Back To Chiropractic

Continuing Education Seminars

Lower Extremity Adjusting:

Foot & Ankle Module ~ 4 Hours

Welcome:

This course counts as 6 Hours of CE for Lower Extremity Adjusting for the Chiropractic Board of Examiners for the state of California.

There is no time element to this course, take it at your leisure. If you read slow or fast or if you read it all at once or a little at a time it does not matter.

How it works:

1. **Helpful Hint: Print exam only and read through notes on computer screen and answer as you read.**
2. **Printing notes will use a ton of printer ink, so not advised.**
3. **Read through course materials.**
4. **Take exam; e-mail letter answers in a NUMBERED vertical column to marcusstrutzdc@gmail.com.**
5. **If you pass exam (70%), I will email you a certificate, within 24 hours, if you do not pass, you must repeat the exam. If you do not pass the second time then you must retake and pay again.**
6. **If you are taking the course for DC license renewal you must complete the course by the end of your birthday month for it to count towards renewing your license. I strongly advise to take it well before the end of your birthday month so you can send in your renewal form early.**
7. **Upon passing, your Certificate will be e-mailed to you for your records.**
8. **DO NOT send the state board this certificate.**
9. **I will retain a record of all your CE courses. If you get audited and lost your records, I have a copy.**

The Board of Chiropractic Examiners requires that you complete all of your required CE hours BEFORE you submit your chiropractic license renewal form and fee.

NOTE:

It is solely your responsibility to complete the course by then, no refunds will be given for lack of completion.

Enjoy,

Marcus Strutz, DC

CE Provider

Back To Chiropractic CE Seminars

Dr. Jason W. Kelberman, D.C., BCIM, DMBBP

Owner and founder of the Westside Wellness Center, a chiropractic corporation for education, non-surgical treatment and prevention programs.

PROFESSIONAL EXPERIENCE & MEMBERSHIP:

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Member American Association of Integrative Medicine.
Masters Certification in the treatment of frozen shoulder: Neil Asher Technique.
Lifetime participant Applied Kinesiology USA

Westside Wellness Center was the first office in Los Angeles to offer a comprehensive treatment program for the treatment of Peripheral Neuropathy. Treating nerve damage successfully by treating neurologically and metabolically.

Previous Experience:

Joint Rehabilitation & Sports Medical Center 1997-2008 Partner and Director of Rehabilitation and chiropractic services, multi doctor, multi specialty clinic (MD,DC).

Santa Monica Chiropractic Center from 1985 to 1997.

Palisades Holistic Chiropractic Center from 1983-1985, associate Dr. Dean Raffelock, DC.

The Cleveland College of Chiropractic @ Los Angeles: 1983 Graduated Cum Laude

The City College of New York, Bachelor degree in education: 1976 Graduated Cum Laude

Teacher, Secondary School in New Haven, Connecticut 1976-1978: Woodworking Shop

Dr. Kelberman's life's work is a chiropractic specialty known as "Applied Kinesiology". Our bodies are moved by muscles and Dr. Kelberman is a master in the diagnosis and treatment of sport related traumas and injuries of all types. Tennis is Dr. Kelberman's favorite sport and Afghan Hound dogs are one of his passions. His first exposure to the wonderful world of chiropractic happened after he was struck by a car at the age of twelve. Chiropractic care was the only treatment that enabled restoration of function. As a result, he continues to treat motor vehicle accidents to this date.

Thank you to :

Dr.'s David Leaf, Bob Blaich, Nancy McBride, Jim Blumenthal, Steven Kaufman, Kirk Meier, Dean Raffelock for giving me my first associate position in 1984, Joe DiDuro for teaching me detailed neurologic examination and to my mom who was an educator, and has two sons that are chiropractors, for supporting me no matter what.

LOWER EXTREMITY: FOOT AND ANKLE MODULE

INTRODUCTION:

Our body is able to perform some of the most complex movements imaginable. Most of our movements are reliant on our feet unless you are in a non weight bearing position. One of the reasons why non weight bearing rehabilitation is so effective for some injuries. (bicycle, pool, etc.) The feet are probably one of the most overlooked areas in our body.

So, today we are going to take a much closer look!

Here is a mini course to help you understand, diagnose and treating foot and gait dysfunction. I've been working on this information and adjusting feet in my practice for 31 years.

I will be showing you techniques for manual adjustments, drop adjustments and instrument adjusting. I will discuss how to use kinesiotape and make foot orthotics to correct the problems that you will find.

There are 24 vertebra, 206 bones in the body, 650-840 muscles, and I want to be the chiropractor that can get you going in the right direction.

ANATOMY: Bones first

The human foot and ankle has **26 bones**, 33 joints, 107 ligaments, 19 muscles and tendons. The **52 bones** in your feet make up about ***25 percent*** of all the bones in your body.

Twenty-six bones of the foot and ankle

Tibia: weight bearing

Fibula: Non weight bearing. Attaches laterally from the tibia and makes up the ankle joint

TARSAL BONES:

Talus, Calcaneus, Navicular, Cuneiforms (3), Cuboid These are the bones that you are most often adjusting.

Metatarsals: (5) Forefoot

Phalanges: (10) Forefoot

Hallux Sesamoid bones: 2 under great toe

Others: There may be accessory bones on the foot

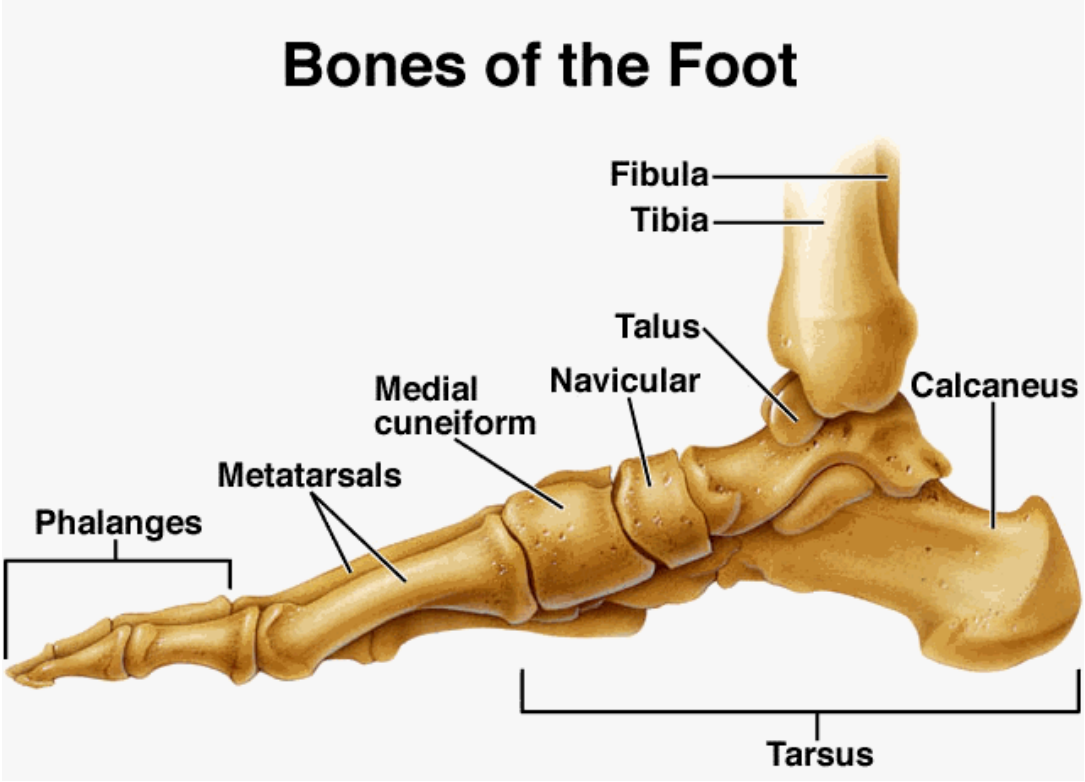
Calcaneus: Heel bone, first point of contact in walking.

