Each child is a conservative treatment protocol combining solid knee orthoses or knee-ankle-foot orthoses at mid-calf with swivel brackets. It can be used for pediatric patients needing night abduction of the hip is needed.

The propensity of a child’s bones and muscles to demonstrate improved reach, grasp and pinch with carryover improvement in daily activities: hair combing, dressing, and play. While desired outcomes sometimes can be achieved with scaled-down versions of adult appliances, providing pediatric orthoses calls into play certain skills and considerations that add complexity to the process but offer commensurate professional reward.

To be effective, FirstFlex™ program requires an extensive daily time commitment on the part of both patient and caregivers. Considerations also include psychosocial family issues as well as the daily logistics of scheduling two 30-minute treatment sessions and of donning the brace at bedtime.

For further information on these and other orthotic options for C.P. management, contact our office.

What’s New

• 7.5 degree-increment abduction or adduction stop,
• 7.5 degree-increment don/doff locks,
• adjustable dynamic tension for abduction assist, and
• adjustable internal/external rotation position.

The FirstFlex custom orthosis provides precise dynamic input to the complete spastic elbow-wrist-hand musculature, including pronator isolations. The dynamic extension MCP finger pan postures, lengthens and strengthens the intrinsic hand musculature needed for grasp and pinch functions.

Patients treated with FirstFlex demonstrate improved reach, grasp and pinch with carryover improvement in daily activities: hair combing, dressing, and play.

A retrospective study covering seven years and a prospective study conducted over two years revealed marked improvement in appropriate patients. The research points to patient cognition, motivation and parental support as crucial ingredients in the treatment’s success. Research details are available through the Ultraflex internet site, www.ultraflexsystems.com. FirstFlex is not recommended for children with fixed capsular elbow or wrist contractures; extremely poor sensation; or prior wrist fusions, tendon transfers, or selective neurotomies.

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FirstFlex™ System

Falk Prosthetics & Orthotics

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Children Are Not ‘Small Adults’

This newsletter focuses on the unique aspects of providing orthotic devices to children. From a biomechanical and design perspective, working with young patients draws largely on the same orthotic principles and materials as with adults; indeed the spectrum of orthotic applications includes relatively few systems designed specifically for pediatric applications.

Nevertheless, the caveat Children are not small adults clearly applies to orthotic management—kids present unique opportunities and challenges. The overall goals are familiar: prevention and/or correction of deformities and functional improvement.

While desired outcomes sometimes can be achieved with scaled-down versions of adult appliances, providing pediatric orthoses calls into play certain skills and considerations that add complexity to the process but offer commensurate professional reward.

Here are some special considerations we encounter in managing children:

• Custom vs. off-shelf. While some popular devices such as the Pavlik Harness, orthopedic shoes and night splints are primarily prefabricated components, pediatric orthoses tend to be custom-made because of the reduced tolerance for error corresponding to the child’s stature and smaller area on which corrective forces can be focused.

• Growth. The propensity of a child’s bones and muscles to grow non-synchronously challenges orthotists to incorporate design features that will sustain productive orthotic forces over time while maintaining range of motion...and at the same time remaining on speaking terms with parents, HMOs, and others who write the checks.
From Tip to Toe, Specialized Orthoses Support and Direct Childhood Development

**Ankle Foot Orthosis (AFO)**
- **Application:** Varum and valgus deformities
- **Description:** Custom-fabricated thermoplastic, metal or composite device designed and trimmed for patient's unique needs
- **Function:** Provides proper alignment, limit or encourage ankle motion

**B-Hip Abduction Orthosis**
- **Application:** Children ages 3-12 months with hip dysplasia or a hip subluxation
- **Description:** Lightweight plastic orthosis consisting of an abdominal strap and thigh cuffs connected to a posterior plate by straddle bars
- **Function:** Maintains hip at 90 degrees of flexion and 60 degrees of abduction to promote proper femoral head and hip development

**Knee-Ankle-Foot Orthosis (KAFO)**
- **Application:** Hemiplegia, diplegia, lower-limb instability and deformities
- **Description:** Primarily thermoplastic laminated brace extending from thigh to footplate, typically incorporating a knee and ankle joint
- **Function:** Controls motion and alignment of the knee and ankle

**Parapodium**
- **Application:** Paraplegic patients 3 years and older, spastic cerebral palsy, myelomeningocele
- **Description:** Aluminum frame incorporating thermoplastic footplate, foam knee block, hip and knee locks, and chest and back panels. Three-point system keeps patient upright.

**Maple Leaf Hip Abduction Orthosis**
- **Application:** Cerebral palsy, ages 4-12
- **Description:** Anatomically contoured thermoplastic-lumbar-pelvic section connected to thigh cuffs by adjustable locking joints
- **Function:** Maintain length of involved musculature and control or prevent recurrence of deformity after soft tissue release or related hip surgeries

**Non-Invasive Halo Vest**
- **Application:** Positioning of structurally stable spine after complications of standard halo immobilization, C1-C2 rotatory instability, torticollis
- **Description:** Plusless, MRI-compatible HALO headpiece and vest with sponge or rigid back post component
- **Function:** Cervical spine immobilization and control

