Posturology And Its Scientific Osteopathic Approach

Luc Peeters, MSc.Ost.

The same author also published books on:

- Cranial Nerve Disorders and the Scientific Osteopathic Approach
- Fascial Chains
- Nutrition and Physical Complaints
- Posturology and its Scientific Osteopathic Approach
- Scientific Osteopathic Approach to Patients with Abdominal Complaints
- Scientific Osteopathic Approach to Patients with Cervical Pain
- Scientific Osteopathic Approach to Patients with Headache
- Scientific Osteopathic Approach to Patients with Knee or Foot Pain
- Scientific Osteopathic Approach to Patients with Low Back Pain
- Scientific Osteopathic Approach to Patients with Shoulder, Elbow, Wrist or Hand Pain
- Scientific Osteopathic Approach to the Immune System
- Scientific Osteopathic Approach to Vascularization and Oxygen Supply in Patients
- Understanding Pain and the Scientific Osteopathic Approach of Pain
- Understanding Stress and the Scientific Osteopathic Approach of Stress
- Understanding the Autonomic Nervous System and its Scientific Osteopathic Approach
- Perimenopausal Women and their Complaints
- Cerebrospinal Fluid and its Influence on Health
- Attention Deficit Disorder / Hyperactivity and the Scientific Osteopathic Approach
- Principles of Modern Osteopathy – Integration of Osteopathy into General Healthcare
- Evidence Based Practice
- Patient Information – What can Osteopathy do for You?

Contact: *Luc Peeters*

Mail: info@osteopathybooks.com

Posturology And Its Scientific Osteopathic Approach

1. Definition and Introduction

1.1. Definitions

Posturology is the medical multidisciplinary science that studies the consequences of systematic wrong body position. The major plumb lines in the standing human body are examined.

Quote: The American Posture Institute defines posturology as *'the scientific study of the body's static and dynamic alignment as it stabilizes itself in space against gravity and other forces. Posturology is a science, it is a method for analyzing the design of the body and how the body aligns itself in relationship to the surrounding environment. Posture then is the framework of human design while upright, static, and moving. Postural balance is the ability to maintain the body in an upright position against gravity.'*

Posture is the position of the body in space.

Several factors contribute to posture, including neurophysiological, biomechanical and psycho-emotional factors.

Dorland's Medical Dictionary defines posture as 'the awareness of the position of the body or its parts in space, a combination of sense of equilibrium and kinesthesia, called also position S.'

Posture is automatic and unconscious as well as conscious.

Postural pathology is an imbalance of the plumb lines, producing excessive stress on different body structures such as ligaments, bones, muscles and fascia.

We are all built in a more or less asymmetrical way because of anatomical asymmetries, habits and lifestyle. Also, lesions (losses of mobility) in different joints can cause asymmetries in our body.

Most of us compensate these asymmetries so that no complaints occur, depending on the load that is brought upon their bodies.

These compensatory mechanisms have a few clear goals:

- Keeping the eyes horizontal.
- Keeping the eyes in the direction of our feet.
- Avoid overload on bone, discs, ligaments, muscles and fascia.
- Defense against gravity.
- Avoid pain.

Good posture, static and dynamic is a good starting point for adaptability. Adaptability is important to prevent injuries.

Poor posture, poor adaptability increases the risk for injuries. This especially accounts for athletes because they put their body under more stress than non-athletes.

Good posture relates to:

- Efficient utilization of muscles and energy.
- No overload (stress) on bones, discs, ligaments, muscles and fascia.
- Fluid bodily movements.
- Good balance and defense against gravity.
- Good, balanced proprioception.

The Posture Committee of the American Academy of Orthopedic Surgeons differentiates ‘good’ and ‘bad’ postural presentations.

Their definitions of good and poor posture (quote):

- ‘Good posture is the state of muscular and skeletal balance which protects the supporting structures of the body against injury or progressive deformity irrespective of the attitude (erect, lying, squatting, or stooping) in which these structures are working or resting. Under such conditions the muscles will function most efficiently and the optimum positions are afforded for the thoracic and abdominal organs.’

- ‘Poor posture is a faulty relationship of the various parts of the body which produces increased strain on the supporting structures and in which there is less efficient balance of the body over its base of support.’

Postural control is an isometric and motor behavior which represents a stable starting point for movements.

- Visceral centers in the brain stem (for example car sickness).
- The cortex through the thalamus.

