Dimensional Massage Therapy for the Leg, Ankle, and Foot

AMTA National Convention
Milwaukee, WI

October 29, 2016

4 CE Hours

Downeast School of Massage
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Muscle Charts, Muscle pictures, and Techniques are from *Kinesiology for Manual Therapies* – McGraw-Hill
Dimensional Massage Therapy for the Leg, Ankle, and Foot
Including specifics on:
Sprain & Strains of the ankle, and foot, Compartment Syndrome, Shin Splints, Pes planus, Pes cavus, Tendonitis, Tarsal Tunnel Syndrome, Hallux valgus, Cuboid Syndrome, Plantar Fasciitis, Morton’s Foot Structure, etc
Saturday, October 29, 2016  4 CE hours 8am-12pm

How do structural gait issues have a relationship with knee, leg, hip and back pain? How do the muscles of the leg impact the conditions of the feet? This workshop will explore, evaluate, and treat a variety of common difficult leg, ankle, and foot conditions. Nancy will lecture on the skeletal and neurological anatomy of the leg, ankle and foot, and specific etiologies, signs, symptoms and massage therapy treatments related to the pathologies of this area. She will demonstrate hands-on evaluation techniques designed to assess the postural considerations of the leg, ankle and foot. Tests including knee, ankle and foot range of motion, muscle length, muscle strength, and orthopedic tests will be explored. Nancy will provide a thorough understanding of the muscular anatomy of the leg, ankle and foot, trigger points, and referred pain patterns. She will explore the relationship of the leg, ankle and foot to the lower back and neck pain through posture, gait and repetitive actions. Nancy will demonstrate techniques used in Dimensional Massage Therapy (techniques using deep tissue strokes and methods designed to balance joints by working on all the muscles that produce, assist in, or oppose the actions of, or stabilize the joint). Careful attention will be given to the execution of these techniques, specific muscles and their idiosyncrasies, and the individual structure of the receiving person on the table.

Nancy W. Dail, BA, LMT, NCTMB has been a professional massage therapist and member of the AMTA since 1974. She is the founder and director of the internationally known program at the Downeast School of Massage in Waldoboro, ME (1980). A leader in her field, she has served on the AMTA national board, numerous committees, and was the charter President of the Maine AMTA Chapter. Nancy has taught and presents workshops internationally, is certified in Orthopedic and Sports Massage, and has developed the working philosophy of Dimensional Massage Therapy as lead author in Kinesiology for Manual Therapies published by McGraw-Hill. Her BA in Health, Arts, and Science from Goddard College helps her balance her administrative duties as Director with teaching Dimensional Massage Therapy, Advanced Skills, Kinesiology, Ethics, and related subjects at DSM. Nancy enjoys her therapeutic practice for her clientele, traveling and teaching, and playing with her grandsons Alexander and Kingston whenever possible at her home in Waldoboro.

Course Objectives:
1. To provide a close examination of the muscular, skeletal, and nervous system structure of the leg, ankle, and foot.
2. To review a variety of leg, ankle, and foot conditions
3. To explore mechanisms of nerve impingement and gait disorders
4. To discuss historical considerations of aspects of disorders that would warrant clinical referral.
5. To take a critical look at how posture and repetitive holding patterns affect the muscles of the leg, ankle, and foot.
6. To review trigger points and referred pain patterns of the muscles of the leg, ankle, and foot.
7. To provide a hands-on physical assessment
8. To practice under supervision Dimensional Massage Therapy techniques for the muscles of the leg, ankle and foot.
9. To explore ways to critically think about sequences, muscles, techniques, and therapeutic outcomes.
10. To answer questions in relation to the workshop.
11. To provide a Bibliography for additional reading and study.

