



PERFORMANCE VOLLEYBALL CONDITIONING

A NEWSLETTER DEDICATED TO IMPROVING VOLLEYBALL PLAYERS

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Power in the Bubble Cheek™: What's Been Hiding in Plain Sight! Precision Form Training™ (PFT) for Midair Explosive Power

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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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 breath pattern, the proprioceptive system and neural feedback control loop.

Personal Anecdote: *I grew up with my best friend in High School being one of the top volleyball players in our city and region. Upon graduation she went on to accomplish so much more in both sports and leadership. Marinda Ashman is an Alumni volleyball player, BYU 1987-1991, earning multiple honors: player of the week, all conference, and all-American nominee. Ashman is a former coach for the NCAA and NAIA in both college and club. Having completed a Master of Education (MEd) in Health, PE, and Recreation (HPER), from Utah state university (USU), she is now a tenured Associate Professor in the department of Student Leadership and Success Studies at Utah Valley University (UVU).*

So, it only seems fitting that Professor Ashman was my go-to, to ask if she knew anyone who did a Bubble Cheek™ when they would spike or hit in volleyball, and if they knew why they did it. It was to both of our surprise, when she said that she herself bubbled her cheeks when she played, but never planned to. It just happened naturally! Marinda Ashman (néé Gorbahn) is the first

elite athlete I ever knew and got to observe up close in High School, her approach to training and her performance in competition. I'm excited to feature photos of her in my first ever article on Precision Form Training™ (PFT) for Volleyball power development and midair explosive power. Figures 1 and 2 Marinda Ashman (née Gorbahn)

The Bubble Cheek™, as seen in the photos Figure 3 of Matt Andersen USA player in bow and arrow position upper body black hair; Figure 4 Srecko Lisinac of Serbia; Figures 5 and 6 of Jovana Stevanovic of Serbia, is performed intuitively during power and explosive power movements, but not just in volleyball.

It can be 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 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, 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).