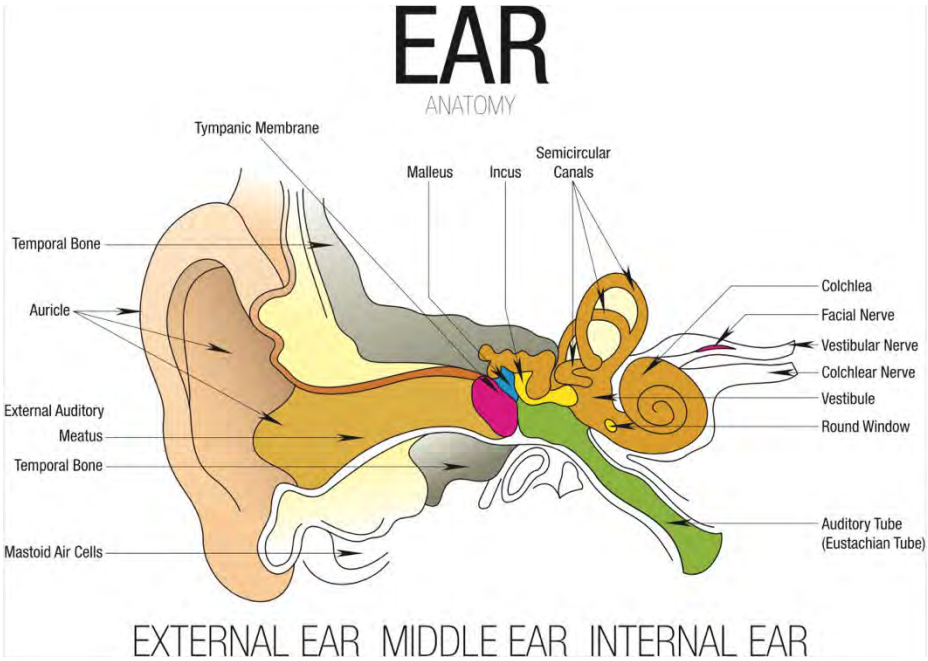

Figure 2 - The ear

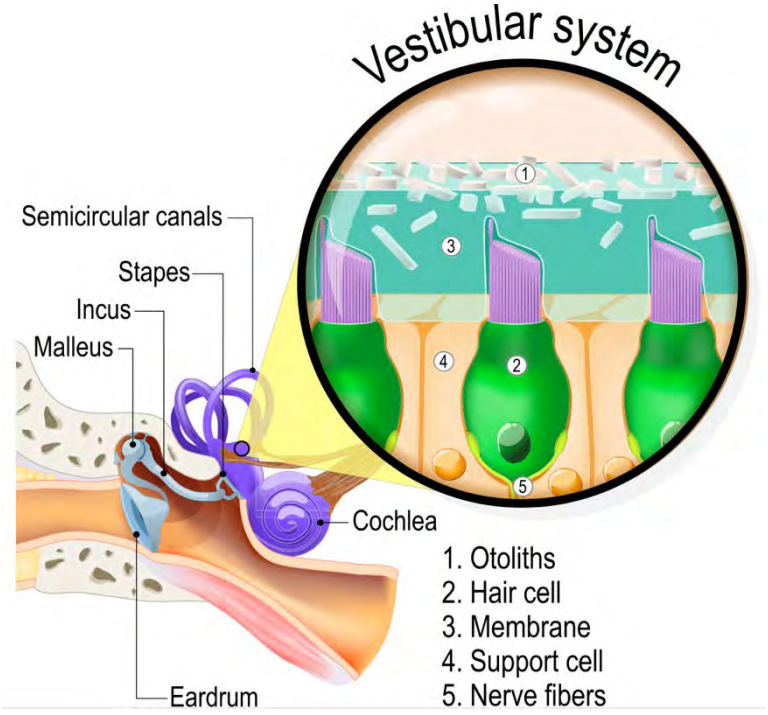

Figure 3 - Vestibular system - sense of balance, spatial orientation and coordinating movement - close up of hair cells in a macula

The Epley maneuver

The patient can do the maneuver him/herself.

If your vertigo comes from the left ear:

1. Sitting position. Turn your head 45 degrees to the left (not as far as your left shoulder). Place a pillow under you so when you lie down, it rests between your shoulders rather than under your head.
2. Quickly lie down on your back, with your head on the bed (still at the 45-degree angle). The pillow should be under your shoulders. Wait 30 seconds (for any vertigo to stop).
3. Turn your head halfway (90 degrees) to the right without raising it. Wait 30 seconds.
4. Turn your head and body on its side to the right, so you're looking at the floor. Wait 30 seconds.
5. Slowly sit up but remain on the bed a few minutes.
6. If the vertigo comes from your right ear, reverse these instructions. Sit on your bed, turn your head 45 degrees to the right, and so on.

Do these movements three times before going to bed each night, until you've gone 24 hours without dizziness.

Video 8 - The Epley maneuver

The second-order neurons leave the nucleus gracilis and nucleus cuneatus; cross over to the other side of the medulla, where they form a bundle called the medial lemniscus, which ascends to the third-order neuron at the thalamus; and then proceeds to the parietal lobe.

