

ORTHOTICS

The ABC's of AFO's

AFO's (Ankle Foot Orthosis), defined by Webster: "A brace worn on the lower leg and foot to support the ankle, hold the foot and ankle in the correct position, and correct foot drop. Also known as a foot drop brace." Common diagnoses that can benefit from AFO's are: CVA, Spinal Cord injury, Cerebral Palsy, Spinal Bifida, Muscular Dystrophy family of diseases, TBI (traumatic brain injury), postoperative foot drop, as well as a variety of neuromuscular diseases.

AFO's are commonly prescribed for weakness or paralysis of ankle musculature. Dorsiflexion, plantar flexion, inversion and eversion weakness as well as severe spasticity can cause significant gait deviations which an AFO can correct. Controlling ankle motion can also affect the stability of the knee.

AFO's can be fabricated out of metal, plastic, carbon fiber or leather. The Metal AFO was the first design used. This design consists of 1 or 2 metal uprights which are attached to a leather covered calf band, which is located below the fibular head, or about 3 inches below the knee. The lower section is attached to a metal ankle joint, which has an anterior or anterior and posterior channel. Springs or pins can be inserted to assist or restrict ankle motion. The joint can allow free motion, assist motion, limit motion, or allow no motion. The orthosis is attached to the sole of the shoe via a metal stirrup. The metal design is slightly heavier than the plastics or carbon fiber, but works well with variable edema or when diminished sensation is an issue. In these cases the normal shoe is worn, and a soft insert can be worn under the plantar surface. The metal orthosis can consist of aluminum, steel or titanium, depending on the strength required.



Photo Courtesy of TruLife



Photo Courtesy of Cascade Dafo



Photo Courtesy of Becker Orthopedic



Photo Courtesy of MFB Orthotics



Photo Courtesy of MFB Orthotics



Photo Courtesy of MFB Orthotics



Photo Courtesy of MFB Orthotics



Photo Courtesy of MFB Orthotics



Photo Courtesy of MFB Orthotics



Photo Courtesy of Arizona AFO, Inc

ORTHOTICS

The ABC's of AFO's – cont.

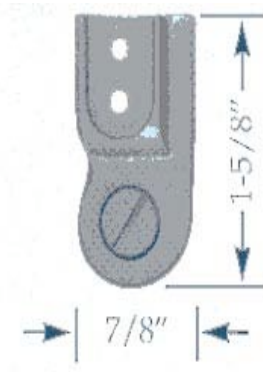
Three joint options are available - free motion, dorsiflexion assist or the double action ankle joint.



Free Motion Photo
Courtesy of Becker Orthopedics

The free motion design allows free anterior – posterior motion, but limits medial – lateral motion. A spring in the posterior channel will provide the dorsiflexion assist motion. A combination of springs and or pins in both the anterior and posterior channels allows a customization of range. Pins will limit or lock motion, and springs will assist motion.

When an orthosis is needed to assist weak dorsiflexors, springs added to the posterior channel can enhance this weakened motion. If a plastic design is chosen the orthosis can be fabricated in two designs: 1) with the plastic trimmed as a posterior leaf spring design which allows the flexible plastic to act as the dorsiflexion assist. Or, 2) with ankle joints to provide dorsi assist using one of several joint designs.



Dorsiflexion Assist Photo
Courtesy of
Becker Orthopedics



Photo Courtesy of
MFB Orthotics



Photo Courtesy of
MFB Orthotics

Posterior leaf spring

Photo Courtesy of Trulife



Another lightweight approach incorporates carbon fiber into the design. This allows the carbon fiber to flex and function as the dorsi assist. When the plastic or carbon design is used, the rigid plastic or carbon fits under the plantar surface of the foot. An extra depth shoe or shoe with a removable insole works best with these designs to accommodate the additional material under the foot.

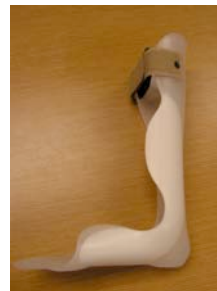


Acor Shoe Photo used with permission

The orthosis can be designed to control motion in 1 or 2 planes, or to limit all motion. If the need is to control varus / valgus or medial / lateral motion, a free motion joint is used. This allows free dorsiflexion and plantar flexion, but restricts medial-lateral motion. The addition of a leather ankle corrective strap can be added to the metal system to provide additional M/L support.