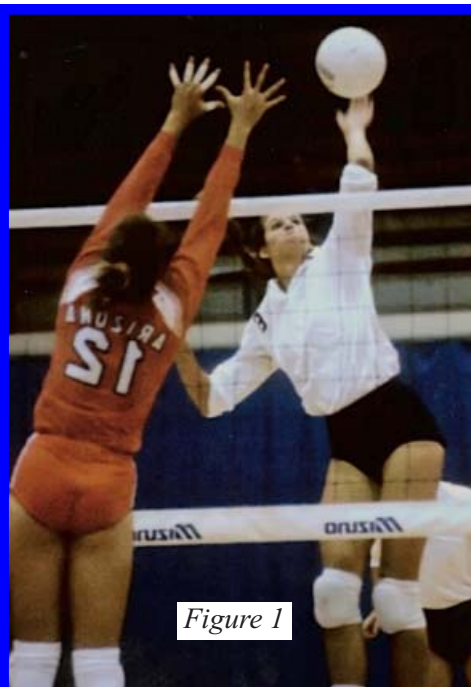


Figure 1

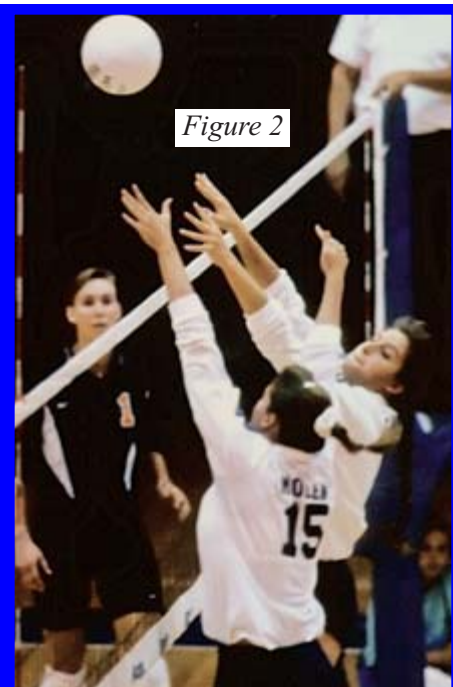


Figure 2



Figure 3



Figure 4



Figure 5

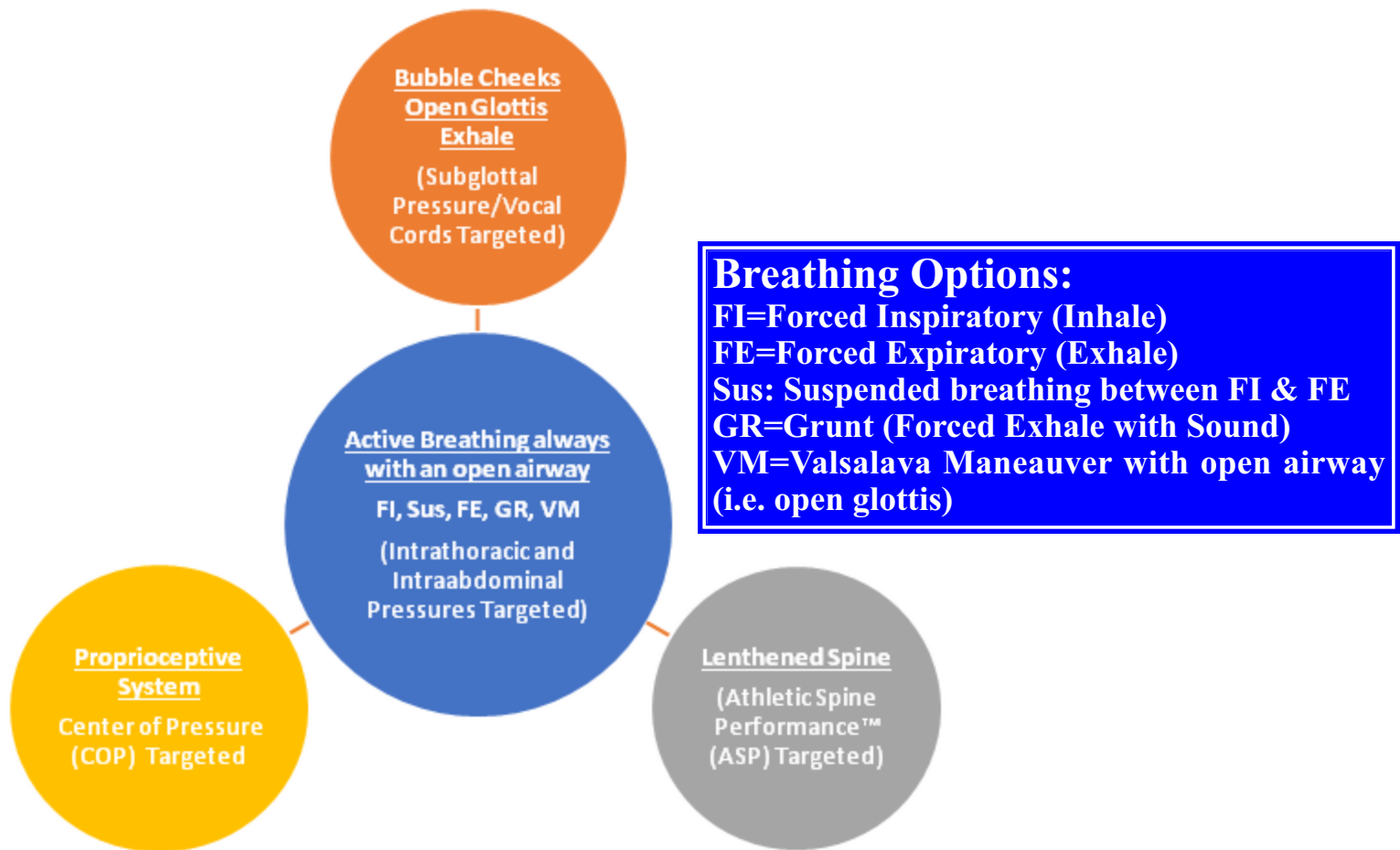


Figure 6

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

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 volleyball, if an athlete can activate PFT during ready position (i.e. athletic stance), then they will be better prepared to continue to activate those parameters throughout the complex skills needed for a spike/hit or jump serve. Ashman in her



