PERFORMANCE SOCCER CONDITIONING

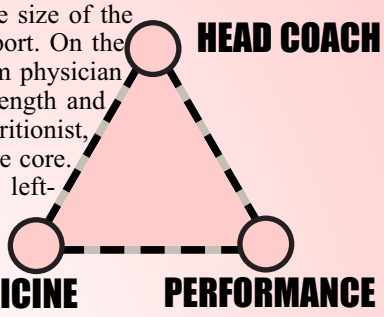
A Newsletter Dedicated to Improving Soccer Players

VOLUME 23, NUMBER 1

Athlete Development Model- the Simple Made Complex

In the old days the Athlete Development Model was made up of Three Bubbles- The Head Coach bubble in the middle (a bigger bubble), the Sports Medicine bubble on the left, and Performance Team bubble on the right.

Each bubble had support bubbles based on the size of the program, its resources and the needs of the sport. On the left the athletic trainer was the go to with team physician and P.T. in support. On the right was the strength and conditioning coach with support from the nutritionist, sports psychologist, reconditioning coach at the core. If an athlete was hurt they would go to the left- healthy athlete to the right.



Today this model is a bust. In its place is a patchwork system based on "Who is in charge of What?" Now there are "departments" competing against each other to gain the attention of the administration and head coach. Administration is now absorbed in analytics which complicates the roles of each department head and the actions of the Head Coach. In many instances the Head Coach dictates the strength and conditioning program. The Sports Science lab competes with the strength coach to monitor training load, over load indicators and recovery. The nutritionist competes with the strength and conditioning coach and sports science lab as to what should be done in recovery. Sports Medicine monitors what the strength and conditioning program is doing to avoid injury and monitor proper movement patterns training. Sports psychologists wants to work with athletes through the trying times of injury rehab. They also want to work with the strength coach to motivate athletes to train harder and smarter. They want to work with the Head Coach to introduce life skills to the athlete to better adjust to the social world of the athlete. In the middle of it all is the athlete, confused as to who to listen to based on what the qualification of the person telling them what to do.

I'm sure you can site examples of this chaotic situations based on your specific situation. I would like to suggest to you a working model, but each situation is unique. The bubbles are now helium balloons floating aimlessly in the air, no strings attached. To start, my only suggestion is to establish a strong set of job descriptions that create an understanding of who is in charge of what and most importantly who they work with and report to.

Not easy. Your ideas on this issue would be most welcomed.

Something to Think About

Ken Kontor, Publisher

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PERFORMANCE SOCCER CONDITIONING
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Volume 23, Number 1

Conditioning Interview: Strength and Conditioning in the World of Soccer, and How Coaches Can Collaborate

Ian Barker, United Soccer Coaches, Director of Coaching Education

Prior to coming to United Soccer Coaches, Ian served as head coach of the men's soccer team at Macalester College in St. Paul, Minnesota starting in 2003 after four years as an assistant coach for the squad. He has also coached at the collegiate level with the University of Wisconsin, where he was an assistant coach for the men's team from 1989-97. He helped the Badgers to four NCAA tournament appearances in a five-year span. The 1995 team won the Big 10 title and claimed the NCAA national championship. He has served as a staff instructor for U.S. Soccer's coaching education program since 1999, teaching both state and nationally hosted residential licenses. He has also instructed the National Youth License for US Youth Soccer. From 1997 through 2007, he also served as director of coaching and player development for the Minnesota Youth Soccer Association (MYSA). Responsibilities included development and coordination of programs for 140 youth soccer clubs throughout the state, management of between forty-five and sixty full- and part-time employees, and collaborative work with the MYSA's board of directors. During his tenure he co-developed and advocated for Parents and Coaches Together (PACT), a training program designed to create a more positive soccer experience for players, coaches, and parents.

PC: As director of coach education for United Soccer Coaches, what is your impression of the relationship between the strength and conditioning coach and the soccer coach? What kinds of different scenarios or situations emerge as a result?

Ian Barker

IB: Let's start with the college environment. A healthy minority of colleges have a full-time strength and conditioning coach on staff sophisticated enough to understand the specific needs of the collegiate soccer athlete. These coaches understand that soccer players' needs are different from those of a football, basketball, or other sport athlete. Individuals and coaches working directly with soccer athletes and goals in mind design specific soccer programs in conjunction with the collegiate soccer coach. This is readily apparent in Division I and Division II programs. I've even seen very good Division III schools with soccer coaches given access to professional resources. These resources allow the coach to identify specific goals he or she wants achieve, and equips them to do so. As an example, imagine a situation where a team is scheduled to

Symbols to Success
Articles preceded by:

BGN indicates author believes content is for beginning-level athletes with training age of 0 to 2 years.

INT indicates author believes content is for sport (intermediate)-level athletes with training age of 2 to 4 years.

ADV indicates author believes content is for expert-level athletes with training age of over 4 years.
Note: Training age year is continuous year-round conditioning beyond just playing soccer.

R following articles indicates the content has been reviewed by the editorial board.

O following articles indicates the content is the sole opinion of the author.

Article preceded by a T + a number 1-7 indicate the article is relevant to one or more T's in our 7-T system of program design.
T-1= Training Age (see above)/History
T-2= Time
T-3= Tools
T-4= Teaching
T-5=Testing
T-6=Total Workload
T-7=Team Position
To find out more about Fit to a T program go to:
www.performancecondition.com/ultimate-conditioning-library/soccer

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play eighteen games in well less than 60 days. This is not untypical NCAA D3 setting and at my college we would see incidences of ACL injuries on the women's team, and multiple lower extremity strains on the men's side. The goal with a successful strength and conditioning program is to eradicate this kind of outcome. The strength and conditioning coach should be aiming for injury prevention beyond just performance purposes. Coaches are just as motivated to have healthy players on the field as they are to have visible performance improvements.

At the high school level, priorities and results are a lot more mixed. I regularly see the soccer coaches equipping themselves with some minimal knowledge of strength and conditioning at this level and as they might in underfunded college programs. They might not have the kids going through ludicrous exercises with high chances of injury for liability reasons, but they will still have their kids run stadium stairs and push sleds around when the football team is not using them, often without context other than the need for conditioning. Those coaches get in their own way because of this ignorance. They either don't have time to get proper training or don't have training available. My advice in these situations is to avoid teaching something you don't know. By teaching an activity or exercise incorrectly, the more potential injury situations develop. There would be more benefit in temporarily employing a conditioning coach to teach and assist for a couple of days rather than improvising and risking athletes' health.

In the youth coaching environment, ninety-nine percent of coaches receive no help at all. They might be aware of and use the FIFA 11+ injury prevention protocol, but that would be where their knowledge ends. Then I look at your publication, designed for the novice who cares and is willing to educate themselves with ideas to support their younger athletes. It might be best to start the strength and condition program with a soccer ball rather than trying to find a gym. When professional support exists, coaches are very respectful of it. I find that the head soccer coach will communicate their goals with available strength and conditioning coaches, the nutritionist, and sport psychologist, ultimately helping align everyone's efforts in that mold. There should be a relationship built that allows a soccer coach to approach the strength and conditioning specialist to say they aren't seeing the results they were expecting. This would be the ideal situation where a coach uses all the resources at her disposal to the best of her ability.

If the head coach is educating themselves on the fly, less is best. In most collegiate settings, both facility and support staff resources are available. From personal experience in the college setting, I would support my strength staff unless injury or performance issues arise that would lead me to question either the periodization model or possibly something I was doing that might lead to the performance or injury impacts. For example, if the strength coach does a heavy leg day and then I send my team out to do an eight vs. eight exercise for one and a half hours, the necessary communication isn't there. I do think that at all levels of coaching today, there is more knowledge of this holistic approach thanks to coaching education. At the youth level there is also an increased focus on the physical well-being of young players since we see kids come out with chronic overuse injuries. The player/coach relationship suffers when contact time is lost due to injury.

PC: Let's focus on the youth level and "farming out" strength and conditioning to an outside source. In some cases, parents do it on their own. How can the youth soccer coach get a handle on this?

