



# PERFORMANCE SOCCER CONDITIONING

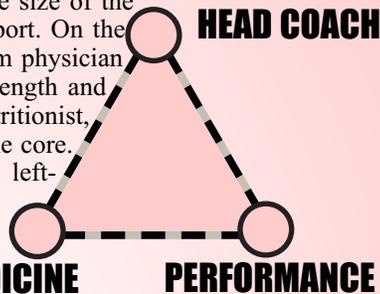
A NEWSLETTER DEDICATED TO IMPROVING SOCCER PLAYERS

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 want 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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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. 

# 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

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T4** **T**o 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.



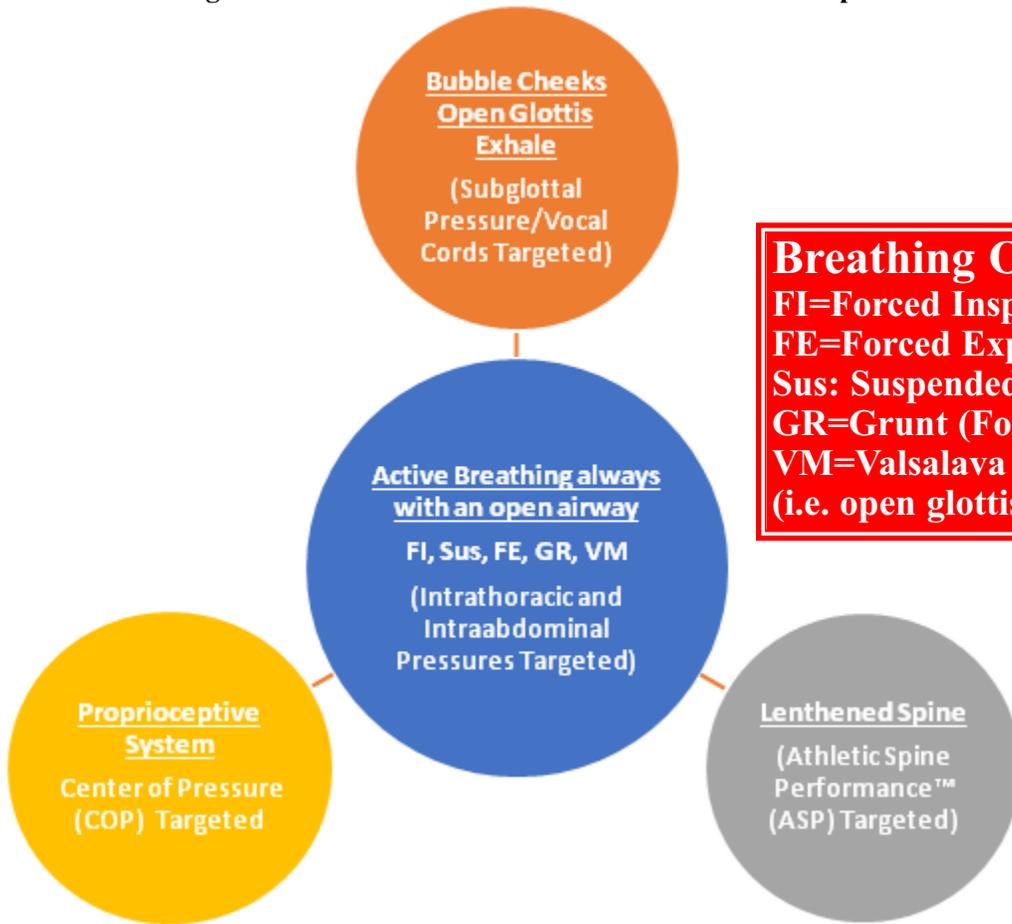
The Bubble Cheek™, as seen in the photos of athletes playing soccer at various levels, inclusive of David Beckham, is performed intuitively during explosive power movements. However, the Bubble Cheek™ is not limited to soccer.

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 Maneuver 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 EFFECTS 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.

