

## Metal vs. Plastic AFO— A Therapist's View

Ankle foot orthoses are generally prescribed for patients who are able to ambulate without an orthosis, but for whom an orthosis allows a safer, and often more cosmetic, gait. Traditional "bracing" in these cases calls for a combination of metal and leather, often a spring-assisted ankle joint, and a so-called posterior stop, which simulates the motion of ankle dorsiflexion and prevents toe drag during swing phase.

More recently, molded plastic ankle foot orthoses have become available. These lighter weight orthoses provide a nearly invisible option to the conventional metal, riveted to the shoe devices. Presently, little agreement exists as to the indications, the timing of the application, or the overall outcome anticipated with the use of plastic AFOs.

The physical therapist plays an important function in the team approach to the care of patients with orthotic needs. Because the physical therapist spends considerable time working with these patients, he or she has an opportunity to continuously evaluate the patient's progress. This constancy is critical to the orthotic decision-making process as changes in patient symptoms may well alter orthotic needs. For this reason, it is often the responsibility of the physical therapist to recommend an appropriate orthotic device. In order to do this, the therapist must not only use the current physical findings, but must accurately predict future changes in these data. He/she must choose a device which will not only facilitate early ambulation, but will also meet the patient's future needs. Thus arise the dilemmas of when to fit which device, and whether to use temporary or longer-lasting orthotic devices.

In the past, metal AFOs were considered more adjustable and more temporary. These devices were to act as the precursor to the more definitive, more cosmetic, lighter, and therefore "better" plastic AFOs. However, experience with plastic AFOs revealed problems with lack of adjustability, thus necessitating multiple fittings in order to accommodate the patient's changing clinical picture.

The therapist must decide how to most effectively provide devices which not only meet the adjustability requirements demanded for early ambulation, but also provide a more cosmetically appealing, definitive device. Questions that need answering are: can an adjustable orthosis be fitted to allow for early ambulation? When should we recommend the more definitive (presumably plastic) devices? How can this be done with a minimum of dollars spent?

In 1971, Lehneis and Sarno made the following statement: "It is clear in the function of our clinic that there is no longer any indication for prescription of the conventional double bar BKO." It would be interesting to know if the authors still feel this way

despite evidence to indicate that the double bar device is still routinely being fit.

The reason for the continued popularity of the bichannel, double upright AFO in our clinic is its adjustability. This allows for medial-lateral control in both swing and stance phase, as well as knee control during stance. The extension moment generated by an anterior pin stop and long foot plate allows good control of knee flexion. Similarly, knee hyperextension can be controlled by adjusting the posterior pin.

The timing for the fitting of such a device should allow a sufficient training period so that the patient can be discharged with skills in the proper and safe use of the orthosis. Frequent return visits or home care sessions are necessary to continue to evaluate progress and provide necessary orthotic changes.

In many situations, the cost of the orthotic care for the patient is the smallest total dollar amount spent during the rehabilitation phase, yet it seems to receive a disproportionate amount of discussion. In those cases where early ambulation is indicated and expected changes in condition dictate an adjustable orthosis, the device of choice would seem to be the conventional, double adjustable, double upright, metal AFO. Later, as the condition stabilizes and the need for adjustability subsides, a plastic, more cosmetically acceptable AFO may be fitted. Even with the fitting of two devices, the total dollars spent for orthotic care will remain a small part of the overall cost of rehabilitation.

This discussion would be incomplete without specific mention of the polypropylene AFO. Since the arrival of the custom-made poly AFO, manufacturers have saturated the market with standard sized, stamped poly AFOs. Many therapists use such devices and compare them with other types of custom-fitted metal and plastic AFOs. If one inspects these devices, it is apparent that they fit very few patients. They do not provide the necessary dorsiflexion assist without a considerable amount of modification, and often never produce the desired effect. Additionally, they provide little knee extension assistance, which is often necessary for many early ambulators.

The choice of plastic vs. metal AFOs should be considered with all aspects of the patient's present and expected future condition in mind. The type of orthotic device prescribed should meet all the needs of the patient, with cosmetics being only one element. Multiple plastic or a combination of metal and plastic orthotic fittings can be justified in order to attain early, safe, and independent ambulation.

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