



MOVING AHEAD

A Swanson Regional Orthotic & Prosthetic Research Center Publication No. 50

—The Essential Orthotist—

Among the many changes under consideration in American health care these days is liberalization of the once well-defined understanding as to the practitioners and qualifications appropriate and necessary to deliver orthotic services.



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Traditionally, the design and fabrication of orthotic devices—bracing systems for the lower and upper extremities and spine—have been the province of the trained orthotist, who by virtue of education, experience and technical abilities possesses a complete skill set for this specialized role.

Over the last half-century, orthotists have added formal education in their discipline to their technical skills, most current practitioners having graduated from one of the baccalaureate level or post-baccalaureate masters or certificate O&P education programs in the U.S.

Credentialing

The hallmark of orthotist qualification has become individual certification by the American Board for Certification in Orthotics and Prosthetics (ABC). To become an ABC-certified orthotist (C.O.), a practitioner must first have earned a bachelor's degree in O&P or a bachelor of science degree and one-year postgraduate education certificate in O&P, then complete a one-year residency program or attain 1900 hours of clinical experience under a certified instructor, and finally pass a rigorous written examination, written simulation, and three-day clinical exam. Every five years, ABC-certified practitioners must renew their credentials.

A second credentialing body, the Board for Orthotist/Prosthetist Certification, has its own education, experience and testing requirements. While it is still possible for uncertified practitioners to deliver orthotic services, most



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orthotists recognize the value of, and thus pursue, certification. In recent years, Alabama, Florida, Illinois, Mississippi, New Jersey, Ohio, Oklahoma, Texas and Washington have embraced licensure of O&P practitioners, several basing their requirements on ABC's certification requirements.

The Prefab Impact

A notable trend of the past decade has been the growth of prefabricated orthotic components in a field that formerly was largely custom-fabricated. Because they usually cost less than custom-molded devices, these products tend to be favored by Medicare and other third-party payers and thus in many applications are approved over a custom alternative.

Orthotics Today

Sometimes a prefabricated product will do the job reasonably well—nevertheless, the importance of a proper fit should not be discounted. Even with these less-expensive alternatives, the skill and experience of a well-qualified orthotist can mean the difference in achieving a successful outcome.

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About Moving Ahead

Moving Ahead is a professional newsletter published by Swanson Regional Orthotic & Prosthetic Research Center to inform health care professionals of developments in the orthotic and prosthetic disciplines.

Swanson offers three board-certified practitioners and three state-of-the-art laboratories. The practice has a solid reputation for quality care and patient satisfaction throughout Northwest Ohio and Southeast Michigan and has been in business for more than 22 years.

To tour our well-equipped facilities or be added to our mailing list, please write or call:

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Compliments of: Vern Swanson, C.P.; Jeffrey Kuehn, C.P.; and Jon S. Eberlein, CPO.

The Ubiquitous Ankle-Foot Orthosis

The ankle-foot orthosis ranks among the leading rehabilitation aids in the U.S. The majority of America's more than 3.5 million stroke survivors wear some form of AFO to overcome dropfoot and other biomechanical complications. Add the additional millions of children and adults challenged by cerebral palsy; multiple sclerosis; head trauma; polio; Charcot disease;



Posterior leaf spring AFO
(Compliments, Orthomerica Products, Inc. © 2003)

fractures, injury and disease processes of the lower limb; and other central nervous system disorders, and you have a vast population of people whose quality of life can be improved by an appropriately prescribed, designed and fabricated AFO.

From a quarter-century ago, when AFO construction consisted primarily of leather cuffs and metal uprights, new design and materials combinations have proliferated, each offering its own particular attributes for specific rehabilitation objectives. It is the particular role of the board-certified orthotist to keep pace with emerging designs and fabrication technology.

That's a critical point: In an era when the financial bottom line competes aggressively with the patient's bottom line, it is sometimes tempting to choose non-traditional alternative providers for certain health services, foregoing qualifications and experience for a lower price. But what purpose is served by a marginally qualified provider, perhaps crossing over from another field, providing a generic or prefabricated "old standby?" In the long run, "You get what you pay for" usually rings true, and "most appropriate" generally works out to be "most economical" as well over the long term.

Applications

AFOs are variously employed to control and correct biomechanical and/or neurological dysfunction, facilitate or restrict joint motion, maintain proper alignment of the lower limb, protect vulnerable structures, alleviate pain, and relieve weight-bearing.