IB: You have to respect people who create new industries. If there are people with private facilities where kids can come in and use resistance bands, chutes, and other paraphernalia and the only appreciable damage is the separation of money from the parents' wallets, I'm comfortable with it. My biggest struggle is seeing an athlete work with the strength coach on an individual basis and never see the performance improvement. I would rather see a club or team hire a support service and take the whole team to this off-site venue once a week. This way, the program can be tailored to the coach and the team and there's less focus on one individual working with one individual who will never see the team.

There are a number of big suburban clubs that employ strength and conditioning coaches to work with the kids at the club. To be fair, a lot of this is window dressing. There will be some speed ladders and two kids working together doing resistance running. I think that the club is selling the concept as a product, but it also leads the kids to realize that they have time they can commit to the strength coach above and beyond their time with the soccer coach. These clubs will also utilize a sports psychologist to help round out the available support for their athletes.

As I mentioned, there is a greater understanding of this holistic approach at most all levels of youth soccer. It's easy to make a fun activity of the strength and conditioning process and also achieve set performance goals above and beyond the usual technical/tactical approach of soccer. For example, when working through a drill and saying, "Last time I did twenty reps, this time let's see if I can do twenty-two," demonstrates the ability of the strength coach to take on a role of coach and a little bit of a psychologist. When cooperating and communicating with the soccer coach, an adverse scenario can be set up as a positive training achievement.

PC: Where does field testing come into play with all this, like showing improvement in athletic performance by running faster or jumping higher?

IB: I think a good strength coach should take it upon themselves to create some performance indicators to validate the value of their program. There are situations in which a coach doesn't have success and blames support staff and those around them. Clearly it is in the best interest of the strength coach to protect themselves by showing the effectiveness of their program. In the collegiate environment I had to work a lot with the concepts of when to start an activity, how often to repeat it, and what the target was of a given exercise or activity. I can make the case that an eighteen-game regular season takes two months, and that I have seven games in two to three weeks for the playoffs. That means I must have a benchmark in place for players to measure the test results. I wouldn't want to test in the middle of two-a-days because my results would only reflect a beaten-down performance at the end of summer. Strength coaches should have a "science" of when and why an exercise or measurement is being taken. I also need to know as a coach how I can connect the data gathered with observable performance outcomes. For example, a player can run a mile and a half for time, but what does this tell me? During an actual game, seldom are the player's arms comfortably at his sides with a consistent, steady speed. As a coach I'm more interested in short-burst of explosive power; that demonstrates functional soccer movement.

PC: Listed below is a potential e-learning course we are working on with United Soccer Coaches entitled: "Youth Soccer Conditioning – Crossing the Bridge: How the Soccer Coach and Strength and Conditioning Coach Can Work Together to Make a Better Young Soccer Athlete."

We present three possible scenarios in this course exploring possible integration of a strength and conditioning coach with a youth soccer club program:

- **Scenario #1: Full-time strength and conditioning coach on staff.**
- **Scenario #2: Strength work at the strength and conditioning facility, conditioning work done at the club.**
- **Scenario #3: Conditioning done at the club, under the direction of knowledgeable club personnel and monitored by the strength and conditioning coach.**

What are your thoughts on this?

IB: I think the different scenarios illustrate both the "crossing the bridge" concept and the practical realities of where athletes train and with whom. I think having an element of parent education from the club in addition to the soccer coach and the strength and conditioning coach creates an integrated program. This combination is critical. One real-life example is the 7-T system designed and promoted by Performance Conditioning Soccer. It can stand by itself and provides an easy-to-remember process, which in turn benefits a coach's ability to use it. My recommendation to any grassroots program is to pick out the Ts that are most comfortable or familiar and build on them.

PC: What incentive would I, as the strength and condition coach, have to collaborate with the head soccer coach to educate and develop sport-specific skills and knowledge?

IB: While the soccer coach generally respects the strength and conditioning coach's expertise, the strength and conditioning coach must acquire some working knowledge around the functional requirements of soccer. The strength and conditioning coach is not going to produce desired results if he's training the soccer player with knowledge or goals based around knowledge from a different sport. It's a disservice to the soccer athlete if their conditioning coach isn't informed on the sport's specific needs. A soccer athlete's needs differ from a football player's, whose needs differ from a basketball player's. The anaerobic energy system and change of direction needs are different. Speed and acceleration are combined as the same attribute, but they are developed differently.
Messi, one of the greatest players in the world, is a master at changing pace. When he speeds up, no one else can stay with him. Because of his style and abilities, his training type would differ from that of a center back. We need to address the individual needs of each player on the team. The best strength and conditioning coach will teach based on the needs of the players.

PC: From the perspective of a strength and conditioning coach, what skills or benefits would be of the most interest to the head soccer coach?

IB: The head soccer coach probably has limited time or multiple distractions keeping him from working with the athletes. The main skills being sought are an ability to stay focused on soccer skills and an ability to quickly drive performance improvement. If the conditioning coach can improve the team's performance two percent but takes up thirty percent of the allotted time, there is minimal benefit. Head coaches are seeking efficiency with whatever time they can spare. The other part of the equation is ensuring the program is built to prevent injury; if a player is injured, helping them bounce back as quickly and safely as possible. Lastly, the head coach wants total integration, which circles back to active communication between conditioning staff and the other coaches.

PC: In this scenario, who should take the lead on integrating goals and plans? Does the strength and conditioning coach come to the soccer coach and say, "This is how much time I need?" Or should the soccer coach initiate the conversation with the strength and conditioning coach by specifically stating their goals and the time allowed?

IB: I think it should be an open conversation, but allowing the head soccer coach to have the final say. To balance this, the soccer coach must be realistic with his expectations of the strength and conditioning staff. I've seen situations where the soccer coach has a lot of demands and wants it done with only two fifteen-minute sessions a week. This would present an opportunity for the strength

and conditioning coach to be transparent and let the coach know that the desired goal is not achievable with the time allotted, but then also present what results the coach can expect based on the time or resource constraints.

The strength and conditioning coach should always work to protect the integrity of their work. He should be comfortable and confident conversing with the head coach about performance and time commitment expectations. For example, stating, "This season I have X number of hours to devote to your program, and this is what you can expect to be accomplished, realistically. I can do this with three thirty-minute workouts a week, or we can alter the time commitment to chase a certain level or goal." The soccer coach should be actively participating in this conversation, and can provide information like, "Our team has sixteen games this high school season and every player gets to play at least fifty percent of the time. Our expectations are based on this level of participation." This will take some pressure off the strength and conditioning coach when understanding the expectation is not to win the World Cup.

I hope a good strength and conditioning coach can refer to this. The best soccer and strength and conditioning coach relationship should proceed in alignment towards a good board-based goal. Both should remain flexible. In the end, this teamwork and collaboration is based on the understanding that the soccer coach is ultimately responsible for the outcome and the strength and conditioning coach is part of the support staff. O

Power in the Bubble Cheek™: What's Been Hiding in Plain Sight! Precision Form Training™ (PFT) for Power Development Improving Joint Performance and Speed

by Dr. Veera Asher, DMA (Voice), CSCS, USAW1, National Faculty of the U.S. Sports Academy

Dr. Veera Kharé Asher, is the inventor of Precision Form Training™ (PFT), a new discovery in human performance for power development. With her unique background and expertise in strength and conditioning, as well as elite opera singing, she alternates between roles as a performance coach for both athletes and artists, a scientific researcher, phygital entrepreneur, and a Loyola Marymount University voice instructor.

Dr. Veera Asher is the only voice professional with a cumulative education or training with pre-medical studies in biochemistry from the University of British Columbia, a Doctor of Musical Arts degree in voice performance with published interdisciplinary dissertation from the University of Nevada Las Vegas, as well as her NSCA-CSCS and USAW1. In 2015 she was appointed to the National Faculty of the United States Sports Academy and is also a former Board member of the Positive Coaching Alliance-Los Angeles Chapter.

As the founder of KPERFORM™, Dr. Veera Asher's company very recently committed to developing performance optimization and injury prevention products targeted for 2019, including in-person trainer certifications, as well as digital products that can measure real-time performance parameters for assessment via smartphone or sensor-based technologies. KPERFORM™ became a member of the Youth Safety and Sports Alliance (YSSA) for American sports programs. Dr. Veera Asher is based in Marina Del Rey, California. She is grateful for the support from her fellow colleagues, coaches and scientists from Strength and Conditioning communities locally, nationally and internationally, for continued collaborations focusing on LTAD (long-term athletic development), military, medicine, health & wellness, elite athlete performance and sports team training.