Talus: Makes up the ankle joint, but also connects to the calcaneus

Cuboid: Lateral

Navicular: Medial

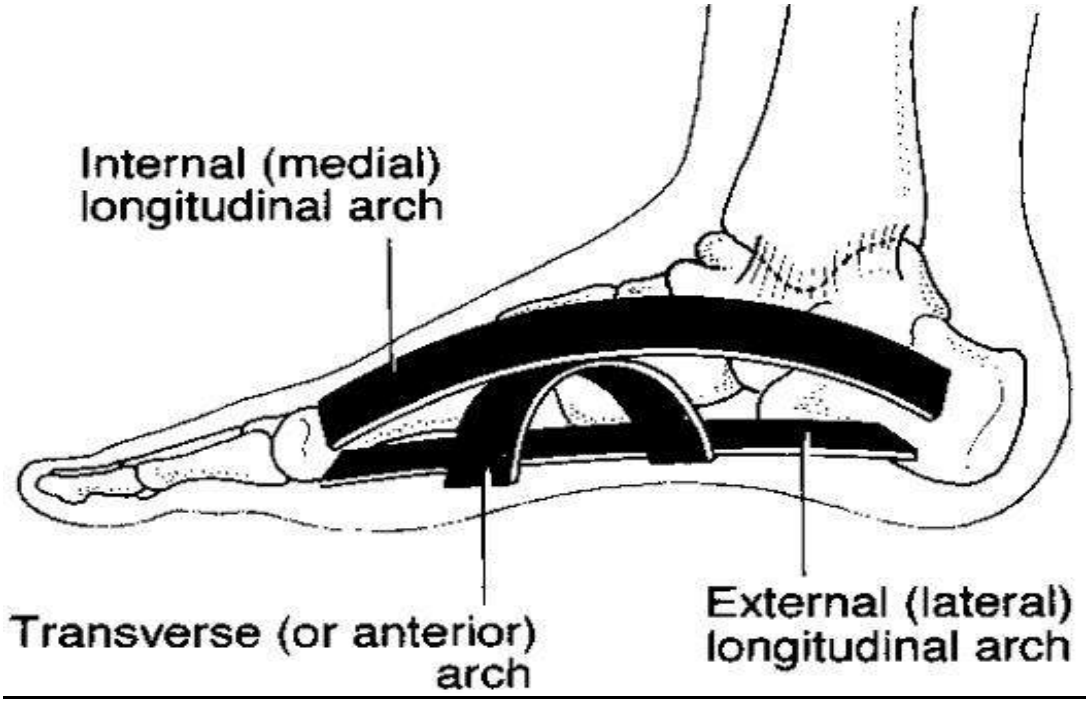
Cuneiforms: Medial, lateral and intermediate create the mid foot.



There are 3 arches in the foot.

Medial and lateral Longitudinal arch and transverse

What makes up the transverse arch (AKA metatarsal): (3) Cuneiforms,



Whether you are treating sport injuries, sprains or just adjusting feet because it will make your pelvic adjustments last longer. The better you know the anatomy the better you can adjust and help your patients.

FLAT FEET (pes planus)

Are they fallen? Did they not develop? Are they genetically flat?

Some people have flat feet because of a developmental fault during childhood, while others may find that the problem develops as they age, or during or after a pregnancy. When the Renalin hormone is released during the latter parts of pregnancy all ligaments have a tendency to become lax. Foot adjustments and arch supports of all types can be helpful. There are some simple devices which may prevent the complications of flat feet. Observing the rear foot having a significant inward distortion is a positive Helbing's' Sign

Podiatrists remind me of chiropractors in that they look at x-rays of the feet and determine the course of action based on that data. They take measurements from the films and create orthotics accordingly. Doesn't that sound familiar? How many of you still mark x-rays?

I recently had a conversation with a Doctor of Chiropractic in California who trained with a podiatrist who used to practice in the 1930'S and 40's.. Yes we are both older than we want to admit. He related that the podiatrists used to be foot manipulators almost exclusively. They had open treatment room with patients in a circle where patients lined up to get foot adjustments!

People with other foot problems may find that flat feet either contribute to them or make symptoms worse. Examples include:

- Achilles tendinitis
- Arthritis in the ankle or foot.
- Bunions
- Hammertoes
- Plantar fasciitis (pain and inflammation in the ligaments in the soles of feet)
- Posterior tibialis tendinitis
- Shin splints

Cavus Foot (High-Arched Foot)

What is Cavus Foot?
Cavus foot is a condition in which the foot has a very high arch. Because of this high arch, an excessive amount of weight is placed on the ball and heel of the foot when walking or standing. Cavus foot can lead to a variety of signs and symptoms, such as pain and instability. It can develop at any age, and can occur in one or both feet.

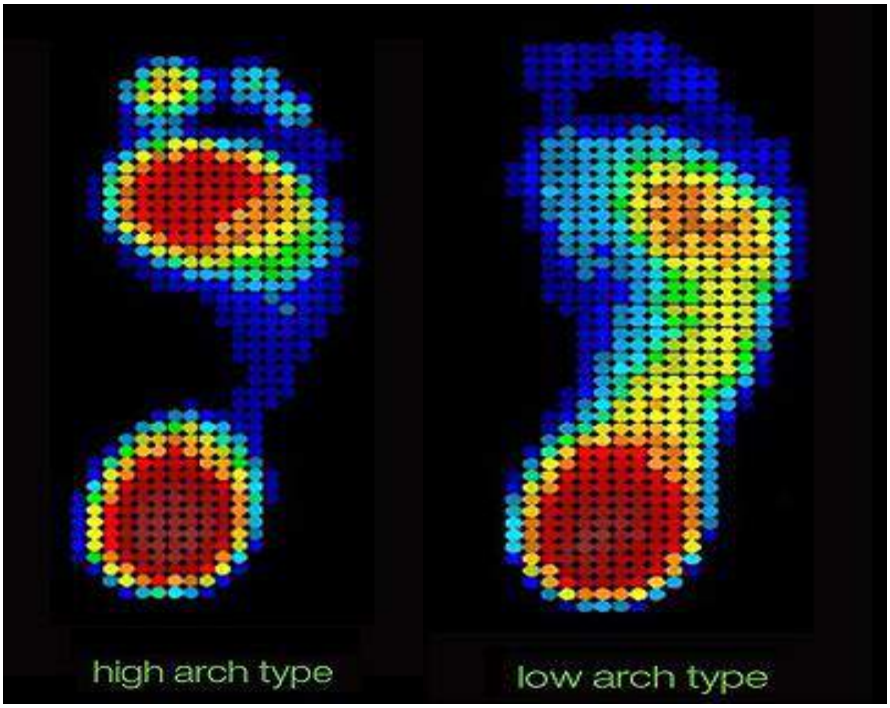
Causes
Cavus foot is can be caused by a neurologic disorder or other medical condition such as cerebral palsy, Charcot-Marie-Tooth disease, spina bifida, polio, muscular dystrophy stroke or peripheral neuropathy. In other cases of Cavus foot, the high arch may represent an inherited structural abnormality.

