consistency and progress.

In this article, drawing from both personal experience and coaching insights, I'll explore effective strategies to navigate injuries, both mentally and physically, to ensure continued progress during these training periods. First we'll focus on mindset shifts before delving into specific training strategies.

Note: This article primarily refers to injuries that do not require surgery or medical intervention. If you have experienced or are rehabbing from such an injury, ensure that a physical therapist or appropriate medical professional clears you before implementing the training strategies.

Mindset Shift #1: You Have an Injured Body Part, Not an Injured Body

While dealing with an injury will alter your training plans, in most cases there are still many options available to you. If you are dealing with a shoulder injury, for example, you still have three good limbs and a torso that you can do a lot with. It's easy to focus on what you *can't* do. But remember, you have an injured body part- not an injured body! Focusing on what you *can* do will help shift your mindset toward the possibilities ahead of you and foster the motivation to stay as consistent as possible with your training. This is a critical aspect of dealing with an injury because the last thing we want to happen is to do nothing. Although a bit of complete rest is okay, we want to avoid hitting the "pause" button for too long and return to a routine as soon as possible.

Mindset Shift #2: Use This Time to Bring Up Weaknesses

In all likelihood, you will not be able to go all-out on your main training goal while you are dealing with your injury. Whether your goal is building strength, gaining muscle, developing speed, or something sports-specific, it's probably in your best interest to switch gears for a while. It might sound counterintuitive, but temporarily shifting your goal or training focus may be one of the best things you can do for your long-term health and progress. I'd argue you should do it periodically even if you're not injured! Not only can this provide novelty and a mental break you may not realize you needed, but it is also a great opportunity to bolster a weakness or a neglected training area. Now, this could be a literal weakness like a body region or muscle group. But it could also be a physical quality, like mobility or aerobic capacity. Or it could be a technical weakness in a particular lift or skill. Let's face it, when left to our own devices in training it's easy to focus on what we like to do or what we are good at. It's not as appealing to do something we don't enjoy

> Vitamin D is essential for bone health, protein synthesis, and muscle function.

(I'm looking at you, cardio!), but it may be just what we need. Oftentimes, the thing we neglect to do may be the key to spurring new progress.

From a movement skill perspective, periods of decreased training intensity are perfect opportunities to refine your skills or hit reset on movements where technique has slipped. I'll cover some specific methods later in the article, but sometimes simply going lighter on a lift or slower with a movement can allow us to focus on practicing the skill rather than fixate on the performance outcome. While we might not like it, recovering from an injury can give us the opportunity to reconstruct movements. And as a bonus, that will go a long way in protecting us from future injury!

Mindset Shift #3:
Learn the Difference Between "Can" and "Should"

This next point piggybacks nicely off the previous paragraph. One of the most important concepts we can learn for long-term performance (and recovery from injury) is the difference between "can" and "should". In the case of lifting weights, just because you *can* lift something doesn't mean you *should*. I know this can be hard, especially when you're eager for progress and want to hit PRs. But consistently gutting through a lift in the presence of technique breakdown is a recipe for developing, or always dealing with, nagging injuries. Unless you are aiming for a PR in competition, technical failure on a lift or complex movement should be your guide for the weight used or reps completed. This doesn't mean you can *never* let technique waiver or push the envelope. But these should be rare occasions that go to the edge of your abilities, not frequent occurrences!

Mindset Shift #4:
Accept That the Process Will Not Be Linear

Recovery from injury is not a linear, straightforward process. You will have good days and bad days; periods of progress and periods of seeming regression. And that is all normal! As someone who has dealt with injury in the past, this is something I wish I would have known from the get-go. It would have saved me a lot of frustration. It's best to consider how you're trending over weeks and months vs isolated days as no single day will be the end-all-be-all. Without this in mind, it can be easy to push too much on the good days or get too down on the bad days. While I will give specific strategies and tips on what to do day-to-day, it may be benefical to work alongside an experienced coach or physical therapist to help you navigate this process.

Training Strategies

Now that we've addressed what to expect and the mindset shift required when working around an injury, let's get to strategies that can help you stay consistent with training. With that said, I've tried to include methods and techniques that confer additional benefits beyond just consistency. In line with the previous section's advice, they may help bring up your weaknesses while allowing your injured area to recover. Then, when you're ready to return to normal training you've set the stage for new levels of progress.