Dr. Veera Kharé Asher

BGN INT ADV T4

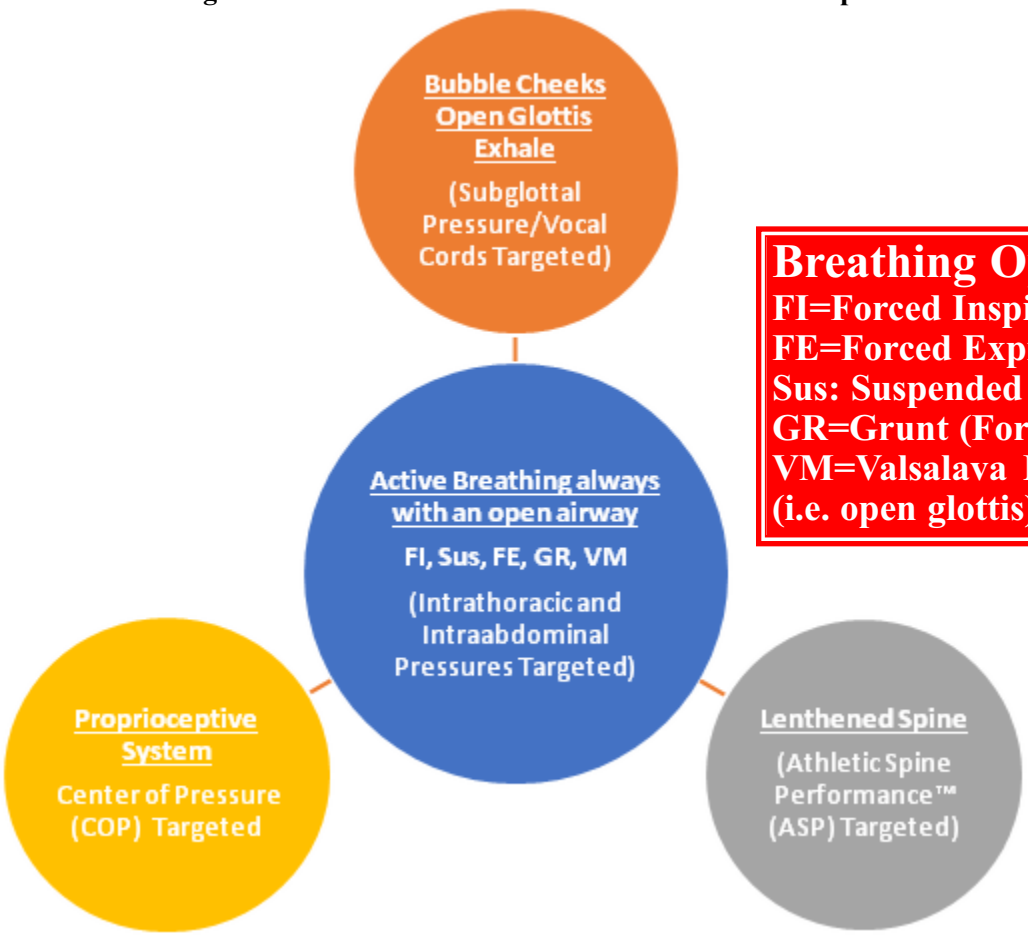
To date there is no training protocol known, apart from Precision Form Training™ (PFT), that specifically prescribes Bubble Cheek™ exercises. Precision Form Training™ (PFT) is a specified neuromuscular recruitment pattern (i.e. muscle action sequence) that targets, with a nonnegotiable specified breath pattern, the proprioceptive system and neural feedback control loop, optimizing biomechanical parameters including dynamic joint stability for power development.

The Bubble Cheek™, as seen in the photos of athletes playing soccer at various levels, inclusive of David Beckham, is performed intuitively during explosive power movements. However, the Bubble Cheek™ is not limited to soccer.

The Bubble Cheek™ is also seen performed in other sports and athletic actions such as sprinting, batting in baseball, jumps in figure skating, javelin throwing, dunking in basketball and diving. The Bubble Cheek™ forced exhale, used intuitively by so many elite power athletes is the first external cue, that hints as to why it could be a hidden tool for improving rate of force development (RFD) or explosive power movements for all athletic levels.

This article will focus on (4) areas, as to why PFT initially uses the Bubble Cheek™ exhale and inhale when training for power development. The four areas will focus on the: **breath, center, spine and vocal cords** (inclusive of the glottis and larynx). Once the connection between the Bubble Cheek™ exhale and power is illustrated in this article also addressing joint performance, it will then be revealed how there is possibly something even better than the Bubble Cheek™ exhale, to recruit the closest to a maximum force production with speed, delivering maximum power (i.e. 1RM).

Performance Target Goals of the Bubble Cheek™ for Power Development in Precision Form Training™ (PFT)



Breathing Options:
FI=Forced Inspiratory (Inhale)
FE=Forced Expiratory (Exhale)
Sus: Suspended breathing between FI & FE
GR=Grunt (Forced Exhale with Sound)
VM=Valsalava Maneauver with open airway (i.e. open glottis)

PFT's Bubble Cheek™ exhale can be used as a baseline reference connecting the four areas of breath, performance of the proprioceptive system's neural feedback loop, spine, and glottis, thereby improving PFT's overall goals of Focus, Center and Power for an athlete [NOTE: see PFT Chart on Focus-Center-Power at end of article]. The PFT sequence once learned, can then become integrated into a sport or skilled movement via a Tai Chi (conscious) to Kung Fu (unconscious/automatic) training approach; thus, allowing for it to be activated during game day in performance-under-pressure situations. For example, in soccer, if a player can activate PFT during ready position (i.e. athletic stance), they may anticipate and respond with better control to a ball or another player due to optimized feedback control parameters that support functional joint performance, explosive power and speed. Precision Form Training™ (PFT) can be integrated into already successful warm-up programs like FIFA 11+ to enhance performance whereby augmenting the benefits of the 11+ program for injury prevention during active play or practice. **LINK: https://usclubsoccer.org/2017/03/08/fifa-11-a-warmup-program-proven-to-reduce-injuries-and-severity-of-injuries/**

Strength and Conditioning Coach Matt Hank, MS, CSCS, USAW, in his experience with PFT suggests benefits for an athlete in that, "PFT helps to create optimal alignment which can directly enhance performance RFD (rate of force development). PFT in athletic posture helps to take slack out of the system. Joints are in correct position. Thus muscles/fascia are in the optimal length tension relationship, which would lead to improved performance in all athletic qualities – strength, power and speed."

An initial PFT activation can be triggered with a Bubble Cheek™ exhale in a ready position (i.e. athletic stance). So let's define Bubble Cheek™ in more familiar terms. It is a Valsalva Maneuver (VM), but with one major difference. The Bubble Cheek™ exhale uses VM with an open airway, or more technically, an open glottis. As a certified strength and conditioning specialist, the VM both closed glottis and open glottis is listed in our strength and conditioning literature, but I could not find anyone who specifically taught the open glottis version of the VM in training for maximum strength and power.

