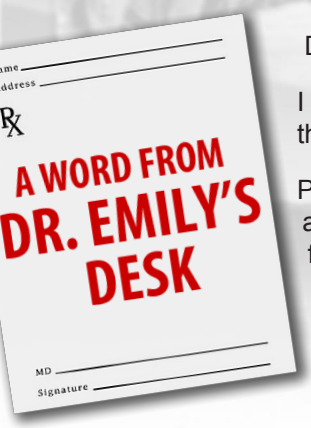
GROW WITH EBFA™

June, 2013

Educational newsletter brought to you by the Evidence Based Fitness Academy Inc.



Hello Health & Fitness Professionals!

Dear Health & Fitness Professionals,

I am very excited to announce that EBFA is branching out to the physical therapy division of education.

Partnering with Medical Minds in Motion, physical therapist and other health professionals can earn CEUs while furthering their understand of barefoot science in the rehab and medical setting.

Learn more about Medical Minds in Motion and the upcoming Barefoot Training in the Rehab Setting by visiting www.medicalmindsinmotion.com

I hope you all enjoy this month's EBFA Newsletter - have a safe and happy Summer!

Dr. Emily

Connect with us

A Different View of Joint Function

Relationships are Complicated: A Different View of Joint Function

Albert Einstein famously quipped: "There is no hitching post in the universe."

A hitching post, in this case, means a starting location: a point A. When an object is moving, the only way to describe how fast it's going, and in what direction, is by comparing

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Core Training as Active Recovery

Whether you are training a client for weight loss or conditioning an athlete for sports performance, they will at some point be trained in the anaerobic zone. From resistance training to performing intervals, the anaerobic energy system offers rapid release of energy lasting approximately 2 minutes in duration and is limited by the formation of lactic acid.

50% of the lactate that is formed in our tissues is cleared through muscle tissue metabolic pathway – specifically through glycogen synthesis (2). Studies have shown that lactate buildup can interrupt muscle metabolic pathways and muscle contractile strength, which means rapid removal of lactate is desired.

Integrating active recovery following intense exercise has been shown to decrease lactate levels more effectively than rest (1). Different modes of active recovery have been recommended, including jogging, swimming and cycling. But have

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Featured Evidence Based Excercise

(Continued from page 1)

you ever considered core training as an active recovery technique?

Surprisingly, performing core stabilization exercises after intense bouts of exercise has been shown to decrease lactate levels by as much as 22% (2). In a 2007 study by Navalta et al., it was found that performing core stabilization exercises including side plank, cobra and prone plank was more effective at reducing lactate levels when compared to rest.

Remembering that it is muscle metabolic pathways that assist in lactate removal, perhaps it is no wonder that core training is an effective active recovery technique. Navalta's proposed explanation for this finding is that core musculature is composed of primarily Type I and IIa muscle fibers, both of which oxidize lactate more quickly than Type IIx muscle fibers (2).

Based on this finding, incorporating core stability exercises during the cool-down period offers a new technique to facilitate lactate clearance. This study provides a great example of how we can look at the evidence to provide our clients and athletes with the most effective training programs, and always have a reason behind our programming!

For additional information on evidence-based core training and the Evidence-Based Core Training workshop from EBFA, please visit

www.evidencebasedfitnessacademy.com

Evidence Based Fitness Academy

"Applying Research – Achieving Results!"

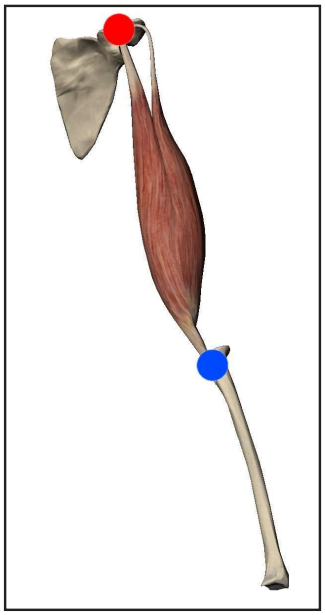
References:
Monedero, J.et al. Effect of recovery interventions on lactate removal and subsequent peribrmance. Int. J. Sports Med. 21:593-597. 2000.
Navalta, J. et al. Core Stabilization Exercises Enhance Lactate Clearance Following High Intensity Exercise. J Strength Conditioning Research, 2007. 21(4): 1305-1309.

it to another object. In the vastness of space, there is no single consistent object—no hitching post—from which to do that. You have to pick one on a case-by-case basis, depending on what you're trying to figure out.

