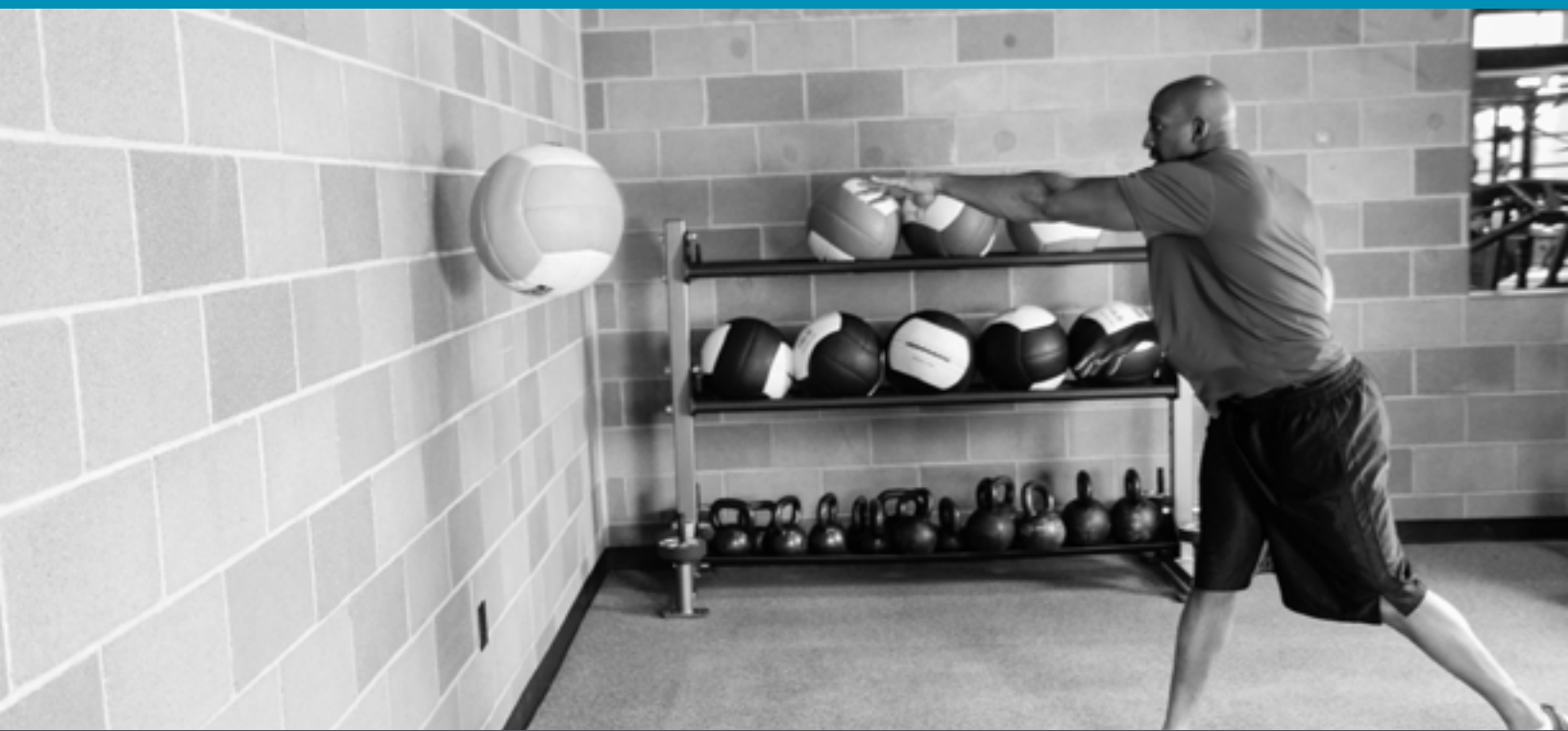




PRACTICAL APPLICATIONS FOR ROTATIONAL POWER TRAINING

DAVID OTEY, CSCS, NSCA-CPT

INTRODUCTION

Rotational training is an often overlooked piece in individual strength programming. While most think of rotational strength training as applying only to specific training for sports and athletic activities, the practical applications of this type of training translate well for general population individuals, excluding those with pre-existing contraindications. Core training has been a topic of conversation for many years, with topics ranging from spinal stabilization to aesthetic goals. This article will address the specific approaches rotational training can have in an individual's strength program to address core integrity, synergistic muscular systems, and overall athletic capabilities as we age.