Overcoming dropfoot is the most common and probably most familiar application. The orthosis supports the ankle at a 90 degree angle, and dorsiflexion-assist may be incorporated to help the foot assume proper position for heel strike. Thus compensated, patients walk more efficiently, more safely and with less fatigue.

Sometimes, the objective is to protect body structures from further insult or injury, such as a chronically inflamed Achilles tendon. Other times, the goal may be to immobilize the ankle, such as in the presence of degenerative joint disease, when the patient is either unable or unwilling to undergo arthrodesis surgery. Still another AFO objective is relief of axial loading by shifting some of the weight-bearing stresses to the orthosis.



Solid Ankle AFO
(Compliments, Orthomerica Products, Inc. © 2003)

Many variables enter into AFO construction: Key design determinants include materials, trimlines and intimacy of fit.

Materials

No factor has had greater impact on the progression of AFO design than the adaptation of sheet plastics to orthosis fabrication. Compared to metal-leather construction, custom-fabricated plastic AFOs are considerably lighter in weight and more comfortable to wear, can easily be worn with different shoes, are more cosmetically pleasing, and most importantly, provide the substantial benefits of total contact: intimate fit, optimal pressure distribution, and prevention of complications from skin breakdown.

In recent years, plastic laminate buildups incorporating fiberglass and graphite resins have been employed to strengthen "solid-ankle" AFOs, to achieve triplanar ankle immobilization. Previously, controlling ankle rotation with an AFO was difficult at best.

The ability to maintain ankle rigidity enables our orthotist staff to address knee stability with an AFO, sometimes called the floor reaction orthosis. During stance phase, this device transfers an extension moment, i.e. the floor reaction force, to the knee through the rigid vertical wall and a broad anterior panel just below the knee. This orthosis is a welcome alternative to a full knee-ankle-foot orthosis in treating stroke, trauma or disease-induced knee instability and cerebral palsy "crouch gait."

Another important advance has been the development of articulating designs featuring metal or plastic ankle joints. These joints can be used to provide adjustability to an otherwise-fixed ankle design or to allow full or restricted dorsi- and/or plantarflexion as desired.

Ideally, the degree of such motion is chosen by prescribing physician, therapist and orthotist in concert; the orthotist then applies his or her skills to deliver the desired result.

Designs

To attempt a comprehensive discussion of all possible AFO types would necessitate a much larger newsletter.

Commonly used broad classifications include dorsiflexion-assist, solid-ankle, articulating, and tone-reducing AFOs. A few representative examples are illustrated with this article.

Tone-reducing AFOs comprise an interesting subset of AFO design based on considerable evidence that hypertonicity can be influenced by cutaneous stimulation and joint position. Maintaining a neutral ankle position and neutral subtalar joint position and stimulating key reflexogenous areas on the plantar surface can inhibit deforming reflexes and/or stimulate appropriate antagonist reflexes, producing a

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Articulating AFO

Off-the-Shelf or Custom?

The surging tide of health care cost-containment in America is exerting ever-increasing pressure on orthotic practitioners to forego the well-established therapeutic and functional advantages of custom fabrication for the immediate cost savings of pre-fabricated alternatives.

Some AFO applications do lend themselves to off-the-shelf products, particularly those whose use will be short-term or a stepping stone to another orthosis. By far the greater number, however, should be custom-made from an anatomic model. Here's why:

To carry out their role optimally, most AFOs rely on a total-contact fit and proper pressure distribution across the entire covered area. Total contact, which also helps guard against skin breakdown, does not occur with prefabricated products. Moreover, even when prefab models come in several sizes, achieving a "proper" fit is difficult.

Prefabricated AFOs and other orthoses certainly have their place and should be used when feasible, but for the majority of applications, custom is better and, by doing the job right the first time, is likely the better buy in the long run.

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.

We gratefully acknowledge the assistance of the following resources used in compiling this issue:

**Fillauer Inc. • Kingsley Manufacturing Co.
Orthomerica Products Inc.**

AFO Innovation

The Orthomerica TC²™ (Total Contact, Total Control) AFO System provides orthotists and their referral sources with a fast-turnaround, central fabrication option for custom adult and pediatric AFOs.

Unique features of this product include a series of differently sized casting plates to assist orthotists in obtaining a custom mold of the patient's anatomy and eight different AFO designs to manage neuromuscular dysfunction and weakness. TC² options range from a sub-malleolar design for patients requiring minimal support and control to higher-level solid-ankle and articulating designs. A posterior-entry AFO for crouch gait applications is also offered.

TC² orthoses can be enlivened with kids' favorite cartoon characters, team logos and other popular transfers.



