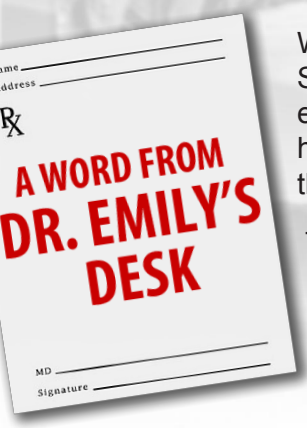
GROW WITH EBFA™

March, 2013

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



Hello Health & Fitness Professionals!

Welcome to the new Grow with EBFA™ Newsletter. Since I first conceptualized the idea of creating a fitness education institution, it was always my goal to bring high quality, affordable and evidence-baed education to the industry.

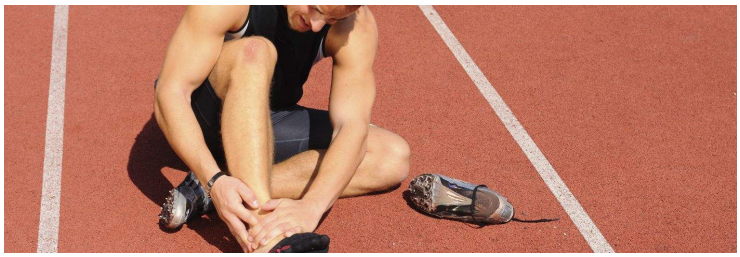
The Grow with EBFA™ newsletter is a great way to stay current with the latest evidence-based exercises, find barefoot training workshops near you, catch up on EBFA in the community - and even guest write for EBFA!

Looking to host a workshop? Or have a barefoot training question? Don't hesitate to contact EBFA at education@ebfafitness.

Dr. Emily

Connect with us

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?

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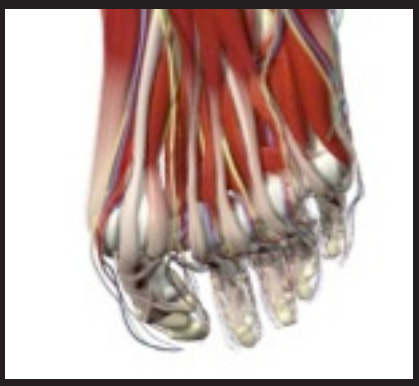
Featured Evidence Based Excercise



Short Foot

When we consider the role of intrinsic foot strength two important functions come to mind:

1. **Dissipation of ground reaction forces**
2. **Support of the medial longitudinal arch**

Both of which are key to optimal foot mechanics and lower extremity kinematics!

As the minimalist movement continues to gain momentum, this type of foot wear and training must still be augmented with some foot-specific exercises. Certainly there may be decreased ground reaction forces (GRFs) if we alter our running mechanics or foot strike patterns - but no type of closed chain movement is free of all GRFs!

So what can we do?

We can start by integrating exercises that specifically strengthen our foot intrinsics and

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Featured Evidence Based Excercise

(Continued from page 1)

create a foundation of proper plantar foot strength.

Various "intrinsic" foot exercises can be found on the internet but unfortunately most are purely anecdotal and have not been "proven" to actually strengthen foot intrinsics.

That is why this month's Evidence-Based Exercise is going to look at one of the best intrinsic foot exercises - short foot! (aka Janda short foot)

A 2011 study by Jung et al looked at the varying muscle activation patterns of short foot and one of the most commonly recommended "intrinsic exercise" toe curls or toe crunches.

Looking specifically at the abductor hallucis muscle, Jung et al. found that EMG muscle activity was significantly greater in the short foot exercise versus the toe curl exercise. When looking at the short foot exercise the muscle activation increased even more when the exercise was performed in a single leg closed chain position.

Why the abductor hallucis muscle?

Muscle activation and strength of the abductor hallucis muscle is important as studies have shown that this intrinsic muscle not only helps absorbs shock but it prevents collapse of the medial arch - or what is called navicular drop. This navicular drop can drive the rearfoot into eversion which translates into leg and hip compensations.

How the health and wellness professional integrate the short foot exercise?

I use the short foot exercise as an activation exercise in my patients and clients with over-pronation or decreased medial arch. As an activation exercise hold the short foot for 8 seconds and repeat 4 times.

I also use the short foot as an intrinsic exercise for my runners, dancers and those suffering from plantar fasciitis! What's great about this exercise is that it is easy enough to do while doing dishes, washing face etc. Its a great exercise to give to clients and patients as homework!

