Alternative Trial AFO Systems for Initial Onset Management of the Rehabilitating Patient

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INTRODUCTION
A primary goal in treating the rehabilitating patient is to attain normal biomechanical alignment as early as possible. The result is an improved gait pattern rather than the motor and or sensory compromise leading to poor joint position, instability and unpredictable movement patterns. Proper timing and use of an orthosis is integral in producing optimal outcomes and should be considered early on in the rehabilitation process (Duncan et al. 2005). Traditional approaches used to address initial onset during the rehabilitation process consist of two designs, prefabricated for the patient who is evolving and custom for when a definitive application has been established. Having an optimal AFO system, improves the efficiencies of the therapist by minimizing the time necessary to improvise with a less than adequate AFO. This leads to the therapist being focused while providing predictable joint position and stability for their patients.

METHOD
Two patients A and B were part of this study; their diagnoses were Stroke and Incomplete Spinal Cord Injury (ISCI) respectively. Three new alternative AFO’s were chosen for this study. They are the TERRA™, ABBY™ and RIBBY® articulated AFO’s. All three designs feature an aluminum posterior upright with varying adjustment capabilities to match the specific needs of the individual rehabilitating patient. A heat moldable 50 durometer removable insole attached with Velcro® to the AFO’s superstructure accommodates fitting of the right or left foot. An open toed shoe is provided to secure the patients foot firmly within the footplate. Further adjustments can be made to the calf height and foot length for optimal biomechanical effect. All three designs offer the ability to statically adjust the dorsi-plantarflexion angle. The ABBY™ Articulating AFO also has the capability of statically adjusting inversion or eversion angles of the foot. The RIBBY® Articulating AFO has the capability to either be locked at the ankle or allow for free dorsiflexion range of motion.

RESULTS
Patient A presented with left hemiparesis, was 65 years of age, 5’11” and 180 lbs. diagnosed in 9/2011 and in her acute rehab stay when evaluated and fit. All three alternative designs were trialed and the RIBBY® Articulated AFO set with a 5° degree plantarflexion stop with free dorsiflexion was the design of choice. The patient indicated that she felt more secure in the RIBBY® Articulated AFO compared to the Posterior Leaf Spring (PLS) AFO she was using previously. The use of PLS AFO’s has been shown to offer inadequate control in the swing and stance phases of gait (Condie 20008 and Bregman 2010). The physical therapist indicated that the need to verbally and manually cue the patient was significantly less. Patient B with ISCI was a 70 year old male, 6’5”, 220lbs diagnosed 3/2011, placed in acute rehab in 9/2011 due to other medical issues. The TERRA™ and ABBY™ Articulated AFO’ set in 5° of dorsiflexion were chosen for the right side and left side respectively. The patient felt more secure while the physical therapist indicated that his cadence and endurance levels increased. Visual observation validated a predictable 1” rocker with the knee and ankle instability being kept in check.

DISCUSSION
It was noted the resistance provided by the posterior aluminum upright (DeToro 2001) not only provided clearance in swing but had a dampening effect of the ground reaction forces at heel strike which the team felt contributed to both patients sense of increased stability and predictability of his gait pattern.

CONCLUSION
Having these new trial AFO systems readily available, with individual adjustment capabilities offer a practical and effective means of managing the rehabilitating patient. This creates an environment that is conducive to maximizing the efforts of the rehab team and the patient (Lin 2009). Studies have shown that early mobilization after stroke results in improved independence (Craig 2010).

CLINICAL APPLICATIONS
Used as a means of managing acute and sub-acute rehab patients at the earliest point prior to definitive management and as a positioning and offloading orthosis at night time.

REFERENCES

American Academy of Orthotists & Prosthetists
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