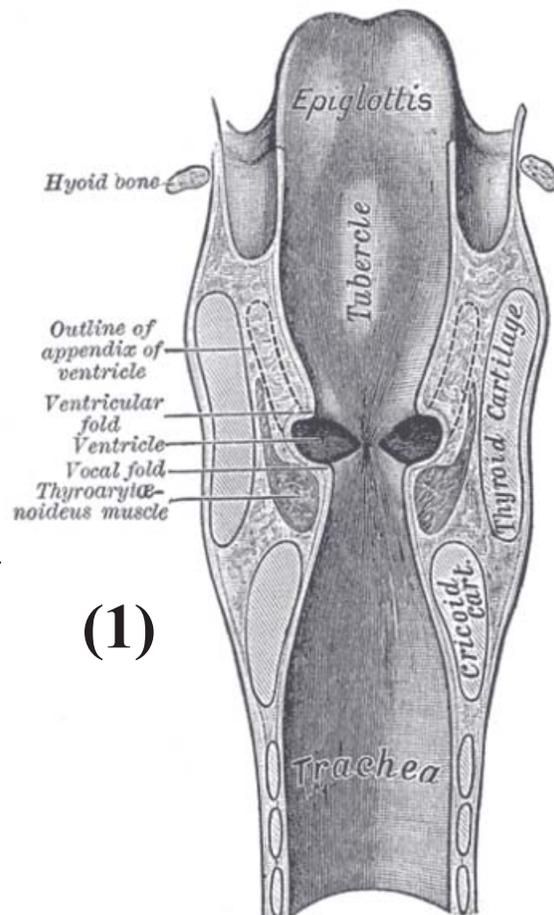
<https://www.nsc.com/education/articles/kinetic-select/anatomical-core-neural-integration/>

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.

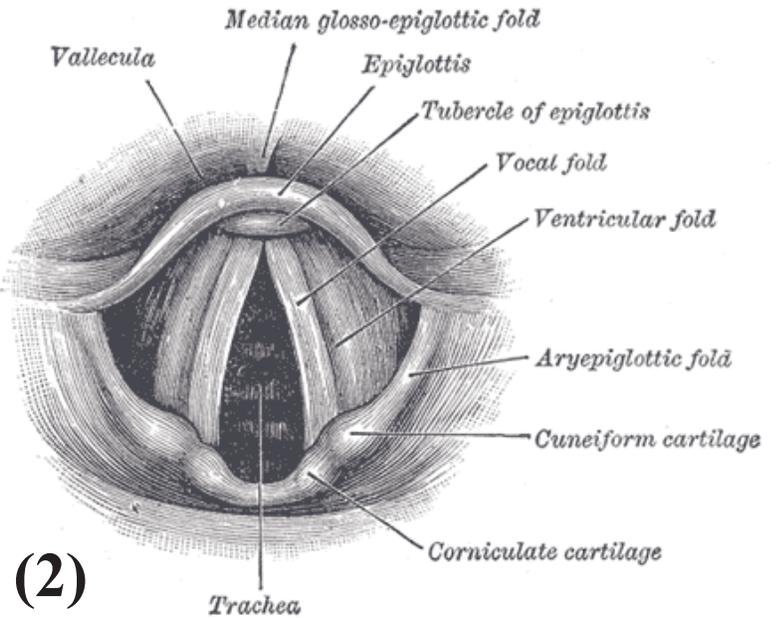
In voice training and voice science, there are several ways one can measure how the voice performs. However, in relation to strength and conditioning, it is important to understand that the power source for the vocal cords is air, via lung pressure, creating something called subglottal pressure (below 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.

### **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](https://en.wikipedia.org/wiki/Laryngeal_ventricle)
- (2) [https://en.wikipedia.org/wiki/Vocal\\_cords](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/cm<sup>2</sup>) 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 be 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 Jordan 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 (mm<sup>2</sup>) 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.

