

# DME for Dummies— What, When, Why and How to Provide Ankle Foot Orthotics—Part I

*Here's an essential guide to AFO's.*

By Paul Kesselman, DPM

**P**rior to 1996, the only exposure most podiatrists had to ankle foot orthotics (AFO's) was when they provided some acute or palliative service to patients with a severe neurological/orthopedic deformity or disease. These patients had in all likelihood received their AFO devices from a rehabilitation facility, physiatrist, physical therapist, orthotist or prosthetist. The introduction of the Richie Brace in 1996 has changed this, providing the podiatric profession with a new orthotic device, and an educational process not previously available to most podiatrists. Since that time, many podiatrists have learned how to appropriately prescribe these anatomically accurate podiatric AFO's and others have gained expertise in prescribing the more traditional plastic and metallic AFO's.

Modifications and improvements to podiatric AFO's have made it possible to utilize them in patients previously limited to the more bulky and traditional AFO's, as well as for those patients who failed previous foot orthotic therapy. The number of diagnoses for which podiatrists now prescribe AFO's has grown exponentially over the last 10 years, and resulted in an ever larger number of situations where patients may be managed successfully by podiatrists without resorting to surgery.

The next several DME for Dummies installments will explore various types of AFO's. These articles will provide the reader with information on:

- 1) Why foot orthotics often fail;
- 2) When an AFO should be used;
- 3) Basic information on how AFO's work;
- 4) A classification system of the

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numerous AFO devices available;

- 5) A process for choosing the appropriate AFO;
- 6) Information on casting strategies;
- 7) Documentation and billing strategies.

#### **Why do foot orthotics often fail?**

Before casting your patient for another foot appliance when others previously failed, one should investigate the possible reasons for failure. Some common reasons foot orthotics fail are:

- 1) The physician failed to ob-

serve the importance of pathologies proximal or at the level of the ankle joint;

- 2) The physician has used a foot appliance that cannot address a pathology proximal to the rear foot;

- 3) The patient has swing phase pathology.

- 4) The patient refused a traditional AFO due to shoe concerns.

- 5) The wrong foot device (e.g., materials) was prescribed;

- 6) The patient was casted in the wrong position.

- 7) The biomechanics of the patient are not adequately addressed by the device.

- 8) The patient's pathology is not amenable to biomechanical correction and surgery is warranted.

#### **When should a patient be prescribed an AFO?**

- 1) Previous appropriately prescribed foot orthotics have failed to control the patient's condition and/or

- 2) There is a significant lower limb pathology whose etiology can be traced at the level or superior to the ankle joint;

- 3) There is swing phase pathology.

In the above scenarios, one must consider the chances that another foot orthotic will fail prior to dispensing another foot appliance.

In order to reduce patient rejection, it is important to educate pa-

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tients that an AFO may:

- 1) Avoid complicated surgery;
- 2) Only be necessary for a finite amount of time (less than one year), after which the patient may be graduated over to a foot orthotic;
- 3) Be unavoidable and that a foot appliance is inappropriate.

### How do AFO's work?

Unlike their foot orthotic counterparts, AFO's work both superior and inferior to the malleoli to either restrain or promote motion. AFO's have direct control over the tibia, ankle and foot in both the contact and swing phases of gait, and they apply a direct force superior to the rear foot.

Additionally, while foot orthotics are usually not covered by private insurers and Medicare (see previous DME for Dummies installments), AFO's are usually covered by private insurance, and by Medicare.

### AFO Classifications

Is there a requirement for an extremity impression? As with foot orthotics, AFO's can be custom-made, custom-fitted, or totally pre-fabricated. This article will ini-

tiate a discussion on custom vs. pre-fabricated devices, with future articles reviewing classifying AFO's as:

1) Podiatric Style (Medial and lateral uprights with foot plate) vs. traditional AFO's: These are primarily manufactured by large non-podiatric laboratories, and small mom and pop orthotic and prosthetic shops.

2) Anatomical level: Solid, absent or interrupted posterior shell which extends up to the calf or lower), or up to the knee (as in the case of knee ankle foot orthotics KAFO's), or patella bearing orthotics (PTBO's).

3) Materials: Plastic AFO's, Metal AFO's, and hybrids (both plastic and metal).