When discussing human musculoskeletal anatomy and kinesiology, a similar concept is frequently—and mistakenly—applied.

The actions of your muscles are described in terms of the movement of the distal (further-from-center) insertion to the proximal (closer-to-center) origin. As a matter of fact, we derive what we call "origin" and "insertion" from this proximal/distal relationship. The bicep, for example, is considered a flexor of the elbow, moving the hand (distal) toward the shoulder (proximal). The gluteus maximus is an extensor of the hip, extending the femur (distal) relative to the pelvis (proximal).

These descriptions are all fine and well, but there are times when the proximal/distal view is not ideal in describing the movement of your joints.

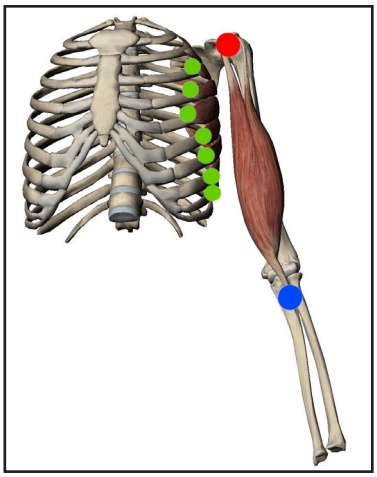


Try to predict what will happen when this muscle shortens:

The red dot is one attachment point and the blue dot another. The muscle acts like a fishing line pulling them closer to each other, but which end is the fish and which is the reel? Will the blue come toward red or the red toward the blue?

The answer is: both. The muscle doesn't know the difference between the two points of attachment; muscles only know how to do one thing and that's shorten.

Now let's add in a few more bones and see what happens when we fix one of our dots to something stable: a fisherman to hold our fishing pole. A more complete version the selection above looks like this: The muscle in question is the bicep. The blue dot is where it inserts into your radius (forearm) and the red dot is its origin at the scapula (shoulder blade). The scapula is fixed to the ribcage at all of those green dots, which represent the origin of the serratus anterior. So the blue dot (our fishing line) moves toward the red dot (our fishing pole) because the red dot is being held in a fixed position by the green dots (fisherman) . . .



So what holds the green dots in place?

Replace the green dot with the red dot, replace the red with the blue and you have to once again

search for the next green dot in the chain. This line of questioning can continue through every muscle, bone and joint in your body and the location of the green dot will continue moving down.

Until, that is, we get to the ground.

There may be no hitching post in space, but there is one on earth: the earth. The speed and direction of everything on the planet is described and measured in relationship to the ground, including you. Your bones operate as a complex set of levers that use the earth under your feet as a fulcrum that converts ground forces into work. The design of your skeleton—of all skeletons, really—is based on the point where feet hit the floor.

As trainers and therapists, this approach is extremely helpful. If a joint is painful or dysfunctional, there is usually some kind of loading problem: forces acting on that joint in a way that they shouldn't. If you assume that the forces acting on all joints originate in the foot*, it's simply a matter of tracing a line between the dysfunctional joint and the ground; somewhere along that line you'll find a blue dot without something stable to hold on to. You'll find a pole with no fisherman.

And this is where describing the motion of muscles from the ground up is more realistic than using proximal/distal relationships. Consider the following:

This is the gastrocnemius, or calf muscle. Gray's Anatomy will tell you that it originates at the femur (the blue dot) and inserts into the calcaneus (red dot) and, if you ask your average trainer for an exercise that utilizes this muscle, they'll tell you to raise your heel off the floor (pictured).

While that's true, it's actually a poor description of what that muscle is actually for. When you're foot is plantar-flexed (pointed, as when standing on your toes) a complex set of actions is taking place in the foot that turn the arch of the foot into a rigid structure capable of channeling ground forces into forward motion. While this is happening, your knee is extending, allowing those same ground forces to be carried from the tibia (or shin) to the femur. With the foot rigid and planted firmly into the ground, it makes an ideal hitching post from which the gastrocnemius can act on the femur, decelerating the extension of the knee and readying the whole leg for the next phase of the gait cycle.