Training Strategy #1:
Don't Be Afraid of Unilateral Training

If you have an injured limb, you may be hesitant to train the non-injured limb because you don't want to become "unbalanced". Rest assured that not only will this not happen but training the non-injured limb will help maintain the strength of the injured limb through a phenomenon called *cross-education* (1). Essentially, the nervous system still gets the signal to maintain strength on the injured side even though it's not being directly worked.

However, if you want to directly train the aggravated limb, unilateral training tends to be well-tolerated when joints and tissues start to get cranky. For example, if your shoulders start giving you fits with bench press, try single-arm DB bench press. If your hips feel like they need a few extra shots of WD-40 on squats, try reverse lunges, split squats, or rear-foot elevated split squats. If it's been a while since you've done these movements, or if you've never done them at all, you'll naturally need to

lighten the weight as you acclimate to the movement. So in addition to being well-tolerated, there can be a built-in recovery buffer to let your aggravated area calm down.

Training Strategy #2:
Manipulate Tempo on Your Lifts

Tempo refers to how fast you move through the phases of a lift. Most of the time, the lowering phase of a movement (the *eccentric* portion) or the lifting phase of a movement (the *concentric* portion) are the areas of focus when adjusting tempo. However, we don't want to forget the transitions between the two phases which are opportunities for isometric holds. Like unilateral training, slowing down or adding pauses to a lift tends to be well tolerated by angry tissues. There could be a couple of reasons for this:

1. *You naturally have to lighten the weight.* If you take 3-5 seconds to lower a weight or add a 2-3 second pause in the middle of a movement, you simply can't use as much weight. This decrease in load may be what's required to alleviate your symptoms and allow recovery.
2. *Your technique will be better*. Slowing a movement down can allow us to feel what's really happening with our body. When lifting quickly, you may not realize when a limb or body region is out of place. But when you slow things down, you'll know right away. And because you're going slower (and the weight is lighter) you actually have time to correct it. This will also help your better technique "stick" when you get back to regular training.

Manipulating your tempo doesn't need to be complicated. My suggestion is to start by increasing the eccentric phase of a movement to 3 seconds. As you get used to the tempo, you can increase the length but there's no need to go longer than 5 or 6 seconds. Isometrics can be beneficial as well. Start by adding a 2 second pause in the middle portion of a lift when the tension is the highest (e.g. at the chest on bench press, at the bottom on squat, at the chest on row, etc.). I would not recommend combining both a slow eccentric and an isometric; choose whichever one feels best to you.

As for the concentric portion, my recommendation is to keep a normal tempo or move as fast as tolerable through it. I would also keep it fairly smooth, meaning no grinding through sticking points. This will ensure that you're not going too heavy and that the focus stays on movement quality. If you're unable to maintain a consistent bar speed through the concentric phase, slightly decrease the reps or weight.

Training Strategy #3:
Improve Your Cardiovascular Fitness

While many non-endurance based athletes may agree that it isn't the most enjoyable to do, improving the capacity and efficiency of our cardiovascular system is an undervalued tool in supporting all aspects of performance. Yes, even if you are a strength and power-based athlete, improving these qualities will help you. Why? Because the ability to deliver oxygen and use it in our muscles underpins everything we do physically. Improving cardiovascular fitness will allow you to sustain high-intensity activity for longer, recover faster between sets during lifting sessions, and recover faster between workouts. This does not mean everyone needs to become an endurance athlete. But if you improve this area even slightly, you will experience performance benefits.

Luckily, it's not overly complicated or demanding to do. It can be as simple as incline walking on a treadmill, riding a stationary bike, or using a rower. As with tempo, the key is not making it *too* intense. With wearables and trackers, there are many ways you can gauge the intensity of your cardio these days. However, perhaps the simplest and most cost-effective method is to only breathe through your nose during the session. If you get to the point where you need to start breathing through your mouth, you may need to slow down or end the session. While dealing with your injury, aim to get 2-3 sessions of ~30 minutes per week and it will pay dividends when you return to normal training.

