

Synergy

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EDITORIAL

Butt v. Butthead

Sherry McLaughlin, MSPT, OCS, CSCS

“The most difficult task of a student is to transform the anal retention of information into a thinking, working knowledge that can be used to benefit others. To call me a butt is an insult. To call me a butthead is a compliment.”—S. McLaughlin

OK...we already know you are capable of memorizing. I think it is probably the way many of us survived in school. Lists, pages, processes and answers are all meticulously tucked away – tidbits of information which carry no connection or relationship to the big picture. This is what is called perceptual learning— learning by what you can see, touch, hear, smell and taste – and it is a necessary part of education.

However, the retention of information in and of itself lacks inherent value if you can't apply it to reality. What does it matter if you can rattle off the origin and insertion of every muscle in the body, or if you can name all of the special tests of the knee or if you can draw the brachial plexus with one eye closed – if you are unable to make the connection as to why it would be important to know that information in the first place? See if you can follow this example:

The right hamstring is tight (perceptual).
The right hamstring is tight due to a lack of right rotation during gait, which probably occurred because this person always holds a leash in the right hand when they walk their dog (conceptual).

The real learning process begins when one explores the more abstract reasoning behind what is immediately visible. Objectivist philosopher, Ayn Rand, went as far to say

that it is—“the only method of discovering and validating principles in any field.” But the hard fact is this...where anal retention can make your butt hurt...conceptual learning will definitely make your head hurt. It is easily the most difficult form of cognition because by this method, principles are not learned all at once. It is the kind of learning that happens in gradual stages, as one learns to relate what they see in one instance to something they have seen in another. After all, when it boils down to it – it's all about the relationships, isn't it?

It's pretty easy to determine whether or not you are a conceptual thinker. If someone asked your opinion on any topic – would you have one? Would it really be your opinion, methodically thought out and pondered – or would it be a regurgitation of someone else's knowledge? Conceptual thinkers don't ingest information and regurgitate it – they digest information, and create from it. They don't rely on what the group thinks, but rather develop their own ideas. They learn principles, not from a book or a lecture, but independently – from reality itself.

The cynic says, “One man can't do anything.” I say, “Only one man can do anything.” One man interacting creatively with others can move the world. – John W. Gardner

It is the difference between the “what” and the “why.” It is the difference between the obvious and the obscure.

And it sometimes makes all the difference in the world.

REAL WORLD KINESIOLOGY

Flex-Time (the importance of ankle plantarflexion/dorsiflexion)

Sherry L. McLaughlin, MSPT, OCS, CSCS

They seem like such insignificant movements - ankle dorsiflexion and plantarflexion. Truth be known, their minute ROM contributions are pivotal in everyday function. And the lack of a few degrees of motion at the ankle joint results in larger compensations up the kinematic chain.

According to Norkin and Levangie, ankle ROM during the stance phase of walking is as follows: 15° plantarflexion at the end of the loading response, 5-10° dorsiflexion at end of midstance and 20° of plantarflexion at the end of preswing. The question is, what else is going on above this? Let's take a closer look...

The need for plantarflexion

When the foot hits the ground and plantarflexion occurs, one is striding forward. The knee and hip are flexing, the femur and tibia are internally rotating and the thoracic spine is rotating towards the ipsilateral side. This rotational pattern results in a natural elongation of the contralateral iliopsoas and quadratus lumborum.

Should plantarflexion be limited, several functional losses may be incurred:

1. An increased knee flexion moment at heel strike – This would place added stress on the anterior knee structures (i.e. patellofemoral joint, patellar tendon, etc.)
2. A shortened ipsilateral stride length— This would result in adaptive shortening of the ipsilateral hamstrings and contralateral iliopsoas. A shortened hamstring may be the cause of a posteriorly rotated ilium and increased flexion stress to the lumbar spine in late swing. A shortened contralateral iliopsoas may result in an anteriorly rotated ilium and a functionally shorter leg, as well as limited ipsilateral thoracic rotation.

3. Decreased ipsilateral thoracic rotation – A lack of thoracic rotation may result in malpositioning of the scapula, creating changes in arm elevation mechanics. This also results in adaptive shortening of the front of the arm line, which can be the cause of ailments such as medial/lateral epicondylitis, carpal tunnel syndrome and DeQuervain's disease. (But that is an article all in itself!)

The need for dorsiflexion

At the end of midstance, the contralateral limb is striding forward. The hip and knee are extending, the femur and tibia are externally rotating and the thoracic spine is rotating towards the contralateral side. This rotation pattern results in a natural elongation of the ipsilateral iliopsoas and quadratus lumborum.