**SWASH - Standing, Walking and Sitting Hip Orthosis**
- **Application:** Cerebral palsy; any child whose adduction and/or internal rotation at hip joint interferes with function or induces lateral migration of the femoral head
- **Description:** Plastic padded waist band and two joint assemblies connected by shaped leg bars to adjustable plastic thigh bands
- **Function:** Stabilize hip and oppose excessive adduction and internal rotation; reduce scissor gait while walking and improve balance while standing

**Reciprocating Gait Orthosis**
- **Application:** Lower-body neurologic impairment: Indicated in L1 to L3 lesions in children with functioning iliofemoral and hip adductors
- **Description:** HKAFO incorporating cable system or similar method of mechanically translating hip extension on one side into hip flexion on the contralateral side
- **Function:** Provide standing and ambulation ability, thereby raising physical and psychological horizons

**Scoliosis Jacket**
- **Application:** Idiopathic scoliosis
- **Description:** Thermoplastic TLSO
- **Function:** Limit curve progression and need for surgical correction

**Scottish Rite Orthosis**
- **Application:** Legg-Calve-Perthes disease
- **Description:** Lightweight orthosis consisting of metal pelvic band, plastic thigh cuffs, aluminum hip joints with thrust-bearing hip joints or a telescoping spreader bar [and design]
- **Function:** Maintain hips in abduction containing femoral head in the acetabulum

**Torticollis Orthosis**
- **Application:** Custom-molded helmet and shoulder sections connected by multi-planar adjustable joint
- **Function:** Maintains head in any desired position, including rotational and longitudinal adjustments, post-sterno mastoid release surgery

**Wheaton Brace - KAFO (Tibial Torsion Orthosis)**
- **Application:** Metatarsus adductus, clubfoot, tibial torsion; used in place of serial casting or corrective shoes
- **Description:** Molded thermoplastic and Velcro knee-ankle-foot orthosis
- **Function:** Applies direct corrective rotational force on the tibia without any torque on the femur or hip

**Orthotic Considerations for Children**

(Continued from page 1)
- **Weight:** Plastics and other synthetic materials are typically chosen over metal and other heavier choices to make the orthosis as absolutely lightweight as possible. Minimizing weight while incorporating sufficient durability to withstand the stresses imposed by an active child adds to the challenge.
- **Finishing Enhancements:** Colorful, creative finishing, as with cartoon or action figures, can make orthoses wear significantly more acceptable to a younger child. Other techniques—designing braces to be worn under clothing or to fit into normal-looking shoes—enhance body image and therefore acceptance among older, appearance-conscious pre-teens and adolescents.
- **Family Support:** Though a child’s abilities, viewpoint and responses will vary significantly from infancy to adolescence, active parental and family participation in the orthotic intervention remains critical throughout. Few pediatric patients can be expected to carry out the at-home portion of the orthotic plan independently.
- **Orthotic Staff:** Well-trained and experienced in working with pediatric patients. We invite your inquiries and referrals.

**Note to Our Readers**
Mention of specific products in our newsletter neither constitutes endorsement nor implies that we will recommend selection of those particular products for use with any particular patient or application. We offer this information to enhance professional and individual understanding of the orthotic and prosthetic disciplines and the experience and capabilities of our practice.

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- Becker Orthopedic • Boston Brace Inc.
- Fillauer LLC • OrthoAmerica Products Inc.
- Ultraflex Systems Inc.
2 New Options for Treating C.P. Spasticity

For nearly two decades, Ultraflex custom orthoses have provided the rehabilitation community with conservative management options for severe neuromuscular and/or orthopedic dysfunction. Recently, the company introduced two new joint mobilization systems for managing cerebral palsy-induced spasticity.

The HOPe1 (Hip Orthosis, Pediatric) is a variation of the traditional A-Frame brace incorporating an Ultraflex joint mounted to solid knee orthoses or knee-ankle-foot orthoses at mid-calf with swivel brackets. It can be used for pediatric patients needing night bracing post-multilevel Botox for spastic cerebral palsy or where abduction of the hip is needed.

The joint unit provides:
- a 7.5 degree-increment abduction or adduction stop,
- 7.5 degree-increment don/doff locks,
- adjustable dynamic tension for abduction assist, and
- adjustable internal/external rotation position.

The solid KO or KAFO sections minimize joint pressure, and patellar counter force snapping keeps knees in full extension (as cast). Components gently abduct to stable full maximum abduction, and bar length adjusts to achieve maximum abduction and allow for growth.

The HOPe1 is easier to don and provides better compliance than traditional A-frames. Quick release components add to this brace’s flexibility of use.

FirstFlex™ is a conservative treatment protocol combining custom bracing and neuromuscular electrical stimulation for select children with upper-extremity C.P.-induced spastic hemiplegia. Patients, age 3-20, with mild-to-moderate spasticity in the scapula, shoulder and elbow and moderate-to-severe spasticity in the wrist and fingers who have been treated with FirstFlex™ have achieved significant gains in posture, strength and control of global arm-hand function without pharmacological injections or surgery.

The FirstFlex™ custom orthosis provides precise dynamic input to the complete spastic elbow-wrist-hand musculature, including pronator isolation. The dynamic extension MCP finger pan postures, lengths and strengthens the intrinsic hand musculature needed for grasp and pinch functions.

Patients treated with FirstFlex™ demonstrate improved reach, grasp and pinch with carryover improvement in daily activities: hair combing, dressing, and play.

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