Joint Coupling *(Continued from page 1)*

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. 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.

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.

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

Dr Emily Splichal

Founder EBFA Fitness
"Applying Research - Achieving Results!"

LEADERS IN BAREFOOT FITNESS

Featured

Barefoot Training Specialist®

BTS Certification Date: June 2012
From: California, USA
Certifications: NASM-CPT, NASM-CES, NASM-PES, FMS, DNS, Kettlebells

How has the BTS Certification changed your fitness practice?

Completing the BTS program was like opening a completely new window into the world of human movement. Until BTS I tended to look at people from the knees up. I didn't pay attention to the feet because I was ignorant about their role in human performance and movement health. Ever since BTS, I have become an avid observer of the feet and ankles and now know that a client's foot type can make a big impact on the risks and benefits of different exercise prescriptions.

Why you encourage others to take BTS Certification?

The BTS course is the only one of its type I've taken anywhere—and I've taken many. Without a basic understanding of the foot and ankle, no trainer is even close to complete when it comes to troubleshooting dysfunctions of the body. In this course, Dr Emily is the first clinician I know who has begun the process of tying the trunk to the pelvis to the knees to the ankles and feet, and I applaud her foresight and tireless enthusiasm.

Biomechanical Impact of Children and Shoes

by Doug Joachim dpjoachim@yahoo.com

The children's shoe industry has been around for over a century and represents almost 20% of the 60 billion dollar U.S. market. Yet, many experts agree children's shoes do more damage to the growing foot than they do to protect them . Kid's shoes are cute, clever but can be quite corrupting. At best a child's footwear will protect their feet from getting dirty and at worst it can promote faulty posture, produce an unnatural gait and decrease brain development.

Children's Footwear Myths:

Shoes need to be a snug fit: This doesn't allow for the elastic movement of the foot and toes to work as they are meant to function. Furthermore,the tightness can reshape the cartilage and change the actual shape of the foot!

Heel support and lift is needed for protection: look at your child's shoe. Is the heel higher (and thicker) than the the toe? If so, and it probably is, this will adaptively shorten their Achilles tendon and calf musculature...this can be permanent.

Pronation protection: Pronation is normal! Overpronation is quite subjective and has been seen to dissipate while walking or running barefoot. Let their little cute ankles get stronger by moving through a full natural range of motion.

Leaving room in the shoe for their little feet to grow (or being too cheap and buying a size up thinking they'll grow into it): When they are running around and suddenly stop their tootsies get slammed up against the front of the shoe causing ingrown toenails and worse the beginning of hammer toes and bunions.

Ever try to put a shoe on a baby or the even the family pet? They can hardly remove the offending shoe or booty fast enough. It is actually quite a funny endeavor to watch. This is a message about our instinct to be barefoot. In fact, studies show barefoot children learn to walk more quickly and have less falls than their shod counterparts. Until about age 10, most children still have soft, malleable feet. Not to mention they are getting larger all the time and literally pushing up through the seams. Kids' feet are not just smaller versions of ours; they tend to be wider across the toes and mostly cartilage (which is gradually replaced by bone). Children's footwear is modeled to be smaller versions of adult ones. Some manufauturers make high heels for kids!

Most shoe companies design shoes with pre-defined shapes and overlook the natural architecture of the human foot. This is especially true when it comes to shoes for kids. Rigid and malformed shoes directly effect how a child's foot bones and arch will shape. Our toes are supposed to be spread out, almost in a "v" shape. Instead most of us have crunched and smooshed in feet with little or no independent control of our toes. Our feet become the shape of the shoes we wear.

The soles of our feet and toes contain over 200,000 nerve endings that serve to tell our brain about our environment in order to balance the body, know where and how hard to step down and provide it with accurate information regarding proprioception. The foot brain connection is vital for equilibrium, gait, and dynamic/passive stability. The sensory blindfold of a thick soled shoe confuses the entire connection. A congenially shod child will never properly develop this brain foot connection and will suffer from functionally weak and under-performing feet, unnatural gaits and faulty postural skills.

Interesting research and reviews of shoe wearing children:

Udaya B. Rao, Benjamin Joseph, (1992) "The influence of footwear on the prevalence of flat foot: A survey of 2,300 children", Journal of Bone and Joint Surgery, Vol. 74, No. 4. pages 525-527.

Findings: An Elevated heel of any height on a child's shoe shortens the Achilles tendon. This marks the beginning of permanent tendon shortening. Flat foot was most common in children who wore closed-toe shoes, less common in those who wore sandals or slippers, and least in the unshod. The study suggest that shoe-wearing in early childhood is detrimental to the development of a normal longitudinal arch.