Should dorsiflexion be limited, several functional losses may be incurred:

1. Knee hyperextension – This would create excessive strain on the proximal gastrocnemius as this is the muscle that prevents hyperextension.
2. A shortened opposite stride length, thereby shortening the ipsilateral iliopsoas. This may create a functional leg length discrepancy.
3. Compensatory overpronation at the subtalar joint in mid to late stance – this would place soft tissue stress on the tibialis posterior tendon, tarsal tunnel and soft tissue structures of the medial knee.
4. Limitation in opposite side trunk rotation – this may create an elevated and protracted contralateral scapula and impair arm elevation mechanics.

A lack of dorsiflexion is often caused by anterior migration of the distal fibula following a lateral ankle sprain. Long after the pain of the sprain has dissipated, this

movement restriction remains, resulting in a posterior capsular restriction at the ankle joint.

Limitations in ankle plantarflexion are often present following traumatic injury to the foot/ankle complex.

Small, but significant. That is the contribution of the ankle joint. It has been said, "When the foot hits the ground, everything changes." Now you know why.

Five (5) Flex-time tests

Someone steal your goniometer? Try these tests with your patients instead!

1. Do they feel a pinch in the front of the ankle with weightbearing and/or non-weightbearing dorsiflexion?

An anterior medial pinch may signify a tight posterior capsule. An anterior lateral pinch may signify an anteriorly displaced distal fibula.

2. Check the downward dog position - do the heels touch the floor?
3. Try the gravity drop - can they stand up straight with the balls of their feet on a 3" block?
4. Try an anterior reach with the leg. If this is limited, it turns into a great home exercise.
5. Can they lay prone? A limitation in plantarflexion will yield ankle pain with prone lying.

CASE STUDY

Plantar fasciitis - or not

Andrew Sharpe, MPT, CHT

SUBJECTIVE

The patient is a 37 year old female who complained of right much greater than left heel pain with walking and standing. Symptoms had gradually increased for 3 to 4 months to the point of severe pain after any prolonged walking and every morning after waking up. She could only tolerate walking in tennis shoes and pain was the worst walking barefoot. She stated that it felt like her right foot was "slapping" on the ground when she walked. The patient saw a podiatrist who made a diagnosis of plantar fasciitis and recommended massage and stretching to the plantar arch as a home program and ordered fabrication of foot orthotics. She had attempted massage and stretching but this had only given mild and temporary reduction in pain. The patient asked for a consult regarding any possible benefit from physical therapy secondary to not having insurance coverage for foot orthotics

The patient denied any attributable injury but stated she started a fitness walking program 5 months prior to examination of approximately 6 miles a day. She was not involved in any significant exercise prior to that. She admitted to intermittent back pain for 4 years for which she had not sought medical attention. She also admitted to a slip and fall, landing on her left hip 4 years ago. The hip was painful for several days but pain gradually got better on its own. She was 3 months pregnant at the time of the fall.

Examination revealed a gait pattern of right greater than left toe out. Standing posture revealed flexion of the left knee and right greater than left pes planus. MMT was normal except for left hip flexion and internal rotation were 4 and right hip internal rotation was 4+. Soft tissue extensibility testing revealed

significant loss of right hip internal rotation (approx. 20°).

Palpation revealed a half inch leg length discrepancy with the right leg longer. The right ASIS, PSIS and ischial tuberosity were inferior to the right. There was slight tenderness and hypomobility of the left sacroiliac joint. She denied any other tenderness prior to treatment.

Treatment consisted of muscle energy technique to reduce of left ilium upslip. Following this she complained of significant tenderness upon palpation in the left piriformis. This was eliminated with and following counterstrain positioning. Leg length and pelvic landmarks were then symmetrical. The patient was asked to walk and reported an immediate significant reduction in bilateral heel pain and a "amazing" relief of low back pain. Gait was retested and toe out remained but she stated her right foot no longer felt like it was "slapping." She was asked to walk with the right foot forward which she said made the right foot feel a little better but her right hip felt "funny." Passive stretching was performed for right hip internal rotation after which right hip and right foot symptoms were further lessened during ambulation. Her husband was instructed in how to perform hip internal rotation stretching. She was advised to have right hip internal rotation stretching performed at least once a day and to be aware of her gait and avoid a right toe out pattern.