WHY ROTATIONAL POWER TRAINING

Rotational power is the generation of force around a singular axis through the integration of the muscular and joint systems. Clients today have goals that are focused on the idea of long-term health and movement quality. Throughout everyday life, individuals will encounter multiple activities that require the need for rotational movement, anti-rotational movement, or general power application in a rotational direction. In order to best prepare ourselves, and the individuals we train, it is important to address not only the needs of specific activities, but also everyday activities.

Low back pain is a common occurrence for most people at some point in their life (1). Transverse movements incorporating the core are an inevitable part of our activities of daily living (ADLs). Through everyday activity, the body is asked to do full body

movements from multiple angles. "The Training Octagon," as created by Santana et al., is one approach to identifying eight patterns we commonly work through involving the anterior and posterior core (5). These patterns were identified as a means of developing a simple training system for the "power highways" that we commonly use. The development of this system can improve movement efficacy, leading to less pain in vulnerable places such as the lumbar spine.

While the core has been traditionally trained in isolation for its aesthetics, the core is the bridge that connects two major ball and socket joints: the glenohumeral (shoulder) joint and the acetabulofemoral (hip) joint. The core serves as either an anchor for limb movement, or a transition point for force generation between the upper and lower body (6). Most of the energy for rotation is developed in the hips, from overhead throwing athletes to shoveling snow from a walkway, and is transitioned from the foot upward (3). When training to improve tasks in everyday life and minimize injury risk, it is important to train in accordance with the Specific Adaptations to Imposed Demands (SAID) principle (4).

THE APS AND THE ROTATIONAL CORE

In 1970, Logan and McKinney introduced the Serape effect (2). A serape is a piece of cloth common in South American culture that wraps around the neck and crosses down in front of the body diagonally. This similar pattern was found in four sets of muscles: rhomboids, serratus anterior, external obliques, and internal obliques. In 2015, Santana et al. expanded on this by introducing

the anterior and posterior serape (APS) (6). This concept was expanded to include the oblique sling system, with upper to lower body connections designed to optimize rotational movement. The spiraling connection between lower body and upper body movements helps explain the foot to finger coordination. While the core stiffens for the transfer of energy, this connecting system helps transfer energy from one portion of the body around to the other side as necessary.

Rotational power is a product of power generated through the hips or shoulders and transferred through the core. Torso rotation, with the intent to produce power, is important for improving athletic ability while also improving injury prevention (5). In light of this, the intention of implementing rotational training, specifically rotational power, has the following three benefits:

1. Enhance local mobility at glenohumeral and acetabulofemoral junctions
2. Establish proper core stiffening in the presence of outside change
3. Improve movement pattern quality for translation to ADLs

With so many patterns in our everyday life that are impacted by rotational movement and rotational power, we can systematically add this into strength programming to better prepare clients.

THE POWER PYRAMID

When approaching rotational power training with an individual of any background, it is important to have a structured approach. Creating a program which yields maximum impact with minimum risk is the goal. In order to accomplish this, the “Power Pyramid” was developed to create a clear-cut line of progression, from baseline movements to power training.

This approach helps to solidify movement patterns, build integrity into the mechanism, and over time, introduce the integration of supporting muscular systems. Developing mobility at two primary mobile joints (acetabulofemoral and glenohumeral) will establish the necessary movement from the limbs for rotational power down the road. Next is building integrity to the anterior and posterior core through the resistance of movement. The core is responsible for transferring power between upper and lower body regions and is influenced by the level of stability.