Lateral Corrective Strap

Photo's Courtesy
of MFB Orthotics



When a plastic or leather design is used, the plastic can include an extension of the plastic trim line to create a wall to prevent unwanted motion.

This design includes a lateral or medial flare.

The plastic wrap around design uses a total contact approach to control this motion. The DAFO style AFO includes a wrap around portion over the dorsum of the foot to maintain alignment.

DAFO Photo Courtesy of
Cascade Dafo



ORTHOTICS

The ABC's of AFO's – cont.

If the weakness involves all motion, the orthosis can be designed as a solid ankle or a limited motion AFO. If a metal design is used, pins are inserted into the anterior and posterior channels, and can be adjusted to lock or restrict motion.

The wrap around leather Arizona design incorporates a plastic inner reinforcement which provides excellent M/L and A/P control.

If a plastic design is used, the trim lines can be extended anterior to the ankle joint, hence locking the ankle and controlling motion in all planes.

If additional ankle and knee stability is required, the solid ankle design can be reinforced using a Ground reaction AFO design. This replaces the anterior calf strap and replaces it with a full anterior panel which can exert more force on the anterior tibia, controlling both the ankle and knee.

When treating small children with excessive spasticity, a total contact design with a tone reduction foot plate assists in positioning the foot in proper alignment. This will aid balance and allow progress in standing and/or walking. The DAFO is one common design of this total contact style orthosis.

Another special design AFO is a CROW walker AFO (Charcot Relief Orthotic Walker). This is a custom fabricated total contact walking orthosis designed to stabilize a Charcot foot and ankle. This orthosis includes an overlapping interlocking design to reduce any ankle / foot motion while the fracture heals. The orthosis also includes a total contact foot orthotic to provide protection and stability as well. A rocker sole is incorporated to aid in walking from heel strike to toe off.

For further information on which design will best meet your patients need, call any of our Mary Free Bed orthotists:

Mary Free Bed Rehabilitation Hospital - Orthotics

Main office: (616) 242-0315 or (800) 474-0324

Hastings office: (800) 474-0324

Holland office: (616) 392-6240 or (800) 474-0325

Muskegon office: (231) 798-0047 or (800) 474-0325

Big Rapids office: (800) 474-0325



DAFO Photo Courtesy of Cascade Dafo



Double Action Ankle Joint Courtesy of Becker Orthopedic



Wrap Around Leather Photo Courtesy of Arizona AFO, Inc



Photo Courtesy of MFB Orthotics



Peds Ground Reaction AFO Photo Courtesy of MFB Orthotics



Photo Courtesy of Cascade Dafo



Ground Reaction AFO with Tone Reducing Modifications Photo Courtesy of MFB Orthotics



Tone Reducing Footplates Photo Courtesy of MFB Orthotics



CROW Photo Courtesy of MFB Orthotics



CROW Photo Courtesy of MFB Orthotics



CROW Photo Courtesy of MFB Orthotics

PROSTHETICS

Prosthetics Education Luncheon for Physical Therapists and Physical Therapy Assistants

On March 6, 2007 Mary Free Bed Prosthetics will be hosting a free luncheon for local physical therapists and their assistants, working in outpatient settings. The subject of this luncheon will be “Trans-Tibial Amputee Management in the Sub-Acute Environment”. It will be held in the 2nd floor conference room in the main building at Mary Free Bed Rehabilitation Hospital.

The program will consist of three speakers, with the keynote speaker being Benjamin Bruinsma, MD from Rehabilitation and Physical Medicine Associates. Dr. Bruinsma is the director of the Mary Free Bed Amputee Program and the Mary Free Bed Regional Adult Amputee Clinic. He will discuss “Predication for Prosthetic use in an Amputee”. Dr. Bruinsma will be followed by John King, CP, and David Firlik, CP, of Mary Free Bed prosthetics. They will present “Postoperative and Preparatory Prosthetic Care” and “Definitive Prostheses for the Trans-Tibial Amputee” respectively. Both John and Dave are prosthetists with over 20 years experience working with amputees of all ages and activity levels.

