Physical Therapy Practice Guidelines for Persons with Bleeding Disorders:

Orthoses for Treating the Pediatric Foot

The following practice guidelines were developed through the consensus of the therapists that work with patients with bleeding disorders and edited by the National Hemophilia Foundation's Physical Therapy Working Group. The information contained in the practice guidelines is not intended in any way to be used as primary medical advice or to replace medical advice. They are intended to guide the physical therapist caring for individuals with bleeding disorders in the important factors and elements of quality care. This is not meant to be a complete catalog of all the orthoses that are currently on the market but a guide to help providers consider orthotic intervention for improved functional outcomes.

Definition

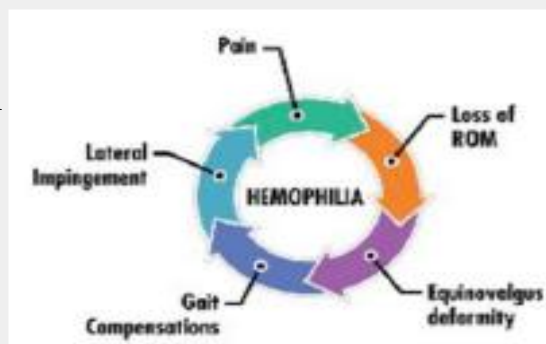
- Orthoses are devices that aide or modify the function or structure of the developing skeletal system in pediatrics
- Semi-rigid to rigid orthoses may be prescribed.
- Must be prescribed by a physician

Goal

- Maintain proper alignment
- Promote sound biomechanics to reduce stress on a joint
- Maintain range of motion (ROM) during periods of growth.
- Prevent recurrent bleeding and arthropathy and slow down progression of arthropathy.
- Provide shock absorption
- Reduce pain by controlling or preventing joint movement, stabilizing a joint or relieving load or stress during weight bearing (axial load and weight distribution).
- Increase stability during gait promoting ongoing development of coordination and power based gross motor skills. Reduce instability and microtrauma

Indications for Orthoses Considerations

- Pain: Pain in children is atypical
- Range of motion loss of foot and ankle joint complex
- Recurrent bleeding episodes due to hemarthropathy, altered joint mechanics, weakness, chronic synovitis despite prophylaxis
- Foot deformity
- Gait compensations secondary to range of motion loss in joints other than the ankle.



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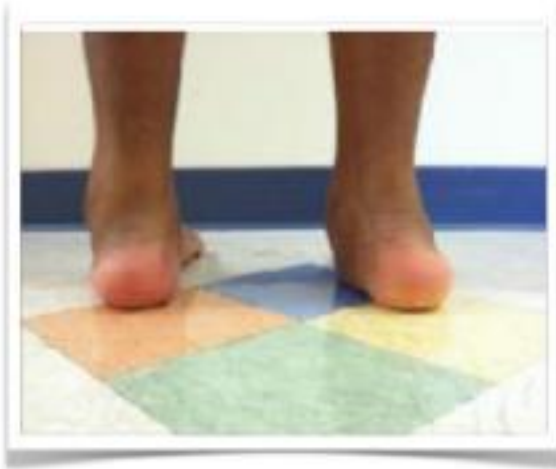
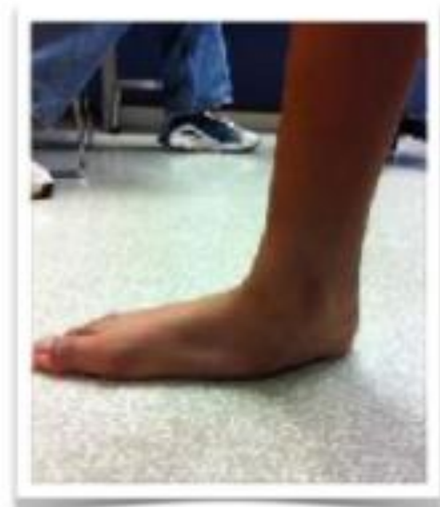
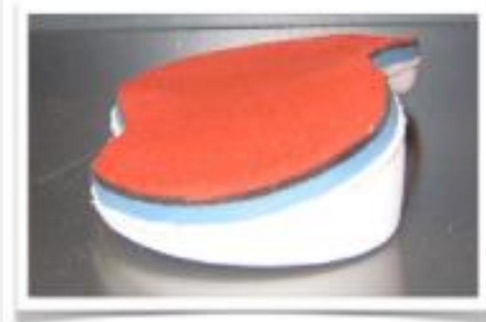
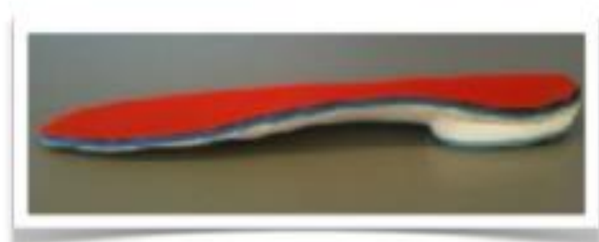




Types of Orthoses for the Pediatric Foot Complex

- **Inserts**:
  - Semi-rigid (never rigid) with or without hindfoot posting and heel lift to promote sound biomechanics and gait





- **Solid Daytime Ankle Foot Orthoses (AFO)**
  - Rigid plastic and solid (never hinged) with or without insert for joint preservation of ankle joint fusion

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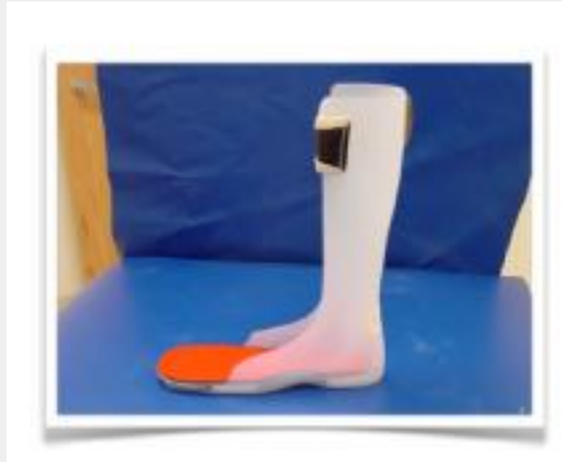

- **Solid Nighttime Ankle Foot Orthoses (AFO)**
  - Maintain or gain range of motion in growing foot
  - Growth hormones released at night creates tension on muscles promoting growth within sarcomeres

Considerations

- Individual prescription is necessary
- Goal is to preserve joint structure
- Continue on prophylaxis or on demand treatment, orthoses do not replace factor treatment
- Be aware of what stage of development the patient's gait. Specifically, as it relates to rockers or stance phase of gait (1st, 2nd, or 3rd)
- Materials must be examined for fit and function
- Encouraged center of mass to move posteriorly
- Monitor for pain and function of orthoses
- Monitor closely as pediatric foot is dynamic and growing
- Regular examination of range of motion and manual muscle testing to monitor strength
- Should always wear shoes flat sole. Rocker bottom shoes are not typically recommended in pediatrics.

References:

1. Tachdjiaan MO. The Childs' foot. Philelphia, PA: Saunders 1985
2. Perry, J. Gait analysis: normal and pathological function. Thorofare, NJ: Slack inc. 1992
3. Sisson GA, Weck M, Prihoda W, et al. The effect on gait of anterior placement of the whole body center of mass. *Gait Posture*. 1994; 2(1): 56.
4. Tabary JC et al. Physiological and Structural Changes in the cat's soles muscle due to immobilization at the different lengths by plaster casts. J Physiol. 19972; 224: 231-244

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