Conclusion

Injuries, while challenging, offer a unique opportunity to recalibrate, refocus, and reinforce your physical condition without exacerbating your injury. Through strategic adjustments to your training regimen, such as unilateral training, tempo manipulation, and cardiovascular fitness improvements, you're not just biding time or settling for your situation; you're actively contributing to your recovery and future performance.

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Breathwork

It's More Than Just a Fad!

By Dr. Jessica Beal-Stahl, PharmD

Au t Ho R BIo :

Jessica Beal-Stahl, PharmD, is the dynamic force behind The Athlete's Pharmacist, a pioneering clinical sports pharmacy venture. Passionately intertwining her love for athletics, holistic wellness, and pharmaceutical expertise, Jessica collaborates with athletes privately while providing consultancy services to teams and organizations. A proud alumna of Mercer University, she earned her Doctor of Pharmacy in 2009 and has since served as the Director of Clinical Services at Hobbs Pharmacy in Merritt Island. She oversees a thriving compounding department and spearheads comprehensive health and wellness initiatives there. With a rich athletic background spanning from D1 Volleyball to international accolades and medals in Olympic Weightlifting, Jessica brings a unique understanding of elite sports performance. Her extensive qualifi ations include certifi ations in women's health, compounding, integrative medicine, sports nutrition, and nutrigenomics, refl cting her commitment to holistic athlete care.

Sometimes, the 'old' becomes 'new' again, such as breathwork. Despite being rooted in centuries of wisdom, breathwork has only recently emerged from the ancient yoga and martial arts disciplines into mainstream sports. This powerful tool, with its numerous benefits for physical performance and overall wellness, is not limited to athletes alone. It offers a unique combination of physiological and psychological advantages that can benefit anyone.

Need evidence of the power of breathwork? Novak Djokovic, arguably one of the greatest tennis players ever, recently revealed conscious breathing as one of his secret weapons to peak performance.[1] Djokovic's consistent triumphs, despite the challenges, serve as a powerful testament to the transformative power of breathwork.

This article will explore the interconnectedness between breath, performance, stress management, and overall health and give an overview of various breathwork practices!

What is Breathwork?

Breathwork is a practice that involves intentionally manipulating one's breath for specific purposes.[2] Most involve altering breathing patterns to influence your body's autonomic nervous system, which controls unconscious functions like heart rate and digestion. There are various types of breathwork, each with a unique focus and benefits. These techniques usually fall into two categories: slow or fast breathing. By understanding and practicing these techniques, you can gain control over your body's responses and enhance your overall well-being.

By slowing down and deepening your breathing, you take the wheel of your nervous system, activating the parasympathetic nervous system and helping you get into a state of rest and digestion.[4] In contrast, fast or fire breathing stimulates the sympathetic nervous system, revving your nervous system, activating fight-or-flight, and heightening alertness and energy levels.

At its core, breathwork extends beyond mere oxygen exchange. Through its influence on sympathetic or parasympathetic tone, breathwork impacts almost every major bodily system (cardiovascular, nervous system, immune, metabolic, and endocrine). In doing so, breathwork can reduce stress and muscle tension, calm nerves, sharpen focus, minimize negative and distracting thoughts, reduce fatigue, and promote stamina.[5] By mastering the art of proper breathing, athletes can tap into myriad benefits that extend far beyond the confines of the playing field.

Benefits of Breathwork Beyond Oxygen-Carbon Dioxide Exchange

Oxygen powers performance. Breathing is pivotal to optimizing oxygen exchange, where our lungs exchange oxygen and remove metabolic waste products, such as carbon dioxide. Breathwork powers physical performance via energy production. Enhanced arterial blood oxygenation contributes to better metabolic function and energy production, including efficient oxygen supply to muscles for performance.

Enhanced focus and concentration

A state of focus is crucial for all athletes, as split-second decisions can differentiate between winning and losing. Breathwork is an instrument that can sharpen mental clarity and focus.