The program will be approximately 90 minutes, beginning at 11:45 a.m. The first 15 minutes will be a social time allowing each participant to meet Dr. Bruinsma and the Mary Free Bed Prosthetics staff, along with an opportunity to converse with other therapists and attendees. Lunch will be served at 12:00 p.m. Each of the three presentations will be 15 minutes, followed by a panel discussion. The open house will conclude with a tour of Mary Free Bed Prosthetics and prosthetic services available to our local amputee population, both in inpatient and outpatient settings.

Invitations will be going out for this program on the 21st of January with a RSVP requested returned no later than February 25th. If you are a physical Therapist working in a nursing facility, outpatient rehab, or any area where these topics can help you serve your patient population, and if you have not received an invitation and would like to attend, please contact Stephanie Millis at (616) 242-0305.

This is the first in what we hope will be a series of educational events relating to care of the amputee. Future topics being considered are “Management of the

Trans-Femoral Amputee” and “Upper Extremity Amputee Care and Management”.

Improvements in C-Leg Technology



Photo
Courtesy
Of
Otto-Bock
Prosthetics

Mary Free Bed clinical staff continues to use the C-leg manufactured by Otto Bock. This is a microprocessor knee unit that provides individualized control setting for stance and swing phase. Mary Free Bed currently has approximately 25 amputees utilizing the C-Leg. The microprocessor knee unit is suitable for knee disarticulation, transfemoral, hip disarticulation and hemipelvectomy, K3 and K4 amputees. The maximum allowable patient weight is 125 kilograms or 275 pounds. A similar unit, C-leg compact, is designed for the lower and middle K2 and K3 ambulators.

A new adaptation has been recently introduced to the C-leg. This updated model has a wireless remote which allows the amputee to change modes quickly by simple pushing a button, similar to the buttons found on most car key rings. This wireless control allows the user to set the knee joint for comfortable standing, bicycle riding or inline skating. The new version has an added lock feature so the user may lock the knee unit in extension whenever full extension mode is required. This new version of the C-Leg has been awarded the “Da Vinci Award” for design innovations that has exceeded legally mandated requirements.

C-Leg Advantages

The C-Leg microprocessor unit continually analyzes the amputees gait and recognizes the walking phase and adjusts accordingly. Through constant phase damping, the C-Leg offers a high level of security even if the user stumbles. The knee unit provides a high degree of stability for stairs, uneven terrain and even on slopes.

PROSTHETICS

C-Leg Advantages – cont.

The amputees weight is more evenly distributed reducing the stress on the contra-lateral side therefore reducing the amount of energy expenditure during gait. This technology allows the amputee to concentrate less on thinking about how to walk, and more on just walking. The C-Leg provides the user with the best possible replication of natural gait.

For information regarding the C-Leg technology and if it would be appropriate for your patients, please call Mary Free Bed Prosthetics at (616) 242-0342 and ask to speak with any of our C-Leg certified prosthetists.

ORTHOSEAT

Product Highlight: Foam Transportation Tray

Vehicle transportation guidelines for persons using wheelchairs do not allow for use of standard plastic or wooden trays to remain on the chair during travel. This causes problems for many travelers who rely on the lap tray for upper body support. The Rehab Technology Center (RTC) / OrthoSEAT Program has designed and fabricated a “Foam Transportation Tray” made of Ethafoam. This material is dense structural foam considered to be energy-absorbing. The tray is upholstered in vinyl fabric to increase durability and allow for easy cleaning. It is designed to rest on the wheelchair armrests for support. A securement strap goes behind the wheelchair back upright bars to keep the tray in place during transit. This strap can be left slightly loose to allow forward movement in the event of an accident. Additional Velcro straps can be attached around the armrest pads to limit side to side movement of the tray.



Photo
Courtesy of
MFB RTC /
OrthoSEAT

The Foam Transportation Tray ...

- ✓ Has no sharp edges
- ✓ Is very light weight (less than one pound)
- ✓ Has a broad 2.25” thickness to distribute any pressure that may occur at the abdomen or sides
- ✓ Provides support for the arms and upper body during vehicle transport
- ✓ Can be easily wiped clean with soap and water.

Sizes ...

Tray widths available: 20” 22” 24”

Price ...