If the high arch is due to a neurologic disorder or other medical condition, it is likely to progressively worsen. On the other hand, cases of Cavus foot that do not result from neurologic disorders usually do not change in appearance.

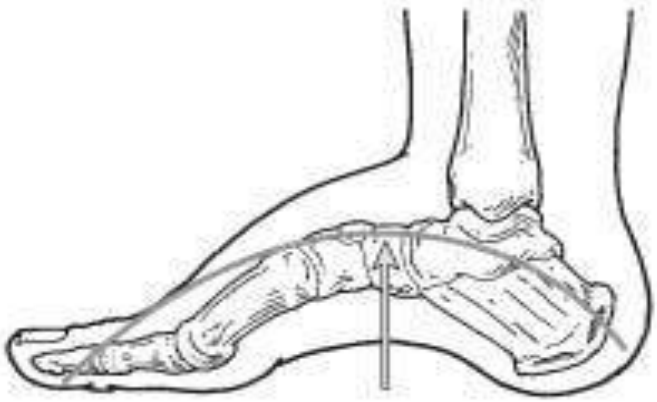
Symptoms
The arch of a cavus foot will appear high even when standing. In addition, one or more of the following symptoms may be present:

- Hammertoes (bent toes) or claw toes (toes clenched like a fist)
- Calluses on the ball, side, or heel of the foot
- Pain when standing or walking
- An unstable foot which can lead to ankle sprains Some people with cavus foot may also experience foot drop, a weakness of the muscles in the tibialis anterior muscle and or extensor hallucis longus that results in dragging the foot when taking a step. Foot drop is usually a sign of an underlying neurologic condition. HELLO! Doctors of chiropractic you are uniquely skilled to diagnose and treat this condition.

The Computerized weight bearing pictures below will give you a better idea of the distribution differences. The same can be done with wet feet on concrete etc…



Normal Foot

- 

Cavus Foot

Muscles:

Intrinsic Muscles of the foot: All begin and end within the foot

Extrinsic Muscles of the foot: Those that are on the calf that also attach to the foot.

Major muscles that control our arches.

Medial Arch

Tibialis posterior Inserts @ navicular **Tibialis Anterior** Inserts @ medial cuneiform

Lateral Arch

Peroneus longus, brevis and tertius (AKA Fibularis)

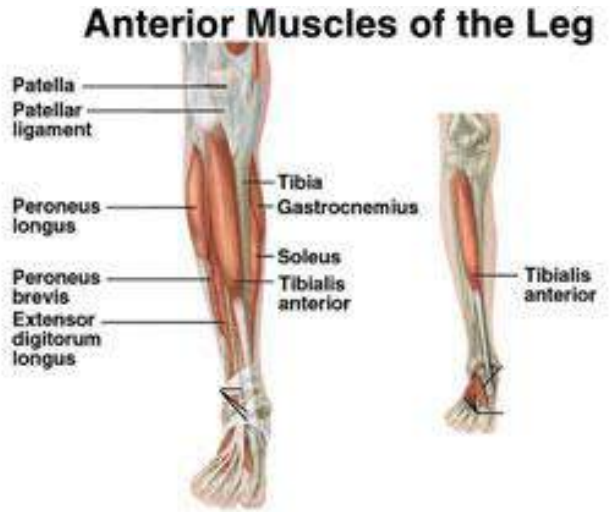
Transverse arch

The transverse arch of the foot is maintained by the strength and integrity of the tibialis posterior and the peroneus longus. I know this is confusing but when you view the plantar surface of the foot, the tendons of these muscles cross so that contraction of the muscles pulls the medial and lateral aspects of the foot together supporting the transverse arch.

Extensor digitorum longus Often involved with ankle sprains

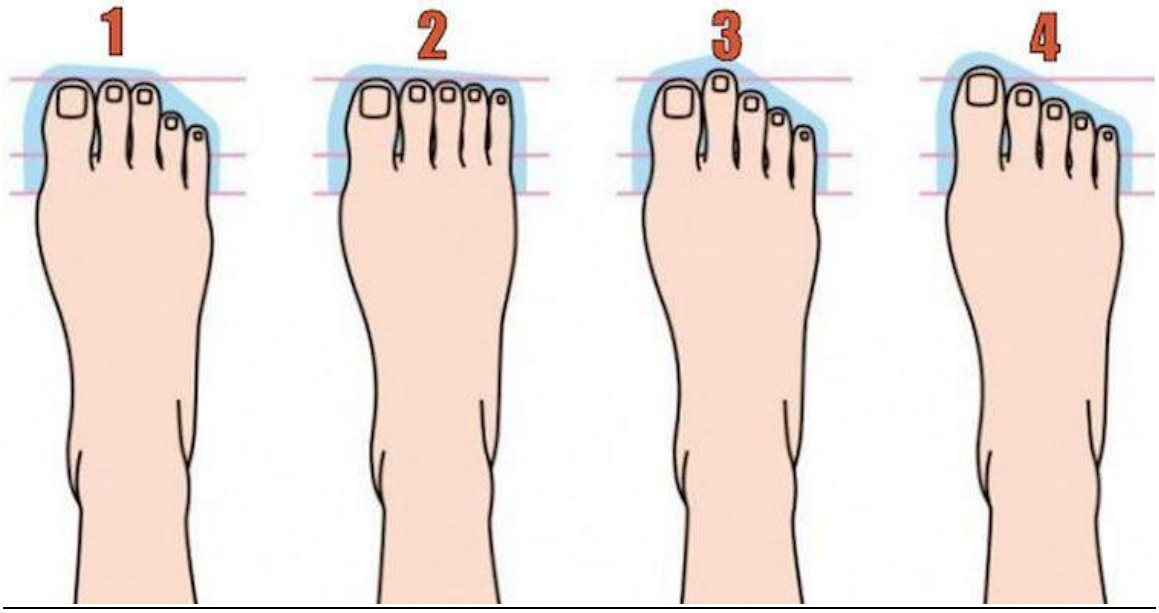
Extensor Hallucis Longus Most commonly involved muscle of the foot.

Flexor Hallucis Longus Flexor Digitorum Longus Commonly with plantar fasciitis.



Types of feet

Your feet can reveal many things about you. For the purpose of this lecture we will take a one minute fanciful look at what your feet reveal about your personality and then stick to the mechanical factors.



Roman Germanic Greek Egyptian

Long second toe (MORTON'S FOOT)

Indicates leadership qualities. Rulers from ancient Egyptian and Hawaiian royal dynasties all had long second toes. You need to be in charge.

