

Correction of the Ankle using Applied Kinesiology (AK) and Low Intensity Laser Therapy (LILT)

This is the second article on LILT and AK procedures in relation to the correction of joint dysfunctions.

If you have missed the 1st or are unable to get hold of it please email me:- tom@prestatynchiro.co.uk.

In the first article I covered the history and development of AK and neurolymphatic points on the body and neurovascular points on the skull.

Considerations in relation to ankle dysfunction.

As mentioned before it is always wise to consider joints above and below. The ankle is often involved with the knee, this is due to the influencing forces that effected the knee would also impact on the ankle.

Primary structures to consider

- 1 Tibiofibular articulation. A common finding is a posterior displacement of the fibular head. This is usually associated with palpatory pain around the fibular head and an ankle that clicks due to torsion along the Interosseous membrane and lateral malleolus. Restriction and pain on full flexion of the knee.
- 2 Talocrural joint or commonly the ankle joint as we know it. This is the articulation between the talus and the medial and lateral malleoli. Associated with history of ankle sprains. Lateral weakness of ankle, tender points around lateral aspect of ankle, occasionally restriction in dorsi flexion. Very common in sports injury both acute and chronic.
- 3 Tarsal and metatarsal articulations.

There are a number of mobilisation techniques available to restore motion into restricted joints, but will not be covered in this article. This article is focused on the muscular weakness associated with the ankle.

Muscles to consider that directly act on or over the ankle

- Solius
- Peroneus tertius
- Tibialis Anterior
- Tibialis Posterior
- Flexor hallucis longus
- Extensor hallucis longus/Extensor digitorum longus

Other muscles to consider – covered in previous article.

- Poplitius
- Gastrocnemius
- TFL
- Hamstrings
- Sartorius
- Gracilis

Muscle testing procedures

As mentioned previously try not to get caught up in treating a diagnosis; but, try to evaluate what is going on and correct the dysfunction; in time symptoms will resolve, if you have got it right. This does not mean you should not help with a patient's current pain and discomfort but as a practitioner that should not be your only focus or our main clinical aim. Over the years I've seen people pushing stripped down, anyone can do it without thinking; easy no effort required approaches because it is a more saleable seminar or benefits the technique salesman. Yes; this procedure can be a bit of a bother, and yes; there is lots to learn in regard to muscle anatomy, yes; you may have to think a little about your care and its application, and yes; you may make some mistakes, but by dedicated application and sometimes trial and error you will give the best care that you can give and that is what this is all about.

For every action there is an equal and opposite reaction. Get involved with the action not the reaction. Right; I've had my rant; now let's look at the muscles.

Soleus

As this shares a common insertion with the Gastrocnemius into the Achilles tendon it is often involved with Achilles tendonitis.



Action: Plantar flexes the foot (points the toes)

Posture: Forward lean is often present due to lack of tibial support.

Test: Patient is prone (Face down) knee is flexed to 90° with the foot plantar flexed –toe pointing to ceiling. The examiner applies traction on the calcaneus (Heel) with one hand and with the other contacts the forefoot and directs pressure inferiorly towards dorsiflexion.

Neurolymphatic: Anterior- 2 inches above umbilicus and 1 inch from midline.

Posterior- Between T11, T12 bilaterally near laminae.

Neurovascular: Lambda

Peroneus tertius



Action: Dorsiflexes and everts the foot (pulls little toe up)

Posture: Allows supination of foot.

Test: Patient supine with foot dorsiflexed (toes pulled up) and everted (foot rolled out). The toes should be relaxed or slightly flexed as a weakness may cause the patient to attempt to recruit flexor digitorum (toe extensors). Examine contacts over 5th metatarsal (little toe) and exerts a pressure inferior and medially while supporting the lower leg with the other hand.

Neurolymphatic: Anterior- Inferior ramus of pubic bone bilaterally.

Posterior- Between L5 transverse process and sacrum.

Neurovascular: Bilateral frontal bone eminences.

Tibialis Anterior



Action: Dorsiflexes and inverts foot(rolls in).

Posture: Occasionally associated with weak medial arch of foot

Test: Patient supine with foot inverted and dorsiflexed. Examiner contacts the lower medial aspect of foot (metatarsal region) and applies pressure superior and laterally – into dorsiflexion and eversion.

Neurolymphatic: Anterior- $\frac{3}{4}$ inch above pubic symphysis, bilaterally.

Posterior- L2 transverse process, bilaterally.

Neurovascular: Bilateral frontal bone eminences.

Tibialis Posterior



Action: Inverts and plantar flexes the foot. Acts as medial stabilizer to ankle.

Test: patient supine with foot maximally flexed and inverted. Examiner contacts the medial aspect of the foot and directs pressure laterally while stabilising the foot by contacting the lower leg just above the ankle with the other hand.

Neurolymphatic: Anterior- 2 inches above umbilicus and 1 inch from midline.

Posterior- Between T11, T12 bilaterally near laminae.

Neurovascular: Lambda

Flexor hallucis longus



Action: flexes big toe; continued action assists in plantar flexion of foot. Assists in medial ankle stabilisation.

Test: patient supine and foot midway between plantar and dorsiflexion. Examiner stabilises the foot with a contact over the top of the foot with thumb supporting just inferior to main joint of the big toe (Metatarsophalangeal articulation). With the other hand the examiner exerts a pressure superiorly while the patient flexes the big toe.