This ground-up view of the calf muscle's function highlights a crucial element of the gait cycle; moreover, in the presence of a variety of knee dysfunctions, the only way to properly diagnose the problem is to understand gastrocnemius' roll from this perspective.

This is just one example of how the proximal/distal perspective can be deceptive. There are a wide variety of pathologies, particularly in the foot and ankle, that are much easier to spot and correct by considering the position of the fisherman standing by the hitching post.

** Obviously, this view omits such issues as direct trauma, wherein force enters the body through other means, like whiplash from a car accident.*

Featured

Barefoot Training Specialist®

Radha Krishnaswamy

BTS Certification Date: Feb 08, 2013

From: Karur, India

Why you would recommend becoming Barefoot Training Specialist®?

I recommend barefoot training to other fitness trainers because it gives us insight in to certain dysfunctions of the lower extremity that is not usually attended to by trainers. So it helps us to serve better.

What did you enjoy the most about the workshop?

What I liked about the workshop was the simple explanations, and the clarity of Dr.Emily's thought and her presence.

Share your story!

We want to hear your stories of how you are using your barefoot training, and how it is benefiting your clients!

Also, if you have suggestions on what you would like to read or hear about in the BTS Newsletter please send your ideas to doug@ebfafitness.com

Joint Coupling: New Insights in Reducing Running Injuries

Running is one of the most common forms of exercise, with benefits ranging from weight loss to cardiovascular conditioning. Despite the millions of dollars spent on research to advance shoe design and orthotic modificaitons, there is still a high rate of lower extremity injuries among runners. In fact a 2007 review by Wen estimated running injury rates as high as 79%!

As a result of the high injury rate among runners, many runners are looking for new ways to reduce their risk of injury. From motion controlled sneakers and orthotics to minimalist footwear, the theories on how to reduce risk of injury are vast. But what is the most effective technique for reducing risk of injury as a runner?

If we look at the latest trends in running and lower extremity biomechanics research, the focus is now turning to what is referred to ask joint coupling.

Or rather the timing of joint coupling and risk of running-related injuries.

For anyone who works with runners or athletes, it is important to understand lower extremity biomechanics – and specifically what happens to the foot and lower leg as the foot strikes the ground.

Walking, running, or pretty much every closed chain movement that we make requires a loading and unloading of kinetic energy – also known as a deceleration and acceleration phase.

When the foot strikes the ground there is a sudden increase in ground reaction forces that travels through the heel and into the subtalar joint above and the midtarsal joints distally.

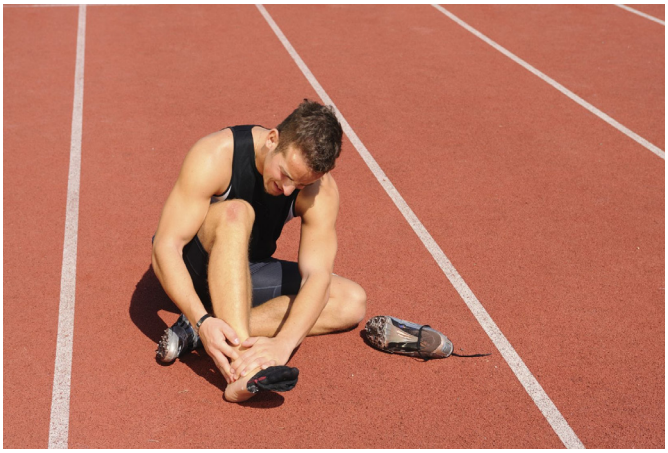
As we transition into the middle of our foot, our sutalar joint and midfoot begin to absorb these ground reaction forces through what is called pronation – or subtalar joint eversion.

Because the foot is closed chain or in direct contact with the ground, research has shown that most of this deceleration of loading phase is actually transferred into the tibia as tibial internal rotation.

As the tibia internally rotates, the knee is brought into flexion in the sagittal plane.

So we have our first example of joint coupling - midfoot pronation, tibial internal rotation and knee flexion!