Proprioception of the head stems from the muscles innervated by the trigeminal nerve, where the general somatic afferent fibers pass without synapsing in the trigeminal ganglion (first-order sensory neuron), reaching the mesencephalic tract and the mesencephalic nucleus of the trigeminal nerve.

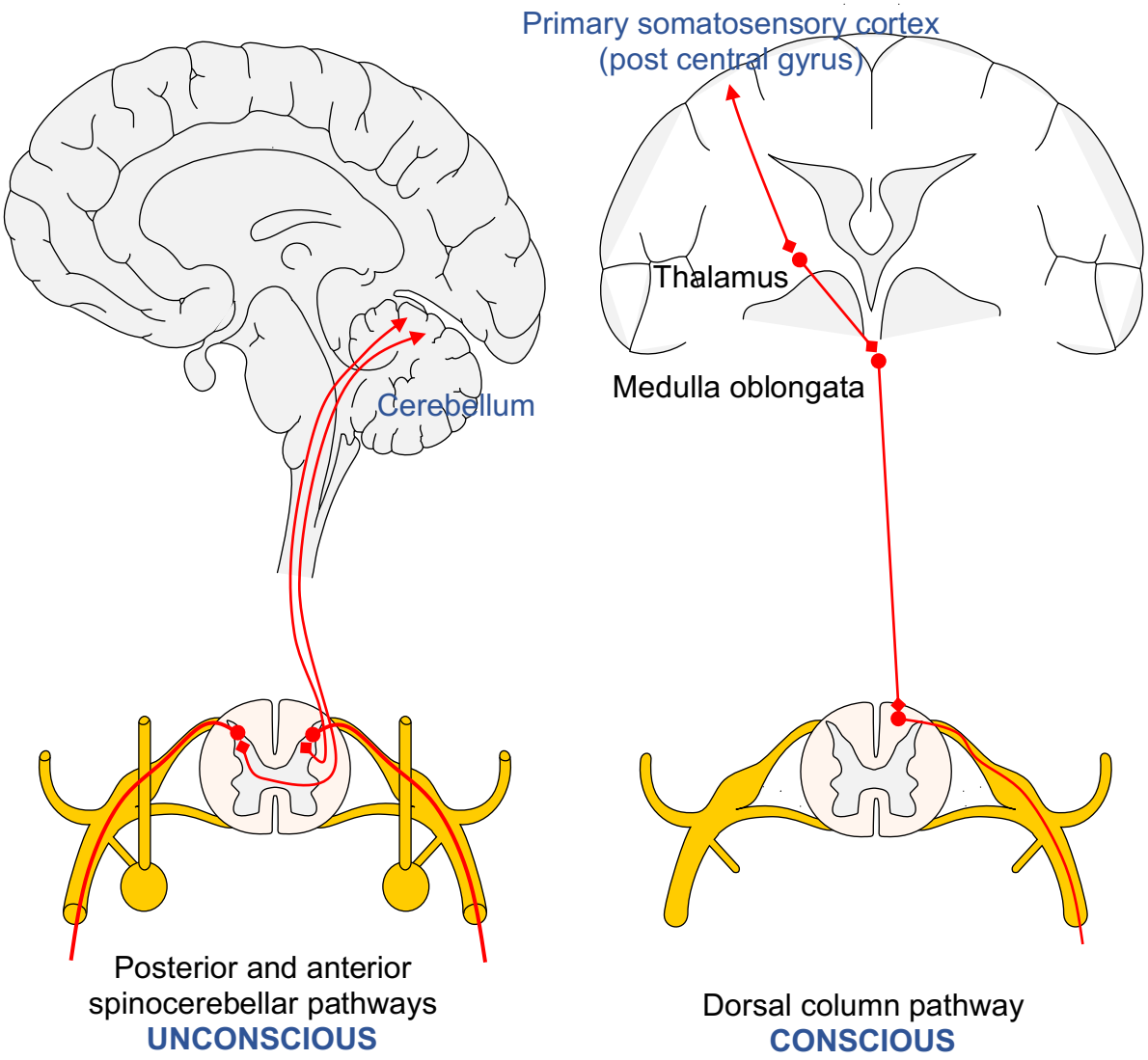

Figure 11 - Proprioceptive pathways

We observe the patient standing and we look at the left knee: we see a strong valgus.

