

This TelAbility handout provides an overview of orthoses (orthotics), including definitions, why they are used, and what they do.

WHAT IS AN ORTHOSIS?

An **Orthosis** is commonly called an “orthotic” or sometimes a “brace”. Orthoses come in a variety of materials and features specifically selected for each child’s needs. “Orthoses” is plural for “Orthosis”. Splints are considered to be a more temporary form of orthosis.

TYPES OF ORTHOSES?

An Orthosis is named according to the joints of the leg that are covered by the orthosis.

- **AFO** – *Ankle- Foot Orthosis* – Covers the foot and ankle and extends partway up the calf.
- **KAFO** – *Knee-Ankle-Foot Orthosis* – Covers the foot, ankle and knee and extends part way up the thigh.
- **HKAFO** – *Hip –Knee-Ankle-Foot Orthosis* – Covers the foot, ankle, knee and hip and includes the pelvis.
- **SMO** – *SupraMalleolar Orthosis* – Similar to the AFO but come just above the ankle bone (the malleolus).
- **Shoe insert** – fits inside the shoe and controls the position of the foot.

Orthoses are also named by some of the following features:

- **Solid/Fixed** – *Designed to hold the joint in a fixed position (i.e., A solid ankle AFO does not allow motion at the ankle joint.)*
- **Hinged/Articulated** – *the orthosis has a hinge that allows a limited amount of motion. (i.e., A hinged AFO allows limited up and down motion of the ankle)*
- **Dynamic** – *the material the orthosis is made of has some flexibility that allows limited motion at the joint.*
- **Contoured** – usually refers to special shaping of the foot plate that encourages desired movement of the foot.
- **Floor reaction** – specially designed to limit a crouched gait (walking with knees bent in the crouched position)

HOW ARE ORTHOSES MADE?

Orthoses are usually fabricated or made from molded plastics but may also include parts that are metal, leather or Velcro. Splints may be made from plastics, athletic tape, webbing or ace wrap. Sometimes a mold or impression is made with a plaster cast to insure an exact fit with the leg in the desired position. Some plastics become soft when heated and can be molded to fit the leg. The sides of the orthotic are trimmed to fit

Enhancing the lives of children with disabilities

exactly over the desired bony landmarks and smoothed to prevent irritation. An exact fit is essential to the success of any orthosis. Most orthoses are worn inside the shoe.

Orthoses should be made by an orthotist or physical therapist with experience in orthotic fabrication. Sometimes the therapist will make a plaster mold to send to the orthotist to use in making the orthosis. Often the therapist will try a more temporary “splint” to determine if the orthosis is likely to benefit the child.

WHAT DOES AN ORTHOSIS DO?

An Orthosis can be used to provide needed stability around a joint or to encourage desired movement and discourage or limit undesired movement at a joint. For example and AFO might be designed to allow bending of the ankle to lift the toes off the floor when walking but limit straightening of the ankle to point the toes into the ground. An AFO might also provide stability by limiting sideways motion of the ankle for a child with weak muscles.

ORTHOTIC PRESCRIPTION

A physical therapist or physician may prescribe an orthosis for a child. Several questions should be answered in determining if an orthosis is right for the child.

- 1. Will the orthosis allow the child to have better movement in the short term or prevent deformity in the long term?*
- 2. What problem will the orthosis address?*
- 3. What kind of orthosis will work best and what special characteristics will be required to achieve the desired effect?*
- 4. When will the child wear the orthosis? Always? Only when walking?*
- 5. Who is the most qualified person to make the orthosis?*
- 6. What will be the cost and will insurance or the family pay?*

Orthoses are always used with other forms of therapy like exercise or functional activities. Research on the effectiveness of orthoses is inconclusive. It is important for the parent and therapist to have clear goals for the use of an orthosis and to monitor the effect the orthosis is having on the child's movement.

Author: Darlene Sekerak, PT, PhD **Contact Information:** dsekerak@med.unc.edu

Last Revised: February 18, 2004

Reference:

Selby-Silverstein L. *Lower Extremity Orthotic Intervention for the Pediatric Client. Topics in Physical Therapy – Pediatrics*. 2001. American Physical Therapy Association. Alexandria, VA, pp. 9-1 to 9-17.

For more information contact the author for a bibliography.