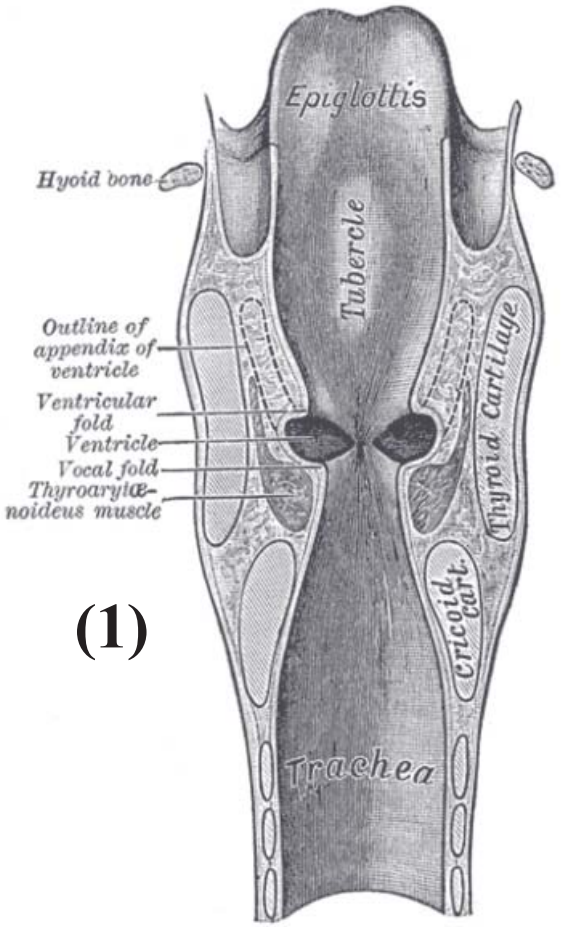
Valsalva Maneuver:
Definition 1: "Valsalva Maneuver described for decades in medical physiology literature as the voluntary increase in intrathoracic pressure by forcible exhalation against a closed glottis."
From: **http://www.dtic.mil/dtic/tr/fulltext/u2/a283651.pdf**
NAVAL AEROSPACE MEDICAL RESEARCH LABORATORY 51 HOVEY ROAD, PENSACOLA, FL 32508-1 046 AD-A283 651 NAMRL-1393 EFFECTIS OF WEIGHT LIFTING ON INTRATHORACIC PRESSURES GENERATED BY ANTI-G STRAINING MANEUVERS L. G. Meyer, J. D. Grissett, and J. G. Lainberth

Definition 2: " The rhythmic action of breathing may compromise spinal stability through the transient relaxation of the core muscles; this is why during performance of maximal lifts, breathing may transiently cease altogether with the Valsalva Maneuver, whereby lifters attempt to exhale against a closed airway. For healthy people without cardiovascular limitations such as high blood pressure, this maneuver can be advantageous by increasing intra-abdominal pressure and thus increasing the compressive forces between adjacent vertebrae to preserve spinal stability.
From: exclusive excerpt from the book *Developing the Core, published by Human Kinetics*.
https://www.nsca.com/education/articles/kinetic-select/anatomical-core-neural-integration/

Most of us have activated and experienced the Valsalva Maneuver (VM) with a closed glottis, to stabilize and protect our lumbar spine during heavy lifts. What we know is to breathe, hold the breath, close the airway and then lift. However, what if there was a way to move the breath through an open airway rather than holding it against a closed glottis, to get the same effect achieving a rigid torso for spine support, while also reducing risk to those with cardiovascular issues? Well the Bubble Cheek™ exhale, because it allows for an open airway with a VM type activation, is the first step towards learning more about this.

To understand why the open glottis or open airway is beneficial to a power athlete, one must be open to learning more about the larynx and its role related to the glottis and the vocal cords.

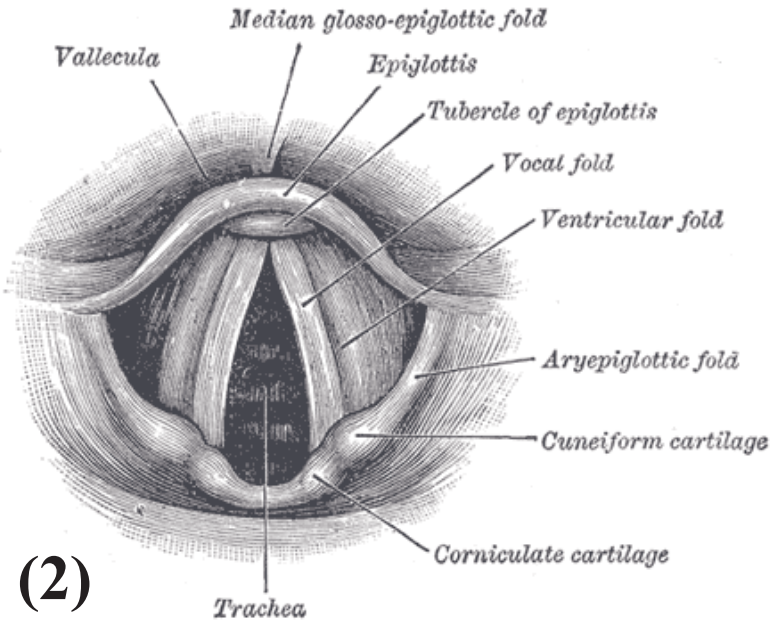
The Bubble Cheek™ exhale is a first external cue of an open glottis VM, but a grunt or voicing, that also necessitates an open airway for glottal performance during a powerful action, as observed in tennis, javelin, shot put and various martial arts, could then be that second cue hinting another action that could define new target goals to measure performance optimization during powerful movements. For purposes of this article, the neural feedback control loop and the proprioceptive system, because it is always activated (i.e. a human is not an inanimate object), does not allow any physical position to be considered static. Therefore, potential for a variety of dynamic movement is possible in an athletic stance or just standing or sitting, even if there are no major visible changes in the outer physical body. A good example is with elite and powerful singers, who seem to perform without much effort, and yet, there is a lot of dynamic movement internally. The importance of the open glottis with or without sound (i.e. nonphonatory approximation of the vocal cords) then introduces new external cues we can borrow from the voice performance discipline. We, as strength and conditioning specialists and sport coaches can look at high performance vocal athletes and their specified target goals, to discover new areas of potential to improve athletic performance for maximum strength and explosive power movements.



(1)

In voice training and voice science, there are several ways one can measure how the voice performs. However, in relation to strength and conditioning, it is important to understand that the power source for the vocal cords is air, via lung pressure, creating something called subglottal pressure (below the glottis/vocal cords). This subglottal pressure is coordinated by laryngeal and core musculature in order to manipulate the qualities of speech and singing. There are also ways to approximate (i.e. shape) the vocal cords, to almost come together, but not make sound. This is where balance and coordination, via the stability and strength of the

laryngeal and abdominal core muscles, stability and mobility of joints, are critical for optimized glottal control, agility and overall vocal power.



(2)

The Bubble Cheek™ Exhale revealed! Why the Vocal Cords, even when not making sound, is important for Athletic Performance.

The Bubble Cheek™ exhale is a version of the Valsalva Maneuver (VM) with an open airway, or more specifically, VM with an open glottis. The glottis sits in the larynx, which is also called the voice box. The shape of the glottis is determined by the vocal cords (i.e. vocal folds). The vocal cords are housed in the voice box, and the power source to the vocal cords is the air that you exhale. The stronger the forced exhaled air, the stronger the sound, and that sound is supported by lung pressure, or subglottal pressure. The laryngeal muscles of the larynx help to stabilize the vocal cords during an open airway with varying subglottal pressures so that they can perform phonatory (voicing) or nonphonatory functions efficiently. This is where grunting or voicing in a power movement could also be deemed a VM with open glottis but with phonation (i.e. sound). There is a level of precision needed in performance of the vocal cords and glottis, because as seen in the images of the larynx and vocal folds (i.e. vocal cords), the vocal folds are very tiny relative to the larynx, and thus the entire body. Their size alone, necessitates a need for an extra level of precision in training to optimize performance.

Sources:
(1) **https://en.wikipedia.org/wiki/Laryngeal_ventricle**
(2) **https://en.wikipedia.org/wiki/Vocal_cords**

In order to have optimal subglottal pressure to approximate the glottis with an open airway for voicing on a forced expiratory breath, there is a complex but precise coordination that also needs to be optimized with intrathoracic (ITP) and intrabdominal pressures (IAP). This complex coordination is true during forced inspiratory breathing as well for optimal power development. The three coordinated internal pressures (i.e. subglottal, ITP and IAP) work together with optimized laryngeal, core and joint stability for advanced level voicing.