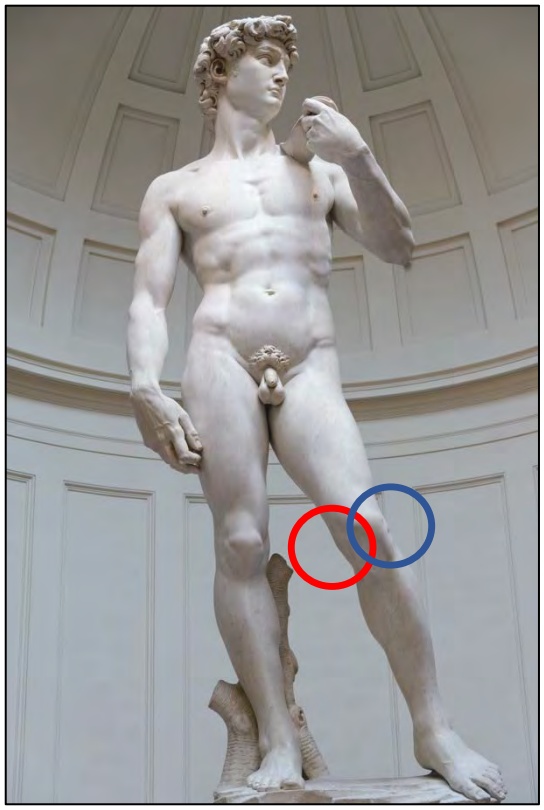

Figure 17 - Example observation short structures

This means that the pain causing structure is in overstretch and can't be treated. We however see that the lateral side of the knee has:

- Shortened structures.
- More compression.

This lateral side is the side to treat locally.

Example:

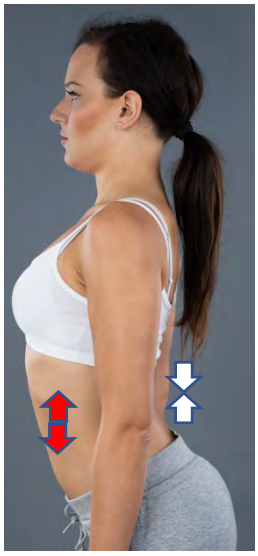

Figure 24 - Stretch the shortened structures and train the weak muscles

Osteopaths consider mechanical, vascular, neurological and metabolic stress in all patients.

The posturological aspect of an osteopathic assessment and treatment is situated in:

- **The mechanical part:**
  - Lesions (losses of mobility) can influence posture.
  - Overload on muscles can for example influence the afferent pathways towards the cerebellum and therefore cause poor posture.
  - Asymmetry in the body such as for example a short leg can influence posture.
  - These possibilities can cause poor posture which on its turn can overload soft tissues such as ligaments, muscles, discs,…
  - Training and exercise in cooperation with physiotherapists.
- **The vascular part:**
  - One of the osteopathic goals in treating posture is provide an optimal vascularization (arterial and venous) of cerebellum and spinal cord.
- **The neurological part:**
  - Treat obstructions of the peripheric neurological system.
- **The metabolic part:**
  - Here the osteopath aims especially for good oxygenation of the blood. (**see the book:** Scientific Osteopathic Approach to Vascularization and Oxygen Supply in Patients)
  - Diet when there is obesity because overweight also influences posture.