4) Trim line considerations: Where does the anterior margin of the device extend? Does it stay posterior or extend anterior to the malleoli?

5) Incorporation of specialty hinges which either restrict or promote range of motion (i.e., Tamarack, Dorsiflex Assist, Plantarflex resist hinges).

6) Ambulatory (for use with footwear) vs. static devices (plantar fascial night braces), or AFO's which are intended to reduce or prevent Achilles tendon contractions or decubiti, in bed-ridden patients.

7) Arizona Type AFO's.

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***AFO's work both superior and inferior to the malleoli to either restrain, or promote motion.***

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8) The presence of add-on modifications.

### Custom AFO's

Custom AFO's require a three-dimensional impression (CAD, or cast), and are made of raw materials from a patient model of the lower extremity. For many podiatric applications, patients require a custom made AFO because of one of the following:

1) The device will be used for an extended period of time;

2) They have significant biomechanical/orthopedic issues which cannot be addressed by a pre-molded device;

3) Their anatomy does not allow for direct molding against the lower extremity;

(The next installment in this series will review the DMERC requirements for custom AFO's.)

**TABLE 1**  
**Orthotic Comparisons**

Foot	Vs.	AFO
<ul style="list-style-type: none"><li>• Minimal ankle control</li><li>• Minimal tibial control</li><li>• Applies force above and below the rearfoot axis (1 point of control)</li><li>• Stance phase control</li><li>• No swing phase</li><li>• Rarely Medicare covered</li></ul>		<ul style="list-style-type: none"><li>• Direct control of the tibia and ankle</li><li>• Applies force below the rearfoot (2 points of control)</li><li>• Stance phase control</li><li>• Swing phase control</li><li>• Medicare covered</li></ul>

### How should I cast for a custom AFO?

Casting may be done with the traditional plaster cast, STS sock or CAD technique. Specific casting instructions are determined by the type of custom AFO being prescribed. Since casting is a crucial step in the AFO fabrication process, it is essential that this be done accurately. Anyone not experienced with casting for a particular type of AFO should attend any of the courses given by many orthotic laboratories, or have some hands-on experience with an experienced orthotist or casting technician prior to ordering any AFO. This will eliminate many fitting errors, and reduce patient and doctor rejection of AFO's.

Plaster casting is done similar to that for a custom-molded shoe—that is, with either a bi-valve casting technique, or with a cylindrical 1-2 layer plaster cast. This method is messy and time-consuming, but in certain situations (significant anatomical deformities) may offer an advantage over the growing popularity of the STS sock.

### STS Sock

This method has become more popular with podiatrists and orthotists. It is clean, neat and quick. While the materials are far more expensive than plaster, the reduced labor time for both the podiatrist and staff more than makes up for the expense. See [www.stssock.com](http://www.stssock.com) for the various applications and sizes available.

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### CAD Impression

Most podiatrists do not have a CAD unit capable of AFO impressions in their offices. Some orthotic laboratories will, however, convert your negative cast to a digital file and save it for future use. In addition, modifications to the prescription and/or device may also

be transferred to this digital image for future reference.

### Patient Positioning

Just as with foot orthotics, the podiatrist needs to understand which patient position (semi-weight bearing vs. off weight bearing neutral position) is best suited for the individual patient. A patient with a Charcot joint may be best served

with an AFO made from a semi-weight bearing impression using a casting plate, whereas a patient with a posterior tibial tenosynovitis may be best served with an off-weight-bearing neutral-posted device.

### Custom-Fitted AFO's

Custom-fitted AFO's are pre-molded and require substantial modifications (i.e., heat-molding to the patient's lower extremity) prior to use. Custom-fitted AFO's are usually dispensed by orthotists in the hospital or rehabilitation facility. This type of AFO would be effective in eliminating or reducing contractures in patients who have recently had a CVA.

Pre-fabricated AFO's are pre-molded devices requiring little to no modification or adjustments. An example of this type of device is the AFO most post-CVA patients receive from physical therapists.

### Summary

AFO's can address many of the forces originating above the malleoli which foot orthotics cannot. Developing an understanding of which AFO's are most appropriate for your patients, how to prescribe and modify them, and how to be reimbursed for them is essential to modern podiatric practice.

The next DME for Dummies article will discuss the DMERC requirements for custom devices. ■



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