Outline:

October 29, 2016  8AM-12:00PM

I. Introduction  - What do you want from this workshop?
   A. Review of Outline

II. Anatomy  - Leg, Ankle, and Foot
   A. Bones
   B. Joints/ligaments
   C. Muscle Specifics for Ankle and Foot muscles
   D. Neurology
   E. Circulation

III. Exam Procedures of the Leg, Ankle and Foot
   A. History
   B. Observation
   C. Lower extremity Postural, Gait Assessment
   D. Palpation
   E. Range of Motion of the leg, ankle and foot
   F. Orthopedic/ Neurological tests
   G. Muscle strength

IV. Pathologies of the Leg, Ankle and Foot
   A. Postural abnormalities
   B. Sprains and strains, Pes planus, Pes cavus, Plantar Fasciitis, Hallux valgus, Tarsal Tunnel Syndrome, Morton’s Toe, Cuboid Syndrome, Compartment Syndrome and others

V. Dimensional Massage – The Philosophy: An Art and Science Mix
   A. Pre and Post Treatment Protocols
      1. Medical History – subjective – include pain scale, objective, assessment, active and passive ROM, plan; SOAP notes for records
2. Palpation
3. Passively shorten muscles/position
4. Work superficial to deep
5. Release hypertonic muscles
6. Use dual hand distraction methods when possible
7. Work individual muscles, their attachments, synergists, stabilizers, and antagonists – study the myotactic unit
8. Do not overwork areas and do trigger point work last on passively shortened muscles

VI. Practical Sessions – Dimensional Massage Therapy Techniques for leg, ankle and foot
   A. Sequence suggestions specific conditions
   B. Acute, subacute, and chronic – when can I work?
   C. Ice and hydrotherapy questions
   D. Integration with chiropractic, medical and other professional health therapies

VII. Wrap-up, Questions, and Evaluations
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<td>Deep peroneal nerve (L4–L5, S1)</td>
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A. Postural Abnormalities

1. **Normal posture**
   - “Posture is a *composite* of the positions of all the joints of the body at any given time.
   - Correct posture is the position in which minimum stress is applied to each joint.
   - If the upright posture is correct, minimal muscle activity is needed to maintain the position.

2. **Abnormal postures**

   **General statements about faulty posture**

   “When muscle imbalances occur some muscles become inhibited and weak, while others become tight. Such imbalances lead to tissue changes that may result in inappropriate patterns of movement.”
   Vladimir Janda, MD, DSc

   “‘Muscle imbalance usually precedes recurrent joint dysfunction.’”
   Karel Lewit, MD, PhD

   Muscle imbalances play an important role in the development of musculoskeletal complaints that are presented in clinical practice. Faulty posture can cause painful conditions, but it can also exist without causing complaints.
What usually makes a faulty posture symptomatic no matter whether it is a severe or minimal fault is the constancy of the fault. An individual who has a major postural fault but maintains mobility to the area is more likely to be asymptomatic. Whereas a person even with a minor fault can experience complaints if mobility is limited. Cumulative effects of constant or repeated small stresses can give rise to the same difficulties a sudden severe stress.

**Factors Affecting Posture**

**Anatomic**
- Congenital Anomalies e.g. short leg
- Genetic growth patterns
- Deformities due to trauma or disease
- Ligament laxity or tightness either genetic or acquired

**Positional**
- Poor Postural Habits e.g. Prolonged activities that reinforce poor postures
- Social e.g. A tall child that does not want to stand out
- Pain e.g. antalgic positioning
- Respiratory conditions e.g. Emphysema
- General weakness or fatigue
- Loss Proprioception
- Excess weight

*Most nonstructural causes can be corrected by stretching the tight muscles, strengthening the weak muscles and teaching good postural habits.*

Faulty posture can cause painful conditions, but it can also exist without causing complaints.

**Pain with Faulty Posture**

What usually makes a faulty posture symptomatic no matter whether it is a severe or minimal fault is the constancy of the fault. An individual who has a major postural fault but maintains strength and flexibility to the area is more likely to be asymptomatic. Whereas a person even with a minor fault can experience complaints if strength and flexibility are limited.