The patient was questioned by phone 3 months after her consultation. She reported an overall 75% reduction in primary complaints and stated she has been able to return to previous fitness walking and no longer has pain in the morning. She admitted to compliance with right hip stretching for one month, but this has only been intermittent since and she feels symptoms have increased

somewhat secondary to this. She stated she has been very careful to avoid right toe out gait. She had not sought fabrication of orthotics.

This is a case of plantar fasciitis that was effectively managed without any treatment to the foot at all. The patient's subjective history of lowback pain secondary to a fall on the hip suggested possible pathology of the pelvis. That the fall happened when she was pregnant increased this possibility. Gait analysis revealed "over pronation" of the foot with possible compensation for a functionally longer right LE via hip external rotation and toe out. Examination suggested a left ilium upslip as the most likely cause of the longer right leg. Manual techniques to treat the pelvis caused an immediate reduction in foot pain (and back pain) with walking. Stretching her right hip back into internal rotation allowed pronation to now occur there instead of all at the foot, thus taking strain off the arch.

Sure, her plantar fascia was irritated from being overstretched and her arches collapsed when she walked. Massaging and even more stretching of plantar fascia was not the answer. Determining the reason why the arches were collapsing (pathology at the hip) and then treating the biomechanical cause of the problem was.

HANDS ON!

Manual techniques to improve ankle plantarflexion/dorsiflexion

Sherry L. McLaughlin, MSPT, OCS, CSCS and James Lander, MS

Self-mobilization

Inadequate dorsiflexion can be combated by applying various techniques and thought processes however how many manual therapies can you perform on yourself? Here is one that is certain to work for just about anyone regardless of where you are.

Cross one leg over the other knee, just above the ankle. Place your hand on the crossed foot configuring it so that your thumb lies across the Achilles just superior to the calcaneus. Your first three fingers should be placed anterior to the ankle so that the medial malleolus aligns with the web between your thumb and index finger. Place your little finger on the plantar surface of your foot. (Fig. 1)

Now that you are in position, it is time to perform a posterior glide. Pull down with your thumb while simultaneously tugging posteriorly with your first three fingers and a dorsal force with the littlest finger. (Fig. 2)

Hand and foot size may require minor changes in technique. Your free hand can be added to the mix if more strength or leverage is needed. For this, simply place the free hand on top of the first hand, placing the thumb over the Achilles, web spacing superior to medial malleolus, index and middle fingers on plantar surface of foot, and ring and little fingers on dorsal surface of foot (Fig. 3)

The downward force of the thumb will open up the ankle capsule allowing the posterior glide to occur with less resistance and thus creating greater dorsiflexion.

MWM for ankle dorsiflexion

Patient stands with involved foot on a stool or chair. PT wraps hand around posterior aspect of tibia, applying an anterior glide. Stabilize the talus with the web space of the

other hand. Apply an anterior glide while patient performs weight-bearing dorsiflexion. (Fig. 4) May also be performed in supine by performing a dorsal glide of the talus on the tibia/fibula. (Fig. 5) Repeat 6-10 times.

MWM for ankle plantarflexion

Patient is supine with knee flexed to 90° and heel on the plinth. PT stands at end facing the patient. Glide the tibia and fibula posteriorly to lock the ankle joint. With other hand grasping at the TMT joint, apply a ventral glide and then pull into plantarflexion. (Fig. 6) Repeat 6-10 times.

MWM Distal tib/fib

This is another glide that may improve dorsiflexion range (especially after an ankle sprain). Patient stands and then PT glides distal fibula posteriorly as patient performs a squat. Maintain hold while patient repeats movement for 6 repetitions.



Fig. 1 - Self-mobilization (start position)



Fig. 2 - Self-mobilization for dorsiflexion (finish)



Fig. 3 - Re-inforced self-mobilization technique



Fig. 4 - MWM for ankle dorsiflexion (weightbearing)



Fig. 5 - MWM for ankle dorsiflexion (non-weightbearing)



Fig. 6 - MWM for ankle plantarflexion

things that make you go hmmm...

Points to ponder about the foot/ankle

- ❑ **A big bear...**The ankle has a larger weightbearing surface area than the hip and knee joints
- ❑ **When the foot hits the ground...** Due to the shape of the talar dome, subtalar joint eversion results in tibial internal rotation, thereby causing elongation (eccentric load) of the lateral hamstring.
- ❑ **Small, but mighty...** Subtalar joint eversion amounts to approximately 6° of motion during the gait cycle and takes up 25% of the stance phase.
- ❑ **What's the difference?** These structures have intimate relationships with the medial calcaneal tubercle and may be the source of pain referred to the area of the plantar fascia.
 - S2 (dermatomal reference)
 - Tibialis posterior
 - Gastrocnemius/soleus
- ❑ **The Long and Short of it...**Tender points in peroneous longus and brevis are often found in people with flat feet.

