Ground your toes, elevate your game!

GUEST CORNER

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In sports or any dynamic activity, optimal body mechanics are crucial for performance and injury prevention. The positioning of the foot and toes during activities are often overlooked particularly in sports that require running, jumping, or quick lateral movements. Maintaining a proper foot posture by keeping the toes grounded, can significantly impact stability, balance, and overall athletic performance.

UNDERSTANDING THE FOOT MECHANICS

The foot consists of a complex structure of bones, ligaments, muscles, and tendons that work in harmony to provide support and mobility. Major parts of the foot include the forefoot (toes and metatarsals), midfoot (arch), and hindfoot (heel and ankle). The foot muscles can be broadly categorized into intrinsic and extrinsic muscles. Intrinsic muscles are located within the foot, while extrinsic muscles originate in the lower leg and attach to the foot. These muscles work together to provide support, movement, and stability to the foot and ankle.

When engaging in physical activities, our feet perform several functions, including:

- Weightbearing - our feet support the entire body weight when standing or moving;
- Shock absorption - the foot's arch act as a cushion during impact like jumping or running.
- Propulsion - muscles and tendons in our feet are essential for generating the force needed for movement, particularly in activities such as sprinting and jumping. The toes contribute to forward motion and speed; and
- Stability - proper foot posture is crucial to maintain balance.

PLYOMETRICS: DEFINITION AND BENEFITS

Plyometrics involve a rapid stretch of the muscle (eccentric contraction) followed by a quick shortening (concentric contraction). Examples of plyometrics include side-shuffle jumps, rope jumping, and box jumping. Plyometric training is essential in athletic performance and involves short, intense bursts of activity that targets fast-twitch muscle fibers in the lower body.

Benefits of plyometrics include the following:

- Improve power – the muscle fibers help generate explosive power that increases jumping height;
- Increase speed - develops the fast-twitch muscle fibers, crucial for sprinting and acceleration; and
- Enhance coordination - engages neuromuscular pathways (muscle memory) that improve overall coordination, balance and proprioception (the body's ability to sense its position in space).

WHY KEEP THE TOES GROUNDED?

Grounded toes produce several benefits:

- promote a wider base of support during sports and encourage the correct alignment of the body through the kinetic chain, which can lead to enhanced performance and reduced injury risk;
- help activate intrinsic foot muscles that stabilize the arch and enhance proprioception;
- improve power generation - the toes play a critical role in the push-off phase of running and jumping. When the toes are properly aligned, they better contribute to propulsion, allowing athletes to generate more power and speed;
- prevent injury - improper toe positioning can lead to overpronation or supination, which places undue stress on the joints and ligaments of the foot, ankle, knee and hip. Keeping the toes down helps distribute forces more evenly, potentially reduce the risk of common sports-related injuries such as ankle sprains, tendonitis, and shin splints; and
- optimize alignment - proper toe alignment influences the entire chain of body mechanics. When the toes are pressed down into the ground, the ankles, knees, hips and back align properly, minimizing the risk of misalignment injuries in the lower kinetic chain.

TWO CASE STUDIES AS ILLUSTRATIONS OF PHYSICAL THERAPY REHABILITATION FOCUSING ON FOOT STABILITY

First, a middle-aged professional ballroom dancer: presented with severe knee and hip pain. Diagnosed with hip bursitis and meniscus strain. He was not able to keep his balance during his ballroom performances and devastated that he had to stop dancing. Traditional conservative treatment (including cortisone injections, stretches and strengthening exercises) did not help. During a PT re-evaluation, I noticed that when walking barefoot, all his toes were up in the air and did not touch the floor. He compensated for lacking proper foot alignment by overusing his knees and hips. Consequently, our physical therapy rehabilitation plan focused on:

- strengthening exercises - targeting the intrinsic muscles of the foot to improve control over toe positioning and to improve "toes down" with arch contractions and resistance band toe pushes to enhance strength and flexibility; and
- proprioceptive training - incorporating balance exercises, such as single leg-stands with pressure shifts from side-to-side and toes-to-heels while toes stay grounded, to enhance awareness of toe-positioning and overall body alignment, realigning the lower kinetic chain.

The result: he is still dancing without any injuries or pain!

Second, a high school accomplished Lacrosse player: presented with severe shin pain each time he runs or plays sports. Diagnosed with Occult injury (possible fracture not visible on imaging). He was placed in a hard boot and rest, and did not improve. During the initial PT evaluation

walking barefoot, I noticed all his toes were up in the air, not touching the ground, causing intense overuse of all his toe extensors attaching onto his shin (Tibia). The weakness of the intrinsic muscles caused overuse of the extrinsic muscles. Our physical therapy rehabilitation plan focused on toe flexor, foot arch strengthening exercises during explosive plyometrics that he needs as an athlete.

The result: he is practicing daily and playing tournaments without any pain and improved his performance as a Lacrosse player.

CONCLUSION

Foot stability is the solid foundation for all movement. The positioning of the toes during sports is crucial for athletes seeking optimal performance and injury prevention. By keeping the toes grounded, athletes can improve balance, generate more power, and maintain proper alignment. Incorporating guidance from a physical therapist can be instrumental in achieving these goals, allowing athletes to reach their full potential while minimizing the risk of injury.

The first step in improving foot function is getting connected to the foot. Make your feet a priority. Keep moving with a solid foundation, balance, stability, sensory input and proprioception to perform at the top of your athletic efficiency and prevent injuries or falls. The good news is with the right exercises, you can improve your foot mobility, balance and coordination.

If you need further advice as an athlete or anyone who wants to improve their foot mobility and stability to keep moving, please contact your physical therapist.

Lize Lubbe is the owner of Lize Lubbe Physical Therapy with its main practice located at 892 Route 35 in Cross River and a PT Studio in the premises of Apex Fitness (where her team focus on the rehabilitation of sports-related injuries). Learn more by calling 914-875-9430, emailing contact@lizelubbept.com or visiting www.lizelubbept.com.