1.2 – Three Functions of Foot

Our feet act as levers, propelling the body forward.

Keep in mind that this is a simplistic statement and more of an archaic overview of how our feet are systematically connected to other areas throughout the entire body. Our big toes are the very foundation of the posterior chain. The big toe function can be traced through the entire posterior chain all the way to the posterior base of the skull. If you were to examine a cadaver you would find that while manipulating the position of the big toe, there will be a slight shift in the skull. This shift is caused by the deep fascial connection that the big toe has with the posterior chain.

Our feet play a major role in biomechanical positioning as well as function in a major chain in the body. The chain that I am referring to is the Lateral Sling. The lateral sling is responsible for proper stabilization of the hips. However, if there is a dysfunctional point in the chain the athlete is likely to compensate, under perform and is at a high risk of injury. To fully understand how this connection works we will trace it all the way down to the function of the big toe.

Here is how the chain works.

Always keep in mind that an athlete can exhibit a broken link at several spots in the chain. We will begin with the very foundation of the chain. The big toe. If the big toe does not possess the ability to maintain short foot there will be an elongation or flattening of the 1st Metatarsal Joint. In this scenario short foot refers to the position in which the big toe is arched pulling the pad of the big toe back to the ball of the foot and the ball of the foot towards the heel, creating a tension filled spring. As the toe elongates this arch is lost and energy potential dissipates. This creates a rotational shift in the foot placing excessive stress on the arch of the foot. If the foot lacks a proper arch the foot will be forced into excessive pronation. This shift in arch position causes the foot to collapse. The collapse subsequently transfers up the chain through the ankle causing excessive rotational forces in the ankle complex during motion. I know this is a quick overview but we can now we can see how a trivial position in the big toe causes a major impact on the foot.

Next, we must follow this dysfunction up the chain. As the arch collapses the tibia internally rotates causing a valgus in the knee. This can be observed through a medial shift of the patella during movement, abundantly recognizable during squatting movements. The valgus in the knee causes a reciprocal effect in the femur, causing this section of the leg to internally rotate as well. This is where major problems begin to occur throughout the hip complex.

All of these internally rotated positions cause an anterior shift in the pelvis, thus downregulating the Lateral Slings ability to function efficiently, in turn generating a scenario in which the Quadratus Lumborum begins to lock down. Now that the pelvis is in poor position and the Glutes are not working optimally, excessive stress is being

placed on the Hamstring. This type of athlete is at a high risk for Hamstring injury as well as ACL issues. While, at first it may have seemed difficult to picture how the big toe can play such a large role in pelvic positioning we can now see that there are major positional implications correlated with the function of the big toe.

Our feet also act as the catalyst for transference of training. While we have provided an overview of multiple connections between the foot and human locomotion, the primary purpose of this manual is to address the foot's ability to transfer force from the body into the ground. The strength and conditioning and human performance field is filled with thousands of exercises and drills claiming to enhance the speed of an athlete. Many times, overlooking the most important aspect that is required to truly become fast, a strong foot! Before anyone can discuss protocols for exercises that strengthen the foot and ankle complex, we need to make sure that we fully understand the basic fundamentals of a properly functioning foot. Broken down to its most basic structure the foot is a tripod.

This tripod is what creates proper functioning and stability throughout the foot. In an essence this tripod is basically the fat pad on the heel below the Calcaneus, the fat pad ball underneath your big toe *(1st Metatarsophalangeal Joint)* and the fat pad ball underneath the pinky toe *(5th Metatarsophalangeal Joint).* In order for the body to effectively create forward push this tripod must create a structure that is both stable and functioning at a highly efficient rate. When your body identifies a stable tripod, it will immediately push and allow for ground departure. If the body is unable to find a stable tripod two things can happen.

The first being that there will be a drastic deficit in the body's ability to dynamically produce and transfer power. The second is, the body will find a way to cheat and create a new point in the tripod. This changing in points will significantly increase the risk of structural damage. More specifically this is the issue that creates an atmosphere in which there is a high likelihood of both ankle injuries and ACL tears. This damaging shift in muscular responsibility can also be referred to as a "Parasitic Action" meaning that muscles that are not supposed to contribute to a movement in the body are drawing large amounts of energy and creating a movement pattern that both creates target areas of future pain as well as horribly inefficient muscle actions. While this phase was first used by Dr. Moshe Feldenkrais many years ago, it holds very true today. A quick and easy way to provide some internal feedback and identify where the athletes tripod is, is to have the athlete lift one foot off of the ground, pull their toes up into extension and simply stand on one foot. They may feel a shift in balance propelling them laterally or a feeling of being stuck, anchored back on their heel.

Be sure to check out video 1.2 for further clarification on the tripod of the foot.