Last joint of third toe at an angle

You have the natural ability to deceive, as well as the propensity to be misunderstood. Frequently to be found in spies.

Extra-small little toe

Denotes a childlike nature, with playful sense of fun.

Second toe on left foot leaning towards big toe

Sign of a sentimental, nostalgic nature. Shared by Hollywood actor Reece Witherspoon.

Little toe pointing at an angle

Denotes unconventional nature. Being able to waggle your little toe indicates restlessness and a need for constant change.

Joint Mechanoreceptors

Surrounding and protecting all joints are tough, fibrous tissues which contain a variety of sensory nerve endings. The input from these specialized sensors keeps the nervous system informed as to the location of the joint, and also the degree of stretch, compression, tension, acceleration, and rotation. (6) These joint mechanoreceptors are classified by their anatomy and their neurological function. (7) Type I mechanoreceptors are found in higher densities in the proximal joints. They sense the position of a joint by signaling the joint angle through normal ranges of motion. These help determine postural (tonic) muscle contractions. Type II nerve endings adapt to changes in position, and are most active at onset and termination of movement. These are more densely distributed though the distal joints, and affect phasic muscle actions. Type III mechanoreceptors are high threshold, which means they require considerable joint stress at end ranges before firing. These receptors serve a protective function similar to the Golgi tendon organs. Type IV receptors are free nerve endings located in the ligaments, joint capsules, and articular fat pads which respond to pain stimulus. They can generate intense, non-adapting motor responses in all muscles related to a joint, resulting in the protective muscle contractions that restrict joint movement.

Foot Involvement

These six specialized nerve sensors are found throughout the musculoskeletal system, in all skeletal muscles and in every ligament, joint capsule, and articular connective tissue. With many small joints, lots of connective and articular tissues, and both intrinsic and extrinsic muscles, the feet are particularly well-supplied with proprioceptive nerve endings. Mechanoreceptors in the joints along with the muscle spindles of the foot muscles are responsible for the positive support reflexes and a variety of automatic reflexive reactions. (8) These include the flexor/extensor reflex, which converts the lower limb into a firm, yet compliant pillar. Weight bearing

compresses the joints and muscles, evoking reflexive activity in the extensors and inhibition of the flexor muscles. (9)

The first research to demonstrate how altered proprioceptive input predisposes to recurring injuries was performed on patients with chronically sprained ankles. (10) Freeman et al. called this phenomenon “articular de-afferentiation” to recognize the importance of inappropriate afferent signals from injured ankle and foot proprioceptors. They pointed out that, “Since articular nerve fibers lie in ligaments and capsules, and since these fibers have a lower tensile strength than collagen fibers, it seems inevitable that a traction injury to a ligament or capsule will lead to the rupture of nerve fibers as well as collagen fibers”. (11)

Conclusion

Except for the spine, the foot is the anatomical region which contains the most proprioceptive sensory receptors, and the foot has very distinctive nerve circuits which must be considered.

Because of the magnitude of sensory input, the feet are frequently involved in clinical conditions which will respond to specific treatment approaches that include the proprioceptors — such as custom orthotics. Structural support and shock absorption for the musculoskeletal system is provided by the corrective orthotics, thereby reducing physical stressors on the muscles and joints of the feet, legs, and pelvis.

Greater understanding of the proprioceptive system of sensory receptors in the muscles and joints has enabled us to more accurately assess and treat many complex musculoskeletal problems. When custom-fitted orthotics are included, treatments can be more effective and responses will be more comprehensive and longer-lasting.

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Examination of the feet

When you get up from your chair, what muscle should contract first? NO it's not your gluts! Flexor hallucis longus… You should start your evaluation of your patients while they are walking into your office or as they get up from the chair if you enter after they do.

I like to have the patient facing me at first. Have them march gently up and down in place and then stop without fixing there posture. Observe everything you can at this point about the feet, knees, pelvis, shoulders and head posture. Walk around the patient to visualize them anteriorly, laterally and posteriorly.

The most telling simple test to have the patient perform, is to ask them to go up on their toes and balance as long as they can. And I show them how to do it, with their feet shoulder width apart and NO toe out. After that I ask them to balance on their heels. You get to see all the weakness in their feet right away.

Does the patient have a high arch, normal arch or low arch?

Does he have a Morton's foot? Of what ancestry does his feet say he belongs to?

Check the ROM of the foot and determine whether the foot is hypermobile or hypomobile. Is it rigid or supple? This will help you determine what to do about the issues you find. **Hypomobile** require mobilization while **hypermobile** require stabilization. You will usually find that as we age we become less mobile.

ROM: ankle and foot (should be equal bilaterally)

Ankle dorsiflexion: 0-20 degrees

Ankle plantar flexion: **0-50 degrees**

Ankle foot inversion: **0-35 degrees**

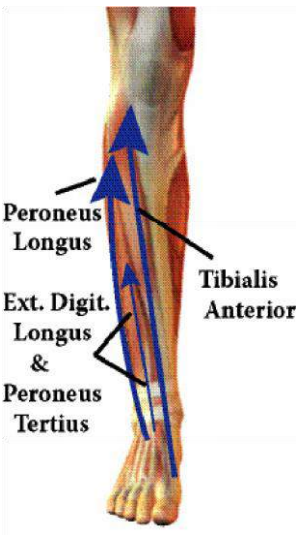
Ankle and foot eversion **0-15 degrees**

What's Next:

In order to determine best adjustments of the feet we need to look at several procedures. If there is foot pain you should be able to determine how to reproduce the pain or how to reduce the pain. This should be done manually. It's been my experience that if you show the patient you know how the pain was created and then show them how to stop the pain they will follow you anywhere.

If you have never tested foot muscles before, I recommend you start testing the Extensor Hallucis Longus muscle (Big toe extensor EHL for short). It's the largest toe of the foot so it's easier to test.

What I initially found, was that people who had weakness of the EHL muscle also had weakness of the arch or flat foot. And that if I strengthened the plantar flexors (restored arch of the foot) the extensors responded in kind.



What I now understand is that when you strengthen the arch it increases the height of the arch. This in turn shortens the foot. That makes it easier on the extensors to work. Short foot exercise is essential in balance therapy.

Fascial chain connection from the extensor hallucis longus will be medial musculature of the foot to the knee and thigh (Tibialis posterior, VMO, adductor, Sartorius, medial gastrocnemius head) as well as tibialis anterior.

If the patient had weakness of the peroneal group (lateral stabilizers) they either had ankle injuries that left them with deltoid ligament or muscular weakness or they had disuse weakness. Very , very common as we age, since most people stop moving sideways as we age.

Fascial Chain connection will be tensor fascia lata, IT band, gluteus medius and minimus.

The following sequence is from Dr. David Leaf's work. A doctor that I feel is the best I have ever trained with. Highly recommend you attend anytime he is on the west coast.

