

Dynamicnews

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a publication for patients and clients of
DYNAMIC ORTHOTICS and PROSTHETICS

Play Ball! Dynamic Sponsors Local Sports Teams

West University Little League has been in operation for 56 seasons. However, the past two have been graced with the addition of a new, unique addition. Since the spring of 2005,



Dynamic Orthotics and Prosthetics has been a proud sponsor of the Challenger Division. This special sub-league was created for children with mental and /or physical disabilities. For most of these children, prior to the creation of the

Challenger division, their baseball experience was confined to watching their siblings swing the bat and round the bases. Now little league baseball has a place for them as well.

The mechanics of the Challenger division are unique. Baseball buddies add a caring dimension to the game as they come early to help set up and then assist the Challenger players bat, take their base, play in the field, and most importantly, cross home plate. Every child bats, and the final score is always a tie, stressing the important lessons of sportsmanship and friendship in the game.

Following the conclusion of their first full, four-game season, a call came from the White House, inviting the Challenger Division to send a team of twelve to play in the South Lawn Game on July 24, 2005. Names were drawn to assemble the team of 12, aptly named the South

Lawn Sluggers. Then for the thirteenth time since President George W Bush took office, a little league field was chalked and fenced off, complete with a backstop supporting a banner for both of the competing teams from West University, TX and Williamsport, PA. Both teams were introduced to the gathered crowd, along with the names of the game's third base coach, Hall of Fame member, Ozzie Smith, the game's first base coach, Hall of Fame member, Paul Molitor, and the game's plate assistant, Houston Astro, Andy Pettite.

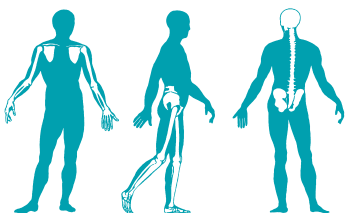
Then, over the sound system, came a phrase that most have only heard on the radio or TV: "Please rise for the President of the United States." Even those typically wheelchair bound did their best to stand for the President



as he entered the field. Following a greeting of the crowd, and welcoming the team from Pennsylvania, with a trademark swagger, the president declared, "And now, from the great state of Texas... West University Little League." The nations Commander and Chief placed the ball on the tee and announced, "Let's play ball!"

If your organization would be interested in an in-service on prosthetics and/or orthotic care, please contact company President, Tom DiBello at (713) 747-4171.

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and PROSTHETICS
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Early Prosthetic Management Of the Lower-Limb Amputee

Few topics in rehabilitation elicit more debate and exhibit less consensus than the management of patients in the first days after lower-extremity amputation surgery and the timing and method of their transition into a prosthetic limb.

This important decision is impacted by (1) the surgeon's natural desire to closely monitor the new amputee's recovery by regularly examining the progress of wound healing; (2) rehabilitation practitioners' preference for resuming exercise and initiating weight-bearing and prosthetic intervention as soon as practicable; and (3) reimbursement realities.

Certainly, the age and health of the patient affect the decision. A young, traumatic amputee may be capable of taking his first steps a few days after surgery, while an elderly, dysvascular patient may take weeks or months before the clinical team feels comfortable initiating prosthetic care. In other cases, an amputee's general state of health may rule out prosthetic intervention altogether.

In 2003, the American Academy of Orthotists and Prosthetists funded a Clinical Standards of Practice (CSOP) consensus conference on lower-limb post-amputation management. The CSOP concept is used by various medical professionals to examine practice concepts that are poorly or under-reported in the literature.

In an intensive two-day process, the assembled multidisciplinary team of experts reviewed and compared the five predominant post-amputation management strategies:

- Soft dressings,
- Non-removable rigid dressings
- Non-removable rigid dressings with an immediate post-operative prosthesis (IPOP)
- Removable rigid plaster dressings (RRDs),
- Prefabricated postoperative prosthetic systems.

The participants concluded that the current level of research does not currently make possible

evidence-based protocols or recommendations favoring one approach over another; however, the CSOP literature review did confirm that rigid dressings do produce significantly accelerated rehabilitation periods and significantly less edema than soft dressings, and that significantly fewer postoperative complications are experienced with prefabricated postoperative prosthetic systems than with soft dressings. Other definitive comparisons are lacking at present.

This CSOP has focused new attention on the benefits and drawbacks of the various approaches and accentuated the need for future research comparing all types of dressings within one study.