experience mentions “the acceleration and momentum effect on power” from jump height to the approach. Then the approach, in midair with back extension and hyperextension, as Ashman explains, has a need to activate further power, “for a pike and torque position on impact and follow through of the hit.” Finally, a controlled and ideally decelerated balanced landing is optimal. Strength and Conditioning Coach Matt Hank, MS, CSCS, USAW, in his experience with PFT further comments on the benefits for an athlete in that, “PFT helps to create optimal alignment which can directly enhance performance RFD. 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 before a spike or jump serve, 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 couldn’t find anyone who specifically taught the open glottis version of the VM in training for maximum strength and power.

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. Images in Figure 7

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/>

shows closed glottis VM in volleyball, and Figure 8 shows the VM closed glottis with bubble cheek. Figures 7 Taylor Sander of the USA. and 8 Christa Harmotto of USA.

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 variation 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 the stability and strength of the laryngeal and abdominal core muscles, stability and mobility of joints, are critical for optimized glottal control and overall power.

The Bubble Cheek Exhale revealed. Why the Vocal Cords are so important, even when they do not need to make sound.

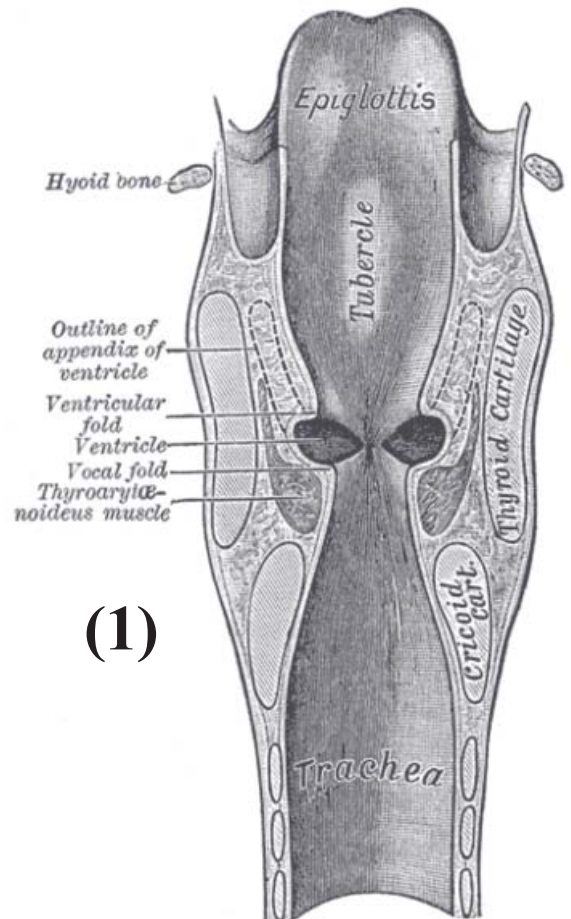
The Bubble Cheek™ exhale is a version of the Valsalva Maneuver (VM) with an open airway, or more specifically, VM with an open glottis. The glottis sits in the larynx, which is also called the voice box. The shape of the glottis is determined by the vocal cords (i.e. vocal folds). The vocal cords are housed in the voice box, and the power source to the vocal cords is the air that you exhale. The stronger the air, the stronger the sound, and that is determined by lung pressure, or subglottal pressure. The laryngeal muscles of the larynx help to stabilize the vocal cords during an open airway with subglottal pressure so that they can perform phonatory (voicing) or nonphonatory functions efficiently. This is where a grunting or voicing in a power movement could also be deemed a VM with open glottis but with phonation (i.e. sound). There is an extra 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 a whole new level of precision in training to optimize performance.



Figure 7



Figure 8



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 is true during forced inspiratory breathing as well. The three coordinated internal pressures (i.e. subglottal, ITP and IAP) then further help to optimize 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, the vertebral column is stabilized with the torso expanded even on the PFT forced exhale (including but not limited to a Bubble Cheek™ exhale).