**Pain with Faulty Posture**
Cumulative effects of constant or repeated small stresses from bad postures can give rise to the same difficulties a sudden severe stress.

**Tonic and Phasic Muscle Systems (Janda)**
The tonic system
Consist of the “flexors”, and are involved in repetitive or rhythmic activity, and are activated in flexor synergies. 
Prone to tightness or shortness
In central nervous system lesions (such cerebral palsy or cerebrovascular accident), the tonic flexor muscles tend to be spastic
The phasic system
Consist of the “extensors”, and work eccentrically against the force of gravity and emerge in extensor synergies.
Prone to weakness or inhibition
In central nervous system lesions (such cerebral palsy or cerebrovascular accident), the phasic extensor muscles tend to be flaccid

* It’s important to note that this classification is not rigid.

Postural Abnormalities
Tonic and Phasic Muscle Systems (Janda)

Tonic Muscles Prone to Tightness or Shortness

- **Gastroc-Soleus**
- **Tibialis Posterior**
- **Hip Adductors**
- **Hamstrings**
- **Rectus Femoris**
- **Iliopsoas**
- **Tensor Fascia Lata**
- **Piriformis**
- **Thoraco-lumbar extensors**
- **Quadratus Lumborum**
- **Pectoralis Major**
- **Upper Trapezius**
- **Levator Scapulae**
- **Scalenes**
- **Sternocleidomastoid**
- **Upper limb flexors**

Phasic Muscles Prone to Weakness or Inhibition

- **Peroneus Longus, Brevis**
- **Tibialis Anterior**
- **Vastus Medialis, Lateralis**
- **Gluteus Maximus, Medius, Minimus**
- **Rectus Abdominus**
- **Serratus Anterior**
- **Rhomboids**
- **Lower Trapezius**
Deep neck flexors
Upper limb extensor

**Lower Crossed Syndrome**
This syndrome is based on Dr. Vladimir Janda's pioneering work in researching and understanding the predictable pattern of muscular compensation and postural imbalances in the body. He postulated that faulty movement patterns on a poor postural base contribute to habitual overuse in isolated joints, while they minimize normal movement in others, thus creating a self perpetuating cycle of dysfunction and eventual injury. **Lower Crossed Syndrome**

TIGHT/SHORTENED/FACILITATED
Hip flexors Iliopsoas & Rectus femoris
Long Lumbar Extensors: Erector spinae I. Lumborum…
Tensor Fascia Latae
Thigh Adductors
Piriformis
Quadratus Lumborum
Gastrocnemius/Soleus
Hamstrings *lengthened*
WEAK/LENGTHENED/INHIBITED
Abdominals: Rectus Abdominis, Obliques, TrA
Gluteals: Maximus, Medius, Minimus
Vastus Medialis & VMO
Vastus Lateralis
Multifidi & Rotatores *shortened

Postural examination:
Increased lumbar Lordosis
Anterior pelvic tilt

Clinical Manifestations:
Chronic Low back Pain
Piriformis Syndrome
Anterior Knee Pain

Treatment:
Stretch tight facilitated muscles and strengthen weak inhibited muscles
Restore normal biomechanics of joints involved

Lower body imbalances affect the overall posture and if left untreated would contribute to/or sustain an upper body postural disorder.

Lewit states the most important imbalance in the lumbopelvic region is between weak gluteal muscles with hyperactive hip flexors, and hyperactive lumbar erector spinal with weak abdominal muscles.
Pathologies of the Low Back, Hip and Pelvis

Part 1

A. Postural Abnormalities

Miscellaneous Postural abnormalities

Flat Back Posture

Head- Forward
Cervical spine- Slightly extended
Thoracic spine- Upper part increased flexion, lower is straight
Lumbar spine- Decreased lordosis
Pelvis- Posterior tilt
Knee Joints- Extended
Ankle Joints- Slight plantar flexion

*Hamstring tightness, weak hip flexors. Back muscle may be very strong and inflexible although they are in a slightly elongated position. Knee flexion with extreme hamstring tightness.

