

Foot cliff notes 101.

This is my journey of how I realized that if the foot wasn't important, it would just be one big ass bone.

I have had the privilege to learn the intricacies of human function from Gary Gray and Dr. Dave Tiberio for almost 12 years now. I remember my first Chain Reaction in Raleigh, NC. The seminar started off with the statement, "When the foot hits the ground everything happens". Huh? The Calcaneus is where? The midtarsal joint who? Inversion and eversion? What the \*###\*!,,?? ?!! The foot?...How the hell have I not learned more about this thing over the first 6 years of my career?

First, let me take a step back and explain how I got to this point. The year we went to the Final Four we had a great rebounder who suffered from incredible back spasms that limited his play. We trained relentlessly trying to stabilize his spine through traditional training methods. We used bridges to get his glutes to fire, tried to condition his core with physioball training and chopped and lifted him like there was no tomorrow. He was a great kid and did everything I asked him, but unfortunately my strategies were not creating a solution to his back spasms. Nothing worked, but I took it upon myself to figure this thing out or at least find someone who could. I had heard from some colleagues about a PT from Michigan that was doing some good things. Fortunately, I was given permission to fly my guy out to see him at one of his seminars in Colorado. Enter: Gary Gray.

The meeting went kind of like this.

He asked the player to take his shoes off. I thought, really? "But Gary, his back hurts"??

As Gary watched my guy walk, he showed me that his right arm wasn't working. Hmmmm... I have no idea where he is going with this.

Gary-"Roll your feet to the inside, now the outside".

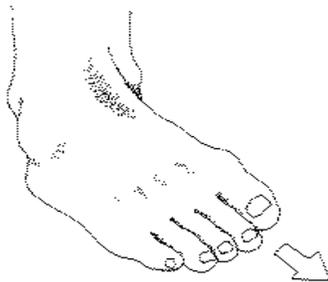
As I stood there, I couldn't help but think what the hell am I doing in Colorado? I really wanted to help this great kid and my inability forced my frustration to spill out.

I interjected, "Gary, what is causing his back pain"? Probably not said in the most polite of ways.

Gary - "See his left heel"?

Me - "Yup".

Gary- "It's locked in Inversion".



Me- "Really....that's great. Why does his back hurt"?

Gary - "His left foot is locked in inversion".

A pretty long pause..... and maybe a confused dog look on my face...but the frustration builds....



Me – “Gary...you don’t get it ...his back is hurting!! What is causing his back pain”?

Another pretty long pause from Gary except his dog face doesn’t tilt to the side with his ears up. He looks at me like he is sitting waiting for me to give him a bone. Calm and confident.

By his calm and assertive look, I suddenly realize, maybe I don’t get it.

Now I’m confused, pissed, suddenly very humbled and now anxious to hear this explanation.

Me – “You’re telling me his left foot is causing his back pain”?

Gary – “YUP”!

At this point, I’m ready to sit like a dog, bark like a dog, rollover, play dead, run and fetch and may even go to the extreme of pooping and picking it up myself with a plastic bag right here at this Colorado seminar.



Me-“Will you teach me what you’re talking about”?

Gary- “YUP”!

As Gary began to teach me, I felt like I was learning Chinese with a little bit of Latin sprinkled on top. But you know what I figured out? If I can learn it anyone can!

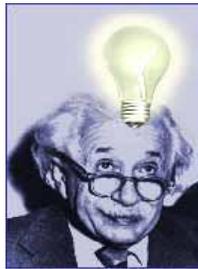
So here are my cliff notes and my interpretation from some very brilliant people.

#### Examining the structural design of the foot

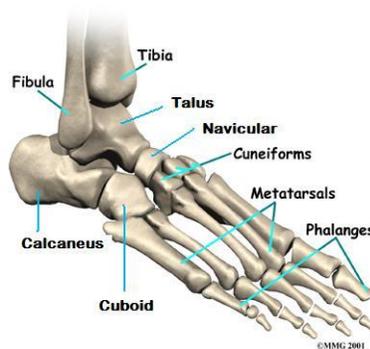
As I started to learn about the foot that night, I wanted to know everything about it.

Ok, so you have 206 bones in your body. 26 bones are in each foot. I knew I could add so  $26 + 26 = 52$  and 206 divided by 52 is.....

Ba Ding! An Einstein moment for me. Over one quarter of your bones are in your feet. Well this thing must be pretty important, right? If it wasn't, wouldn't it just be one big ass gigantic bone? Profound, isn't it?

