The essence of Foot and ankle reconstruction is to achieve a plantigrade and stable foot with as normal as possible properties for propulsion and stance.

We are still lacking evidence on how to treat neuromuscular deformities in the best and most reproducible way for many conditions. Around the world there are still different strategies for the same conditions. Fusions or joint preservation?

Which transfers of tendons are most rewarding?

Foot-related neuromuscular deformities may be caused by a variety of different pathological conditions.

This could be peripheral nerve injuries, Infections like Polio, Vascular disease like stroke, hereditary Conditions like CMT, or different plegic conditions after myelomeningocele or Central Palsy relating to birth, just to mention a few.

In peripherally caused paralytic conditions logic deformities develop such as dropfoot after common peroneal palsy. This however can include both extensors and/or peroneals and therefore even with a less complex pathology a variety of symptoms occur.

Both in spastic and flaccid neurogenic deformities an individual analysis is needed. After that an individual preoperative plan is mandatory. A thorough physical investigation with an analysis and work-up is mandatory to make a correct diagnosis and plan for treatment.

In deformity surgery we can evaluate our results with weight-bearing x-rays and CT. Sometimes foot pressure is used. This is generally not enough for neuromuscular patients.
Should we not all agree on common requisites to improve our documentation and evaluation? It is costly and time-consuming to use gait analysis. Electrophysiological methods are also complicated and not for everyday use.

Today most of us have electronic patients records. What if we all agree to use video-clips before and after on all patients? Easy, cheap and accessible.

Then we ought to follow all patients on a consecutive basis with a life-quality score and a functional score. These need to be validated and short enough to fill in and collect on a everyday daily basis on all patients. When non-surgical treatment fails we are to prove our skills with surgery.

The Surgical possibilities are numerous:

* **Fusions** (Usually for rigid deformities and severe instability)
* **Ostetomies** (for realignment of bony foot but also to shift the vectors of pull either direction)
* **Tendon balancing** (lengthening and shortening (tenodesis) and transfers to restore a function)
* **Ligament reconstructions for stabilisation**

A general recommendation is to plan from proximal to distal. The majority of procedures need to be started at the rear of the foot or sometimes higher up in the hip or knee. Is this always true?

**Osteotomies of Lower leg, ankle, calcaneus, midfoot, and forefoot**

- Tibial rotational ostetomies
- Ankle osteotomies with varus or valgus correction
- Calcaneal osteotomies
  - Tuber shift-Varus / valgus
  - Z-shaped
  - Lengthening / shortening of lateral process
- Talar ostetomies
- Tarsal ostetomies
- Metatarsal Ostetomies
- Forefoot ostetomies

Tendon transfers: Every tendon can be moved and reinserted in many ways. The idea is to restore the deficient function with as little loss of function as possible.

Tendon reconstruction can be discussed on as restoration of a movement or function:

* **Restoration of ankle extension**
  - Tibialis posterior (TP)
  - Tibialis anterior (TA)
  - Peroneus Longus (PL)
  - Toe flexors (FDL)
  - Long toe extensors (EDL)
Restoration of eversion/pronation
- long toe flexors (FDL)
- big toe flexor (FHL)
- Tib posterior (TP)
- Long toe extensors (EDL)
- Tibialis anterior (TA)
- Peroneus longus (PL)

Restoration of inversion
- Long toe flexor (FDL)
- big toe flexor (FHL) both at Chopart and lisfranc levels
- Tibialis anterior (TA)

Restoration of plantar flektion
- Long big toe flexor (FHL)
- Tibialis anterior (TA)
- Long toe extensors (EDL)
- Peroneus longus/brevis (PL/PB)

Correction of toe deformities
- FDL
- FDB
- FHL

In the case of a long-standing deformity with imbalance, over time a fixation/stiffness develops. If the deformity is not reducible by hand or when standing on edge-load like with a Coleman block it is considered fixed or rigid.

Strategic fusions are usually an important piece in the corrections of these deformities.