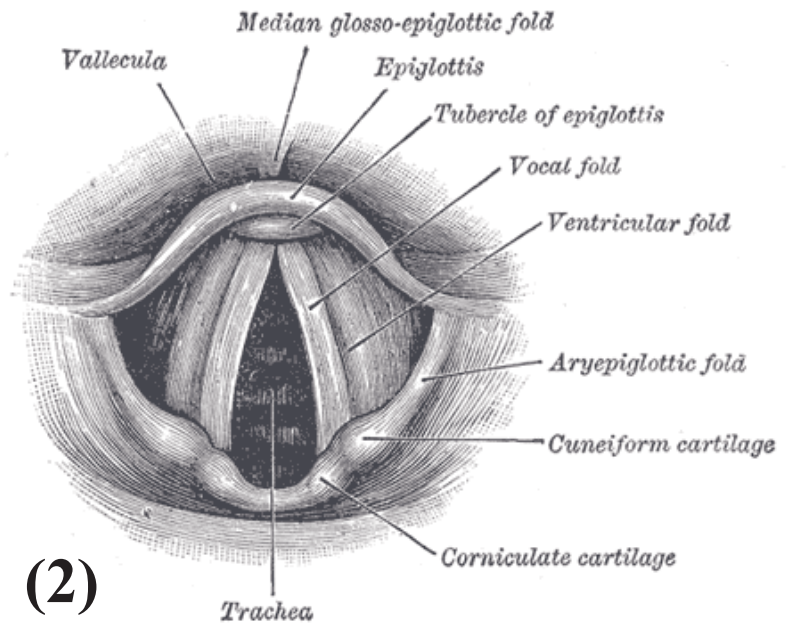
Center of Pressure (COP) as a measurement:

Once a PFT muscle action sequence with breath pattern is achieved while targeting the proprioceptive system, center of pressure (COP) improves. 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.

The “Silent Grunt”

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 with 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 strength and power to facilitate the increased subglottal, ITP, and IAP pressures. A progression of this, can be seen in images of elite players with their tongues sticking out of their mouths. Figure 9 Foluke Akinradewo USA; Figure 10 Ivan Miljkovic Serbia; Figure 11: Kerry Walsh Jennings for USA Beach Volleyball in the Rio Olympics.

The Bubble Cheek™ exhale is a more closed mouth option, in contrast to forcefully ‘sticking out’ the tongue. because due to the lips being used as resistance affecting 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. The best option for explosive power training is to progress from the Bubble Cheek™ exhale to the advanced skill of a silent vocal cord/glottis approximation using PFT, where benefits of breath, center (core) and spine (ASP) performance can still be optimized.

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. This is a primary benefit of preparing in what may be a visibly a 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's hand(s) with the volleyball.



Figure 11

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), 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 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 for grounded or midair a back-extension phase for spike or jump serve, Step A:** In standing or seated position with feet parallel, bubble your cheeks then breathe in through your nose as far as you can go. Then keep your airway open (still with the Bubble Cheek™) and bend backwards (i.e. back extension) to experience what a lengthened torso with loaded coiled-like spine feels like (i.e. ASP).
- (3) Activate the Power for a grounded or midair back-extension phase for a spike or jump serve, Step B:** Repeat Step A above. Then in the back extension, while keeping the pressure in the bubbled cheeks, start an exhale with the Bubble Cheek™. (i.e. Allow the force of the exhale, still with the bubbled cheeks, to unseal the lips slightly so that air exits via the mouth and not the nose.) During the exhale, feel free to do the slow movements of the 'bow and arrow' with the arms, coordinating with the activation of core power, a slow-motion flexion, mimicking the action and range of motion of an explosive power movement. Remember: Slow motion first to get the 'feeling' before your speed it up (e.g. a Tai Chi to Kung Fu process)
- (4) Alternate option on exhale to Progress the Power:** Bubble your cheeks and then breathe in through the nose. Then, just practice first in standing or sitting position, during the Bubble Cheek™ Exhale when you force the exhale through the lips

that unseal due to the force, try to also make sound (a consistent tone). 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 keeping ASP.