> *Having athletes concentrate on slowing their breath will help reduce heart rate and thus hijack the nervous system, helping induce calmness and a feeling of control.*[11]

Focused breathing, such as mindfulness or meditation, helps athletes learn to center their attention, reduce distractions, and enhance concentration by improving neural connections related to focus and attention.[6]

A published study linked both fast and slow types of pranayama to reduced stress and improved cognition, including attention, retention, and speed in tasks that merge vision and physical action, such as playing sports.[7] One example involving controlled breathing techniques is the martial arts of Tai Chi and Qigong. Breath control is synchronized with physical movements, which becomes meditative practice. This relationship aids in developing mental focus, fluidity in movements, control, and a heightened sense of awareness.

Improved Emotional Regulation

Are you stressed or have pre-game anxiety? One of the best things you can do to help is to take control of your breath. Slow and controlled breathing signals the brain that you're not in danger. Breathwork is an effective tool for managing physiological responses to stress.[8] An athlete's ability to stay composed under pressure is an invaluable skill for athletes, a common challenge in the high-stakes environment of competitive sports.

One specific area where breathwork can offer a powerful solution for performance anxiety.[8] Anxiety is an opponent many athletes face at all levels of sport. Performance anxiety shows up as nervousness, tension, increased heart rate, GI symptoms, fast and shallow breathing, or even a complete performance blockade.

Breathwork can help athletes reach a state where they believe they have the resources to meet the challenge, thus a perception of control. For many athletes, breathwork is an integral part of a pre-game ritual. I use breathwork before lifting, both in practice and at an Olympic Weightlifting meet, as it helps my mind focus on lifting and calms my nerves. A few seconds or minutes of mindful breathing can center the mind and prepare the body for optimal performance. Whether it's a volleyball serve or a basketball free throw, breathwork can help athletes maintain composure under pressure.

Techniques like diaphragmatic breathing and long exhale breathing activate the body's relaxation response, mitigating the effects of the stress hormone cortisol and helping induce a state of calm or focus.[9] A state of emotional balance is vital to helping athletes perform at their peak.

Better Recovery

Prioritizing high-level performance entails high training loads, often leading to an imbalance between stress and recovery.[10] Breathwork plays a significant role in post-exercise recovery by helping the athlete into a parasympathetic state. Having athletes concentrate on slowing their breath will help reduce heart rate and thus hijack the nervous system, helping induce calmness and a feeling of control.[11]

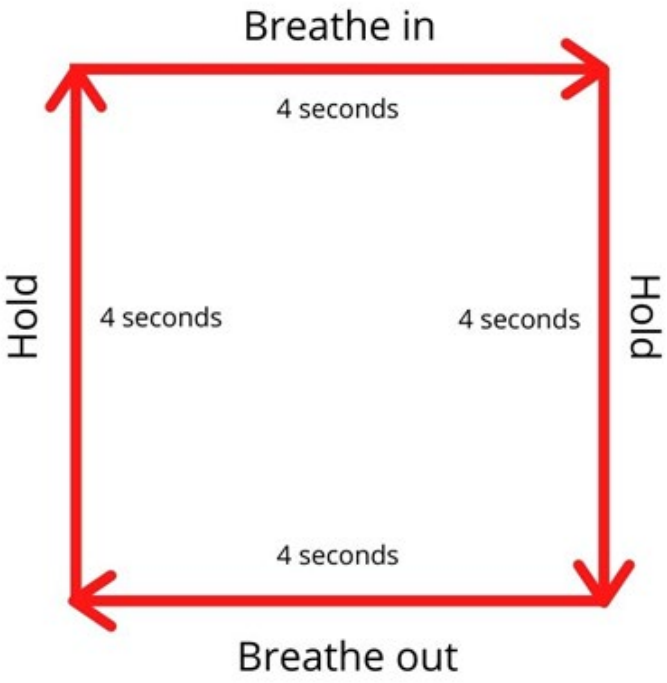
After training or competition, athletes must switch from sympathetic (energy expenditure) to parasympathetic (energy production) to improve training adaptation and recovery.[12] Effective breathwork can enhance parasympathetic nervous system activity, which is responsible for the body's rest and digestion functions. This activation is crucial for post-exercise recovery as it aids in repairing and rebuilding muscle tissues, replenishing energy stores, and restoring the body to a state of balance.

