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Back to the Basics

By Derek Steveson, DPT

As clinicians we have the unique privilege to assist people who present to us with functional limitations and/or pain. In order for us to be as significant as possible to these people it is imperative that we have a solid foundation in comprehending how the human body functions. We must utilize our knowledge of the basic sciences to guide our intervention. It is not a coincidence that anatomy classes are offered prior to physiology classes in medical education. The thought process required to appreciate function is greatly facilitated by our knowledge of structure. Thus, it is safe to say that anatomy dictates function. The scope of this article is to provide the clinician with a rational approach on how anatomy can lend undisputed evidence to understanding function.

It is important to establish a reference point in order to understand how anatomy effects function. So, we will use the upright anatomical position to guide us in this process. Starting from the ground and moving upward, we can note that the location of some of the ligaments of the foot and ankle help to support how and why they have specific functional roles. The deltoid ligament on the medial aspect of the ankle is a broad expansive structure compared to the thin, much less dense lateral ligamentous complex (ATF, CF, PTF) lending evidence to the fact that the body requires more fortified structures medially in order to absorb pronatory forces. Moving up the chain to the knee, the same inference can be made by observing the thick, broad medial collateral ligament in comparison to the thin lateral collateral ligament. At the hip, it is noted that the iliofemoral ligament is structurally positioned to attenuate triplane forces, especially those occurring in the transverse plane.

One unique way to simplify the process of understanding function and how one specific structure is integrated into the entire chain is to visualize yourself as that structure. We call this intransformationalizing. One ligamentous structure that most clinicians deal with is the anterior cruciate ligament of the knee. So, if we intransformationalize ourselves as the right ACL with our head serving as the proximal portion of this structure, we note that our head is embedded into the posterior part of the medial side of the lateral femoral condyle. Our body then extends inferiorly, anteriorly, and medially to attach our feet into the anterior part of the intercondylar area of the tibia, just posterior to the attachment of the medial meniscus. Now that we know our position in life, we can figure out what we are supposed to do. We also know who our friends are (like the gluteus maximus and the abdominals) and that if they all do what they are designed to do, we will be safe. It is interesting to note that recent studies have shown an increased incidence of ACL tears in female soccer athletes vs. their male counterparts. Many theories have been and continue to be investigated with respect to why

this occurs. One plausible cause could stem from the differences between male and female anatomy.

As mentioned previously, the gluteus maximus is a close friend to the ACL. When observing the fiber orientation of this muscle, we note that the fibers originate posteromedially from the ilium and sacrum and that they slope inferolaterally across the buttock at a 45 degree angle, then inserting into the iliotibial band. The IT band then extends distally connecting to the lateral patellar retinaculum and to Gerdy's tubercle on the anterolateral aspect of the tibia. Knowing the position of these previously mentioned structures enables the clinician to theoretically explain why the gluteus maximus acts as a decelerator of functional triplane forces acting on the hip and knee. Thus, acting, as any good friend should, to protect the ACL from having to absorb a load that proceeds into the non-elastic region of deformation, causing it to tear.

The thought process required to put each patient's functional puzzle together can create confusion. Understanding functional anatomy serves as a foundation to create optimal healing environments, specific to the needs of each person. Any clinician that accepts this challenge will undeniably be significant to the patients and colleagues they interact with. The following are some ideas mentioned to provoke a functional thought process. Be prepared to share these ideas at the Chain Reaction EXPLOSION course.

1. Explain the role the abdominals have in the diagnosis and treatment of chronic hamstring dysfunction. (Hint: Look at the fiber orientation and attachment sites of all the abdominals and decide for yourself whether or not the "sit-up" or "crunch" will functionally train these muscles to do what they are asked to do during gait or running.)

2. Why are our ankles so small in size in comparison to our butts? With this in mind, is it important to functionally evaluate and treat the gluteus maximus in a patient with a grade II ankle sprain?

3. We have muscles that can, in an isolated fashion, cause the hip to internally rotate. What causes the femur to internally rotate during the contact phase of gait? (Hint: It is not one of the muscles that can cause the femur to internally rotate during an isolated open chain environment.)

These questions can go on indefinitely, but hopefully by now you can see that all the research in the world cannot refute what God has so graciously already given us... the very complex, yet oh so simple, human body.

REFERENCES:

1. Atlas of Human Anatomy, Frank H. Netter, MD. CIBA-Geigy Corporation, 1989.
2. Clinically Oriented Anatomy, 3rd Ed., Keith Moore, PhD. Williams and Wilkens, 1992.
3. Chain Reaction Festival (course manual), Gary Gray, PT, Wynn Marketing, Inc., 1996.

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He specializes in functional biomechanical consultation, with emphasis on education. He has had the unique opportunity to lecture on functional theories to physicians, therapists, trainers and students on numerous occasions.

He is also currently investigating functional relationships between hip restrictions and upper extremity dysfunction in baseball pitchers.

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