Tibialis anterior

Tibialis posterior

Peroneus longus/brevis

Peroneus tertius

Extensor hallucis brevis

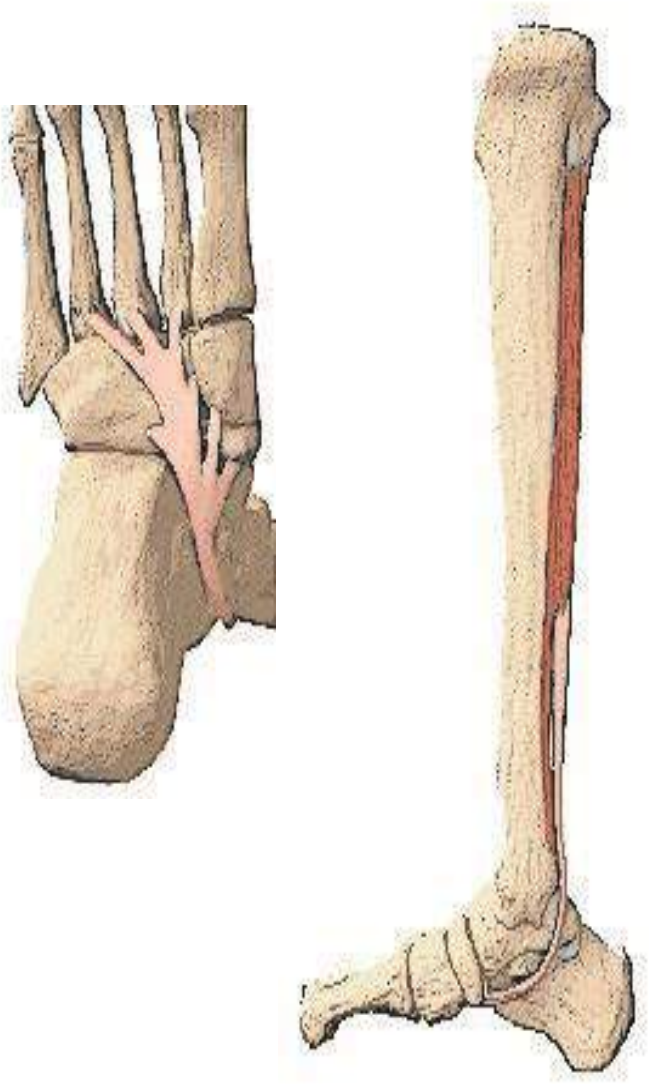
Flexor hallucis brevis & longus

Gastrocnemius

Buerger's test. (Simple challenge for vascular problems in the lower extremity)

Patient is supine and the straight leg is raised 45 degrees and held there for three minutes. The subject then sits with their legs over the table

Positive = foot blanches and veins collapse with leg elevated OR it takes 1 - 2 minutes for reddish cyanosis to cover the foot and the veins to engorge.



I wanted you to see the slide above because it shows you why the tibialis posterior tendon is so important to the medial arch, and where to find it. It may also mimic other pain in the calf. You may think you have a gastroc or soleus problem when in actually it‘s tibialis posterior. More than 50% of the attachments for tibialis posterior in the foot are in the navicular bone. When the arches are intact the body weight should be supported on a tripod.

Adjusting feet 101

What is the most important area of the foot to adjust? Is it medial or lateral is your first decision.

MAKE SURE THE PATIENT CAN TOLERATE THE ADJUSTMENT YOU WANT TO PERFORM! SELECT MANUAL VS INSTRUMENT VS DROP or SOFT TISSUE..

I used to love to manipulate all metatarsals manually. Once you sprain a foot and have to fix it for a patient that wanted to go travelling or run a race that day you will appreciate this fact. This is experience talking here! Do this by examining ROM in the area you are going to adjust and see if the patient is already in pain or not.

Calcaneal and talus adjustments are great to do as a pull move : check inversion , eversion ROM and adjust to improve those ROM's. As the foot elongates it tends to allow the calcaneus to drift posteriorly. Remember this later when we use taping techniques.

A dropped navicular (most common) Does not make sense to do a pull move since it is already inferiorly displaced. Try drops or instrument adjustments since they are easy to adjust superiorly and DNFT is fine. Usually enhances Tibialis posterior but can enhance other closely related fascial chain muscles.

Cuboid adjustment: subluxation either lateral or inferior, same as navicular just lateral in location. Usually enhances the peroneus longus musculature.

Transverse arch: Cuneiforms: I prefer drops (use form to adjust over) or activator for this region as well since they tend to drop inferiorly. Flexion manipulation is great also.

Phalanges: Axial pull traction manipulation works fine here. Just make sure the patient can tolerate the pressure required to hold the phalange. Older patients may not tolerate this adjustment very well.

Fibula: The fibula has an arthrodial joint between the lateral condyle of the tibia and the head of the fibula. The contiguous surfaces of the bones present flat, oval facets covered with cartilage and connected together by an articular capsule and by anterior and posterior ligaments. I mention this in greater detail because it is often overlooked. Usually enhances the peroneal group function.

Fibula-tibia junction, unless traumatically misaligned will respond to whatever the foot and associated muscle weakness pattern is occurring. So, **pronators** usually sublux the **fibula anteriorly** And **Supinators** usually sublux the **fibula posteriorly**

The other very common issue with that joint is that it becomes hypermobile, unstable and just needs to be approximated and taped (can do with whatever adjustments you elect). As long as you apply the force in the direction all techniques are great.

Which came first? The chicken or the egg? Was the muscle weakened or tightened and the bone became misaligned? Or was there a single or multiple traumas?

Are there racial differences?

You bet. Just like Asians have straighter spines meaning much less spinal curves , African Americans have more spinal curve and lower arches. That does not mean they all need orthotics.

Compared to Caucasians, African Americans were almost 3 times more likely to have pes planus and were nearly 5 times less likely to have Tailor's bunions or pes cavus.

EXAMPLES FOR YOUR OFFICE MONDAY MORNING:

1. The patient is complaining of foot pain. You test their extensor hallucis longus (EHL) and find it to be weak. Challenge the transverse arch by manually compressing it together with one hand while you retest the extensor hallucis muscle with the other. If this strengthens the muscle you know you have a **metatarsal** failure. You can adjust and tape accordingly. Think about adding a metatarsal support to facilitate the rest of the inflammation reduction. This is probably why foot levelers became so popular.
2. Raising the **navicular bone** strengthens the tibialis posterior muscle. Adjust the navicular superiorly. Recommend a drop adjustment or an instrument as the typical pull move is not optimum. Or do a prone push move.
3. Lowering the navicular strengthens the EHL, means you had a trauma to the dorsal surface (patient rolled the foot underneath them) and you need to pull the navicular inferiorly (yank and crank OK). Will usually see weakness of the toe extensors also (Extensor digiti longus). Soft tissue treatment helps a lot in this type of trauma along with taping. Try active tissue therapy with the patient extending their foot while you rub it out.
4. Pulling the **calcaneus** anteriorly strengthens the EHL. There is a plantar fascial issue and the calcaneus has drifted posteriorly. Adjust calcaneus anteriorly and tape accordingly. ALSO check the navicular afterward.
5. The patient has pain at the ***lateral ankle*** area. You will usually find a weak peroneal (longus, brevis or tertius). Try challenging the **cuboid** superiorly and or the fibula posteriorly.
6. We have not yet really talked about the fibula so here goes. You should find that ***without trauma*** if the foot tends toward pronation or pes planus the fibula will move anteriorly and if the tendency is for a cavus foot or one that rolls outward you will find a posterior fibula. Adjustments can be done manually with drops or instruments and if needed taped. Especially effective for knee pain.
7. You perform ROM on the ankle and you find it bound completely or in one other direction (inversion or eversion). The **Talus** may be jammed and is classically and wonderfully released with a pull manipulation. It should create an audible release. Oh this one feels so good!