Dressing Options
Examining the different amputation dressing alternatives in more detail:

- A soft dressing – soft gauze used alone or in conjunction with a device such as an ACE wrap, shrinker sock, or gel liner to achieve compression and perhaps some form of a knee immobilizer to counter contractures – can be easily removed for wound inspection. However, its potential drawbacks with respect to early prosthetic intervention are significant: reduced edema control, increased risk of contractures, extended post-operative patient inactivity, and potential depression from being confined to bed for a long period. Using soft dressings only, prosthetic management may not begin until the third or fourth month after surgery, by which time the patient's motivation to ambulate may have waned.

- A rigid dressing can prevent most of these problems. This dressing is usually constructed of plaster, fiberglass or a combination, and if it is to serve as the foundation of an IPOP, incorporates an attachment for the prosthesis. In addition to controlling edema and preventing contractures, a rigid dressing helps reduce pain and guards against wound contamination.

- By allowing frequent inspection of the amputation site but retaining many benefits of a rigid cast, the removable rigid dressing (RRD) offers a compromise between soft and rigid dressings. The RRD is fabricated of plaster or fiberglass and suspended by stockinette and supracondylar suspension cuff or sleeve; residual limb socks are added as needed to maintain a close fit. The RRD has lower trimlines than a non-removable rigid dressing and thus permits knee range of motion exercises. Care must be taken not to leave the wound exposed for lengthy periods as edema buildup can begin within 20 minutes. While exercise and weight-bearing can be initiated with the RRD, it is not normally used as the basis for an IPOP. Contraindications include noncompliant patients and lack of a strong support environment.



An immediate post-operative prosthesis (IPOP) consists of a non-removable rigid cast, a simple pylon and basic foot.

The polyethylene semi-rigid dressing (PSRD), has been applied in place of an initial dressing as early as five days post-op...with staples/sutures still in place. Used in conjunction with a shrinker, it has been shown to provide better edema control than either an RRD or shrinker alone. Moreover, the PSRD's flexibility enables a new amputee to apply and remove the dressing, which is similar in design

Amputees (continued)

to a prosthetic socket. To minimize weight, the rehabilitation team may forego the addition of a prosthetic pylon and foot is added. In these cases, partial-weight bearing can be initiated by positioning the distal end in a wheelchair seat or other appropriate surface under qualified supervision. In cases where the addition of a prosthesis to the bottom of the PSRD is acceptable, touchdown weight bearing can begin in the early days of rehabilitation.

What About IPOPs?

The immediate post-operative prosthesis is usually a simple, relatively inexpensive device that gives the patient an immediate reason to begin using his amputated limb. Just the psychological benefits of this approach provide justification for its use, as the therapeutic objective becomes one of rehabilitation rather than simply recovering from surgery.

The rigid dressing applied in the operating room serves as the IPOP "socket," to which are attached a basic pylon and prosthetic foot. The IPOP is intended to be used until the amputation wound has sufficiently healed and staples or sutures have been removed. At that point, the patient is usually ready to transfer to a more substantial prosthesis.

The key to successful IPOP management is strict limitations on weight-bearing in early use. With neurological function of the limb severely altered, the new amputee will have abnormal sensory indication as to how much weight is being applied to the prosthesis; thus considerable care must be exercised to avoid stressing the wound.

Patient ability to withstand early weight-bearing is individualized, but in general little

or no weight should be applied except for prosthetic touchdown for the first day or two. Then, as patient tolerance and indications of satisfactory healing will allow, weight-bearing can gradually be increased.

An IPOP alternative gaining some measure of popularity of late is the early post-operative prosthesis, or EPOP, which is typically applied five-to-seven days post-op. EPOPs are sometimes considered a better choice for patients with vascular disease, as the wound can be regularly examined before the EPOP is applied. Another advantage is that the prosthetist can fabricate an EPOP at the bedside rather than having to be present in the operating room during surgery.



(Above) Casting materials for a transtibial rigid dressing include (from left) conformable fiberglass, fibula and medial tibial pads, patella pad, cast padding, lambs wool, sterile post-op socks, adjustable waist belt with pick-up (top) and reticulated distal foam cup (bottom).

Prefabricated Post-operative Systems
For appropriate patients, prefabricated post-operative prosthetic systems, such as the



Adjustable Postoperative, Protective and Preparatory System (APOPSS), offer a nice compromise between a soft and a rigid dressing, allowing for periodic wound evaluation and providing a degree of residual limb protection and contracture prevention and edema control.

Like the RRD and PSRD, prefabricated protective sockets can be removed for wound inspection, but unlike those options, systems like the APOPSS are intended to serve as the basis for an immediate prosthesis. APOPSS models are available for both transtibial and transfemoral amputees.

APOPSS transfemoral and transtibial systems provide prefabricated post-amputation management options for wound protection and early weight-bearing.