Pathologies of the Low Back, Hip and Pelvis

Part 1

A. Postural Abnormalities

Miscellaneous Postural abnormalities

Handedness

A. Right. shoulder is depressed, slight convexity of lumbar spine to left, right hip is elevated and the left foot slightly pronated. gluteus medius is weak on right (right handed)

B. Shows just the opposite (left handed)
Evaluation of Posture of the Low Back, Hip, Knee, Ankle and Foot

A. History
   1. Chief Complaint
      Onset
Quality (achy, sharp, throbbing, numbness, burning....)
Severity (VAS, pain Scale)
2. Past & Present Medical History
3. Systems Review / Family History
   Timing (duration, frequency)
   What makes worse/better
   Associated manifestations

4. History questioning associated with postural exam
   - They generally do not present to you with postural problems as the major complaint
   - Was there any Injury if so were there any postures that caused or relieved pain
   - Currently are there any postures that cause or relieve pain
   - Family history of postural problems e.g. Scoliosis
   - Does footwear make a difference
   - Has there been a growth spurt (if a child)
   - Any neurological symptoms
   - Having a hard time with clothing fitting
   - Difficulty breathing e.g. scoliosis
   - What's the dominant hand

B. Observation
   1. Determine your dominant eye:
      Make a circle with the first fingers and thumbs, then overlap the circles and hold arms out in front of the face and observe an object across the room through the circles with both eyes opened. Close one eye if the object is still in the circle that’s the dominant eye. (*Generally the eye you instinctually look into a camera with*)
      * Attempts should be made to allow dominant eye closest to the center of what's being viewed.
   2. Adequately undressed for the areas to be observed
   3. No shoes worn initially. You can observe changes in posture with shoes on after.
   4. Provide time for the patient to adopt their relaxed posture.
   5. Look for asymmetry
   6. Note any muscle atrophy, soft tissue swelling, boney enlargement, scars, skin changes

C. Exam Procedures
   1. Standing Postural Assessment
      a. Posterior View: *Should be done first!*
         Iliac crest level
         PSIS level
         Gluteal folds
      
      b. Lateral View:
         Lumbar curve
Pelvis
Knees
c. **Anterior View:** *Helps to provide addition info at the end*
Iliac crest level
ASIS level

2. **Sitting:**
   - Position patient with feet flat on the floor and back is unsupported
   - Observation is the same with standing
   - Note any changes between sitting and standing postures

3. **Forward flexion:**
   - Is there asymmetry of the rib cage or spinal musculature?
   - Is there any restriction to movement e.g. tight hamstrings?

4. **Supine Lying:** *note lumbar lordosis or hip angle position*
5. **Prone Lying:** *note lumbar lordosis or hip angle position*

**D. Range of Motion**

**Active Versus Passive**
Active is always done first
Pain with active range of motion but not with passive range of motion suggests a muscular injury
Look for asymmetry and painful arcs

**D. Palpation-** Note the muscle spasm, tenderness, or abnormal bumps. Take careful note of differences from side to side

**Palpation of Anterior Bony Structures**
Muscle belly, tendons, attachments, bursa

**Additional Procedures**
- True leg length measurement
- Tibial length measurement
Pathologies of the Leg, Ankle, and Foot

Inversion Ankle Sprains

Ankle sprains are one of the most common injuries among physically active people. Sprains involve the stretching or tearing of one or more ligaments. Ninety-five percent of all ankle sprains result from excessive inversion, which causes damage to the lateral ligamentous structures, primarily the anterior talofibular ligament and the calcaneofibular ligament. Although the fibula prevents most eversion sprains, excessive eversion forces can occur, causing injury to the deltoid ligament on the medial aspect of the ankle. Ankle sprains can be somewhat avoided by keeping the entire ankle strong and flexible.