Athletic Spine Performance™ (ASP):

This complex whole-body coordination activates Athletic Spine Performance™ (ASP), a target goal in PFT. ASP is where the spine remains expanded like a loaded coiled spring with the potential of further loading during torque or transverse plane movements, at both the thoracic (i.e. T-Spine) or Cervical (C-Spine) levels. ASP allows for sustained length in the torso, with segmental stabilization of the entire vertebral column, on both the inhale and the exhale (or voicing) for single or repetitive breath cycles during performance of powerful movements. The Bubble Cheek™ forced inspiratory breath, a PFT skill, targets total lung capacity so that potentially all the ribs are affected thereby optimizing range of motion within the ribcage (i.e. the thoracic cage). Due to the connection between the ribs and the vertebral column, by keeping the ITP, IAP and subglottal pressures optimized, and with core strength and stability, the vertebral column is stabilized with the torso expanded even on the PFT forced exhale (including but not limited to a Bubble Cheek™ exhale).

Center of Pressure (COP) as a measurement:

Once a PFT muscle action sequence with the specified breath pattern is achieved targeting the proprioceptive system, center of pressure (COP) is also optimized. COP, that is, center of mass over base of support with a single point of ground reaction forces is never static because it is based on the proprioceptive system. [NOTE: see glossary for measurement details.] Therefore, an athlete's performance ready position that also has optimal COP will have balanced and dynamic movement characteristics internally activated with potential to improve reaction and response time as well.

Joint Performance:

Precision Form Training™ targets to improve both ASP and COP by optimizing core and laryngeal stabilization and strength (trunk control). The result of that PFT activation results in a 'suspended-like' athlete, with dynamic joint stability for improved controlled movements. This is an ideal athletic state for deceleration, controlled landing after a jump, and return to bilateral stance after a single leg action, such as a kick. With PFT activated, there is a reduced stress on the joints, measured with myopressure plate technology. It is represented as reduced pressure (measured in N/cm2) on the base of support in contact with the ground but keeping optimized dynamic joint stability via COP with ASP, allowing for potential for maximum force production at

faster speeds for improved explosive power.

Transverse Plane Movement and Torque in Explosive Power:

If an athlete needs to be in performance ready position, they will ideally access the PFT sequence, allowing for lengthened torso with segmental stabilization of the spine (i.e. ASP), optimized center of pressure (COP), and forced breathing with an open airway, ready to activate during performance-under-pressure an explosive power movement or maximum strength. Since Athletic Spine Performance™ (ASP) is a parameter of PFT, then isolation of the head, shoulder girdle and pelvic girdle is possible, while keeping a stable and strong center due to that expanded loaded coiled spring-like vertebral column. The movement is further supported by joint stability and mobility, and abdominal core strength, powered by the forced expiratory musculature, also responsible for transverse plane movement. Thus, the transverse plane, even in sagittal or frontal movements, is always ready to react or respond when PFT is activated. The athlete keeping a lengthened torso during a full breath cycle, allows for better isolation of the pelvic girdle, the shoulder girdle and head, leading to a more optimal unrestricted rotation during timed and synced torqued movements on an explosive power action. This is true for both grounded or midair power actions. A primary benefit of preparing in what may be a visibly static stance, an internally dynamic ready position with PFT so that explosive power or maximum strength can be performed in any plane without any extra delay to reaction time or feedforward response. A further benefit of the reduced head movement, especially in midair, is better eye tracking and timing of contact of the athlete with the ball.

The "Silent Grunt": Alternative to the Bubble Cheeks™

If an athlete were to activate PFT at its elite level for explosive power, but wishes to stay silent, there is an option for the vocal cords to approximate similarly to a voicing posture, while not actually needing to make sound (i.e. the "silent grunt"). The ability to posture the vocal cords with the articulators (i.e. primarily the tongue and jaw position) to mimic voicing but not make sound, necessitates for a more advanced recruitment of musculature than the Bubble Cheek™ exhale due to a need for more overall stability, strength and power to facilitate the increased subglottal, ITP, and IAP pressures. A progression of this, can been seen in images of elite athletes with their tongues sticking out of their mouths. One of the best basketball players of all time, legend Michael Jordon was known for sticking his tongue while playing.

The Bubble Cheek™ exhale is a more closed mouth option, in contrast to forcefully 'sticking out' the tongue, due to the lips being used as resistance approximating for optimal jaw and tongue position. Although the resistance by the lips on the Bubble Cheek™ exhale is helpful to support subglottal pressure, it can also limit potential for breath speed and velocity on the exhale during an explosive movement, and thus limits RFD. Although there may be limitations with the Bubble Cheek™, the tongue example is not recommended due to possible injury to the tongue during play or practice. Beckham's tongue position, though, is an example of how it can prevent one from clenching their teeth, and thereby reducing added joint stress to the jaw hinge (i.e. the temporomandibular joint). However, the best option for explosive power training is to keep the tongue in the mouth, but to progress from the Bubble Cheek™ exhale to the advanced skill of a silent vocal cord/glottis approximation using PFT, ideally with an open mouth, where benefits of breath, center (core) and spine (ASP) performance can still be optimized.

Final Summary, Comments and Exercises:

Precision Form Training™ (PFT) always starts the athlete with a specified Bubble Cheek™ breathing pattern, matched with the nonnegotiable neuromuscular recruitment pattern. PFT focuses on new considerations inclusive of performance of vocal cord approximation (i.e. glottis) to optimize the neural feedback system and Athletic Spine Performance™ (ASP) during explosive power movements, thereby improving the neural feedforward system for overall human performance optimization and injury prevention. PFT can be integrated and activated during traditional strength and conditioning programs. Precision Form Training™ (PFT) not only addresses the sympathetic mode in performance-under-pressure, but there is also a reversed PFT sequence that targets the parasympathetic mode for down regulation back to rest. Overall, PFT for performance-under-pressure, targets the proprioceptive system, center of pressure (COP), Athletic Spine Performance™ (ASP), the use of breath perturbations for core strength and stamina anaerobic conditioning, and the importance of eye focus, laryngeal stabilization and dynamic joint stability.

Since the vocal cords are so tiny in proportion to the rest of the body, the level of precision based on their performance, whether with sound or just approximating for sound, allows coaches to consider new biomechanical and optional auditory cues, to assess for potential ways for optimizing explosive power or maximizing strength in specified movements. The Bubble Cheek™ exhale was our first cue, the second is the grunt, but I conclude and reiterate, that the option of a forced expiratory breath allowing for approximation of the vocal cords and glottis in a 'silent grunt' formation (with tongue inside the mouth) during an explosive power movement should be the goal.

Power in the Bubble Cheek™ Exercises: (standing or sitting)

(1) Set-Up the Power: Bubble your cheeks and see if you can breathe in and out through your nose, keeping the bubble in the cheeks and without letting the chest fall.

(2) Activate the Power: Bubble your cheeks then breathe in through your nose as far as you can go. Then keeping the bubbled cheeks on the exhale, allow the force of the exhale to unseal the lips slightly so that air exits via the mouth and not the nose, all while keeping the pressure in the bubbled cheeks and staying tall.

(3) Progress the Power: Bubble your cheeks and then breathe in (through the nose), then during the Bubble Cheek™ exhale when you force the exhale through the lips that unseal due to the force, try to also make sound. The air while making the sound will exit through the lips and not the nose. Once you start to make sound, consistently get louder, or accelerate the air of the exhale, all while staying tall.

NOTE: All exercises can be done three to five times in sequence, ensuring good form. Stop if any pain or fatigue.

BONUS - Usain Bolt, Bubbled Cheeks and Speed:

Explosive power is a fundamental element in sprinting. Usain Bolt, one of the most elite sprinters of all time, is seen bubbling his cheeks at times on the exhale. Having debuted this year in soccer, it was interesting to see him sticking his tongue out versus bubbling his cheeks!

BONUS EXERCISE:

I. Develop Soccer Speed with Flying Curved Sprints by Coach Matt Hank, MS, CSCS, USAW: See last edition of Performance Conditioning Soccer Volume 22, Number 6, Pages 5 – 8. **Net Link:** Click **HERE**

II. Precision Form Training™ (PFT) with Flying Curved Sprints BONUS: Prep with the Bubble Cheek™ inhale for chosen ready position, and then suspend (hold with open airway). Then activate the Bubble Cheek™ exhale, with or without sound at start and during acceleration on the curvilinear sprint path, trying not to let the chest fall over the entire sprint. The feeling of a PFT activated performance will be experienced when trying to achieve optimized explosive power for faster results.