8. OK, so you are new to this stuff. You know the patient has foot problems but you don't have time to figure it out or just need a few suggestions. Remember the million dollar roll? Ok here's mine.

   Use a rubber dowel (Theraband foot roller or equivalent shapes). Adjust the navicular superiorly with a drop block or drop section of your table over the footie as I call them. Do the same for the cuboid and the metatarsal arch. You only need to drop on them 1-2 times three is not necessary unless it's really stubborn. Perform this gently, as if it was your mothers feet and they hurt. It should be pain free if you are gentle. They will rarely be audible but you should find something that you are working on is either better, easier, or the patient feels less pain, more function, more ROM. Don't have access to a drop block then use an instrument while you hold the foot steady.

CHECK YOUR PATIENTS SHOES!

This is frequently an issue. Patients have no idea what a good shoe is! Especially women! Quick Check. The two most important things to look for in a shoe are: Strong **counter** (rear heel structure) and **Torsional stability.** The shoe cannot be twisted easily especially in the forefoot. I recommend a closed rear shoe since that is the impact point when we walk. Open toe for a woman is OK if they have a closed rear. Look at your patient from the rear while they are in their shoes. You will be surprised at what you see. If the shoe is broken down, you will see it with them in it. The old days of wearing a shoe till you see your toes coming through is a very bad idea.

Most common causes for weakness of the extensor hallucis longus muscle: Injury to the muscle itself, metatarsal splaying, dropped navicular, plantar fascia issues and weakness of the flexor hallucis or flexor digitorum longus.

Most common causes for weakness of the peroneal group: Deltoid ligament tear, stretch, or instability, cuboid subluxation , fibula subluxation, myofascial issues, high heels, or an arch supports that is ***too high***.

Muscle Activity From heel strike to flat foot

Tibialis anterior Eccentric
Controls pronation of the subtalar joint and decelerates plantarflexion
Extensor hallucis longus/Extensor digitorum Eccentric
Decelerates plantar flexion and controls motion of tibia on the talus

Foot Muscle Strengthening

We initially utilized the typical old fashioned techniques for feet, which are really more for keeping range of motion than strengthening (picking up marbles, towels etc.). Later we used the Pilates foot corrector or the Elgin ArchXerciser. These are far superior to all of the older techniques, except barefoot walking or running on the beach. Superior because they are a form of resistance training. People actually get stronger in their feet.

CORD THERAPY

Tubular cords are great for strengthening the peroneal group as well as tibialis posterior and anterior.

Rocker Board Therapy (later wobble board can be used)

Great for lateral peroneal group. Start slowly and keep ROM short at first.

There is Synergy between the extensor hallucis longus (deep peroneal nerve L5-S1) and tibialis anterior muscles (peroneal nerve L4-5-S1) much like any other fascial chain in the body or a lumbar nerve root.

Which brings us to the next point about using muscle testing as functional neurology to better assist you in treating the lumbar spine.

The first thing I do is determine whether the muscular weakness is from a biomechanical issue in the foot or a nerve supply from the lumbar spine.

If nothing you do to the foot brings the strength back it MUST be a nerve from the lumbar spine or peripheral nerve and occasionally a lymphatic blockage. So you should be connecting the 4^{th} or 5^{th} lumbar subluxations to the foot issues as well. Is it a simple misalignment or a disc/nerve compression? Is it on the same side as the sacroiliac joint lesion? If it's a compression and you decompress the nerve, you should see an improvement in the foot muscle strength. Oh, you don't have any decompression tables? Try having the patient sitting and flex them forward as you help them flex the lumbar spine using your thumbs on the spinous processes. This is a great way to have the patient flex there own lumbar spine at home ! I love inversion for this purpose. This I think goes way back to the times when Major Bertrand Dejarnette (SOT USA) used his blocks on the L5 spinous for sciatica.

GENERALIZATIONS

Let's say there are 2 types of foot anatomical alterations.

Pronators and Supinator's

Are they STABLE or UNSTABLE…..OR **normal motion versus hypermobility**

Pronators usually require medial arch supports.

Supinator's or high arch patients usually need lateral support.

Was it caused by: Trauma, genetics, repetitive stress, over weight, bad shoes?

Do you need to correct Rear Foot? Separate decision than just support arches.

OXFORD, ENGLAND—A new report in the *Journal Of The Anthropological Society Of Oxford* reveals that human feet were likely once used as a means of extravehicular locomotion. "Apparently, as recently as 20 years ago, the foot was used in a process called 'walking,' by which the human body actually propelled itself," the report read. "Starting sometime in the late 1970s, these crude early feet gradually evolved into their present function of operating the gas and brake pedals on automobiles." The same team of researchers discovered in 1994 that the human brain was once used for various problem-solving applications before evolving into an absorption/storage unit for lyrics to TV-show theme songs.

HYPERMOBILITY TEST

This really works ! 8 Finger extension ROM as a general test for hypermobility. Most people cannot extend there fingers more than 25 degrees. A hypermobile person can extend sometimes to 90 degrees. If they are hyper mobile in there hands they are usually hypermobile everywhere.

PROPER SHOES

Walking and jogging shoes are similar because they both utilize a heel strike first.

Running is different. You don't land on your heels because you are moving too fast. Mid strike versus toe strike. Sprinters use toe strike and slower runners can use mid strike.

A strong counter is a must for all. Torsional stability may vary according to the task. Cross country and rougher terrain may require a more flexibility for traction.

CONDITIONS THAT YOU CAN TREAT

Ankle Sprains or Inversion Sprains

An ankle sprain refers to the tearing of the ligaments of the ankle and account for approximately 40% of all athletic injuries. 85% of ankle sprains occur on the outside (lateral side) of the ankle and are known as an inversion sprain. This is the type of injury that most runners experience when they sprain their ankles. Medial ankle sprains (along the inside of the ankle) occur less frequently and are usually caused by fractures or other traumatic events.

So, why is an inversion sprain so common? The bone on the lower outside of the ankle (the lateral malleolus – distal fibula) extends further down than the bone on the inside of the ankle (medial malleolus – fibula). This difference gives the inside of the ankle (medial side) more stability than the outside of the ankle (lateral side).

The deltoid ligament can also be strained due to long distance running or walking on uneven surfaces for an extended period of time. The key is that the symptoms are inferior to the medial malleolus. Both plantar flexion and eversion aggravate the pain. The inferior medial malleolus will usually be tender to palpation.

The tibiofibular ligament may also be damaged causing a separation of the ankle mortise joint. In this case, fracture of the fibula will usually be found in the lower 1/3. Presence of a fibular fracture in this area is indicative of a torn tibiofibular ligament.