When the weight of the body is behind a fall and forces the foot into an unnatural, inverted position, it puts too much strain on the ligaments of the ankle. Fluids rush into the painful area and often cause a secondary trauma to the area. The peroneal muscles become stretched in the action, and specific ligaments fall prey to the inversion sprain. The anterior talofibular ligament is located at the distal end of the anterior fibula, attaching distally to the talus. The calcaneofibular ligament is located at the very distal end of the fibula at an angle to the calcaneus. On either side of the calcaneofibular ligament, tacking down the peroneal tendons, are two tissue bridges called the superior peroneal retinaculum and inferior peroneal retinaculum. If the sprain mechanism is significant, these tissue bridges could be torn and the peroneal tendons might ride up over the lateral malleolus as a result. When the sprain involves the ligaments, retinacula, and possibly the extensor digitorum brevis, there will be a great deal of swelling. Ice will help reduce the inflammatory response and possible secondary trauma due to the swelling, but it has to be applied immediately for best results. It is never too late to work on the small structures of the foot. Years after being injured, old sprained ankles can harbor puffiness around the lateral malleolus. A technique that addresses injury to the involved ligaments includes deep transverse friction to the anterior talofibular ligament and calcaneofibular ligament. In a prone position flex the client’s knee joint. Locate the ligaments. Apply your thumb at a right angle to each ligament and draw across it.
Walking with a limp affects the knee, hip, and low back. From a dimensional perspective the massage therapist should treat compensatory muscles affected by the injury. A careful medical history including evaluating active and passive ranges of motion for the leg, ankle, and foot lead to a better treatment protocol and appropriate sequence critically thinking about the involved joints and muscles. Bodywork does not have to be mysterious; it should be based on science, the structure of the client, and the art of applying techniques in a knowledgeable fashion. Success is at your fingertips.

**Anterior Compartment Syndrome**

Definition: Swelling in muscles in compartment causing pressure on neurovascular structures, such as the deep peroneal nerve and anterior tibial artery and vein. Includes: Tibialis anterior, extensor digitorum, and extensor hallucis longus.

Chronic: Exertional compartment syndrome. Acute could be from a direct blow and could cause a tibial fracture – medical emergency and could require a fasciotomy.

Causes: Overuse condition, repetitive strain as in running on hard surfaces. Pain is strong.

Observation: Look for color changes, and motor impairment in more serious syndrome – foot-drop gait and maybe cold feet.

Contraindication: ice, compression and elevation. Massage if acute or immediately after activity.

Treatment: Activity modification, changing footwear and orthotics, massage for chronic: deep broadening with thumbs, and with dorsiflexion; deep long stripping with plantar flexion

**Shin Splints**
Definition: Overuse condition caused by excessive eccentric loading on dorsiflexors – constant tensile stress on tibial attachment of involved muscles that produces irritation and inflammation in the periosteum, (periostitis, fascial tearing, ischemia, hypertonicity and trigger points) Involves the tibialis anterior, extensor digitorum, and extensor hallucis longus. Exhibits pain in lateral leg.


Test: tibialis posterior compression test.

Treatment: Activity modification, rest, orthotics, MTSS; stripping medial tibia with dorsiflexion, calf techniques, elliptical movement.

**Pes Planus**

Definition: Flat feet – Tibialis posterior works harder as flat feet impair shock absorbing capabilities of the foot. Can contribute to plantar fasciitis, shin splints, and stress fractures. Treatment: Orthotics, stretching and massage therapy.

**Pes Cavus**

Definition: High arch – Increased tensile loads at attachment sites of both tibialis anterior and posterior. Can contribute to Morton’s neuroma and precursor to plantar fasciitis. Treatment: Stretching and massage therapy.