Today, many wearable devices measure heart rate variability (HRV), the varying interval of our heart rate, where an increase reflects a greater capacity to deal

Whether you are a professional athlete or just looking to improve your performance in your favorite sport, breathwork is a simple and effective way to gain an edge.

with stress.[13] If your heart rate can go from slow to fast and back again quickly, you are more adaptable to the demands you may face. A higher HRV means your heart can adapt appropriately and quickly from a state of "rest and digest" to a "fight or flight" response, thus driving other physiological systems, such as oxygen delivery to the muscles.[14]

The benefits of HRV biofeedback are not reserved for elite athletes. Modern life is stressful for everyone. Adopting a regular, long-term schedule of breathing practice, around six breaths per minute for 10 minutes every day, could help improve the body's ability to manage stress.[15]



Breathwork Technique

Whether you are a professional athlete or just looking to improve your performance in your favorite sport, breathwork is a simple and effective way to gain an edge. Here are some techniques that athletes can use.

Box Breathing

Box breathing is excellent for athletes of all levels, including kids. Box breathing is a simple technique that involves inhaling for a count of four, holding the breath for a count of four, exhaling for a count of four, and holding the breath for a count of four. You can play with the number of repetitions and durations of inhales/exhales/holds to find what works best for you.

Alternate Nostril Breathing

You might have tried this technique in yoga classes. It involves inhaling through one nostril (while closing off the other with your finger) and then exhaling through the one held closed during the inhale, alternating nostrils with each breath. This can help improve focus and concentration.

Breath of Fire

I learned about this tool from a coaching friend many years ago. It is a quick, forceful breathing technique that involves exhaling through the nose while quickly pumping the belly in and out. It can help increase energy and focus. "Breath of Fire" can be a great alternative when you need a boost, possibly even in place of caffeine.

Pranayam Breathing

An ancient yoga technique used to help people gain control over breathing, the breathing count pattern goes 4-7-8: breathing in (4 count), holding breath (7 count), and exhaling (8 count). On this one, focus on slowing inhalation through your nose, expanding your

diaphragm, and keeping your tongue off the roof of your mouth. You can play with repetition, but most find 4-to 8 rounds helpful.

Rhythmic Breathing

Rhythmic breathing focuses on synchronizing breathing with strides (or strokes). It is often a pattern of inhaling a certain number of steps (or strokes) and exhaling for the same. This synchronization and rhythmic breathing can help with a consistent oxygen supply. Some say this pattern also helps reduce side stitches.

Psychological Sigh

Andrew Huberman recently highlighted this technique.[16] When stressed, you tend to under-breathe, elevating the level of carbon dioxide in the bloodstream and causing alveoli to collapse. So, to help reinflate, take two quick inhales (the second is critical to sneak air to reinflate alveoli) and then one long exhale. Long exhalations help lower the level of carbon dioxide that's built up and triggers stress in our bodies. This breathwork can also be great if you have difficulty falling or returning to sleep. Try doing a few physiological sighs and extending that exhale, and you'll notice your core and your diaphragm region start relaxing.

Tip: *Teach or practice these during practice so the anxiety of competition doesn't take away their focus. These are great tools for both on and off-the-field situations, so empowering your athletes with them will help them in other places.*

Breathwork – A Necessary Item for Your Toolkit!

From strength training to nutrition, athletes, and coaches leave no stone unturned in their pursuit of success. Many are missing out on the power of breath. Many athletes and coaches find breathwork transcends being a supplementary practice and is a cornerstone of athletic training. From enhancing physical endurance to mastering the mental game, breathwork equips athletes with a comprehensive toolkit for success. The journey to athletic greatness encompasses both the mastery of the body and the art of breathing.

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Work Hard, Play Hard… And SLEEP HARD:

Applied Strategies for Enhanced Sleep Performance

By Sean Casey, RD, CSCS

Au t Ho R BIo :

Sean Casey is a registered dietitian and performance health coach who works with everyone from middle/high school athletes to Olympians, including an Olympic Gold Medalist. His expertise is sought after on the international level where he has traveled to 15 countries, helping clients reach their athletic potential through nutrition, physical training and recovery techniques. Additionally, Sean heads up the science team for Hometown Pharmacy of Wisconsin, a group of 65 independent pharmacies focused on helping people reduce the need for medications through lifestyle intervention.