All sizes: \$177.00 (plus shipping)

For more information contact the Rehab Technology Center at: 616-242-0342 or 800-211-4813

ORTHOTICS & PROSTHETICS NEWS AND HIGHLIGHTS

Marketing News

In December 2006, Mary Free Bed Rehabilitation Hospital opened a small hospitality facility called “**The Inn at Mary Free Bed**”. Orthotics and Prosthetics patients coming from over 80 miles away may be able to take advantage of this inexpensive, on-campus hotel.

Patients requiring overnight stays related to appointments that are in a series (covering multiple days), lengthy time frames, or multiple departments at Mary Free Bed over several days would be eligible to stay at The Inn at Mary Free Bed, for a very reasonable fee.

For reservations contact Linda Schillinger at (616) 242-0360, or an O&P Clinical Manager at the numbers listed in Staff Contacts on the next page.

Restoring Hope and *Freedom*
Mary Free Bed
Rehabilitation Hospital

ORTHOTICS & PROSTHETICS STAFF UPDATES/CONTINUING EDUCATION

Satellite Offices

Mark Bennett, CPO has transferred to the Prosthetics Department at Mary Free Bed Rehabilitation Hospital, so the Big Rapids Satellite office is now being serviced by Mark Porth, CPO.

New Staff



Welcome to Elisa DeJong who has joined the orthotics department as an orthotic resident.

Elisa hails from Jackson, TN. She received her BS in Psychology at Eckerd College in St. Petersburg, FL., and attended the orthotics program at California State University in Dominguez Hills, CA.

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Foreign Missions

John Flynn, CPO and Mike Shedd, RTP participated in a mission trip to Ecuador in January/February 2007. The trip focused on providing prosthesis for local amputees. John was involved with patient care and Mike was involved in the fabrication. This was Mike Shedd's third mission trip to Ecuador.

Continuing Education

Ethan Leavitt traveled to Dallas, TX in December 2006 for the final section of his national orthotics examination.

Doug Richardson, CO attended a conference in Detroit, MI on the "Spine Cor" Scoliosis system.

Gina Corazza, CO attended the annual "Star Scanner Summit Meeting" in Orlando, FL in October 2006. This is a meeting of national experts in the treatment of Plagiocephaly and the Helmet therapy we provide at Mary Free Bed Orthotics.

Mark Porth, CPO attended the 4th AOPA coding committee meeting in November, 2006. This committee evaluates devices and how they are coded for proper billing.

Staff Contacts:

Orthotics: John Flynn CPO (Clinical Manager 616-459-1810), Rex Brown CO (Pediatrics 616-356-1886), Gina Corazza CO (Plagiocephaly 616-356-1887), Doug Richardson CO (Spinal Deformities, Brain Injury and Facial Burns 616-242-0315), Becky Meyer CO (Spinal and Pediatrics 616-242-9213), Brent Tuinstra CO (Pediatrics and Plagiocephaly 616-493-9823), Larry Dubinshak CPed (616-356-1884), Becky DeLongpre CPed (616-356-1894), Stacy Mulder, Assistant (River Valley Orthopedics 616-493-9698).

Ortho.S.E.A.T.: Karen Gora (Clinical Manager 616-242-0347), Steve Anderson (Production Supervisor 616-456-4847), Joel Allchin (SLP 616-242-0342), Peggy Barbour (OTR 616-356-1907), Mary Hamell (COTA 616-456-4843), Lisa Newhouse (OTR 616-242-9278), Amy Ortego (OTR 616-242-9289), Matthew Scholtens (Assistive Technology Specialist 616-356-1892).

Prosthetics: Patrick Nimphie CPO (Clinical Manager 616-356-1865), Mark Bennett CPO (Staff Prosthetist 616-242-0437), David Firlik CP (Upper Extremity 616-242-0453), Tony VanEss CP (Pediatrics 616-242-0461), John King CP (Trans Femoral 616-242-9240).

Rehab Technology Center: Karen Gora (Clinical Manager 616-242-0347), Sister Kathryn Mullarkey (Assistive Tech Coordinator 616-242-9253).

Orthotics & Prosthetics Muskegon / Holland Satellites: Mark Porth (Clinical Manager 616-392-6240).

In-service Requests: Stephanie Millis (Orthotics Assistant and Marketing Specialist 616-242-0305).