**Excessive supination**

Definition: Body’s weight is placed on the outside lateral edge of foot rather than spread equally across the plantar surface. Supination includes inversion, adduction and plantar flexion. This can lead to ankle sprains. Treatment: orthotics and massage for invertors.

**Excessive pronation**

Definition: Overpronation – more weight on medial side of foot during gait. Primary factors; tibialis posterior weakness, ligament weakness, excess weight, pes planus, genu valgum, subtalar eversion, foot pain, plantar fasciitis, ankle injuries, MTSS, periostitis, trigger points and can contribute to meniscal injury or ligament sprain.

Treatment: Orthotics, Massage therapy for Tibialis posterior, trigger points, stretching gastroc and soleus, gait retraining and lengthen evertors.

**Calcaneal Varus**
Definition: structural deviation – distal end of calcaneus deviates medially at subtalar joint and is associated with inversion – prone to ankle sprain. Treatment: reduce tightness in invertors, peroneals, trigger points, orthotics and movement reeducation.

Calcaneal Valgus

Definition: Distal end of calcaneus deviates laterally at subtalar joint and is associated with eversion over pronation. Caused by improper footwear, genu valgum – knock knees, large Q angle, shin splints. Treatment: Reduce hypertonicity in evertors and overstressed tibialis posterior.

Genu Valgum – knock knees

Genu Varum – bow-leg

Genu Recurvatum – hyperextension of knees

Patellar Tendinosis – Jumper’s knee

Definition: Location above or below patella. Anterior knee pain caused by chronic loading on tendon from excessive eccentric or concentric muscular activity. Treatment: Strength training if no progressed too far. Ice, reduce tension in quadriceps, and massage therapy for quads and for hamstrings, active engagement for quads and deep transverse friction for patellar tendon.

Patellar Tracking Disorder – Patellofemoral Pain Syndrome

Definition: Patella tracking other than over the knee in flexion and extension. Causes: Wide Q angle, strength imbalances between VMO and other quads, gait issues, sitting too long. Treatment: Correct imbalances including quads, hamstrings, anatomical tripod and gait issues. DMT massage techniques and possibly kinesiotaping.

Chondromalacia

Definition: Starts with a patellar tracking problem but develops softening of the cartilage and degeneration on the underside of the patella causing friction on bone. Treatment is similar to patellar tracking.

IT Band Friction Syndrome

Definition: Lateral knee pain caused by the IT Band tracking over the lateral epicondyle of femur developing friction in flexion and extension. More prevalent in cycling, running on crowned roads. Affects TFL, Gluteus maximus, developing trigger points. Watch for the bursa often irritated at this site. Treatment: reduce inflammation and treat muscles leading into the ITB. Vastus Lateralis could develop TP’s. Stretching.
**Tarsal Tunnel Syndrome**

Definition: Compression or tension neuropathy of the tibial nerve in the tunnel. Flexor retinaculum is the roof and calcaneus and medial malleolus is the floor. Tom, Dick, and Harry – Tibialis posterior, Flexor digitorum, and Flexor hallucis longus, posterior tibial artery and vein and posterior tibial nerve are contents in the tunnel. Causes: Over use of tibialis posterior and flexor tendons causing swelling in tendon sheaths – tenosynovitis, lesions, tumors, swelling and overpronation – greater eversion during overpronation increases tension on tibial nerve. Pain is near medial side of ankle or along bottom of foot and can be sharp or shooting, can go to toes and can include numbness and tingling. Treatment: Orthotics, anti-inflammatory meds to reduce swelling, deep long stripping to medial leg for tibialis posterior, deep stripping on plantar fascia, massage therapy to posterior calf and hamstrings.

**Plantar Fasciitis**

Definition: Inflammation involving the plantar fascia at its attachment site on the calcaneus. Causes: over pronation causing Tibialis posterior to not function as a shock absorber, leads to hypertonicity in gastrocs and soleus; significant weight gain as in pregnancy, high heels, steel shank boots, pes planus, pes cavus, calcaneal valgus. Bone spur is not always there but can be caused by the pull on the periosteum of the bone.