Plantar Fasciitis Peripheral Neuropathy

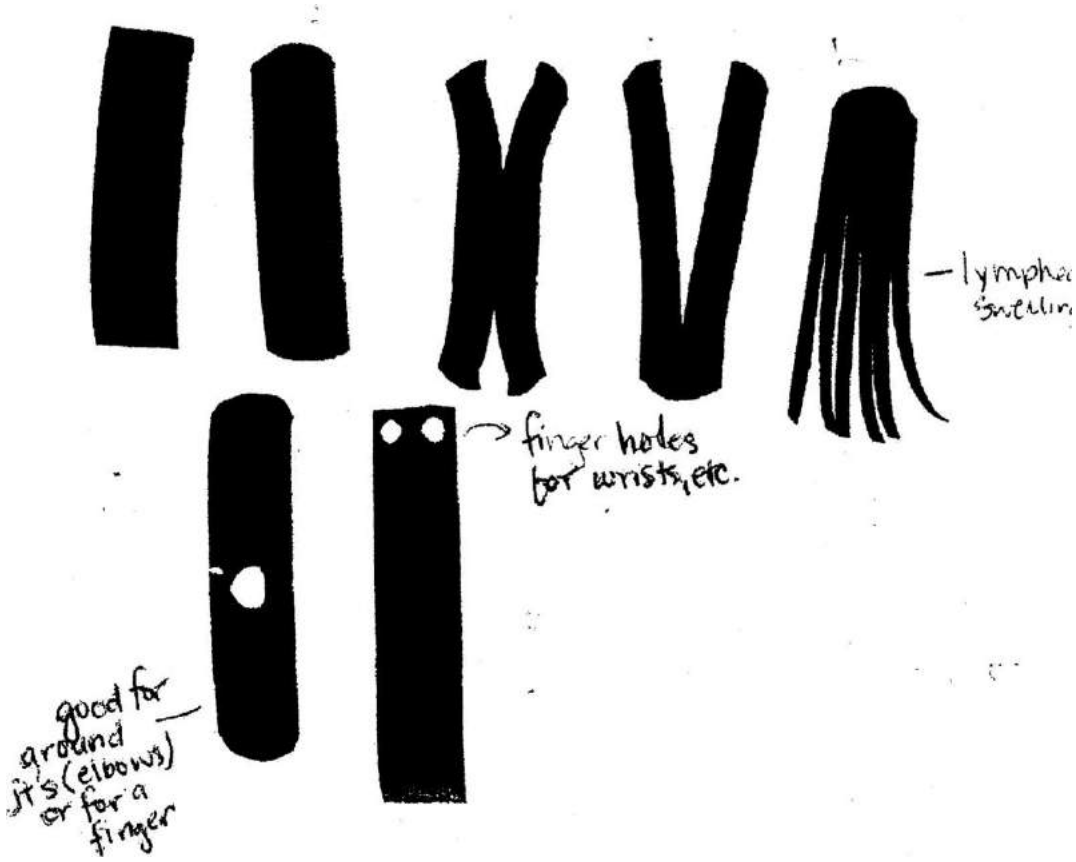
Heel Spurs: Foot and Ankle Sprains and Strains

Neuromas Metatarsalgia

Tarsal Tunnel Syndrome Bunions: Hallux Valgus (Show typical pictures)

Bunionette: Tailor's Bunion 5th metatarsal deviation usually from tight shoes and rubbing.

Kinesio Taping Shapes



Shapes are described as: I" shape, "Y" shape, "X" shape or Fan shape

Holes may be cut for fingers and elbow by folding the tape and cutting it out in the middle.

A wider piece of-tape can be cut into thinner strips (i.e. a 2 inch tape cut into 2- 1 inch strips) without the tape losing its integrity for fingers or body parts that are . smaller.

Tissue Targeted for Treatment	Tape Tension
Lymph, Skin, Edema	None to Very Light (0-10%)
Muscle	Light to Moderate (20-50%)
Ligaments or Adhesions	Almost Maximum (75%)

Tips on applying Kinesiotape

1. You can use the squares on the paper side of the tape to duplicate exact lengths.
2. Always round the ends of the tape like a band aid. It sticks much better.
3. Layering is just fine. Example: you can tape for lymph drainage and muscle support over it.
4. **Taping for pain** really does work. I call it the asterisk or star burst shape because it's 4 layers crisscrossing. Start with a cross + and then add the other two. Remember the center of the cross is where the worst pain is. In this procedure you stretch the tape from the center not end to end. This technique also works great over the **deltoid ligament** of the lateral foot, or any other joint that would benefit from compression.
5. Do not stretch the beginning or end of the tape, approximately 1 ½ inches.
6. Apply over the muscles you are trying to support. Think of it to try with any chronic joint you are having trouble stabilizing. Especially the sacroiliac joint and fascia.
7. **Metatarsals** can be easily wrapped after adjustment by encircling the forefoot.
8. **Calcaneal** taping is consistent with short foot concept. In this taping you should also stretch from the middle at the calcaneus and pull the tape forward to the forefoot.
9. **Navicular.** When you have to tape this region you probably have to go around the whole foot. This type of taping is sometimes uncomfortable and you'll find the tape rolls a bit more. I usually tape the tibialis posterior tendon instead so I can keep the bottom of the foot clear of tape.
10. **Plantar Fasciitis:** Tape the bottom of the foot as a flexor compartment with the foot in flexion. Also tape the rest of the foot issues that you find at the same time. All fasciitis patients have other foot issues that allow the over use of all plantar structures. Tape them all for maximum relief.
11. **Achilles Tendinitis:** Similar to plantar fasciitis you will most often find other foot issues that allowed the overuse of the achilles tendon. Trauma is always different. Determine whether the achilles tendon was stretched too much and you need to shorten it OR overworked and it needs stretching.
12. **Shorten versus elongate.** You can shorten the muscle through taping in two different ways. By tearing the tape at the middle and stretching the tape from the middle as opposed to the ends. This will shorten or tighten the muscle. As if you treated the muscle spindle cell. Or by taping the muscle in a shortened position. This technique sometimes pulls apart easier.
13. **Lymphatic taping:** If you need to clear fluids, swelling or for generalized drainage. Use the fan shape and do not stretch at all. Just gently place the strips down.

SKIN CARE WITH TAPING

WEARING

The tape can be worn for several days.

Generally the tape can stay on for 4-5 days. Many people are able to wear the tape for a week or so. This may vary with the area being taped and your individual skin and bathing habits.

Shower with the tape on. Baths and swimming usually affect the tape.

The tape is water resistant. You should ask if the patient is going to swim with the tape on. IF so you should use the most waterproof tape available. Once out of the water, pat the tape dry instead of rubbing which may peel the tape and or use a hair dryer if very wet.

REMOVAL

Remove the tape in the direction of hair growth.

If you remove the tape in the opposite direction, it gives a "waxing" type of effect and may pull the hair out.

Pull your skin off of the tape

Do not pull the tape off of your skin like a "band aid". Peel the tape back on itself and work the skin off of the tape as you peel the tape. Pulling away from the body at 90 degree angles can pull layers of skin off, causing redness and irritation.