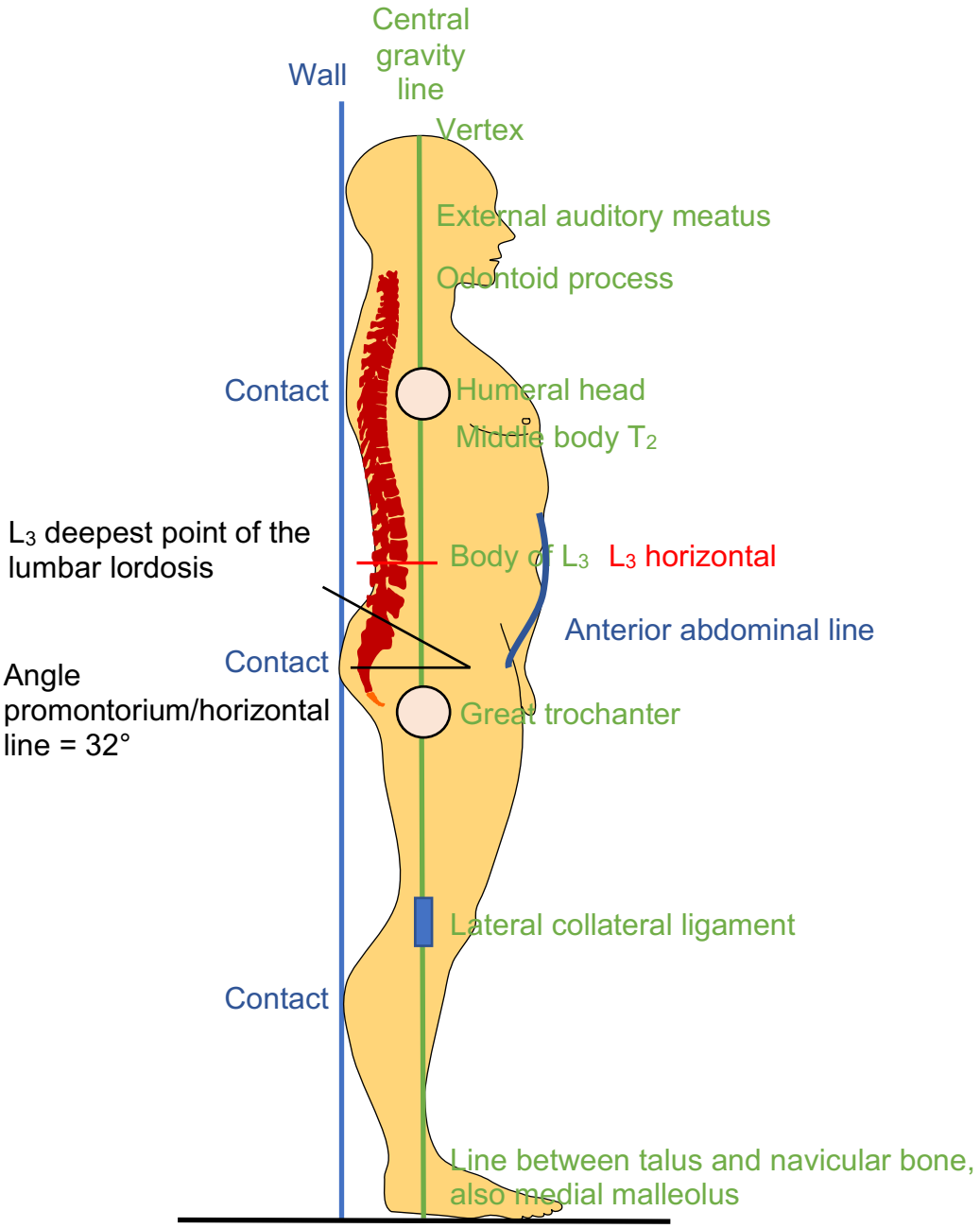

Figure 25 - Normal posture in the sagittal plane

4.1.4. Lower Cross Syndrome

The lower cross syndrome is also an agonist-antagonist-synergy loss in a characteristic, predictable pattern. Some muscles become tight other muscles become weak.

The pattern forms an X or a cross when viewed laterally.

The pelvis area projects more anterior.

Psoas and erector spinae are short; abdominals and gluteus maximus are weak.

Tensor fascia lata are also short and tight, as well as piriformis, quadratus lumborum, hamstrings and latissimus dorsi.

The pattern is seen with or without complaints.

The eventual complaints can be various:

- Low back pain.
- Neck and shoulder pain.
- Rotator cuff syndrome.
- Loss of lumbar range of motion.
- Thoracolumbar pain.

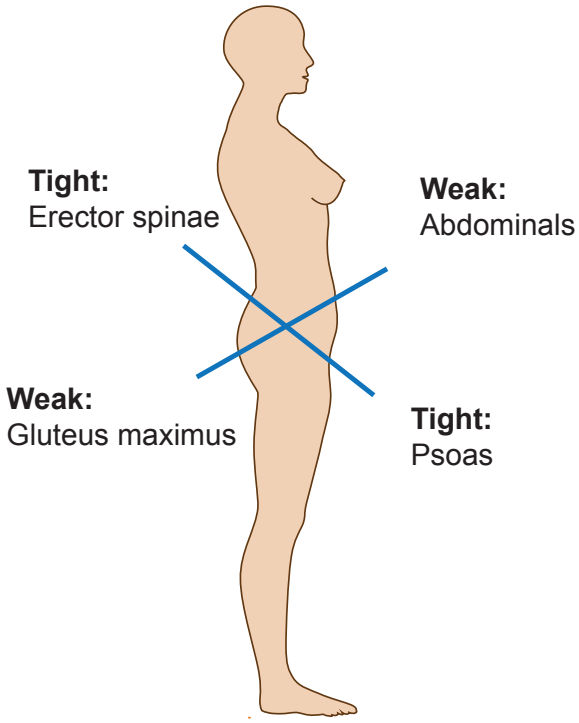

Figure 50 - Lower cross syndrome

Video 31 - Mobilizing a posterior lesion of the sacrum (fixed pelvis tendency)

- Normal and functional breathing.