"On Your Marks, Get Set, Go!"

When it comes to racing, these six words are etched in our human psyche. This holds whether you're a 12-year-old racing your friends to the flagpole and back at school, a 100m dash sprinter waiting for the gun to go off at the Olympics, or even a grandparent challenging your toddler grandkids!

Regardless of which race one finds themselves in, one thing often holds true – winning or losing may come down to a tenth of a second or less! When one finds themselves on the losing side of this 0.1-second loss, especially when the stakes are high, the questions of self-reflection are sure to set in,

"What could I have done differently? Was my form a bit off? Could I have trained harder? Did I eat right, etc.?"

These are all valid questions. However, over the past twenty years, I have worked with a wide variety of athletes, from middle schoolers to Olympians. One of the most overlooked questions I see individuals forget to ask themselves is, *"Did I prioritize my sleep?"*

Sleep & Physical Performance

The impact of sleep on sports performance is well established. In a 2023 literature review, which included 25 studies, Cunha et al. noted that extending sleep duration by 46-113 minutes or taking 20–90-minute naps during the day may enhance athletes' physical and cognitive performance.[1]

Looking a bit closer at one specific study, a 2011 study involving the Stanford Men's basketball team, Mah et al. found by increasing nightly sleep time by ~ 110 minutes (+/- ~ 80 min) over 5-7 weeks, athletes increased their free throw performance (~9%), 3-point field goal accuracy (~9%), while also improving reaction time, vigor, and fatigue resistance .[2]

Sleep & Overall Wellbeing

Poor sleep affects way more than just physical performance on an athletic field. It affects your entire well-being. Research has shown that poor sleep impacts anxiety levels, sex drive, the ability to accurately judge human facial emotions, and susceptibility to the common cold.[3-6] In other words, poor sleep lends itself to higher stress levels, which greatly impacts the body's ability to recover, setting the stage for overtraining syndrome.

Furthermore, sleep may impact changes in body composition when losing weight. In a 2010 study completed at the University of Chicago, Nedeltcheva et al. had ten overweight individuals complete an interesting crossover trial.[7] Each trial consisted of the same moderate caloric restriction over 14 days with a washout period in between . The only difference between each 14-day block was the amount of sleep one received, 5.5 vs. 8.5 hours per night.

During both interventions, participants lost approximately the same amount of weight.[7] However, the type of weight lost

> *Poor sleep affects way more than just physical performance on an athletic field. It affects your entire well-being.*

varied significantly depending on how much sleep they got. Caloric restriction during the semi-sleep-deprived state resulted in a 55% reduction in fat loss and a 60% greater loss of fat-free tissue vs. the fully rested condition.

Although more research on changes in body composition with caloric deficits and poor sleep is needed in athletes, Nedeltcheva et al.'s study suggests that sleep may be a secret weapon in maintaining lean muscle mass for athletes looking to cut weight or change body composition. [7]

Applied Strategies in Enhancing Sleep Quality

Sleep has a huge impact on physical performance and mental well-being. However, knowledge is only part of the battle. It matters to a lesser extent than applying principles that lead to improved restfulness upon waking up following a night's sleep.

Sleep duration is often one of the hardest challenges individuals face, as many variables beyond one's control influence it. For example, for individuals working a 9-5 career with kids, one's sleep is often interrupted, and the ability to simply sleep in is a non-option with work the following day. The high school student-athlete is on the other end of the age spectrum who go from sun up to sun down; early morning practices, school, homework, practice/game, dinner, friends and then try to wind down before midnight only to repeat again.

Considering these factors, sports medicine professionals and coaches should emphasize pragmatic ways to improve sleep quality as much as, if not more than, actual sleep duration. So, if life circumstances dictate an individual can only 'schedule' a 7-hour time block to sleep, saying, "You n*eed to sleep for 8 hours,*" will likely have very little impact on outcomes.

Here are some strategies that target sleep quality regardless of how much time one has to sleep.

