



Modes of Modelling Feet



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Definitions

The following definitions are used in these guidelines:

- Orthosis:** A device utilized to assist, resist, facilitate, stabilize or improve range of motion and functional capacity.
- Foot orthosis:** A custom or stock orthosis utilized to treat the foot.
- Custom foot orthosis:** A device derived from a three-dimensional representation of the patient's foot.
- Prescription custom foot orthosis (PCFO):** A custom foot orthosis created specifically to address the pathomechanical features of a foot condition that may be structural or functional in nature.

Modes of Modeling Feet

Numerous techniques have been developed to capture the shape and contour of the foot for the purpose of prescription fabrication of custom foot orthoses. These techniques fall into two general categories:

Category 1

Modeling the foot in a specific position (most often STJ neutral with the MTJ locked) for the primary purpose of affecting the function of the foot in the gait cycle.

Category 2

Modeling the foot in the position it assumes naturally in partial or full weight bearing for the primary purpose of accommodating one or more deformities by redistributing weight bearing forces.

Category 1

The following techniques are equally appropriate for modeling the foot in a pre-planned position for the fabrication of functional PCFOs. The technique to be used should be based upon clinician judgment and preference.

- Neutral suspension casting with the foot positioned by holding the sulcus area of the 4th and 5th toe. The cast may be obtained either in a supine or a prone position.
- Computer imaging and mechanical imaging systems which reproduce the actual foot shape and contour of the foot with the foot positioned by holding the sulcus area of the 4th and 5th toe. The image may be obtained either in a supine or a prone position.

The following techniques are also acceptable for modeling the foot in a pre-planned position for the fabrication of functional PCFOs but may be less optimal because they may not capture the relationship of the midtarsal joint. The technique to be used should be based upon clinician judgment preference.

- Semi-weight bearing casting with the subtalar joint held in a pre-planned position.
- Computer imaging of the foot held in the same manner.
- Compressive foam casting of the foot in a pre-planned position.
- In-shoe casting with the subtalar joint held in a pre-planned position (vacuum casting).

Category 2:

The following techniques are appropriate for modeling the foot in the position it assumes in weight bearing for the fabrication of accommodative orthoses. None of the listed techniques is deemed superior to the others. Therefore, the technique to be used should be determined by clinical preference.

- Weight bearing (rarely) and/or semi-weight bearing casting.
- Computer and mechanical imaging systems which reproduce the actual foot shape and contour in a weight bearing or semi-weight bearing position.
- Compressive foam.
- In-shoe casting without attempts to control STJ position.

The following techniques are deemed inadequate for the fabrication of PCFOs:

- Any two-dimensional representation of the foot (i.e. tracings, pressure sheets, photos, etc.).
- Any technique using measurement of foot size (length, width, etc.) as the only technique.
- Any technique which exclusively uses a single foot impression to make a pair of orthoses (i.e. mirroring).
- Any technique which uses a “library/data base” of standardized foot models.
- Any technique which uses plantar pressures to reconstruct a 3D image of the foot.

Prescriptions for Custom Foot Orthoses

For an orthosis to be considered a PCFO, the prescription should include at least the following. Orthoses fabricated from prescriptions where the practitioner has left these decisions to the laboratory's discretion should not be considered PCFOs unless appropriate morphological data is provided to a laboratory that has an appropriate consultant for that purpose.

Functional orthoses

For a functional PCFO, the prescription should include at least the following:

- Type of material to be utilized.
- Cast balancing technique (intrinsic correction) and/or rearfoot/forefoot posting.
- Depth of heel seat.

Accommodative orthoses

For an accommodative PCFO, the prescription should include at least the following:

- Type of material to be utilized.
- Location of lesion(s) or areas of pressure to be accommodated or off weighted.