Glossary:

Proprioceptive System: Neural feedback control system. Neuromuscular system based on neurophysiology of proprioception and CNS (Central Nervous System) (i.e. Proprioceptive feedback loop).

COP (center of pressure): Center of mass over base of support represented by a single point of cumulative ground reaction forces on that base in a moment of time. [NOTE: A measurement that focuses on the proprioceptive system taken over a period of time, ideally with myopressure plate technology, includes the distance traveled between all single point values as COP path length (mm), represented in a confidence ellipse area (mm2) and inclusive of COP average velocity (mm/sec).

Precision Form Training™ (PFT): a specified muscle action sequence (i.e. neuromuscular recruitment pattern) with non-negotiable breath pattern that targets performance of proprioceptive system. Measured by, including but not limited to, center of pressure (COP), Athletic Spine Performance™ (ASP) and performance of the larynx, vocal cords and glottis with an open airway.

Athletic Spine Performance™ (ASP): a target goal in PFT, where the torso is lengthened with segmental stabilization of the spine (i.e. intervertebral expansion with optimal performance of the spine's passive, active and neural systems) on the forced inspiratory breath and sustained on a forced expiratory breath (keeping that spine length inclusive of core stability and strength) with open airway, during any movement including voicing.

Bubble Cheek™: an introductory exercise in PFT where the cheeks are filled with air and the pressure is kept in the cheeks during all forms of breathing inclusive of a forced, held or suspended breath. An open airway at all times should be prioritized. O

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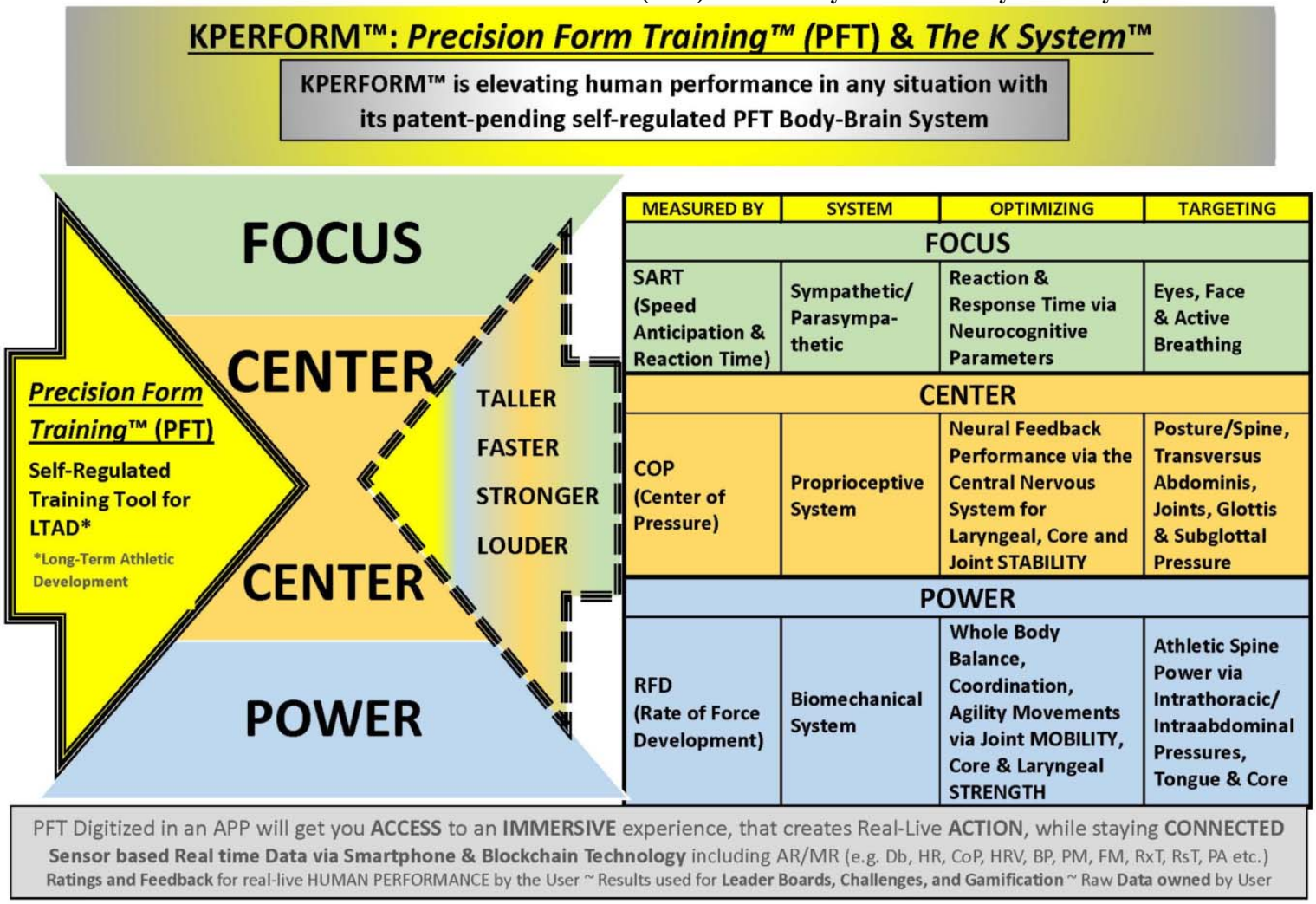

Reading Research: Effect of the Fatigue on the Physical Performance in Different Small-Sided Games in Elite Football Players

Calderón Pellegrino, Gabriel[1]; Paredes-Hernández, Víctor[2,3]; Sánchez-Sánchez, Javier[1,4]; García-Unanue, Jorge[1,4]; Gallardo, Leonor[1]

The Journal of Strength & Conditioning Research: **October 05, 2018**

Abstract

Effect of the fatigue on the physical performance in different small-sided games in elite football players. Football players need to be able to perform high-intensity efforts of short duration with brief recovery periods. The aim of this study was to analyze the influence of the pitch dimension on high-intensity actions and the effect of a repeated sprint ability (RSA) test on the physical performance in different 4-against-4 (4v4) small-sided games (SSG) dimensions. Sixteen U-18 elite football players performed an RSA test between two 4v4 SSGs (pre and post) to induce fatigue and compare physical data. Speed, sprint number, accelerations, sprint distance, total distance covered, and total distance covered of the players at different intensities were evaluated in 3 different SSGs (125, 150, 250, and 300 m^2). Results revealed a significant detriment of physical performance in the 125-m^2 SSG after RSA, mostly in number of sprints (−6.56; confidence interval [CI] 95%: −10.13 to −3.00; effect size [ES]: 1.13 $p < 0.001$), accelerations (−2.69; CI 95%: −5.13 to −0.24; ES: 0.68; $p = 0.032$), and sprint distance (−65.44 m; CI 95%: −103.73 to −27.16; ES: 1.20; $p = 0.001$). In bigger SSGs (250 and 300 m^2), higher distance at high intensity was covered and V_{max}, V_{mean}, and sprint distance were greater. In summary, accelerations, sprint number, and fatigue were higher in smaller pitches, and higher

velocities were reached in bigger SSGs. Football players should be aware that changes in pitch size can modify the physical performance on high-intensity actions in SSGs.

PRACTICAL APPLICATIONS

This study is the first to investigate the influence of the fatigue caused by the RSA protocol on a 4v4 SSG, especially on high-intensity actions. The results of this investigation show that it is possible to use different pitch sizes to modify the physical intensity, and that mainly, in the smallest SSG (125 m^2) significant differences were found after the RSA test. From a practical perspective, coaches can modify the playing area of small-sided training games to increase the physical parameters (e.g., speed, sprint number, accelerations, sprint distance, total distance covered, and total distance covered of the players at different intensities) according to the training purposes. Finally, the results of this study provide new information about the incidence of repeated sprint actions on the physical performance in SSGs, especially in smaller size fields (125 m^2) and the effectiveness of using SSGs as a high-intensity training stimulus for soccer. Moreover, it is demonstrated that the SSG pitch size has a direct influence on the conditional aspects. In bigger spaces, high-speed actions are reached, and in shorter ones, a higher number of accelerations and short-duration actions are required. This new information may be useful for prescribing soccer-specific conditioning programs for elite youth soccer players. R

Speed Zone

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PERFORMANCE SOCCER CONDITIONING PRESENTS

SPEED ANALYTICS and APPLICATION

Combining Soccer's 7 T's (Speeds) with the 7 S's (of Program Design) to Develop Soccer Speed

Goals:
1. Understand and prioritize the speed characteristics an exercise develops.
2. Teach how to apply the exercise to a program based on the needs of the soccer athlete.