Moisturize the skin,

Apply a light moisturizer to the skin as you normally would in your

FOOT ORTHOTICS

How do you know you should recommend a foot orthotic?

This will vary based on your experience. A simple approach is to adjust the foot and see how the patient is doing. Does the patient hold the adjustment? How do you judge this? By symptoms? By muscle strength, by posture? Each of you will adapt a different way of utilizing them.

I use them for all my neuropathy, lumbar disc and sciatica patients! I never saw a lumbar nerve root problem that didn't have an associated weak foot. I frequently use them for knee patients with patellofemoral tracking issues and hip patients.

But mostly I include a foot exam for ALL patents that I see whether they have lower extremity complaints or not. And then factor it into my analysis for the patient.

Here is a thought sequence that will help you.

1. What type of support does the patient need? Medial, lateral, transverse?
2. What type of shoes will the patients wear them in ? Athletic, dress, sandals!, flip flops!, open toe, open heel, Clogs, narrow, wide, deep, or shallow.
3. Does the patient need a heel lift?
4. What type of activities will the patient perform while in them? (run, walk, sit, sprinter, gym, etc.)
5. Does the patient have a prominent plantar fascia tendon? If you dorsal flex the foot to it's maximum you can palpate the tendon like a guitar string under your fingers. Order an accommodation (recess in the arch surface so the tendon does not slam onto the orthotic every time they walk or run).
6. Refer to the attached orthotic ordering form that I provided to remind you of all the possibilities. Every lab has a unique form. Get to know your lab technician they can be of enormous help to you along the way.
7. Does the patient have any specific painful areas? Are they very sensitive overall and or their feet?
8. Did you already adjust them give them appropriate exercises but they are not doing them? These are patients that absolutely should have them since they require almost no effort by the patient.

CALIFORNIA ORTHOPAEDIC LAB

1-800-433-0882 562-985-9924
FAX 562-985-9974

LOG# _____

PATIENT NAME _____

SEX _____ AGE _____ HEIGHT _____ WEIGHT _____ SHOE SIZE _____

SHOE WIDTH: N M W USUAL FOOTWEAR _____

DOCTOR _____

CHIEF COMPLAINT _____

ADDRESS _____

CASTS : ☐ NEUTRAL PLASTER ☐ SEMI-WEIGHT ☐ IN SHOE ☐ FOAM BOX

TELEPHONE _____

☐ RETURN CASTS WITH ORDER ☐ STORE CASTS FOR 6 MONTHS

GERIATRIC/ ACCOMMODATIVE

☐ PLASTIZOTE	Flexible, soft, accommodative, to toes.
☐ OPTIMA	Maximum firmness. Aliplast and crepe. For heavy patients and active seniors. maximum arch support.
☐ SOFTFLEX	Ultra soft EVA Puff, flexible, good support, won't bottom out.

FASHION ORTHOTICS (MUST send patient's shoes for this type)

☐ CONFETTI	Semi-flexible, to sulcus, for pumps and high heels over 1", and flats.
☐ CREPE	Semi-flexible crepe, for low heeled pumps to 1", and flats.
☐ GRAPHITE	Rigid, low-heeled pumps to 1", and flats. Cast in shoes for best fit.

PEDIATRICS

☐ UCBL	Semi-rigid, deep heel cup, medial flange, lateral flange, rearfoot post, to control severe pronation.
☐ GAIT PLATE	Please specify: ---------To promote in-toeing ---------To promote out-toeing
☐ SCHAEFFER PLATE	Semi-rigid, deep heel cup and medial flange, to control excessive pronation.

FUNCTIONAL

☐ SEMI-FLEX	Semi-flexible subortholene. ☐ PICASSO ☐ BLUE
☐ SEMI-RIGID	Semi-Rigid Polypropylene ☐ WHITE 3/16" ☐ BLUE 3/16" ☐ WHITE ¼"
☐ GRAPHITE	Rigid, use when shoe fit indicates a thin, rigid orthotic.
☐ LEATHER LAMINATE	Thermocork and leather, semi-flexible, for hard to fit shoes.
☐ CREPE	Firm flexibility, great control, for active patients who can't tolerate hard orthotics.

SPORT ORTHOTICS (INCLUDES rearfoot posts, covers and accommodations)

☐ Aerobics (to toes)	☐ Skiing (to toes)
☐ Marathoner, Jogger (to toes)	☐ Tennis/Raquetball (to toes)
☐ Sprinter (to toes)	☐ Basketball (to toes)
☐ Golf (sulcus)	☐ Football (to toes)

POSTING

☐ INTRINSIC
☐ EXTRINSIC

FOREFOOT:

RIGHT	LEFT
VARUS _____	VARUS _____
VALGUS _____	VALGUS _____

REARFOOT ☐ YES ☐ NO

RIGHT _____ / _____ VARUS / VALGUS

LEFT _____ / _____ VARUS / VALGUS

☐ ACRYLIC ☐ CREPE

HEEL LIFT FOR LIMB LENGTH:
☐ RIGHT ___MM ☐ LEFT _____MM

REARFOOT POST ELEVATION:
☐ NONE ☐ 4MM ☐ 8MM _____MM

HEEL CUP HEIGHT
☐ 12MM ☐ 15MM ☐ 18MM _____MM

MEDIAL POST FLARE ☐ RT ☐ LT

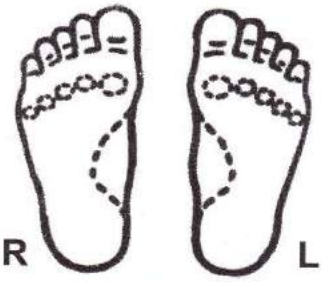
LATERAL POST FLARE ☐ RT ☐ LT

SPECIAL ADDITIONS

	RIGHT	LEFT
1ST MET HEAD CUT OUT	☐	☐
5TH MET HEAD CUT OUT	☐	☐
HEEL PAD	☐	☐
HORSESHOE PAD	☐	☐
HEEL SPUR ACCOM	☐	☐
METATARSAL PAD	☐	☐
METATARSAL BAR	☐	☐
MORTON'S EXT	☐	☐
FASCIA ACCOM	☐	☐
MEDIAL FLANGE	☐	☐
LATERAL FLANGE	☐	☐
MEDIAL HEEL CLIP	☐	☐
LATERAL HEEL CLIP	☐	☐
TOE FILLER	☐	☐

COVERS

☐ METS ☐ SULCUS ☐ TOES
☐ SPENCO 1/8, 1/16
☐ PPT 1/8 1/16
☐ PLASTIZOTE 3/16, 1/8, 1/16
☐ EVA PUFF 1/8, 1/16
☐ NAUGAHIDE
☐ SUEDE



AREAS TO BE ACCOMMODATED

RUSH SERVICE:

☐ 24 HOUR RUSH (50% Extra Charge)
☐ 48 HOUR RUSH (25% Extra Charge)

SPECIAL INSTRUCTIONS:

_____
_____
_____
_____
_____
_____

SEND MORE: ☐ ORDER FORMS ☐ MAILING LABELS ☐ BOXES ☐ BAGS

FOR LAB USE:

LOG # _____

DATE REC'D _____

DATE OUT _____

THANK YOU FOR YOUR PARTICIPATION