**More Information Please!** Contact/Follow DR. Veera at [DrVeera@KPerform.com](mailto:DrVeera@KPerform.com)

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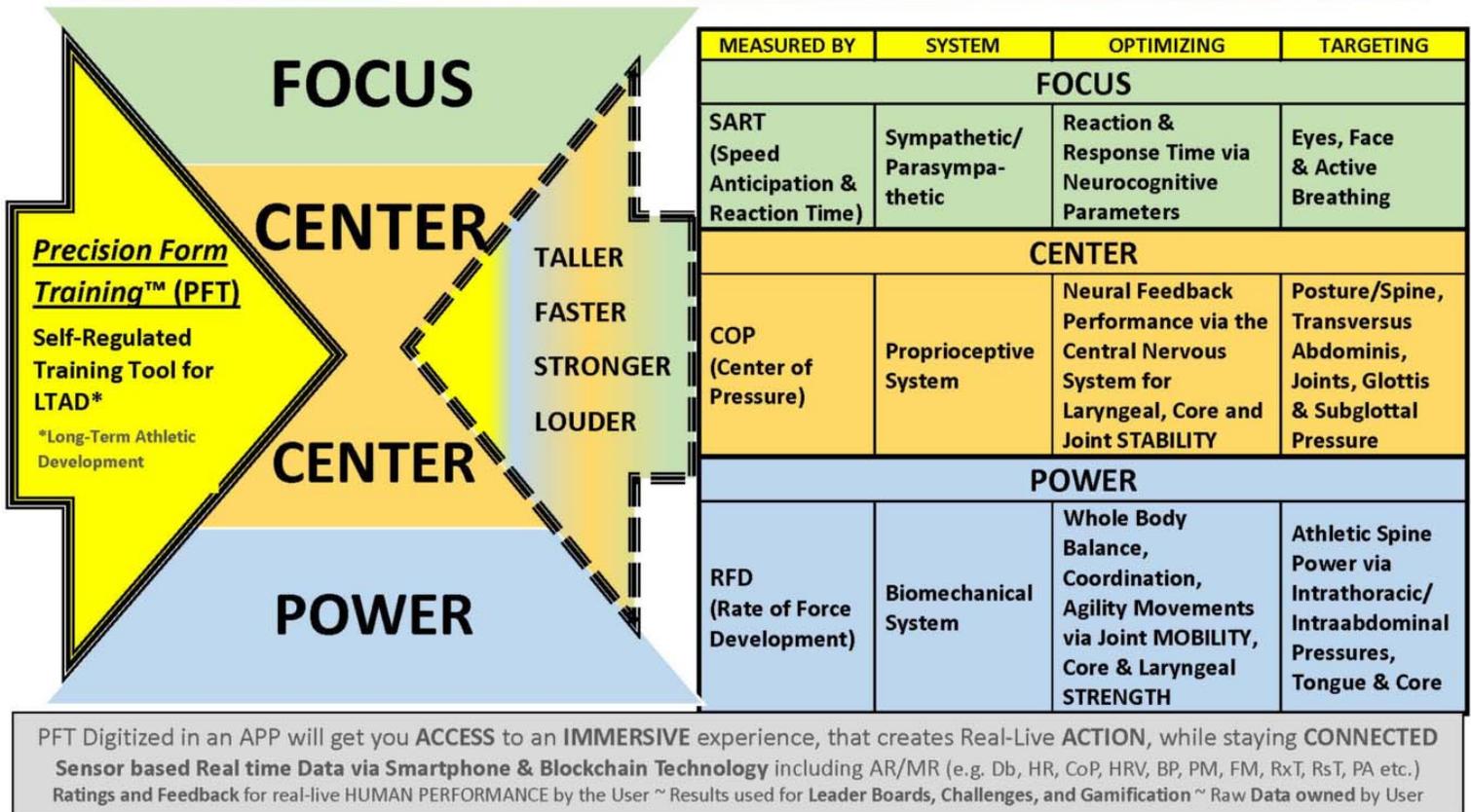
Youtube: [Activate Your Brave](#)

*Matt Hank, Head of Strength and Conditioning for KPERFORM™*

Learn More! Here is the KPERFORM™ (PFT) &amp; The K System™ Body Brain System

**KPERFORM™: Precision Form Training™ (PFT) & The K System™**

KPERFORM™ is elevating human performance in any situation with its patent-pending self-regulated PFT Body-Brain System



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

Calderón Pellegrino, Gabriel<sup>1</sup>; Paredes-Hernández, Víctor<sup>2,3</sup>; Sánchez-Sánchez, Javier<sup>1,4</sup>; García-Unanue, Jorge<sup>1,4</sup>; Gallardo, Leonor<sup>1</sup>

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<sup>2</sup>). Results revealed a significant detriment of physical performance in the 125-m<sup>2</sup> 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<sup>2</sup>), 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