Pain upon rising in the morning at first step, relieved somewhat during the day with walking, returns later. Treatment: Towel grabbing with toes, longitudinal stripping towards heel, reduce hypertonicity in tibialis posterior, compressive broadening in triceps surae, elliptical movement, ankle, foot, and let techniques, medial tibia longitudinal stripping tibialis posterior.

**Hallux Valgus – bunion**

Definition: distal end of hallux angles toward outer toes. Genetic pattern. Biomechanics – pes planus, ligament laxity and over pronation – can cause a drift in position of metatarsal heads and forces 1st metatarsal head in a medial direction.

Hammer toes – pain over PIP joint associated with pes cavus – claw toes – dip in flexion instead of extension. Cause muscular hypertonicity, neuromuscular or joint disorders such as gout or RA. Treatment: orthotics or pads for the toes.

**Morton’s Foot – Grecian Foot**

Definition: 2nd toe appears longer than great toe. Changes distribution of weight and gait. Develops trigger points and causes biomechanical compensations. TPs in peroneals, knee extensors, gluteus medius, minimus, TFL, as well as in shoulders, head and neck. Treatment: Orthotics, massage and stretching.

**Morton’s Neuroma**
Definition: nerve injury in distal region of the foot. Neuroma is enlarged and irritated section of nerve tissue. Likely to get the branches of the tibial nerve, medial and lateral plantar digital nerves or their terminal branches of plantar digital nerves. Usually this is between the 3rd and 4th metatarsal heads. These are stretched during dorsiflexion with toe extension. Sharp pain in forefoot or into the toes. High heels can be a cause. Treatment: do not do deep gliding as it may irritate, dome pad as it spreads the metatarsal head; Manually spread the metatarsal heads; stretch the hamstrings, do elliptical movement of foot. Morton’s test and interdigital squeeze test.

**Cuboid Syndrome: A Painful Experience**  
By Nancy Dail

A couple of years ago I went to my favorite Freeport store to get new boots. They fit well but they had a toe-off feature that I thought might be good for my gait. Evidently not. The inflexibility of the new boot with the toe off feature made my foot vulnerable to injury. What can a bad old inversion foot and ankle sprain and new footwear add up to? A Cuboid Syndrome. “Cuboid Syndrome is typically defined as a minor disruption or subluxation of the structural congruity of the calcaneocuboid portion of the midtarsal joint.” (Stephen Patterson) The subluxation irritates the surrounding joint capsule, ligaments, and the peroneus longus tendon. Cuboid Syndrome, according to Stephen Patterson of the University of Wisconsin, can be also referred to as subluxed cuboid, locked cuboid, dropped cuboid, cuboid fault syndrome, lateral plantar neuritis, and peroneal cuboid syndrome. There is extreme point tenderness on the cuboid bone laterally just below the fifth metatarsal. The extensor digitorum brevis is likely to spasm and the entire lateral dorsal foot locks making walking a limping if not impossible experience. As the cuboid bone stays subluxed, the muscles start a spasm cycle on a cataclysmic scale. Plantar flexors referred pain to the leg and pulled with spasm onto the bottom of the foot. Since I was walking on the inside of my foot to not put pressure on the cuboid bone, my arch and the point of attachment of the peroneus longus started screaming with discomfort. And just to make it all worthwhile, if I stepped just right, it felt like I was spraining it all over again and felt and heard audible crunches. Those really hurt. What to do? I knew I had not sprained the ankle. I did not fall or twist the foot. I had originally sprained my ankle and foot in 2005 and knew at that time that I had done some damage to the cuboid area and ligaments. Truly, not many listened to me. I think now, that I could have walked around with a subluxed cuboid for some time. I found an article on the internet about Cuboid Syndrome: A Review of the Literature by Stephen Patterson. In the article, Patterson clearly reviewed the anatomy, etiology and conservative measures needed to deal with this painful problem. The cuboid bone is the only bone in the foot that articulates with both the tarsometatarsal joint and the midtarsal joint. It is a link to the transverse arch as it houses the peroneus longus tendon and gives stability to the foot. It has numerous ligamentous attachments.