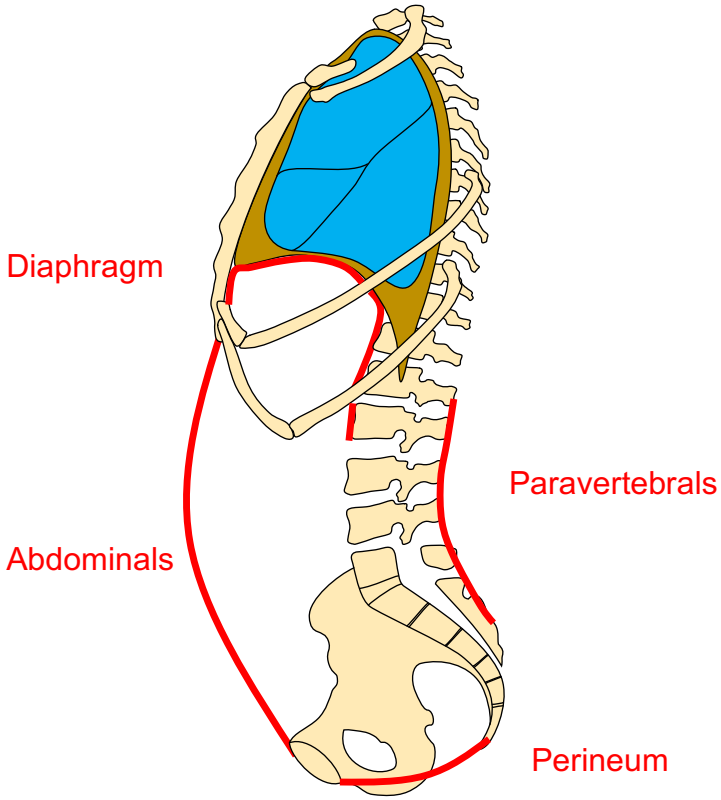

Figure 55 - Core stability

Good Core Stability Provides:

- Stiffness of the lumbar spine with lateral tension through the attachments to the transverse processes (stabilizes rotational motions).
- Good counterforce against the apex (L3) of the lumbar lordosis.
- Prevents spinal extension.
- Counteracts the pull of the psoas m.
- Stabilizes the spine.
- Controls intervertebral compression.
- Controls vertebral translations.
- Creates a pressurized visceral cavity.
- Equalizes the compression forces in the SI-joints.

To Have a Good Core-Stability the Following Elements Must Be Present

- **Bony integrity:** the bones of the spine must be in a rather normal state. Problems such as arthritis, malformation, Scheuermann disease, Bechterew disease and similar conditions compromise the core stability. This cannot be treated osteopathically.

4.1.9. Posterior Type or Back Sway

In the sagittal plane, the central gravity line lies posterior of the talonavicular joint.

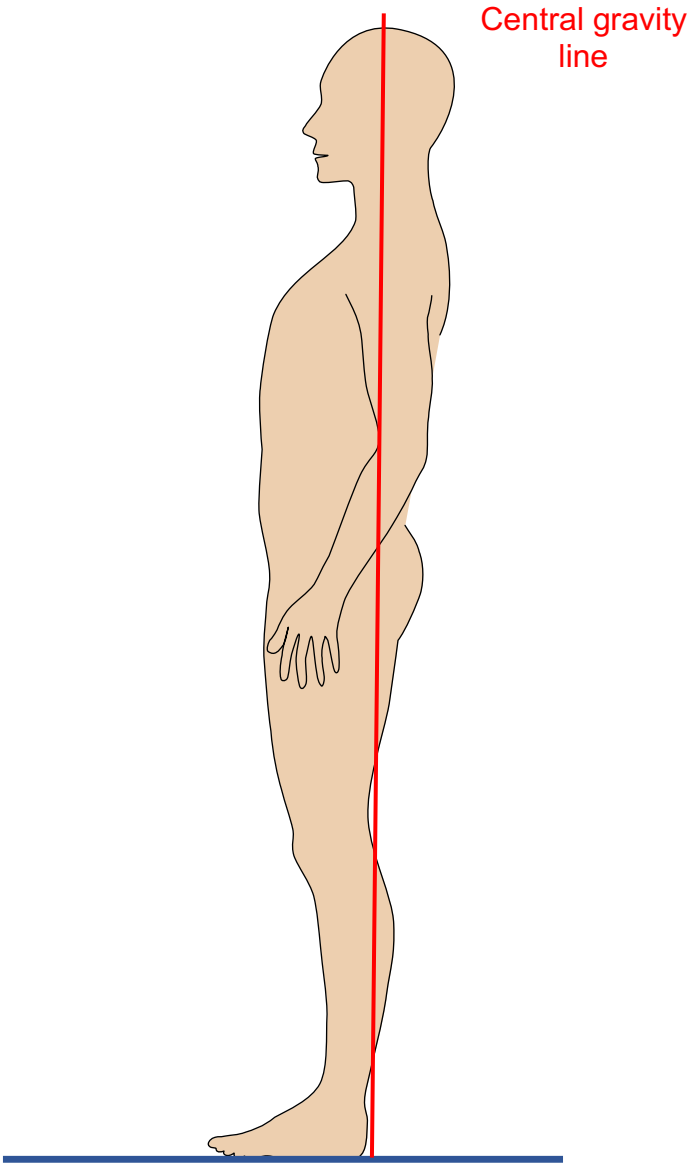

Figure 57 - Posterior posture or back sway

In this posture we often see:

- Knee flexion.
- Posterior pelvis position.
- Strong lumbar lordosis.
- Anterior head position.

