

Evaluation Procedures for Lower Limb Orthoses

- Examination is essential element
- Orthosis fits and function properly before attempting to train the patient to use it
- Team should determine the adequacy of orthosis as pass, provisional pass or fail.
- *Pass* indicates that orthosis is altogether satisfactory and patient is ready for training
- *Provisional pass:-*

means that minor faults exist, generally having to do with the cosmetic finishing of the appliance ; the patient can wear the orthosis in training program without the harmful effects

- ***Failure:-***

signifies that orthosis has major defect that would interfere with training ; for example shoes that are too tight for the patient.

Problem must resolve before training.

assure orthosis meets patients needs.

- Lower-Limb Orthotic Static Examination:-

examination of orthosis on patient while standing and sitting, as well as examination of the device off the individual.

Dynamic examination:- analysis of the wearer's gait.

- Calf bands Terminate below fibular head
- If patellar tendon bearing brim Caoncave relief.
- Calf shell, bands and patellar tendon bearing brim.....
should not intrude on popliteal fossa
- Shoe and bands should be such that donning easy
- Knee lock should be function properly.....
- Medial uprights should terminate appr 1.5 in. below the
perineum

- The calf and distal thigh shells or bands should be equidistant so that when the orthosis is flexed, as in sitting, the plastic or metal parts will contact one another, rather than pinch the back of the wearer's leg .
- KAFO's quadrilateral brim to reduce weight bearing Should provide a sufficient seat for ischial tuberosity..

- Pelvic joint:- set slightly above and ant to the greater trochanter to compensate for the usual angulation of the femoral neck
- Pelvic band:- conform to the contours of the wearer's torso , without edge pressure
- Brace is off..... Inspect pt skin
- Move joint slowly
- Binding....tilting distal portion of the joint.....
- If Medial & lat stops not working at the same time.... Stop that contact first erode rapidly and contribute to twisting of the orthosis..



Deviation in Early stance

Deviation	Orthotic cause	Anatomical cause
Foot slap	Inadequate dorsiflexion assist inadequate plantarflexion stop	Weak dorsiflexors
Toes first: tiptoe posture may or may not be maintained throughout stance	Inadequate heel lift Inadequate dorsiflexion assist inadequate plantarflexion stop Inadequate relief of heel pain	Short LE Pes equinus Extensor spasticity Heel pain
Flat foot contact: entire foot contacts ground initially	Inadequate dorsiflexion stop Inadequate traction from sole	Poor balance Pes calcaneus
Excessive knee flexion: knee collapse when foot contacts ground	Inadequate knee locks	Weak quadriceps Knee pain Knee and hip flexion contractures Short contrlateral LE

deviation	Orthotic cause	Anatomical cause
Hyperextended knee:	Genu recurvatum inadequately controlled by plantar flexion stop Inadequate knee lock	Weak quadriceps Lax knee ligaments
Wide walking base	Excessive height of medial uprights of KAFO	Abduction contractures Poor balance
Lateral trunk bending	Excessive height of medial uprights of KAFO	Weak gluteus medius Hip pain Short leg Poor balance Abduction contracture

Difficulty in Late stance

- Delaying weight transfer or being unable to transfer weight over the effected foot
- Problem can be mitigated with an anterior stop and a rocker bar.
- One should be certain that the stops on the stirrup function properly.
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During swing phase

- Pt must be able to clear the floor with the braced leg.
- Hip hicking occurs when hip flexors are weak, as well as when the limb is functionally longer than the contralateral limb.
- Increased length may be produced by a faulty posterior stop that no longer limits plantar flexion
- The problem should be anticipated and, for the unilateral KAFO wearer can be prevented by adding a 1/2in. Lift to the contralateral shoe.
- internal and external hip rotation may be caused by motor imbalance b/w medial and lat musculature; the orthotic causes relate to malalignment of the brace

- A walking base that is abnormally wide can be caused by a limb that is longer than that on the opposite side
- Vaulting refers to exaggerated plantarflexion on the contralateral limb during swing phase of the affected side.
- Vaulting occurs because the braced leg is functionally too long, possibly because the posterior ankle stop has eroded .
- The less agile may obtain foot clearance by hip hiking