Reduce Evening Blue Light Exposure

Living in a modern world, one is exposed to blue light all day. It doesn't get any better at night with scrolling on phones, watching TV and/or working on computers – all emit blue light, a known suppressant of the sleep hormone melatonin.[8]

Results differ from study to study, but looking at the total body of evidence, research indicates that reducing blue light exposure during the evening hours tends to improve various aspects of sleep quality and duration.[9,10] Reducing blue light allows one to quickly drift to sleep upon laying down vs. tossing and turning for 20 minutes prior to falling asleep.

Here are simple ways to help reduce blue light and light in general during the evening hours:

1) Consider wearing blue light-blocking glasses during the evening hours.
2) Reduce the amount of blue light exposure from electronic screens by activating "Night Mode" color settings and downloading blue light blocking programs such as "f.lux" to your computer devices.
3) Turn off or cover up light-emitting devices in your room.
4) Use blackout curtains to reduce light from outside that may be filtering through your windows.

Create a Consistent Nighttime Schedule & Consider Breathwork

Every successful athlete can attest that consistency is key. This holds true whether it relates to attending practice, shooting a free throw, or prepping for a competition. The same consistency principle also holds true when it comes to sleep routines.

Helping individuals establish a sleep routine has proven to be an effective way to promote feelings of drowsiness, help them fall asleep quicker, and feel more refreshed in the morning. By creating a consistent routine

that ends in sleep, you're training your body to respond to cues that lead you to feel drowsy.

Building on a consistent routine, I often find many clients struggle with shutting their minds off at night. Thoughts of what did/did not go well during the day and anxiousness about the events of 'tomorrow' creep into their minds.

As Dr. Jessica Beal-Stahl discusses in her article *Breathwork – It's More Than Just a Fad!*, which appears in this issue Sports Pharmacy Magazine, breathwork is a powerful tool.

Adding evening breathwork into one's nightly routine has proven to be powerful, calming the mind and helping easily drift into a deep sleep vs. having your mind racing on a hamster's wheel. It exerts this effect by helping the body shift from a sympathetic to a parasympathetic state.[11]

There are many types of breathing practices one can implement. However, two methods I've found to be effective for many individuals are the box and 4-2-4 methods.

The box method involves breathing in, pausing, exhaling, pausing, and repeating. Each segment of the box is held for a given number of seconds. For instance, one may inhale through their nose for 4 seconds, pause for 4 seconds, exhale for 4 seconds, pause for 4 seconds, and repeat.

The 4-2-4 method is similar; however, you breath in for a count of 4 seconds, pause for 2 seconds before exhaling for a count of 4 seconds and repeating.

Consume a Micronutrient Rich Diet

The brain is like a complex interstate highway with thousands of vehicles traveling. As a busy interstate needs road signs and traffic rules to help it run efficiently, the brain needs the right micronutrient balance to keep it in check.

As it relates to sleep, a few specific ones include magnesium, zinc, and vitamin B6.

Magnesium plays a key role in assisting a healthy sleep cycle by acting as an antagonist to excitatory NMDA receptors within the brain, which when fully activated prevents one from drifting into and maintaining a normal, healthy sleep cycle.[12] From a clinical perspective, supplementing with magnesium to individuals experiencing poor sleep duration has been shown to improve one's sleep efficiency, sleep onset latency, sleep time and melatonin production.[13]

Zinc is another essential mineral that appears to influence a normal sleep cycle. In a 2017 study completed by Saito et al., it was found that adding zinc-rich food into healthy individuals' diets enhanced sleep efficiency and onset latency.[14]

Vitamin B6 is a key micronutrient required for the synthesis of multiple neurotransmitters, including serotonin, a precursor to melatonin, and GABA. GABA acts as an inhibitory neurotransmitter in the central nervous system.[15]

Conclusion

Sleep plays a foundational role in health, wellness, and performance. Despite its importance, many often struggle to achieve optimal length and sleep quality. For those who struggle with sleep quality, applied strategies worth focusing on include reducing blue light exposure in the evening hours, establishing a consistent nighttime routine that includes breathwork as well as eating a micronutrient-rich diet rich in magnesium, vitamin B6 and zinc.

In doing so, you'll add one more tool in your performance toolbelt, allowing you to work hard, play hard and *sleep* hard!

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