Staheli LT, (1991) Shoes for Children: A Review, Pediatrics, 88(2):371-375.

Optimum foot development occurs in the barefoot environment. 2. The primary role of shoes is to protect the foot from injury and infection. 3. Stiff and compressive footwear may cause deformity, weakness, and loss of mobility. 4. The term "corrective shoes" is a misnomer. 5. Shock absorption, load distribution, and elevation are valid indications for shoe modifications. 6. Shoe selection for children should be based on the barefoot model. 7. Physicians should avoid and discourage the commercialization and "media"-ization of footwear. Merchandising of the "corrective shoe" is harmful to the child, expensive for the family, and a discredit to the medical profession.

Upcoming Workshops

US & Canada

Fri. March 22, 2013 1pm-4pm
Functional Foot & Ankle - NYC, NY
American Academy of Personal Training
138 West 14th St, NYC, NY 10011

Sat. March 23, 2013 11am-5pm
Barefoot Training Specialist® - Chicago, IL
Precision Human Performance
1335 W Lake St, Chicago, IL 60607

Sun. April 7, 2013 1pm-6pm
Fundamental Techniques in Movement Assesment - NYC, NY
Physique
58 E. 11st St., NYC, NY 10003

Sat. April 27, 2013 12pm-3pm
Functional Foot & Ankle - Bel Air, MD
Bel Air Athletic Club
658 Boulton Street, Bel Air, MD 21014

Sun. April 28, 2013 11am-5pm
Barefoot Training Specialist® - St. Louis, MO
Naturally Fit
8029 Clayton Rd., St. Louis, MO 63105

Sat. May 4, 2013 11am-5pm
Barefoot Training Specialist® - Phoenix, AZ
Athletes' Performance
2629 E Rose Garden Ln.
Phoenix, Arizona 85050

Sun May 5, 2013 10am-1pm
Barefoot Training for Power & Agility - Phoenix, AZ
Athletes' Performance
2629 E Rose Garden Ln.
Phoenix, Arizona 85050

Asia

Sun. May 26, 2013
Barefoot Training Specialist® - Singapore
Fitness Innovations Singapore PTE LTD, For more info contact fitsg@fitthai.com

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

EBFA in the Community

back on my feet

We're happy to announce that EBFA will be holding a foot health clinic for the runners of Back On My Feet Chicago.

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.

For volunteering opportunities, please visit their "Run With Us" page (http://chicago.backonmyfeet.org/chicago-run-with-us)

For fundraising info, visit the "FundRacing" (http://chicago.backonmyfeet.org/chicago-fundracing).

For donations http://chicago.backonmyfeet.org/chicago-donate-now

Foot Fact:

The plantaris muscle of the posterior leg is considered a vestigial structure meaning it has evolutionarily lost most of its function. As a weak plantarflexor of the ankle, the tendon of this muscle is often used for tendon grafts during surgery with patients experiencing no loss of function after its removal.

Recently Certified

Barefoot Training Specialist®

Farrell Lenoble - Oceanside, NY

Michele Rogers - Philadelphia, PA

Dr Catherine Casteel - Rockwall, TX

Ann Margaret McKillop - Vermont

Mirko Turla - Hong Kong

Derek Poon - Hong Kong

Sanjay Dev - Bangalore, India

Radha Krishnaswamy - Karur, India

Upcoming Webinar

Barefoot Training: A role in the rehab setting?

Thursday April 4, 2013 from 8:00 PM to 9:00 PM EDT
Space is limited.

Reserve your Webinar seat now!

Register Here: https://www3.gotomeeting.com/register/614178054

As we enter 2013, the top of barefoot running and training is still hot! As researchers continue to explore the benefits of running / training without shoes - can we begin to apply these concepts in the corrective exercise and rehab setting?

Join Dr Emily as she explores the latest in barefoot science and specifically the power behind this training technique in the rehab setting. From clients with ankle instability to patients with SI joint dysfunction, learn the vast applications of barefoot training.

Past Archives

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

EBFA Photo Gallery

EBFA presented at Nike Head-quarters in Portland, Oregon on March 8, 2013

Barefoot Training Specialist® Shanghai, China

ACCREDITED
BAREFOOT
TRAINING FACILITY

Does your facility specialize in barefoot training? Become an Accredited BTS Facilty! Contact us at info@ebfafitness.com

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