FIGURE 1. POWER PYRAMID



With the foundation of rotational training established, the next three steps involve working the body as a synergistic mechanism. From there, power and locomotive power are added. Ballistic rotation can be seen in some daily tasks, but locomotive ballistic rotation is primarily identified with sports. The appropriateness of exercise prescription and progression should be made with consideration of what will safely progress the individual, and what can be deemed necessary and unnecessary due to their current lifestyle and activities. There are a few considerations when discussing rotational training with regard to skill demand, risk management, and anticipated outcomes.

FIGURE 2. BASE OF SUPPORT



BASE OF SUPPORT

Rotational exercises can be seen from a segmental approach, or a full body perspective. When building up the Power Pyramid from dynamic mobility upward, the progressions listed prime the system to allow movement at common junctions and establish the necessary stability to withstand power transfer. With respect to rotational training, when building into the rotation phase, it is important to understand the necessity of the appropriate stance to support the movement.

Any movements from the rotational phase and above should be performed from the bilateral, staggered, or unilateral stances. Integrating muscular and joint systems for rotational movement allows joints to absorb force and move naturally. With a fixed position closer to the hip joint, full acetabulofemoral range of motion is compromised. This fixed position could, over time, lead to harmful movement patterns or increase the demands required from other supporting joints, such as the lumbar spine.

LEVER ARM

As the load translates further from the body, there is an increased force demand due to increased torque. This must be considered when deciding modalities for individuals (e.g., medicine ball, cables, ViPR, sports equipment, etc.).

SKILL DEMAND

Movement complexity should only mirror the individual you are working with. Creating more difficult demands in training may be ideal, unless it is at the risk of the client's muscular or orthopedic health. Your clients' training should be based on pre-existing conditions, training goals, age, and training history.

PRACTICAL APPLICATIONS FOR ROTATIONAL POWER TRAINING

APPLICATION

The implementation of a program which incorporates rotation training should be added according to the client's place in the Power Pyramid. With any new movement, it is important to allow time for the system to acquire new skills and to accomplish them with ease rather than racing to more advanced power applications. At lower levels in the pyramid, moves can be added as dynamic warm-ups, or even during active rest periods. As you progress through rotation training and beyond, exercises should be added into your program with the intention of learning and skill proficiency. With this in mind, it would be best to implement the movements in a similar manner to energy system development. They should be added slowly into the program as 2 - 3 exercises with the overall goal of solidifying movement quality.

Multiple modalities can be used for rotational training. The modality should be selected based on availability, full range of motion capability of the client, and adjustable lever arm. As rotational training is added to a client's program, it should be with the intention of translating to more efficient movement patterns. While certain high power rotational movements are beneficial as a conditioning piece, the implementation of this training with general clients should proceed with caution.

CONCLUSION

As rotation, power, and rotational power are all common pieces of our everyday life, it is important to train for efficiency in the movements. Identifying movements through the APS model and Training Octagon will allow individuals to understand the synergistic connections in the body that help us accomplish rotation. Implementing this work systematically with the Power Pyramid will allow you to devise programs for clients with the intention of maximizing movement quality while minimizing risk. Understanding concepts such as base of support, lever arm, and skill demand in relation to training is essential for maintaining a healthy progression between steps in the pyramid. These considerations can move individuals towards more synergistic collaboration between muscle groups, allowing more athleticism as we age.



