

A METHOD FOR INTERCHANGEABILITY BETWEEN FIXED AND ARTICULATED AFO DESIGN

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Articulated AFOs are commonly prescribed by the Orthotists at Orthotic and Prosthetic Solutions to manage a variety of pathologies. It is often found that it is beneficial to have the ability to “convert” the AFO from articulated to fixed or vice versa. Fixing of the ankle joint is often required for stability in early post-operative treatment, but increased dorsiflexion range of motion is desirable as healing and rehabilitation progress. Alternatively, an AFO may need to be converted from articulated to fixed if muscle contractures lead to a loss of ankle joint dorsiflexion range, creating the need to limit the occurrence of dynamic compensatory shear forces within the foot section of the AFO. Although there are existing systems on the market that are designed to fulfill this purpose, some of these can be price restrictive and time consuming, therefore the following system using a Tamarack™ Flexure Joint™ (available from Becker Orthopedic) was devised (figure 1).



Figure 1 The flexure joint plantarflexion stop system.

Cast, fill and modify as per usual practice for an articulated AFO. Affix the medial and lateral flexure joint dummies over the malleoli as per normal. Select a third flexure joint dummy of either medium or large size (paediatric is too small for this purpose) depending upon patient size and activity level. Affix this joint dummy posteriorly over the achilles tendon, to act as a plantarflexion stop. Ensure the flexure joint dummy is positioned proximal to the superior border of the calcaneus to allow for footwear clearance (figure 2).



Figure 2

Cast with dummies attached; posterior dummy placed proximally to clear footwear.

Drape the AFO and mark all screw holes whilst the plastic is hot. Trim out the AFO and remove the joint dummies. Mark out and cut through the plastic articulation line. Finish all trim lines, ensuring that minimal extra material is removed from the articulation lines. Drill appropriate holes and insert all three flexure joints. Cut through the central part of the posterior flexure joint if articulation is required (figure 3a&b).



Figure 3(a) Cutting through the posterior flexure joint.



Figure 3(b) The articulation and plantarflexion stop.

Once the AFO has been articulated it can be converted to fixed by removing the two pieces of posterior stop/joint and replacing them with a whole flexure joint. The angle of the stop can also be minimally adjusted by replacing half of the joint with a shorter or longer piece of flexure joint.

At Orthotic and Prosthetic Solutions we have been using the flexure joint stop system with all plantarflexion stop articulated AFOs for the past 2 years. The flexure joint material is hardy. We have not seen any noticeable wearing of the

opposing pieces of joint/stop and therefore the plantarflexion stop angle does not change appreciably over time. Noise associated with the contact of the proximal and distal sections of the AFO is not noticeable. The flexure joint plantarflexion stop system allows the use of a fixed or articulated arrangement using the one AFO, and can therefore accommodate for changes in range of motion or tone over time. We have found this method of interchangeability to be very effective in both a clinical and cost sense.