My chiropractor helped. She did electric stimulation, ultrasound and acupuncture. But as suggested by the article the real help was having it manipulated by my osteopath. The longer the cuboid is subluxed the more manipulations it might require. It is also not something you can do for yourself. Massage really helps. I am grateful I am surrounded
by massage therapists. Leg and foot muscles need additional treatment to recuperate from this foot condition. Once the bone is manipulated correctly, the discomfort subsides substantially. Irritated muscles will take a while to calm down, but conservative measures of massage, stretching, strengthening, and hydrotherapy are just the ticket to restore normal healthy gait and happy feet. For more information about this problem you can link to: http://www.jssm.org/vol5/n4/18/v5n4-18pdf.pdf This article is very complete about a little known problem. Thank you Stephen Patterson!

Cuboid Syndrome: A Review of the Literature, Stephen Patterson, Dept of Exercise and Sport Science, University of Wisconsin-La Crosse, La Crosse, WI 54601

As you know the nature of a blog is to be short and sweet. Please check this article for more thorough information. NWD
You can reach Nancy at ndail@aol.com. She will be coming to Austin, Texas to teach Dimensional Massage Therapy for the knee, ankle, and foot in June 7,8, 2014 where she will explore many more knee, foot, and ankle conditions. Nancy is the author of Kinesiology for Manual Therapies published by McGraw-Hill. Visit her website at www.downeastschoolofmassage.net.
How do you unwind the thigh muscles and knee joint in a sequence?

- Take a careful medical history appropriate for the client; look for gait issues, patellar tracking, and foot structure problems.
- Always use treatment protocols to determine the sequence of a therapeutic session; assess active and passive ranges of motion of the hip and knee.
- Palpate tissues.
- Follow a dimensional approach, and critically think about the involved joints and muscles; work the muscles in groups and in paired opposition.
- Determine pressure intelligently; ask for feedback from the client.
- Work superficial to deep.
- Visit all the muscles possibly involved in the problem.
- Visit all the attachments of the involved muscles.
- Passively shorten muscles whenever possible with your techniques to decrease tension.
- Do not overwork sore areas.
- Begin supine, and try the techniques below for a dimensional approach.

Techniques for the Thigh and Knee
- Flex the hip and knee.
- Locate the origin of the rectus femoris.
- Apply deep transverse friction to the attachment.
- Apply deep transverse friction to the patellar tendon above the patella.
- Use compressive effleurage liberally throughout the routine.
- Locate and treat trigger points in both the anterior and posterior positions.
- Apply loose-fist percussion to the posterior thigh muscles.
- Finish with stretches and nerve strokes.
Leg, Ankle and Foot

**TREATMENT PROTOCOL**

**How do you unwind the foot and ankle muscles in a sequence?**

- Take a careful medical history appropriate for the client, look for contraindications, assess edema, and refer the client to an appropriate professional when necessary.
- Always use treatment protocols to determine the sequence of a therapeutic session; assess active and passive ranges of motion of the leg, ankle, and foot.
- Palpate tissues.
- Follow a dimensional approach, and critically think about the involved joints and muscles.

- Determine appropriate pressure; ask for feedback from the client.
- Work superficial to deep.
- Visit all the muscles possibly involved in the problem.
- Visit all the attachments of the involved muscles.
- Passively shorten muscles whenever possible with your techniques to decrease tension.
- Do not overwork sore areas.
- Begin supine, and try the techniques below for a dimensional approach.
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