Courtesy FLO-TECH

Baseball (continued)

Following a successful game in which all participants were declared winners, President Bush spent time with each player and their respective "buddies," giving each child a signed baseball complete with the presidential seal. Following their time with the President, White House chefs grilled hot dogs and baked cookies to the delight of players, buddies and families alike.

This year, participation has increased, with league enrollment expanding from 48 special needs players to 69 players on 6 teams with nearly 200 baseball buddies and volunteers. Games are held at the West University Little League each Sunday. Dynamic Orthotics is pleased to be involved with the organization and hopes for the continued success of these motivated players, their buddies, family members and volunteers.

Today's certified prosthetist is well prepared to assist surgeons in post-operative amputee management, beginning with initial dressing in the operating room if desired, and to work directly with nurses and therapists during early prosthetic activity.

The tools, techniques, technical knowledge, and fabrication abilities are readily available to give patients the ample benefits of early prosthetic support. It only remains for those who chart the amputee's rehabilitation course to put these resources to use.

A-K Amputee Gait Takes Another Step

Computerized knee componentry, arguably the major prosthetic technology breakthrough of the last decade, has taken another step forward with the introduction of the Rheo Knee™, a microprocessor-controlled swing and stance system that continuously samples and “learns” the user’s gait pattern and optimizes cadence response.

The Rheo Knee thus joins the C-Leg and Adaptive Knee in the growing arena of microprocessor-actuated advanced knee componentry.

The Rheo name derives from the knee’s “magnetorheological (MR) fluid actuator,” which varies swing resistance to adapt to its user’s movements in real-time. Electronic sensors within the knee measure changes in knee angle and load bearing 1000 times per second. A computer chip creates and regulates magnetic field intensity to control the viscosity of the MR fluid and thereby deliver the proper degree of resistance with each step.

For above-knee amputees, this technology can mean greater security, more natural motion, less ambulation fatigue, and the ability to walk with confidence on uneven surfaces.



Courtesy Ossur

By continually sampling the sensors’ force measurements, the microprocessor is always aware of how the limb is being loaded. Disturbances in the user’s path are readily detected and stance support instantly activated to protect against a potential stumble and fall. The Rheo also provides safeguards against inadvertent stance release:

The knee must be fully extended, momentarily still and achieve 20 percent of the average maximum extension moment during each step to initiate flexion.

The Rheo Knee’s microprocessor controlled stance feature enables amputees to negotiate a ramp, stairs or uneven terrain with confidence, some for the first time.

Unlike conventional hydraulic knee systems, Rheo Knee swing resistance is activated only when necessary. Veteran amputees who have worn the Rheo report the welcome experience of walking freely and resistance-free with easy motion and less effort, reducing oxygen consumption and fatigue.

The Rheo Knee, developed by Ossur in conjunction with the Massachusetts Institute of Technology, has won various accolades including the 2005 Frost & Sullivan Technology of the Year Award and inclusion



Courtesy Ossur

in *Fortune Magazine’s* 25 Best Products of 2004, and *Time Magazine’s* Coolest Products of 2004.

Like most advanced technology, the Rheo Knee is not inexpensive and definitely not for everyone. However, this new technology promises even greater prosthetic capabilities for amputees in the future.

Meet Our Staff



Insurance Verifier
Blanca Quijada

Q: What do you like about working at Dynamic O&P?

A: Dynamic O&P is a very family oriented place. Everyday is a new learning experience, never is it the same.

Q: If you could retire tomorrow, what would be the first thing you would do?

A: I would spend more time with my daughter.

Q: Tell us about your family?

A: All I can say about my family is that they are wonderful.

Q: What is the best advice you’ve ever received?

A: Every decision you make has a consequence.

Custom Socket Liners Fill in For Difficult Residual Limbs

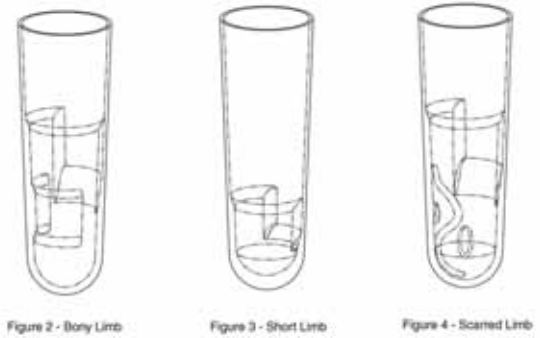
The introduction of gel socket liners in the early 1990s opened new vistas of comfort and improved prosthesis suspension for lower-limb amputees and spawned a steady stream of new liner designs and materials, which continues today.