4.4.2. Shortening of the Central Fascial Chain

- This chain begins at both hips and is extended cranially by the psoas muscles.
- It continues cranially via the thoracolumbar junction and the crus of the diaphragm in the central muscular section of the diaphragm.
- Cranially from the diaphragm the chain extends via the pericardium.
- The pericardium is attached to the spine at T3 via the vertebropericardiac ligament and with the sternum via the sternopericardiac ligaments. The vertebropericardiac ligaments are not actual ligaments in the real sense of the word but fascial thickenings.
- The central chain continues further as the: a) pre-vertebral fascia, inserting onto the occiput and b) pre-tracheal fascia, inserting onto the hyoid, from where it further extends to the cranium via the supra-hyoidal muscles.

Figure 78 - Shortening of the central fascial chain

- Both hips in external rotation.
- Significant lumbar lordosis.
- Both shoulders turned inwards.
- Significant cervical lordosis.
- Occiput in sidebending lesion.
- SBS in compression.

This deformation can resolve spontaneously or can be permanent.

These deformations can be minor or sometimes very obvious and they can lead to postural changes, often called idiopathic.

When we see these skull deformations in adults, it is not possible to correct them, but they can be an indication to the compensatory pattern in the patients' posture.

5.2. Normal Proportions

- Symmetrical face.
- Equal distances:
    - Hairline – frontonasal suture.
    - Frontonasal suture – lower part of the nose.
    - Lower part of the nose – lower part of the chin.
- Eyes horizontal.
- Eyes of the same size.
- Eyes of same distance of the table.
- Straight chin.
- Normal bite.

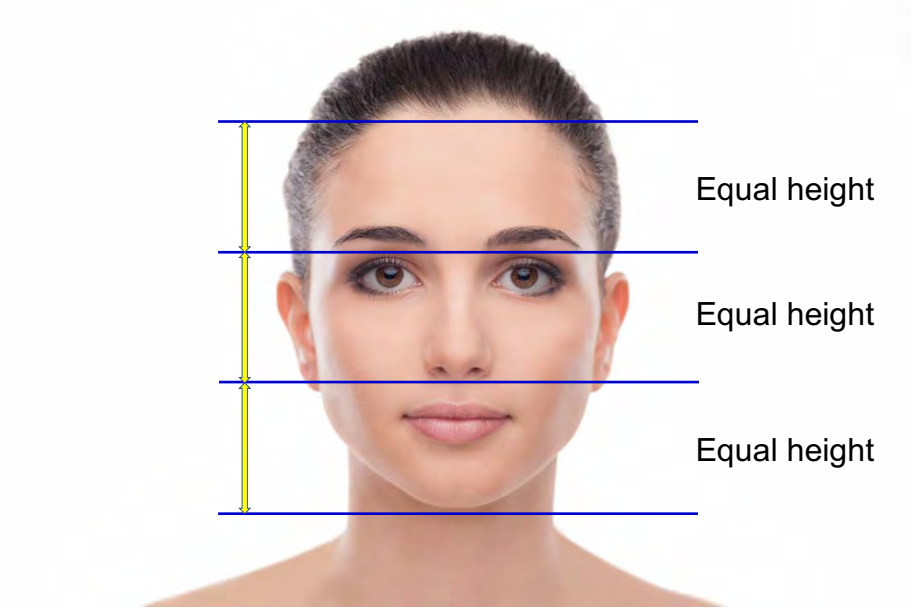

Figure 84 - Normal proportions

5.3. Frontal Plane Dysfunctional Proportions

- Central face-line not straight.
- Eye-line not horizontal.
- Ear-line not horizontal.
- Chin deviates.
- This means that the SBS is in a rotation/sidebending lesion.
- Possible cervical consequences:
    - Occiput in sidebending lesion.
- Possible TMJ consequences:
    - Unilateral compression lesion.
- Possible consequences on whole body posture standing:
    - Scoliosis with compensations in the frontal plane.

