Orthotic management of the stroke patient

BY BRENT LIBBY/C.P.O.

Qualifications

Educational requirements certified Orthotist
American Board for Certification in Orthotics
1) Bachelors of Science degree
2) Postgraduate certificate in Orthotics or Masters in Orthotics and Prosthetics.
3) One year Clinical experience supervised by ABC certified practitioner.
4) Post residency the candidate must pass all three parts of certification exam.

Ohio Licensure Requirements
ABC certification + continuing education

Assessment

Patient history
Patient needs and functional potential
Multidiscipline plan based on team goals
Implementation of treatment plan with respect to orthotic management
Outcome assessment
Team members

- Patient
- Family Physician
- Surgeon
- Nurse
- Physiatrist
- Physical/Occcupational therapist
- Orthotist
- Vocational counselors
- Case managers
- Family members

Physicians

- Evaluation and diagnosis
- Prescription
- Final determination of appropriate orthosis

Types of orthoses for CVA patient

- Upper extremity
- WHFO, EO, SO
- Lower extremity (majority of orthotic management)
- Foot orthotics, AFO’s, KAFO’s, HKAFO’s
- FES type devices,
- Walk Aide, Bioness, etc.
Lower extremity orthotics

Function of lower extremity orthotics
- Accommodate/correct neuromuscular deformities.
- Accommodate/correct musculoskeletal deformities
- Prevent future deformities
- Use orthoses to aide in rehabilitation

Types of lower extremity orthotics
- AFO (Ankle Foot Orthosis)
- KAFO (Knee Ankle Foot Orthosis)
- HKAFO (Hip Knee Ankle Foot Orthosis)
- KO (Knee Orthosis)
Types of ankle foot orthoses

- Articulated AFOs
- Solid AFOs
- Conventional AFOs
- Ground reaction AFOs
- PTB AFOs
- Carbon hybrid AFOs

Articulated AFO

- This type of AFO is used quite a bit with stroke patients.
- Must have strong enough quads to prevent knees from buckling while standing.
- When used with a plantar flexion stop can be effective when dealing with a stroke patient with a lot of tone.

Solid ankle AFO

- Provides high level of ankle and knee stability.
- Generally used when there is not only weakness at the ankle and knee but also if there is a high degree of genu recurvatum.

Articulated AFO

A variety of joints can be used depending upon the specific needs of the patient.

An articulated AFO should only be used if the patient has the range in the foot and ankle complex.
### AFO

<table>
<thead>
<tr>
<th>Ground reaction AFO</th>
<th>PTB AFO</th>
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<tbody>
<tr>
<td>• Used for a patient who has weaker quads 2+/3-.</td>
<td>• Effective for patients who need knee and ankle stability.</td>
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<tr>
<td>• Effective as an alternative to a KAFO as long as there is not a lot of genuvalgum or genuvarum at the knee.</td>
<td>• Another alternative to KAFO as long as quad strength is not too low or there is too much medial or lateral instability of the knee.</td>
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<td>• Contraindicated for a patient with hyperextension of the knee.</td>
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### Carbon AFOs
- These AFOs provide an extremely lightweight and effective AFO for the stroke patient.
- These work well as long as the patient doesn’t have too much instability of ankle, knee, etc.
- The carbon AFO has a dynamic quality and provide a much more normal gait pattern than a typical plastic or conventional AFO.
A carbon AFO provides a lightweight option for the stroke patient. The carbon AFO allows for a more dynamic gait pattern. Patients tend to be more compliant with carbon AFOs.

The Orthotic treatment challenge

- Assist the individual to maximum functional level with the minimum amount of bracing or orthotic management.
- Functional outcomes
- Educate patients with respect to the use of the orthosis.

Carbon AFO's

KAFO

Indications for KAFO
- Quad strength 3+ or less
- Genu recurvatum greater than 30 degrees
- Medial or lateral instability knee
- Transverse plane instability (combined instability)
- Significant problems with proprioception
There are many lightweight KAFO options. Plastic or hybrid carbon KAFO's are needed for more involved stroke patients. It is important to have appropriate orthosis for patient.

KAFO

Stance control KAFO

Much more energy efficient way to ambulate with KAFO. Patient must meet specific criteria for different stance control KAFO's

Studies have shown that gait biomechanics as well as walking function improved following a locomotor training program using FES technology.

Functional Electronic Stimulation for hemiplegic gait
FES technology offers possibility of improvement in stroke patients'. Reimbursement for FES devices is still a problem.

References


References