As we continue through the midfoot into the forefoot, we begin to enter what is referred to as the unloading or acceleration phase. During the acceleration phase the opposite joint coupling occurs. This means we begin to supinate the foot, externally rotate the tibia and extend the knee.



So what does joint coupling have to do with running injuries?

What research has shown is that it is not just the joint coupling that is associated with risk of injury but the timing – or synchrony of the joint coupling!

This means that in an uninjured runner we are seeing peak subtalar joint eversion (pronation) happening at the same time as peak internal tibial rotation and peak knee flexion.

LEADERS IN BAREFOOT FITNESS

Where researchers have primarily seen the asynchrony is joint coupling and the greatest risk of injury among runners was in the prolonged tibial internal rotation.

This means that as the knee has reached peak flexion, the tibia is still internally rotating which requires the hip to activate to try and stabilize the knee . This prolonged internal tibial rotation and over-recruitment by the hip is associated with one of the most common injuries seen in runners – patellofemoral pain syndrome!

In fact most running related injuries including Achilles tendonitis, shin splints, plantar fasciitis can be linked back to prolonged internal tibial rotation - or asynchronousjoint coupling.

So what can you do?

If most running related injuries are associated with asynchrony in the joint coupling moments – and prolonged internal tibial torsion – sounds like we need to teach our runners how to better control their internal tibial torsion!

So which muscles decelerate or control internal tibial torsion?

If you guessed the foot invertors or supinators, you are correct!

We are talking about the soleus and posterior tibialis muscles. Both of these extrinsic muscles insert on the medial aspect of the foot and play a role in both the eccentric control of foot pronation (and therefore internal tibial rotation) and the concentric acceleration of foot supination.

To condition the soleus and posterior for adequate loading and unloading or deceleration and acceleration we need to train the foot in both an eccentric and concentric manner.

Some of my favorite eccentric exercises for the soleus and posterior tibialis are:

1. Reverse heel raises - perform high repetitions one foot at a time and loaded.

2. Walking backwards on treadmill - a great way to warm up the neuromuscular system while training the foot eccentrically.

3. Step offs - perform high repetitions and loaded. Will train both foot and quads eccentrically which is the joint coupling of the loading phase!

To concentrically train the foot invertors we have:

1. Heel lift with ball between heels - research has shown greatest posterior tibialis muscle activation during this exercise

2. Janda Short Foot - one of my all time favorite exercises! See EBFA Blog for more on this.

To train the eccentric to concentric conversion of the soleus and posterior tibialis I recommend:

1. Jumping Rope

2. Barefoot jumps, agility ladder, lateral hops

3. Barefoot kettlebells or lower body strength conditioning

To learn more about reducing injuries among runners - please check out the EBFA Webinar on:

Reducing Injuries in Barefoot Runners!

Foot Fact: Did you know that the Achilles tendon rotates as it descends down to its insertion on the calcaneus? This rotation and the stacked nature of the tendon, makes the gastrocnemius an evertor of the subtalar joint and the soleus an invertor of the subtalar joint.

Upcoming Workshops

US & Canada

Friday July 12, 2013
Barefoot Training Specialist®
-Denver, CO
willPower® Summit
1400 Welton St.
Denver, CO 80202

Saturday July 13, 3pm
Rethinking Proprioception Training for Ankle Instability
- Las Vegas NV
NSCA 36th National Conference
Las Vegas, Nevada

Sat. July 27, 2013
Barefoot Training for Power & Agilty
- British Columbia, Canada
Okanagan Strength & Conditioning Conference
Kelowna, BC

Sat. June 29, 8am-4:30pm
Barefoot Training in Rehab
- Orland Park, IL
Comfort Inn & Conf Ctr
8800 W. 159th Street
Orland Park, IL 60462

June 30, 8am-4:30pm
Barefoot Training in Rehab
- Schaumburg, IL
Best Western Plus
1725 E. Algonquin Rd
Schaumburg, IL 60173

June 21, 8am-4:30pm
Barefoot Training in Rehab
- East Elmhurst, NY
Marriott LaGuardia
102-05 Ditmars Blvd
East Elmhurst, NY 11369