Most prosthetic liners are off-the-shelf products of uniform gel thickness throughout and available in various sizes. These products work well for most transtibial and some transfemoral amputees; however, those with residual limbs that are particularly bony, short, uneven, deeply scarred and/or invaginated often experience pain when wearing their prosthetic limb and sometimes difficulty in maintaining suction suspension.

Alpha® DESIGN™ custom liners are one of several liner options that can extend a comfortable, secure prosthetic fit to individuals

with one or more of those limb characteristics. These liners are made to conform to the unique variations of a challenging residuum, as modeled by an OMEGA® Tracer® computer-assisted design (CAD) system or a plaster cast of the limb. In the absence of a CAD image, the amputee's prosthetist can participate in the fabrication of the custom liner through an interactive online consultation with the designer, known as Web Assist. The resulting liner will be one of a kind.

DESIGN liners feature varying gel thickness at strategic points that contact difficult areas on the residual limb surface. The standard 6 mm gel thickness can be decreased as needed or increased up to 12mm in the distal end and up to 15mm over invaginations. The additional padding



Line drawings show areas of gel build-up in DESIGN liners created for (from left) bony, short and scarred limbs.

Courtesy Ohio Willow Wood

enhances comfort; the closer fit improves suction continuity.

The first DESIGN liners were available only for transtibial amputees; transfemoral liners are now offered as well. Both can be ordered in a pure suction version or incorporating a distal attachment for a locking pin. DESIGN liners come in one of three fabric coverings (two for the transfemoral version), many sizes, and three fabric colors.

Dynamic Clinician Takes Top Research Award.

Dynamic O&P's Director of Clinical Education, Phil Stevens CPO, has been announced as the winner of the 2006 Graduate Student Research Award by the University of Houston's College of Education. Nominated by his graduate advisor, Phyllis Gingiss, Dr.P.H., Phil will share the award with two other graduates from the College of Education. The award is intended to recognize excellence in research and scholarship. The award, bestowed by the College of Education's Research Committee, is based on the student's curriculum vitae, current research, articles and conference submissions. Phil's application was supported by recent publications in the *Journal of Prosthetics and Orthotics*, lectures at the state and national meetings of the American Academy of Prosthetics and Orthotics, professional posters and other non-peer reviewed publications. The award will be formally presented at the College of Education's Faculty Breakfast on August 14. Phil recently completed his graduate degree at the University of Houston in Allied Health Education and Administration.



Academy (continued)

among the post polio population to determine patterns of disease progression and orthotic use. The survey revealed, among other data, the prevalence of symptoms in both the previously affected and previously unaffected limb decades after the initial discontinuation of lower extremity braces. The poster also described the need for the majority of the surveyed patients to go back into lower extremity orthoses. Reasons for patient resistance to the use of lower extremity orthoses were also reported. A smaller version of the poster is on display at our Alameda office. Additionally, key findings of the poster were included in the May 2006 issue of *Biomechanics*.

Dynamic Contributions to the Annual Academy

The American Academy of Orthotists and Prosthetists held its annual meeting and scientific symposium in Chicago Illinois in early March. Several clinicians from Dynamic Orthotics and Prosthetics, including Tom DiBello CO, Phil Stevens CPO, and Doug Sammons CO, were invited to participate as presenters at the meeting.

Tom DiBello was joined by fellow orthotist, Keith Smith, and the Vice Chairman of Clinical Neurology at Washington University School of Medicine, Brad Racette MD, to present a symposium on the "Pharmacologic and Orthotic Management of Lower Limb Spasticity, Treatment Protocols, Clinical Application and Outcomes."



Reviewing their respective experiences in Houston and St. Louis, the trio discussed the increasingly prevalent combination of aggressive, dynamic-assist orthoses following injections of Botulinum Toxin. Preliminary outcomes, treatment protocols, and orthotic techniques were all presented and discussed.

Phil Stevens was joined by fellow clinician, Joseph Terpenning CO and Charles Thorne MD, Associate Professor of Plastic Surgery at the NYU Institute of Reconstructive Plastic Surgery. The three co-presented an extended instructional course on "The Role of Orthotic Intervention in the Management of Craniosynostosis." Dr. Thorne opened the course by reviewing

pertinent cranial anatomy and developmental physiology, followed by the pathogenesis of craniosynostosis and differential diagnosis. He also presented general principles involving the corrective surgeries performed on this patient population. Phil Stevens then presented case studies from the Houston area, demonstrating the role and outcomes of post-operative remolding helmets. Joseph Terpenning concluded by presenting a new technique of initiating helmet therapy to treat co-morbid positional asymmetries prior to corrective surgeries.

Doug Sammons was the lead author of a clinical poster describing "Insights Gained through a Recent Survey of Patients with Post Polio." The poster highlighted the results of a survey Doug conducted

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