(Compliments of Orthomerica Products, Inc. © 2003)

Among recent improvements in AFO componentry has been the development of better and more durable joints for articulating orthoses. Articulating AFOs provide built-in adjustability for enabling a prescribed range of motion and accommodating changing patient needs. The stainless steel **Meridian Ankle Joint** from Kingsley Manufacturing combines light weight and high durability in a low-profile design. These attributes can extend the functional life of an AFO, making it more cost-effective over time.

The Meridian Ankle Joint can be set to provide virtually any range of motion without changing parts and has the ability to lock in any degree of dorsi- or plantar flexion. Besides basic articulating designs, applications include solid ankle, posterior-entry, floor-reaction and tone-reducing orthoses, as well as AFOs for contracture management.



(Compliments of Kingsley Manufacturing, Co.)

Certified Orthotists Know All About AFOs

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more normal posture. It has been shown that the spastic response can be inhibited in all but the most extreme cases.

The dynamic AFO (DAFO) is a thin, highly flexible orthosis featuring a custom-contoured soleplate that provides total contact support and stabilization of the dynamic arches of the foot. The DAFO's construction allows varying degrees of plantar- and dorsiflexion along the natural axis of ankle movement, thereby preserving important balance and postural control movements, which are restricted by rigid orthosis designs.

The DAFO is widely used in the pediatric population in conjunction with active postural control and balance-oriented therapy programs.



The AFO Expert

For people involved in rehabilitation, the important thing about providing AFOs to patients who need them is not to try to keep up with the latest designs and fabrication techniques but rather to recognize that there is one type of practitioner—the certified orthotist—who, generally speaking, knows more about AFOs than anyone else... including how to:

- perform a comprehensive patient orthotic evaluation...
- identify the most appropriate AFO design for a given problem...
- accurately cast and modify a lower limb model...
- select the most advantageous materials...
- fabricate, then refine, the finished orthosis, and...
- measure outcome and modify the AFO as necessary to produce the best possible results.

The important thing about AFOs is that in the certified orthotist, rehabilitation decision-makers have at their disposal an AFO expert, who can help them achieve an optimal outcome.

Down to Cases

New Freedom at Age 73

A retired farmer, 73, presented with severe fixed equinovarus deformity of the left leg, with which he had been “getting along” since a childhood accident and subsequent lack



of proper care left him walking on the side of his foot for his entire adult life. On evaluation, he could walk perhaps 30 feet at most.

The patient’s physician, orthotist and physical therapist developed a coordinated treatment plan focused on therapeutic stretching and an ankle-

foot orthosis incorporating several advanced features.

The AFO combined laminated construction for extra strength and rigidity with patellar tendon-bearing support to relieve axial loading on the deformed ankle and adjustable ankle joints to accommodate the patient’s progress.

At six weeks, results far exceeded expectations. With regular therapy and orthosis wear, the patient’s deformed ankle gradually approached a near-neutral position, and his walking distance grew to a full city block.

With continued therapy and AFO use, this patient continued to progress and came to enjoy a freedom he had not known since childhood.



How Will Medicare Reform Impact Orthotics?

(Continued from page 1)

Competitive Bidding and ‘NegRegs’

In its ongoing campaign to control Medicare expenditures, the federal government is considering two new approaches to the delivery of orthotic services:

- Under *competitive bidding*, the Centers for Medicare and Medicaid Services (CMS) would solicit bids for the provision of certain health services including many orthotic products and grant exclusive rights for reimbursement for those products in a given region.

The House version of the 2003 Medicare Reform bill would require nationwide competitive bidding for durable medical equipment, “off-the-shelf orthotics” and medical supplies.

- O&P *Negotiated Rulemaking (NegRegs)* is a process mandated by Congress to establish criteria for determining who is qualified to deliver and bill for specific O&P products and services with the goal of reduced Medicare fraud and abuse by unqualified providers.

A committee composed of major industry groups, including orthopedic surgeons, physical therapists and occupational therapists, as well as orthotists and prosthetists, will recommend standards of competency to be required by CMS for practitioners delivering O&P care to Medicare patients.

Our Position

We respect all providers of clinical rehabilitation services. We also believe that any health professional who seeks qualification for reimbursement or authorization to deliver orthotic, as well as prosthetic, services should continue to be required to meet appropriate preparation requirements and demonstrate competency based on education, training, and experience by passing a proper examination.

These are important issues, which may well frame the future delivery of orthotic and prosthetic care in America.

We welcome your comments and questions.

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