Soccer Program Coordinator ***by Tyler Miller, CHKD Sports Medicine LPTA, CSCS, CES***

Tyler Miller has a Masters of Exercise Science is a Licensed Physical Therapist Assistant, Certified Strength and Conditioning Specialist, Certified Speed Specialist, and Corrective Exercise Specialist.

Tyler played soccer at Beall High school and played collegiately at Allegany College of Maryland and Frostburg


Tyler Miller

State University. Once his playing career was over he was a Goalkeeper coach for one season at Allegany College of Maryland and two years with Allegany High School. He currently works as Physical Therapist Assistant for Children's Hospital of the King's Daughters Sports Medicine Program in Norfolk, VA and is the coordinator of their soccer program which helps youth soccer players enhance their athleticism and performance, as well as reduce the risk of soccer-related injuries.

Step 1: The Exercise: Sled Towing for Speed Development

Setup

The setup for this exercise is simple. Connect a loaded sled using a waist harness to the athlete and set up two cones 15 meters apart. This will be the optimal sprint distance for speed development using a sled. Before setting up the sled drill it will also be important to do your due diligence in determining the appropriate weight for the athlete's sled. It is important to understand that training sprint speed requires max effort from the athlete. Studies have been done on different loading patterns and the best results for speed development using resistance requires no more than a 10% drop in max sprint velocity. In order to avoid using a large amount of time to test each player's max sprint velocity and then trial and error multiple sled loads to find that 90% "sweet spot" I wanted to review an equation to use so that sled training isn't a total drag. See what I did there?

The Equation

Alcaraz et al. (2009), determined through regression analysis an equation to determine optimal sled loading. The equation is: % Body mass = -0.8674 X % velocity + 87.99. Ok, super easy to follow right? Let's make this easier. We already know 90% max velocity is our sweet spot, so we will input 90 for % velocity and the equation is solved. -0.8674 x 90 + 87.99= 9.92% Body Mass. How can a coach then use this 9.92%? Simply take the athletes weight, for easy math let's say he/ she is 100 pounds, and multiply 9.92 and then divide by 100 to get the total weight for the optimal sled load.
100 lbs X 9.92/100=
992/100=
9.92 lbs.
Another example that isn't a neat round number would be:
170 lbs X 9.92/ 100 = 16.86 lbs as the optimal sled load.

Step 2: Rate the Speed Characteristics of your Exercise Based on the 7 S's on a scale 0-5. 0= no developmental qualities, 5= maximum developmental qualities.

7 S's:

S-1. Improving Perceptual Speed
0 1 2 3 4 5

S-3. Improving Decision Making Speed
0 1 2 3 4 5

S-2. Improving Anticipation Speed
0 1 2 3 4 5

S-4. Improving Reaction Speed
0 1 2 3 4 5

S-5a. Improving Movement Speed without the Ball-Cyclical/ Starting
0 1 2 3 4 5

S-5b. Improving Movement Speed without the Ball-Cyclical/ Sprint Endurance
0 1 2 3 4 5

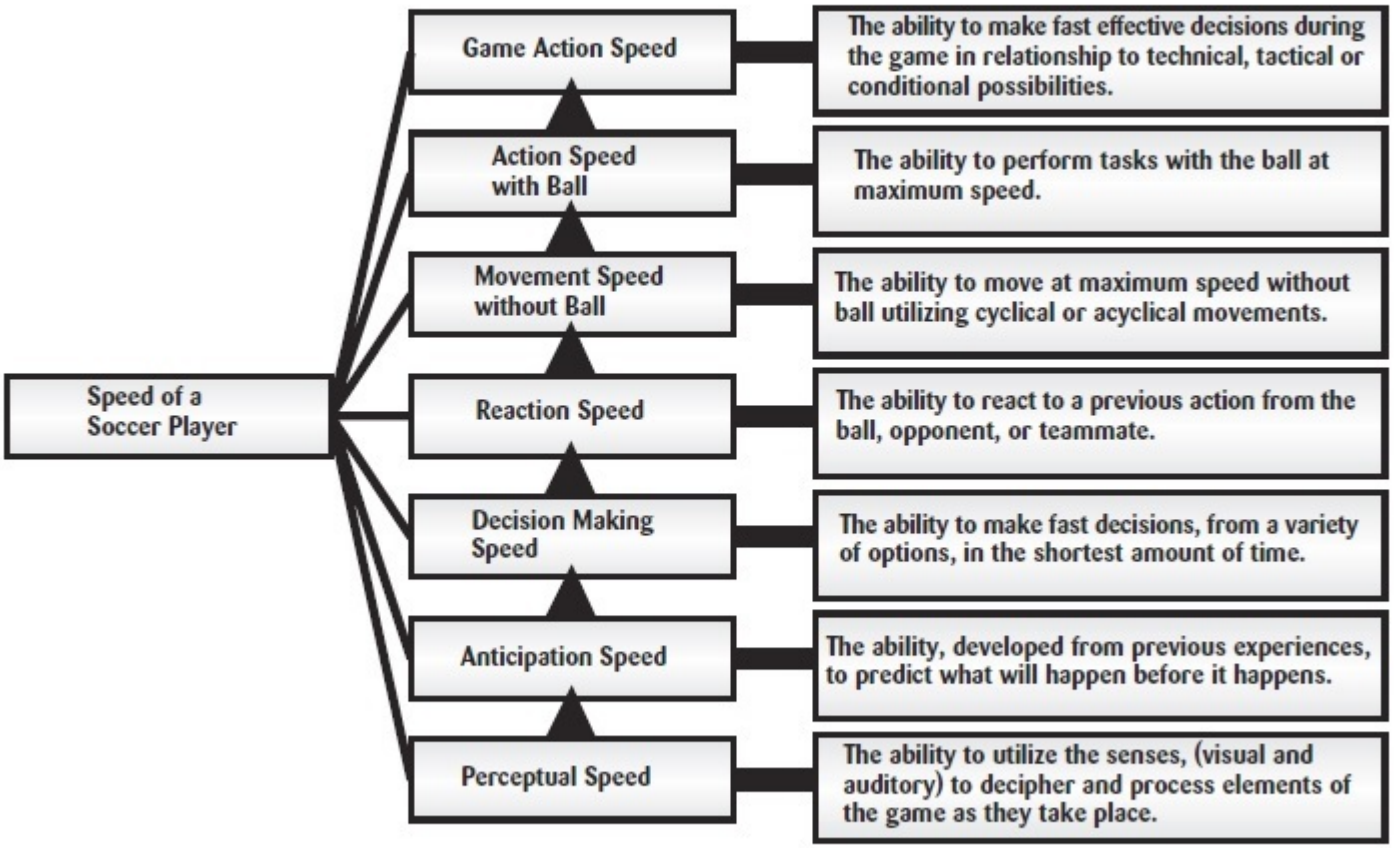
S-5c. Improving Movement Speed without the Ball-Cyclical/ Speed Endurance
0 1 2 3 4 5

S-5d. Improving Movement Speed without the Ball-Acyclical
0 1 2 3 4 5

S-6. Improving Action Speed with the Ball
0 1 2 3 4 5

S-7. Improving Game Action Speed
0 1 2 3 4 5

Characteristics of speed and their significance as they relate to the performance of a soccer player. (Weineck, 1992)



Step 3: Determine if and how the exercise fits into your program based on the 7-T's of Program Design.
Net Link: Detailed Definitions of the 7-S's

Training Age: ***What speeds should your athletes prioritize based on their age level? Does the exercise meet/challenge your athlete's level of physical abilities? What adjustments, if any, could you do to make it make it fit their level of physical abilities?***

Athletes of all ages should perform this at max effort. Max sprint speed should not be reduced by any more than 10% during this drill. This is specifically designed to improve maximal sprint speed; therefore, it is crucial this is performed at max effort. This exercise is not indicated for younger athletes who lack motor/ trunk control.