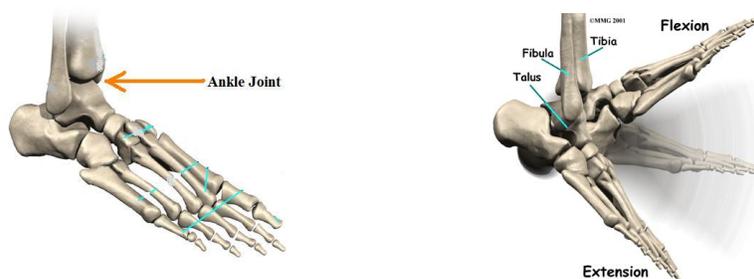


I couldn't help but marvel at the complexity of the foot. Along with its 26 bones, the foot also contains over one hundred muscle bellies, tendonous insertions and connective ligaments. It is wrapped with thick fascial bands, enclosed by protective fat pads and contains elaborate networks of nerves, blood vessels, and skin. With the complexity of the foot now in perspective, to me, its importance became obvious.



Yep, this is me feeling stupid again for ignoring the foot for so many years. Let's break this thing down.

Ok, so starting from top to bottom, the initial mobility joint of the foot is the ankle or talocrural joint (uhhh...yeah we'll just call it the ankle). While the ankle often serves as a catch all term, by definition it constitutes the interaction between the talus bone and the bones of the lower leg. The setup of the ankle allows it to act somewhat like a hinge to give it front and back motion.



The next foot joint may actually be the body's most important joint for upright movement. The subtalar joint...hold up...subtalar??? Ok SUB-Talar...Below the Talus bone...Boom...Got it! The subtalar joint is made up of the Talus bone and the heel bone. Unlike the ankle, this joint doesn't just move front to back but allows the rear-foot to move in three dimensions, which is why it's so important. See, I consider the subtalar joint to be the trigger of the body. If the trigger is working right, the gun fires and amazing things happen throughout the rest of body. But, if that trigger gets jammed up, bad things happen and the rest of

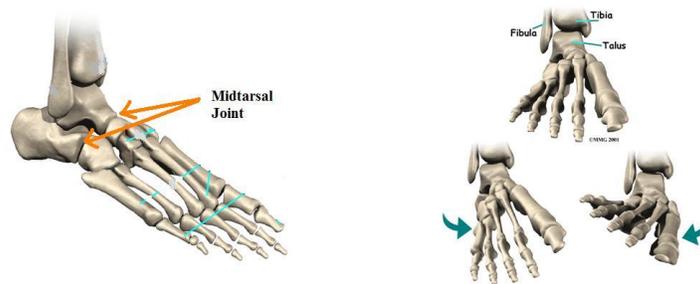
the body can't do its job. The subtalar joint converts motion of the heel up the chain of the body, allowing other joints to move and muscles to activate.



Gunshot.mp4



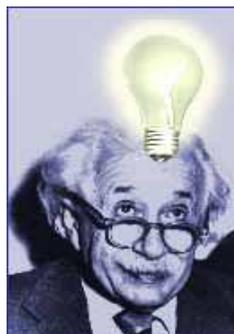
The importance of the subtalar joint also extends to the influence that it has over our next joint. The mid-tarsal joint...hit the brakes again...mid-tarsal??? Ok MID-tarsal...middle of the foot...Boom...I think I'm starting to figure this thing out! The mid-tarsal joint is interesting, because it's actually two joints 1. Talonavicular joint (Talus bone + Navicular bone) and 2. Calcanealcuboid joint (Calcaneus bone + Cuboid bone). The subtalar joint gives the rear-foot 3D motion while the mid-tarsal joint gives the forefoot 3D motion.



Like I told you....Chinese with a little Latin...but stick with me.

Ok...that makes sense...all the joints of the foot work together to give it 3D motion...Boom...But why I thought?

Are you ready? Maybe the foot has different responsibilities based upon the task and this design allows greater structural diversity? Ba Ding! Einstein moment #2!



I think just being around Gary and Dr. Tiberio made me smarter!

Gary confirmed my intuition, I remembered him telling me that the foot not only has to function as a "mobile adapter" to react to gravity, ground reaction and the mass of the body, but also as a "stable propulsive flipper" to allow the foot to explode off the ground. They told me to think of the foot as a

wave...It flows from, mobile to stable, mobile to stable, mobile to stable. ....Load then explode, load then explode, load then explode.

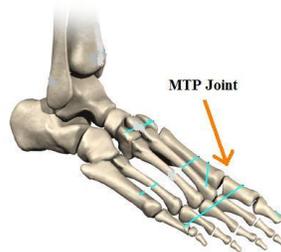


3d Ocean.mp4

Hmmmm....makes sense...at this point I was slowly becoming bilingual and picking up a little bit of Gary's functionese!

Hold on though...one more joint we need to talk about.

The often overlooked MTP joint (metatarsophalangeal joint (metatarsal bone + Phalange bone) aka...the Big Toe! BigToe??? Can the big toe affect the rest of the body?...You're damn right it can! If that toe doesn't flex upward or go through hallux dorsiflexion (as the people smarter than me called it) when the foot pushes off the ground, that trigger can get jammed up again. A locked up trigger means the rest of the body (hip, knee, back) can't work right. Back pain from the big toe...sounds nuts...but I'll give you a story on that one another time.



In part 2 we'll break down how this thing actually works and how the task dictates the foot's function.  
Until next time...Boom!