(5) Practice (3): Step B add alternate option with sound on the Bubble Cheek™ exhale.

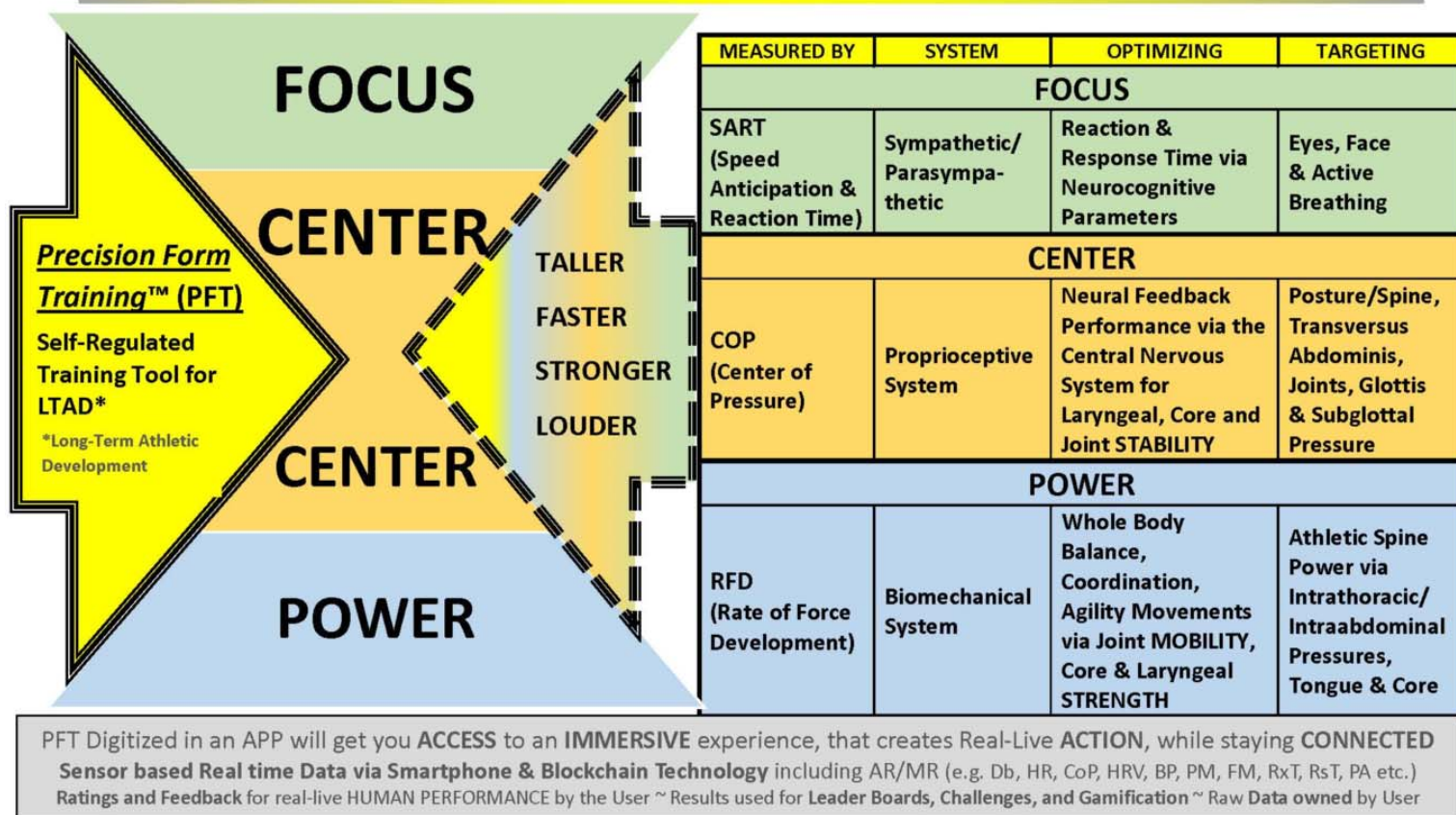
NOTE: all exercises can be done three to five times in sequence, ensuring good form and no pain.

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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



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 (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) 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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