FIGURE 3. ANTERIOR INFLUENCE



FIGURE 4. LATERAL INFLUENCE



FIGURE 5. QUADRUPED THORACIC ROTATION



FIGURE 7. DEADBUG



FIGURE 6. QUADRUPED THORACIC ROTATION



FIGURE 8. DEADBUG

PRACTICAL APPLICATIONS FOR ROTATIONAL POWER TRAINING



FIGURE 9. SHUFFLE MEDICINE BALL TOSS



FIGURE 10. SHUFFLE MEDICINE BALL TOSS

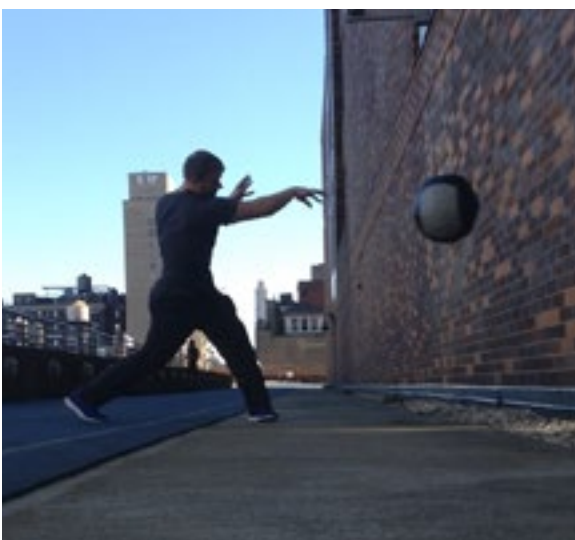


FIGURE 11. SHUFFLE MEDICINE BALL TOSS

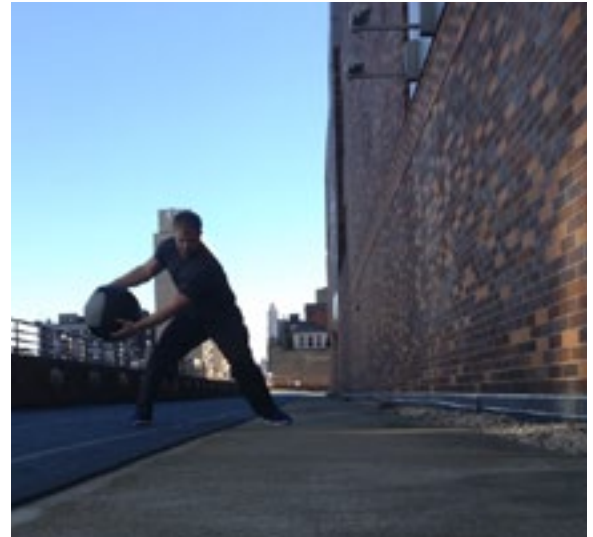


FIGURE 12. SHUFFLE UNDERHAND MEDICINE BALL TOSS

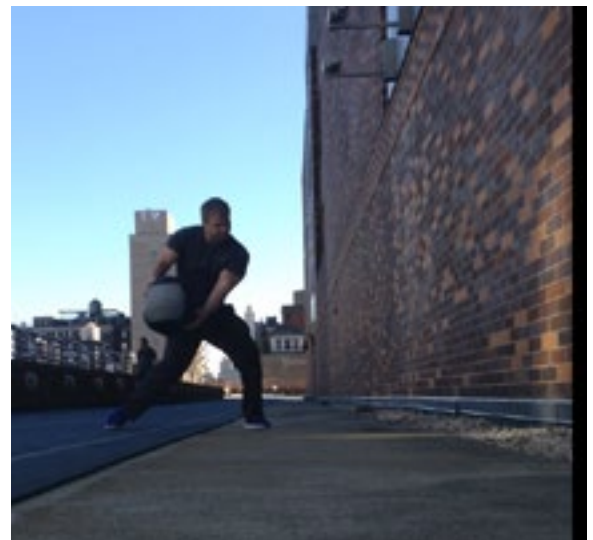


FIGURE 13. SHUFFLE UNDERHAND MEDICINE BALL TOSS

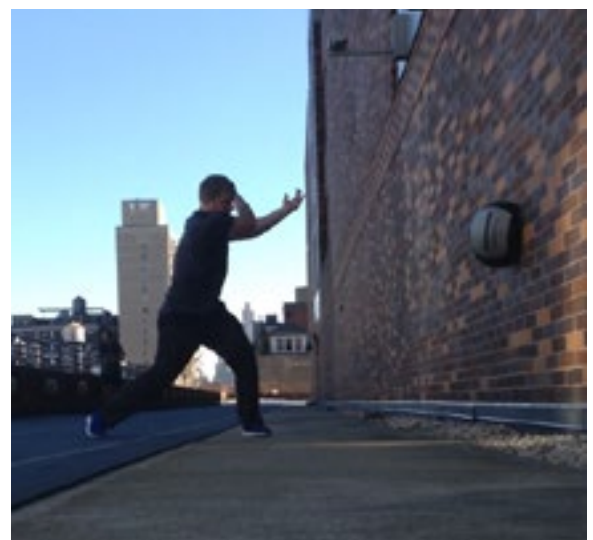


FIGURE 14. SHUFFLE UNDERHAND MEDICINE BALL TOSS



FIGURE 15. SINGLE-ARM LANDMINE PRESS



FIGURE 17. VIPR LUNGE WITH EXTENSION



FIGURE 16. SINGLE-ARM LANDMINE PRESS



FIGURE 18. VIPR LUNGE WITH EXTENSION

PRACTICAL APPLICATIONS FOR ROTATIONAL POWER TRAINING



FIGURE 19. VIPR PUNCH



FIGURE 20. VIPR PUNCH



FIGURE 21. STANCE 1 – HALF KNEEL



FIGURE 22. STANCE 2 – FULL KNEEL

