Stance Control Grows ‘Intelligently’

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Such is the case with stance control orthoses, or SCOs, for which the initial, largely mechanical joint designs have now been taken to a new level of microprocessor control to address the specific needs of a wider range of patients. Two recently introduced products exemplify this new generation of “intelligent” SCO technology.

The E-MAG Active system extends the benefits of a stance control knee-ankle-foot orthosis and provides an added level of safety to patients with no ankle function. In lieu of an ankle sensor or weight-sensing footplate, an on-board gyroscope monitors the affected limb’s position within the gait cycle at all times and controls an electro-mechanical knee unlocking mechanism accordingly to enable flexion during swing phase and ensure at any degree of knee flexion, facilitating change cadence during ambulation, and can be as simple as walking for a time between parallel bars. Many users quickly gain sufficient confidence to climb stairs, change cadence during ambulation, and walk on uneven terrain.

The Sensor Walk can be set to function as a fully locked or free-swinging knee to accommodate changes in the patient’s ability and special circumstances. Like the E-MAG Active, the Sensor Walk uses a rechargeable lithium ion battery that gives active wearers a full day of service. This next generation of SCOs illustrates the exciting future of orthotic limb rehabilitation. Call our office for more information.

The E-MAG knee joint is completely enclosed, preventing clothes from becoming snagged and protecting against external impact and contaminants entering the joint. This system can be used for appropriate patients weighing up to 187 pounds.

By contrast, the Sensor Walk can withstand users of up to 300 pounds, most of any stance control KAFO currently available. This heavy-duty orthosis, developed in conjunction with the Mayo Clinic, offers several unique features that provide the benefits of sophisticated stance control to individuals who cannot operate other SCOs.

Sensors in the knee and footplate feed data to the Sensor Walk microprocessor and unlock the knee in late-stance phase when weight has been transferred to the contralateral side and is ready for single limb support. Gait is frequently more natural than with other SCOs, because a knee extension moment is not required to unlock the joint. After mid-stance but prior to initial contact, the Sensor Walk knee joint will lock at any degree of knee flexion, facilitating stumble recovery.

Unlike other stance control systems, which can take up six months to master, gait training for the Sensor Walk is fast and can be as simple as walking for a time between parallel bars. Many users quickly gain sufficient confidence to climb stairs, change cadence during ambulation, and walk on uneven terrain.

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In 1993, the American Medical Association recognized orthotics and prosthetics (O&P) as an allied health profession, culminating the evolution of the two disciplines from medical-related craft to true patient care specialty. Yet, O&P has not been subject to mandatory regulation in the U.S. until recently. Currently, 12 states have passed licensure requirements, and several more have legislation in progress.

Licensure carries the force of law—state agencies determine who may legally provide O&P services to their citizens. In time, many more states may adopt licensure, particularly those with a large elderly population and many practitioners; but for now, the large majority of states does not require a license to practice this specialty.

Filling that void is an aggressive self-regulation effort centered around individual certification and facility accreditation to certify knowledge, competence and experience for the benefit of physicians, other health professionals, patients and insurers. Two credentialed bodies for orthotists and prosthetists function in the U.S.:

• The American Board for Certification in Orthotics and Prosthetics (ABC) was founded in 1948 to protect the public against unqualified providers. ABC practitioner certification is open to orthotists, prosthetists and technicians who meet well-defined educational and experience requirements and pass a rigorous written examination, written simulation, and two-day clinical exam. ABC’s facility accreditation program evaluates practices against exacting standards relating to governance, administration, staff qualifications, patient care, quality assessment, facility management and safety.

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A Welcome Alternative to Traditional KAFOs

Providing effective and patient-acceptable orthotic intervention for individuals with post-polio symptoms, for example, has the facility and motivation to succeed with a stance control brace. The same is true with all other relevant diagnoses for this category.

The majority of currently available SCOs are mechanical in nature, which means the patient’s gait such as ankle range of motion to lock the knee just before commencement of stance phase (heel strike) and unlock it at transition to swing. More recent microprocessor-controlled systems extend stance control benefits to individuals with minimal hip musculature that precludes using mechanical hip bracing. Though SCOs have not been around long enough for conclusive long-term outcomes studies, initial research involving some of the early designs suggests significant benefits can be achieved for appropriate patients not only for better biomechanics but also for improved gait efficiency. For example, patients with knee instability resulting from lower-limb injuries comfort KAFOs for this population.

The majority of current SCOs tend to be somewhat bulky as compared to their standard counterparts, and the newer microprocessor-controlled SCOs tend to be heavy by comparison; some are noisy as well. For the patient, the question becomes, Are these beneficial and if so which design will be most appropriate for a given individual? For up-to-date information, visit the web sites for Handicap International, O&P Outreach, and the experience and capabilities of our practice.

The concept behind these devices—locking the knee during weight-bearing support for stability and during stance and thereby prevent knee collapse and resulting falls. Another common outcome of abnormal compensating biomechanics associated with long-term use of a locked-knee KAFO is pain and loss of motion stemming from soft tissue and joint dysfunction, especially in the hips and lower back.

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- A bachelor’s degree in orthotics and/or prosthetics as offered by a CAABEP-accredited institution;
- A bachelor’s degree plus a certificate in orthotics and/or prosthetics as offered by a CAABEP-accredited institution;
- A foreign degree equivalent to a bachelor’s degree in orthotics or prosthetics or a foreign degree equivalent to a bachelor’s degree, plus a certificate in orthotics and/or prosthetics as offered by a CAABEP-accredited institution.

Credentialing Accord to Help Ensure High-Level O&P Care

Componentry Capsule

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Another innovation: The E-MAG Active can provide auditory feedback to the patient regarding the capabilities and proficiency for those they serve and with whom they interact. This condition is every bit as true for orthotics and prosthetics as for other health care professions.

In 1993, the American Medical Association recognized orthotics and prosthetics (O&P) as an allied health profession, culminating the evolution of the twin disciplines from medical-related craft to true patient care specialty. Yet, O&P has not been subject to mandatory regulation in the U.S. until recently. Currently, 12 states have passed licensure requirements, and several more have legislation in progress. Licensure carries the force of law—state agencies determine who may legally provide O&P services to their citizens. In time, many more states may adopt licensure, particularly those with a large elderly population and many practitioners; but for now, the large majority of states do not require a license to practice this specialty. Filling that void is an aggressive self-regulation effort centered around individual certification and facility accreditation to certify knowledge, competence and experience for the benefit of physicians, other health professionals, patients and insurers. Two credentialing bodies for orthotists and prosthetists function in the U.S.: The American Board for Certification in Orthotics and Prosthetics (ABC) was founded in 1948 to protect the public against unqualified providers. ABC practitioner certification is open to orthotists, prosthetists and technicians who meet well-defined educational, clinical and experience requirements and pass a rigorous written examination, written simulation, and a two-day clinical exam.

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The Credentialed Orthotist

Orthotist—a health care professional specifically educated and trained to manage comprehensive orthotic patient care, including patient assessment, treatment plan formulation and implementation, follow-up and practice management.

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