The innervation of peroneous longus and brevis is by the superficial peroneal nerve from spinal nerves L4, L5 and S1.
- ❑ **Don't be a Jerk...**Tender points in the soleus muscle may cause a reduced amplitude in the ankle jerk reflex in response to an achillies tendon tap.

FIT FOR FUNCTION

Footloose and ankle-free!

James Lander, MS ExPh, NASM/ACE-CPT

Foot and ankle patients in addition to just about everyone else could use a little work on ankle stability and dorsiflexion ROM to keep them on their toes. Stability in the ankle joint allows proper ankle and foot function to take place, limiting excessive pronation and supination.

Being caught on your heels is not as bad as once thought. If you can rock through these exercises on your next visit to the gym or even in your living room, you'll be well on your way to a more functional ankle.

Foam Roll Rockers

Stand on a foam roll with the flat side up, positioning feet shoulder width apart. Foam roll should lie under the transverse arch. With knees slightly bent, rock back onto your heels and then forward to your toes. Make sure you are using your ankle joint to get this motion. Avoid moving your body forward and backward.(Fig. 1)

BOSU Rockers

With feet shoulder width apart on the flat side of the BOSU, rock both forward and backward, and side to side. Also circumnavigate the BOSU by touching one edge down and roll around the perimeter. Master each direction. (Fig. 2)

Alternating Chest Pass on Foam Roll

Stand on foam roll, flat side down. With toes on apex of foam roll, throw the ball from over your right shoulder and catch it over your left. This exercise emphasizes the transverse plane while also promoting sagittal plane flexibility at the ankles.(Fig. 3)

Posterior Lunge

Step back with one leg shifting weight to back leg, pushing heel to ground. Should induce a soleus stretch to permit increased dorsiflexion. Push back to starting position and repeat to the other side. (Fig. 4)



Fig. 1 - Foam roll rockers



Fig. 2 - BOSU Rockers



Fig. 3 - Alt. chest pass with dorsiflexion bias



Fig. 4 - Posterior lunges

THOUGHTS FROM A HOT-DOG STAND

Learning from Beavis and Butthead

Carl Rundell, BS

GQ: Hello Tito, I will have a hotdog with onions please.

HM: Hello James . . . one hotdog with the works coming right up. Hey, do you know there is a typo on the front page of your Synergy newsletter.

GQ: Where? I did not see one. We proofed the entire issue before taking it to print.

HM: Right there, it should read “*Beavis*” and Butthead, not “*Butt*” and Butthead. Seems like everyone is learned something from those two characters and their cartoon show Beavis and Butthead.



GQ: Tito, there is nothing even remotely connected to Beavis and Butthead in this article. Those two guys are going through life with no real thought or purpose except to come up with insults and humor related to poop.

HM: Young James . . . do not be so quick to pass judgment. Beneath all their potty talk there actually is some intelligence going on. What is the article talking about? Do you want mustard and relish on that hotdog as well?

GQ: Sherry is describing the difference between perceptual and conceptual learning. Neither of which would have ever occurred between Beavis and Butthead.

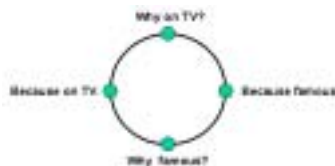
HM: So, what exactly is the difference? **GQ:** Well, to start with Tito, let’s define each type of learning. Perceptual learning is that which is learned

by what you can see, touch, hear, smell, and taste. Basically, it is what is immediately visible.

HM: Hold it right there! Beavis and Butthead are all about learning from the senses and what is immediately visible. For instance in one episode they are watching TV.

Beavis asks Butthead, “How come Tom Petty’s on TV?” Butthead responds, “Coz he’s famous.” So then Beavis asks, “Yeah, but how come he’s famous?” Butthead immediately responds without thinking, “Coz he’s on TV!” And Beavis asks again as inquisitive as before, “Yeah, but how come he’s on TV?”

GQ: You are helping me prove my point. There is problem with that limited thought process. Look at it in terms of a circle. The thought process goes nowhere and really solves nothing.



HM: But Young James, that is not always the result of faulty logic, is it?