International

May 29, 31 & June 5 2013
Human Gait Analysis
Bangalore, Mumbai, Delhi- India
For more info
contact sanjaydev2002@yahoo.co.in

Sunday June 2, 2013
Barefoot Training Specialist®
Fitness Innovations Singapore Pte Ltd
335B Beach Road
Singapore 119564
Contact: fitsg@fitthai.com

Saturday June 8, 9am-5pm
Barefoot Training Specialist®
SALT Studio
Grand Hotel Saltsjöbaden
Hotellvägen 1
Saltsjobaden, Sweden 133 36
Contact: wlundqvist@hotmail.com

Sunday June 9, 9am-12:30pm
Foot Strike & Functional Movement
SALT Studio
Grand Hotel Saltsjöbaden
Hotellvägen 1
Saltsjobaden, Sweden 133 36
Contact: wlundqvist@hotmail.com

Sunday June 9, 1:30-5pm
Barefoot Training for Power & Agility
SALT Studio
Grand Hotel Saltsjöbaden
Hotellvägen 1
Saltsjobaden, Sweden 133 36
Contact: wlundqvist@hotmail.com

Interested in hosting an EBFA workshop? Contact education@ebfafitness.com

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EBFA in the Community

EBFA is honored to work with Back on My feet again. We recently held a foot health clinic for the runners of BoMF in New York City!

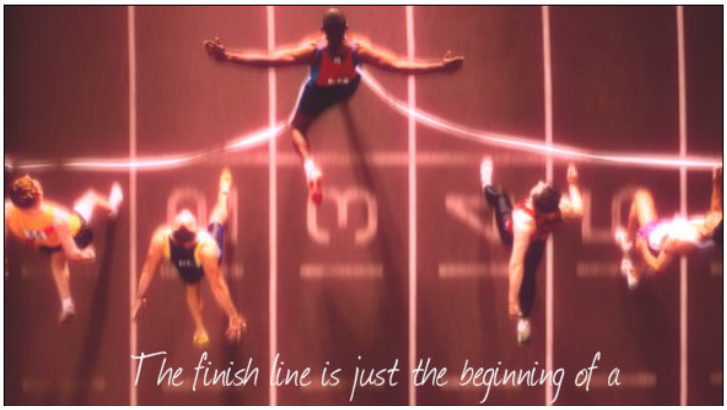
Back on My Feet (BoMF) is a national nonprofit organization that uses running to help those experiencing homelessness change the way they see themselves so they can make real change in their lives that results in employment and independent living.

Do you want to write for EBFA? Contact us info@ebfafitness.com

Recently Certified

Barefoot Training Specialist®

Dr. Noel Snodgrass - Portland, OR
Naoko Songster - Beaverton, OR
Curtis Long- White Plains, NY
Heather Balajadia - Kirkland, WA
Anitha Vasanthi - Chennai, India
Abby Johnson- Portland, OR
Amanda McVey - Seattle, WA
Sathish Kumar - Chennai, India



Upcoming Webinar

Joint Centration & Hip Dysfunction - with Dr Evan Osar

Thursday June 13, 2013 from 8:00 PM to 9:00 PM EDT

Reserve your Webinar seat now!

Register Here: https://www3.gotomeeting.com/register/753187822

Tight hip flexors. Decreased hip rotation. Valgus knees.....These are just a few of the things that immediately come to mind if you were to ask most trainers about common patterns of hip dysfunction.

In this EBFA webinar, Dr Evan Osar joins us to look at what may be the greatest drivers of hip dysfunction and hip arthritis – the loss of optimal joint centration.

Sponsored by Skora Running.

Past Archives

Make sure to view all of our past webinars on our Archive
http://evidencebasedfitnessacademy.com/webinar-directory.html

EBFA Photo Gallery

EBFA's Dr Emily partners with National fitness chain Crunch Fitness to launch the first ever barefoot balance workout - BARE®

EBFA introduces a new online course through Leaders in Fitness! Learn more at www.leadersinfitness.com

EBFA introduces our newest workshop Foot Strike & Functional Movement May 29th in Bangalore, India

Not a subscriber? Sign up now to get free monthly education from EBFA!

Leaders in Barefoot Fitness