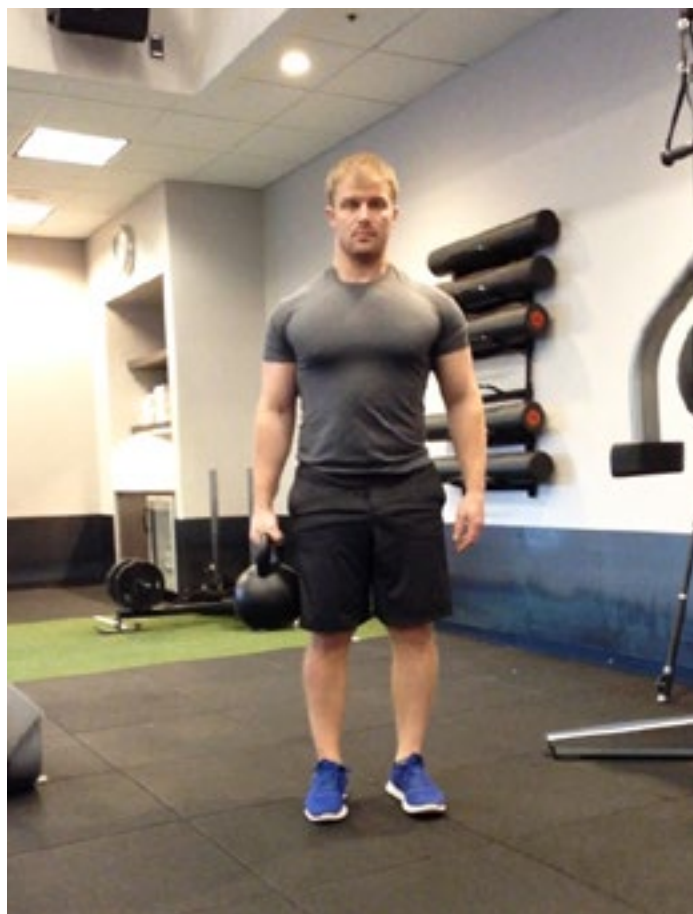


FIGURE 23. STANCE 3 – STANDING

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ABOUT THE AUTHOR

David Otey is the 2016 Fitness Manager of the Year for Equinox Fitness Clubs. He currently is the Personal Training Manager for Equinox in New York, NY, overseeing a staff of 60+ trainers with 750 clients. Otey graduated with a degree in exercise science from Rutgers University and currently holds both the Certified Strength and Conditioning Specialist® (CSCS®) and National Strength and Conditioning Association (NSCA) Certified Personal Trainer® (NSCA-CPT®) credentials through the NSCA. With 10 years in the industry, Otey has a knowledge base of commercial fitness centers and performance facilities. With his experience, he is a regular contributor to top fitness magazines and is a speaker on various fitness topics. Otey currently mentors trainers in program design, exercise protocols, and business development.

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