GQ: Well, not exactly. It is more the result of having what Sherry describes in the article as “tidbits of information which carry no connection or relationship to the big picture.” That is why we must go one step beyond perceptual learning, to conceptual learning. Conceptual learning is exploring the more abstract meaning behind what is immediately visible.

HM: Hold it right there again. I am telling you James, Beavis and Butthead do just this! In another episode, Beavis whines, “Why is it called taking a dump? You’re not taking

it anywhere. They should call it leaving a dump.”

GQ: Well, I guess in a way Beavis and Butthead are teaching us some form of logic and learning. Conceptual learning is relating what one sees in one instance to something they have seen in another.

HM: See, my point exactly Young James, in the episode last night Beavis and Butthead were talking about an injury.

Butthead says, “Uhh, I have an injury.” Beavis responds, “You do?” Butthead says very matter of fact, “Yeah, I have this great big crack in my butt.”

NOTE: Did you know that anal retentiveness is an elaboration of Freud’s ideas on anality, first published in 1908. Freud talked about anality in part because he thought toilet training was a major factor in personality development.

WHAT DID YOU SAY?

“Even a mistake may turn out to be the one thing necessary to a worthwhile achievement.” --Henry Ford

“A man begins cutting his wisdom teeth the first time he bites off more than he can chew.” --Her Caen

“A wonderful harmony is created when we join together the seemingly unconnected.” --Heraclitus

UPCOMING SEMINARS

APRIL

- 1 - BackTalk Workshop @ MIHP
(7 PM - 9 PM)
- 8 - Missing Links to the Knee
(8 AM - 5 PM)
- 19 - Run Pain-Free Workshop @ The
Community House
(7 PM - 9 PM)
- 31 - The Missing Link @ MIHP

MAY

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(7 PM - 9 PM)

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RESEARCH ROUND-UP

Ab-use and couch potatoes

James Lander, MS ExPh, NASM/ACE-CPT

Overrated Ab Machines

There are countless abdominal machines on the market, but which one is best and is it any better than the traditional crunch? With these questions in mind, a study was formulated with 33 healthy subjects in hopes of creating significant data to point us in the right direction. The devices tested were the Ab Roller Plus, Torso Track 2, AB-Doer Pro, and the Perfect Abs. During each repetition, surface EMG was recorded from the upper and lower portions of the rectus abdominis, external oblique, and the rectus femoris. Previously, portable abdominal devices had been proven most effective, meaning they showed the most EMG activity, if they both mimic the mechanics of the traditional crunch and provide an external resistance to increase the involvement of the abdominal musculature. Of the devices tested in this study, The Perfect Abs was the only device to provide sufficient external resistance to elicit significantly greater abdominal muscle recruitment than a traditional crunch while mimicking its movement pattern. With the Perfect Abs being an exception, most abdominal device manufacturers claim that their abdominal devices are superior to a crunch, however published research fails to support these statements.

Sternlicht, E., and S. Rugg. Electromyographic analysis of abdominal muscle activity using portable abdominal exercise devices and a traditional crunch. *J. Strength Cond. Res.* 17(3):463-468.2003.



The function of the rectus abdominis is to prevent hyperextension and provide stability to the trunk during movement through all planes of motion. Therefore, would it not be better to train this muscle through eccentric ROM rather than flexion, teaching it to perform a task for which it was not designed?

Can A Couch Potato Leap?

There is extensive research on training induced adaptations in terms of neural and structural changes, however few studies have been designed to explain inter-group differences in explosive and isometric strength by determining factors such as neural recruitment or contractile characteristics.

This cross sectional study, involving twenty-five healthy men as subjects who were endurance-trained, power-trained, or sedentary, compared explosive and isometric strength between the three groups. Explosive and isometric strength were tested using performance in the vertical jump and the force reached during knee extensors maximal voluntary isometric contraction. Neuromuscular characteristics were the level of maximal voluntary activation and the contractile properties of both knee extensor and plantar flexor muscles, which were evaluated using the electrically evoked twitch.

The results were that low speeds of contraction like those seen in endurance athlete, do not compromise the development of maximal isometric force. Intrinsic muscular qualities however, tie in directly to performance in the vertical jump.

Lattier, G., G.Y. Millet, N.A. Maffiuletti, N. Babault, and R. Lepers. Neuromuscular differences between endurance-trained, power-trained, and sedentary subjects. *J. Strength Cond. Res.* 17(3):514-521. 2003



Training can induce changes in muscle fiber type nevertheless the couch potato has been genetically engineered to unleash a given isometric force. Although couch ridden, the potato has the ability to perform! The lingering question is what effect does the sagging sides and handles with extra to love have on his performance?