Neurolymphatic: Anterior- Inferior ramus of pubic bone bilaterally.

Posterior- Between PSIS and L5 spinous process bilaterally.

Neurovascular: Bilateral frontal bone eminences.

Extensor hallucis longus/Extensor digitorum longus



Action: Extends the big toe; continued action assists in dorsiflexion and inversion of foot and ankle.

Test: patient supine with the big toe is fully extended (toe pulled up).examiner stabilises the foot and exerts a pressure inferiorly against resistance.

For digitorum contact on the 2nd – 3rd digits and test as for above

There are no reflexes listed for this muscle group show focus would be on origin and insertion



Correction of muscles weakness

Step 1 The first and in my opinion the most important input is to the origin and insertion of the muscle as this is where the primary neurological control of muscle contraction occurs. In my experience this will correct the majority of muscle weakness.

Step 2 The neuromuscular spindle cell in the belly of the muscle.

These two steps represent the main neurological input leading to and maintain a muscle weakness. Correction at this level is like going straight to the source. These two procedures will correct 80+ % of all muscle dysfunction.

Step 3 Neurolymphatics – It is tempting at this stage to jump to the cranium (neurovascular) as it is easier and does not require disrobing the patient. If disrobing your patients is not practical then stimulation of these reflex points can be done, through clothing, in the ‘old fashion way’ with vigorous digital stimulation for 30sec to 1 min. Active reflex points can be very tender and/or ticklish and can remain tender for up to 4 days after – this was the motivation that initially prompted me to try the laser instead.

Step 4 Neurovascular /Stress Receptors– Now it is time to move to the skull and clear the neurovascular and stress receptor points. Once they have been identified as active then it is fair and reasonable to go directly to them in subsequent visits. If after rechecking the weak muscle and correction has not occurs then you would be wise to backtrack to step one.

Chronic conditions tend to be multilayered; so avoid the tunnel vision trap of assuming recovery will follow a linear path. I tend to see many patients that come to me with a collage of life’s little mishaps and experiences, while working with them it often resembles peeling an onion, layer on layer.

Laser protocols

If you suspect the fibula head is involved then apply laser to that area directly over the fibula head. If you use a multihead probe. If not work around the head of the fibula, some sources recommend 'painting' the area. Recommend a dose of up to 25j. If there are trigger points or tender areas along the lateral shin then work down area with the laser. On soft tissue like this I use the 5 x 820nm by 200mW Cluster Probe dose of 15 sec (24J/cm²). And on the ankle itself working laterally from behind the lateral malleolus across the talus into the lateral malleolus and finally Achilles tendon.



If the problem is not directly in the ankle joint proper then palpate the tarsal bones looking for tender areas. There should be a degree of motion between tarsals if you feel rigidity then mobilise that area first you will be amazed at how much motion can be returned to these joints. Apply laser to area as indicated. Most common bone involvements I have found are Cuboid and Navicular. Patients that complain of sharp pain in forefoot on walking may have a dropped transverse arch which is located across the metatarsal-phalangeal joints. As well as laser to this area I have found that tapping a cotton wool ball (used to clean off makeup- or so I'm told) under the arch for 2-3 weeks will help return of normal. This should be tapped starting on top of medial foot under plantar surface and back over lateral foot with enough tension to induce a lift of the arch but not too tight as that will only get to uncomfortable.

Note on Gait

Plantarflexion / dorsiflexion acts primary in the anterior-posterior direction along the sagittal plane. If your patient walks with a toe in (10%) or toe out (90%) gait then the ankle is forced to flex with a degree of lateral movement. This will generate intolerable stress to the ankle joint and that will lead to irritation and inflammation. Instructing our patients to walk with their toes and knee facing directly ahead will help any chronic conditions settle down. This often noticed walking up and down stairs. If this is part of their gait then when they make a correction they will expect to feel like they are walking pigeon toed, persist till the body adapts back to a normal walking pattern. This situation also applies to stress on the knee.

Note on Arthritis

Most 'arthritis' is not a disease but is a built in normal adaptive response to stress overload to a joint. It is in fact more accurate to call it bone and joint remodelling. This process also applies to other soft tissues including muscles, Prolonged bed rest will lead to muscle wasting overloading your biceps at the gym will lead to them increasing in mass this is not a disease but adaptation. If the forces applied to a joint exceed their physiological limits the body will shift from soft tissue i.e. joint capsule and ligament etc to hard tissues i.e. bone. Those bone spurs that you see on an x-ray and are told is arthritis is in fact the process of calcification of the soft tissues in response to their mechanical stress levels. Taking anti-inflammatory medication will help the pain and symptoms associated with this situation but will not influence the mechanical forces involved so in the medical model this is 'medical incurable and lifetime medication is indicated. Imagine what would happen in a dynamic living system if you changed the force input to the joint, would it be unreasonable to expect the body to reverse this situation. As a chiropractor I expect exactly this response. One of the most miraculous observations on the human body is its ability to adapt and survive. Will it happen every time; unfortunately no, there is a limitation to matter and a point of no return. But, that does not mean that the patient would not benefit by having that destructive force removed or diminished in their body.