Time: ***What are your speed priorities based on the time of year (in-, off- and pre-season)? What speed(s) should be a priority based on the practice time you have? When should the exercise be done during practice to provide maximum speed development benefits?***

Sled towing is a great way to maximize speed in the off-season where developing ball skills, developing sport specific technique, and learning game tactics are less crucial and time spent increasing general athleticism is indicated.

Tools: ***Do you have the tools/staff to do the exercise?***

The equipment needed includes 2 cones. A sled is not the only way to perform towing exercises. Other equipment options include bands, harnesses and weight plates, and parachutes. Just be sure when using these modalities for developing speed to make sure individual athletes sprint velocity doesn't decrease by more than 10%.

Teaching: ***What are the key teaching points to get the most out of the exercise? What teaching adjustments can you do to meet your goal in T-1 of adjusting to meet their level of physical abilities?***

The lighter the athlete the lighter the weight. Players who lack conditioning may also need to decrease weight used on the sled to allow for less than a 10% decrease in max speed.

Testing: ***Can the exercise be used to test/measure speed improvement?***

This can absolutely be incorporated into a testing protocol. Implement 4-6 weeks of sled training into a program performing 2-3 times a week. At the end of the 4-6 weeks retest, each athlete's max sprint velocity.

Total Workload: ***What are the number of repetitions, and how much rest/recovery should you allow between the exercise to ensure the characteristic of the speed you are developing are met? Which speeds require athlete fresh- ness to be effective? Which are done under fatigue conditions to be effective? How does the exercise add to the overall workload to your practice session?***

To utilize this exercise for increased speed I would recommend 4-6 max effort sets of a single sprint. Full recovery from the previous sprint should occur before the next set. This could range anywhere from 3 to 6 minutes. For the purpose of this article, we are only looking at sled towing to improve max speed. However, with modifications to reps and rest sled towing can be used to improve acceleration and speed endurance.

Team Position: ***What are your speed priorities base on team position? How does the exercise meet each team position's priority?***

All players are required at times to reach max velocity in a short bout. Therefore, this exercise is useful for all field players and keepers.●

References: Alcaraz, P.E. et al. (2009). Determining the optimal load for resisted sprint training with sled towing. *Journal of Strength and Conditioning*, 23(2), 480-85.

More Information Please!
Contact Tyler at **tyler.miller@chkd.org**

The Six Elements of a Keeper Conditioning Program Part 9 - Beginning Explosive Power/Jumping Ability

Chris Kranjc, Head Men's Soccer Coach University of Alabama in Huntsville
USSF 'A' License; USSF National Youth License, NSCAA Premier Diploma; NSCAA GK II Diploma

Kranjc comes to Huntsville after spending 17 years creating a terrific resume at NAIA power Hastings College in Nebraska.

Kranjc has compiled a 297-67-21 record at Hastings, and his crowning achievement came in 2010 when he guided his team to the NAIA national championship, and he earned the NSCAA's NAIA National Coach of the Year award that season for his efforts.

Kranjc took his team to the NAIA national tournament 11 times, reached the national semifinals on four occasions, and in addition to the national championship in 2010, his team was the national runner-up in 2011.

Named the Great Plains Athletic Conference Coach of the Year a stunning 15 times, Kranjc guided his program to 16 GPAC Conference Championships. His teams have featured 95 all-conference players including 17 GPAC Players of the Year, and his players have also been recognized on the national level as Kranjc has had seven first team All-Americans and 20 All-Americans overall including the 2011 National Player of the Year.

BGN INT ADV T7

Last issue we presented keeper Agility and Movement. This issue we'll look at Beginning Explosive Power/Jumping Ability.

Net Links: Click on these links to read the previous parts in this series.

Part One - The Six Elements and Considerations Before You Start
Part Two - Warm-up
Part Three - Establishing Functional Movement
Part Four - Balance and Coordination
Part Five - Core Strength and Stability

Part Six - Quick Reaction Program | Part Seven - Footwork | Part Eight - Agility/Lateral Movement

Explosive Power/Jumping Ability (EP) Program

Chris Kranjc

Plyometrics are used to build speed, explosive power and reaction time off the ground and jumping ability. Exercises include warm-up activities, one- and two-legged bounding, standing jumps. Equipment includes one- to two-foot hurdles, one-to three-foot boxes and stadium stairs. The following provides you with a progression of plyometric drills for the lower extremity, ranging from low to high intensity.

Warm-up
Equipment - Jump Ropes

Can be performed as a five- to seven-minute warm-up activity before a practice or conditioning session. Jump ropes are very useful tools for developing foot speed and coordination.

To begin, measure the rope by standing in the center of it with both feet. The tip of the rope should reach the underarms. In jumping, wrists do most of the work while the body stays erect and eyes look straight ahead. Jump high enough to clear the rope, landing lightly on the balls of the feet. As a beginner, try to master each selection by doing 20 repetitions. For the more advanced players, perform a variety of the following selections for a five-minute period.

Two-Legged Jump in Place: Move rope forward, then backward.
Two-Legged Jump Forward and Back: Move rope forward, then backward.
Two-Legged Jump Side-to-Side: Move rope forward, then backward.
One-Legged Jumps in Place: Move rope forward, then backward.
One-Legged Jumps Forward and Back: Move rope forward, then backward.
One-Legged Jumps Side-to-Side: Move rope forward, then backward.
Alternate Leg Jumps: Move rope forward, then backward.
Scissor Jumps: Scissor kick legs with one leg in front of the other. Switch legs front-to-back with rope going forward.
Slalom Jumps: Jump, rotating the hips from side-to-side. Land at 45-degrees to each side.
Double Turns: Jump in place, turning the rope twice before landing.

Low Intensity
No Equipment
Bounding, Jumping and Leaping

Use a 20-yard area of open space.

High Knee Skipping: Bend the right knee to a 90 degree angle and lift your right leg waist high bending the elbows 90 degrees. Lift the left hand chest high. As the right knee and left arm are lowered, lift the left knee and right arm into the same position. Emphasize speed and pushing off the big toe attacking the ground.
Lateral Skipping: Attacking the ground.
One-Legged Hops for Speed: Performed with each leg.
One-Legged Hops for Distance: Stick each landing and hold for three seconds.
Alternate Leg Bounds Forward: An exaggerated running style pulling the knee high and hanging in the air as long as possible before extending leg to touch the ground. As soon as you land, drive foot, knee and hips into the air and bound to the opposite leg.
Alternate Leg Bounds Diagonal: Same as Alternate Leg Bounds Forward but jumping on a diagonal.
Alternate Leg Bounds Diagonal Holds: Stick each landing and hold for three seconds.
Diagonal Double Bounds: Do two push-offs sticking the second landing.
Two-Legged Broad Jumps: For speed.
Two-Legged Broad Jumps: For distance. The feet are shoulder width apart with the hips lowered into a jumping position. Using a big arm swing, flex the hips and jump forward as far as possible.
Two-Legged Skier Jumps: Jump forward at 45-degree angle. O

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The four pillars of soccer are as follows: technical, tactical, mental and physical. The physical pillar can be further broken down into four of its own pillars: strength, speed, endurance and recovery. Here they are!

Soccer Pillar - Speed

• Introduction Soccer Speed
• Lateral Speed and Agility
• Soccer Speed with the ball
• Soccer Speed without the Ball
• Situation Speeds for Soccer: Perceptual, Anticipation, Decision-Making, Reaction
• Soccer Conditioning Movement/Footwork

Soccer Pillar-Strength/Stability

• Introduction Soccer Strength
• Soccer Kicking Performance
• In-Weight Room Strength Training for Soccer
• Soccer Conditioning Warm-up and Flexibility
• On-field Strength Training for Soccer
• Soccer Core Strength Training

Soccer Pillar- Endurance

• Introduction Soccer Endurance
• Soccer Conditioning Circuits
• Soccer Conditioning Circuits Volume II
• On-field Ball Skill Endurance
• On-field Ball Skills Endurance Volume II-Small Sided Games
• Soccer-Specific Without and With Ball Endurance Training
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