DAILY KNEADS

Lessons from overseas

James Lander, MS ExPh, NASM/ACE-CPT

I recently visited Japan for a week - and took home lessons for a lifetime.

As I stepped from the plane and made my way down the staircase, my first glimpse revealed something drastically different about Japan. The thing that struck me was how remarkably fit everyone looked. In the week I was there, the number of overweight people I spotted could have literally been counted on a single hand. Extraordinary!

How can an entire nation be so thin yet healthy?

Here in the States, a restaurant that did not overwhelm one with food would surely receive a faulty rating. Typically I would head into a meal quite hungry and that is where the American expectation would be one of little time spent waiting for the onslaught of food to begin.

Interestingly my experience was that the more expensive the restaurant, the longer the wait for the initial and proceeding course. Typically the meals would have 3 to 5 courses which took anywhere from 2 to 4 hours to get thru. The quantity of food was quite opposite of what I was used to. It seemed as if everything was on some sort of timer so that the previous course would be digested when the next was presented. This is advantageous for our bodies as we are most efficient when we graze or eat small portions throughout the day. It is a lesson in metabolism that we can learn from the Japanese culture. If we skip meals or go 4, 5 or even 6 hours between meals, we are confusing our bodies. It does not know when it is going to be fed next and so the metabolism is slowed and the body transitions into a survival mode. It is in this standby mode that the pancreas responds by secreting insulin resulting in fat storage which is accompanied by a lull in energy as the blood insulin level drops off the chart after the initial super-compensation phase or insulin spike.

In Japan, I would leave meals feeling very light and energized as opposed to the bulging gluttonous feeling of an overstuffed Thanksgiving turkey that we have all experienced here stateside. What we need to practice is maintaining a steady blood glucose level in which case counterproductive insulin spikes are eluded. And we wonder where insulin resistance comes from.

Interestingly, a Japanese dinner bill is modestly inflated compared to a similar American dinner out. Because Japan imports a lot of its food, it costs a lot more to eat a lot less.

However, the Japanese eating habits are not flawless. Cholesterol levels across the nation are sky high. Rest assured, it is not the habit of grazing that translates into high cholesterol but rather their high fat intake. If you are served beef or chicken in that country, you can expect a good percentage of the calories to come from fat. Saturated fat intake like those found in these sources should be limited in a healthy diet.

The overseas take home message is simple. If we were to adopt grazing habits like those of the Japanese, we would have more energy, lower risks of cardiovascular disease, heart disease, diabetes, and create a greater quality of life at an older age.

Ingredients for Success

- Eat Breakfast
- Graze: Eating 4 – 6 small meals per day
- Avoid Saturated Fat
- Feed the furnace, let it burn hot and work for you!

What came first, the high cost of food in Japan or the small portion size?--JL

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FYI

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...

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NEXT ISSUE...

Real World Kinesiology

The latissimus dorsi

Case Study

Thoracic pain in a 50-year old female

Hands-On!

MET to correct rib subluxations

Fit for Function

Restoring rib mobility

Things that make you go hmm...

Points to ponder about the thoracic spine

Quick Link (Professional subscribers only)

Thoracic outlet syndrome

Listen...

Common Causes:

- Running on a crowned road
- Previous ankle sprain
- Chronic lower back pain
- Previous LE surgery (on the opposite side)

Trigger point pain reference (as related to symptoms of plantar fasciitis):

- Gastrocnemius - arch of the foot.
- Quadratus plantae - plantar surface of the heel
- Soleus - plantar surface of the heel.
- Tibialis posterior - over the plantar surface of the heel, to the plantar surface of the foot and toes

Think...

Check to see if there is a functional leg length discrepancy:

- Iliopsoas tender point
- Quadratus lumborum tender point
- Supine to Long Sitting Test
If leg gets shorter - anterior rotation of innominate

If leg gets longer - posterior rotation of the innominate
- Lack of subtalar joint eversion
Subtalar joint mobility testing

The functionally longer leg usually sustains excessive pronatory stress, thereby overloading the plantar fascia.



Live.

To strength gluteus maximus:

- Anterior reach w/ bilat arms
- Posterior step-downs
- Walking lunge
- Mini-band routine

To improve medial hamstring flexibility

- Warrior I
- Warrior II (make sure knee is out over 2nd toe)

To improve ankle flexibility

- Foam roll rockers (df/pf)
- Foam roll rockers (inv/ever) - opposite side
- BOSU rockers