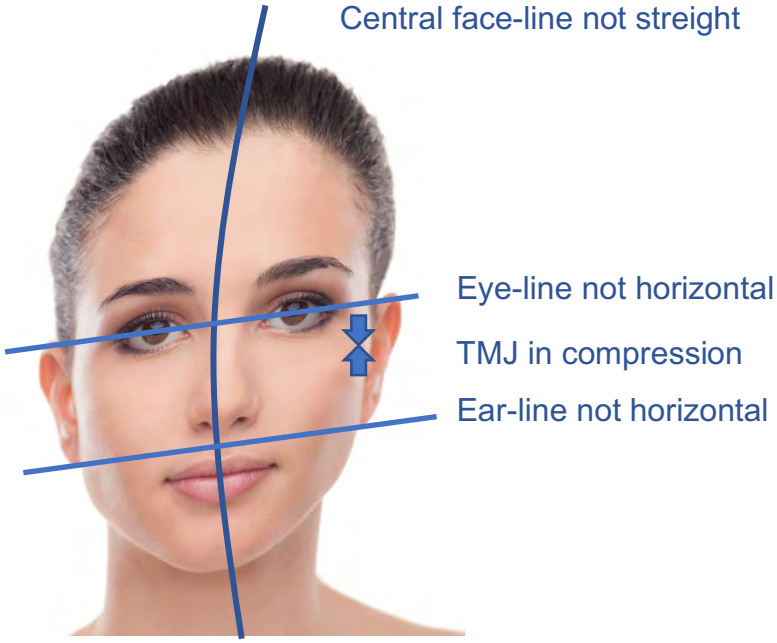

Figure 85 – SBS in rotation/sidebending - Banana face

11. Bibliography

Alotaibi A. et al. (2016) Effect of absence of vision on posture. J. Phys. Ther. Sci., 28(4) pp. 1374-1377.

Alqutaibi A.Y. & Aboalrejal A.N. ((2015) Types of Occlusal Splint in Management of Temporomandibular Disorders (TMD) Journal of Arthritis 4:4. 10.4172/2167-7921.1000176

Aman J.E., Elangovan N., Yeh I.L. & Konczak J. (2015) The effectiveness of proprioceptive training for improving motor function: a systematic review. Frontiers in human neuroscience, 8, 1075. https://doi.org/10.3389/fnhum.2014.01075

An Jung-Sub, Jeon Da-Mi, Jung Woo-Sun, Yang Il-Hyung, Lim Won Hee & Ahn Sug-Joon (2015) Influence of temporomandibular joint disc displacement on craniocervical posture and hyoid bone position. American Journal of Orthodontics and Dentofacial Orthopedics, ISSN: 0889-5406, Vol: 147, Issue: 1, pp. 72-79.

Anderson V.B. & Wee E. (2011) Impaired joint proprioception at higher shoulder elevations in chronic rotator cuff pathology. Arch. Phys. Med. Rehabil. 92(7), pp. 1146-1151. doi:10.1016/j.apmr.2011.02.004

Baiatilde M., Neiva O.D., Vilella O.D., Silva G.C., & Amaral E.D. (2012) Posture alterations related to temporomandibular joint dysfunction. https://doi.org/10.5897/JDOH10.029

Blood A.J. (2008) New hypotheses about postural control support the notion that all dystonias are manifestations of excessive brain postural function. Bioscience Hypothesis. Vol.1, Issue 1, pp. 14-25.

Brook A., O'Donnell M.B., Hone A., Hart E., Hughes T., Smith R. & Townsend G.C., (2014) General and craniofacial development are complex adaptive processes influenced by diversity. Australian Dental Journal, 59(1 Suppl), pp. 13–22, 2014. http://dx.doi.org/10.1111/adj.12158

Carini F., Mazzola M., Fici C., Palmeri S., Messina M., Damiani P., & Tomasello G. (2017) Posture and posturology, anatomical and physiological profiles: overview and current state of art. Acta bio-medica: Atenei Parmensis, 88(1), pp. 11–16. https://doi.org/10.23750/abm.v88i1.5309

Chang C.L., Wang D H., Yang M.C., Hsu W.E. & Hsu M.L. (2018) Functional disorders of the temporomandibular joints: Internal derangement of the temporomandibular joint. The Kaohsiung Journal of Medical Sciences.

Acknowledgment

I am grateful to those colleagues who knowingly or unknowingly assisted in the development of this book.

I also acknowledge that the constant questioning by students has significantly contributed to the development of the material in this book.

My greatest debt of gratitude goes to those family members and good friends whose tireless support made the making of this book possible.

Disclaimer: *The author cannot be held responsible for the wrong use of the described tests, techniques or procedures. The author does not take responsibility for your patients.*

Luc Peeters

Master of Science in Osteopathy (MSc.Ost) - UAS

Luc Peeters is an osteopath since 1985. He was the Joint-Principal of the largest Academy of Osteopathy in Europe from 1987 till 2020. He provided curricula, syllabuses and academic recognition from several universities.

This book gives a practical overview of different postures in patients and the scientific osteopathic approach to postural dysfunctions.

The theory and procedures in this book are checked on their scientific background and esotericism is avoided.

Author & Publisher: Luc Peeters
Mail: info@osteopathybooks.com