

ORTHOPÄDIE TECHNIK

O&P · REHABILITATION · HOME HEALTH CARE

English Edition
Quarterly

Calendar

June 17, 2011

3rd ISPO Czech Republic Conference,
Olomouc, Czech Republic.
Info: www.ispoint.org

August 14-19, 2011

MEC 2011, International Conference
on Advanced Limb Prosthetics, New
Brunswick, Canada.
Contact: mec@unb.ca

August 25-27, 2011

6th ISPO Central European Scientific
Conference, Nyíregyháza, Hungary.
Info: www.kmcongress.com/ispo2011

September 19-21, 2011

1st ISPO Africa Congress, SAOPA, Sun
City, RSA. Info: www.ispoafrica.com

September 19-24, 2011

6th International Seminar of FATO,
Arusha, Tanzania.
Info: www.fatoafrique.org

September 19-22, 2011

AOPA National Assembly, The Mirage
Resort&Casino, Las Vegas, NV, USA.
Info: www.aopanet.org

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Fax: +49 (0)231 / 55 70 50-70
E-mail: boecker@ot-forum.de

Edited by Dirk Böcker

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Prosthetics

D. Baty

The effects of the Plié 2.0 microprocessor regulated knee unit on balance, confidence and ease of ambu- lation: Results of a recent end user survey

Introduction

There is a growing trend in global healthcare towards evidence based practice. While the exact meaning and application of this phrase are generally only loosely understood, the fact remains that patients, practitioners and pay sources are increasingly less satisfied with generalized marketing claims and desire some level of objective evidence to support the efficacy of new technologies and interventions. As the demand for evidence in healthcare has grown, leading authorities have recognized that there are many different types of evidence and that some may be more influential to clinical decision making than others. In response, the editors of the British Medical Journal coined the descriptive phrase, POEM or Patient Oriented Evidence that Matters to describe

those findings that are more immediately oriented to the clinical care of individual patients. According to the original assertion, a POEM must satisfy three criteria [1]:

- It addresses a question that doctors encounter.
- It measures outcomes that doctors and their patients care about.
- They have the potential to change the way that doctors practice.

With this in mind, an end user survey was developed and administered to current users of the Plié 2.0 prosthetic knee joint. In doing so, the objective was not just to begin collecting evidence, but to collect patient-oriented evidence that matters across such domains as balance, confidence and ease of ambulation.

Methodology

An end user survey was developed to gather preliminary patient-derived evidence associated with the Plié 2.0 across such parameters as stumbles and falls, ease of walking and balance confidence. The survey instrument was divided into three general areas: Demographics (1), Comparative assessments (2), and Open ended reporting (3).

1. Demographics: In this section, the instrument gathered the general information necessary to

Demographics	
Gender	Male: 32 (80%) Female: 8 (20%)
Age: mean (range)	49.44 y/o (9-77 y/o) 0-18 y/o: 2 (5%) 19-64 y/o: 30 (75%) 65+ y/o: 8 (20%)
Residual limb length	Short (<4"): 2 (5%) Medium (4-8"): 12 (30%) Long (>8"): 20 (50%) Knee Disarticulation: 5 (15%)
Time since amputation	0-2 years: 9 (23%) 2-5 years: 7 (18%) 5+ years: 24 (60%)
Cause of amputation	Vascular: 11 (28%) Non-vascular: 29 (73%)
Previous knee mechanism	Non-MPK: 31 (78%) MPK: 9 (22%)

Table 1 Demographics of survey respondents.

understand the background and presentation of the individual patients. These included such generalities as gender, age, weight, limb length, time lapsed since amputation, foot and socket type and prior prosthetic knee unit.

2. Comparative assessments: In this section, subjects were asked to assess their abilities and experiences with the Plié 2.0 relative to their experiences with their prior knee joint in such domains as ease of walking, number of stumbles and falls, amount of walking, and relative confidence during ambulation outdoors and in crowded environments

3. Open ended reporting: This section allowed subjects to identify any new activities that the Plié may have enabled them to per-

form, changes in reliance on upper extremity assistive devices and the most notable benefits and drawbacks that they've experienced with the knee.

Results

Of the 47 collected surveys, 40 clearly identified prior experience with a previous prosthetic knee that allowed for comparative assessments. Of these, 31 came from patients who were coming off of a conventional knee unit or non-microprocessor knee (non-MPK). The remaining nine sub-

jects had transitioned to the Plié 2.0 from another type of microprocessor knee (MPK) (7 Otto Bock C-Leg, 2 Ossur Rheo). As the responses of those who had prior MPK experience were quite different than those with no prior MPK experience, they will be presented separately. Additional demographic information for the 40 subjects who had prosthetic experience prior to their use of the Plié 2.0 is shown in Table 1.

Patients with no prior MPK experience

As earlier indicated, thirty-one completed surveys satisfied this criteria. Their results are summarized as follows (see Table 2): Of the thirty subjects who responded to the ease of walking question, all thirty reported that walking was

easier with their Plié 2.0 compared to the prior knee. Twenty-nine of 31 subjects indicated that they had experienced a decrease in the number of stumbles and falls experienced with the Plié 2.0. Of the two remaining respondents, one indicated that there was no change in this parameter with the two knees. The other reported an increase in stumbles and falls but clarified that this resulted of a substantial increase in activity level. Seventy-four percent (23/31) reported walking more with the Plié 2.0. With respect to confidence, all respondents (31/31) reported an increase in outdoor walking and 67% (21/31) reported increased confidence while walking in crowded environments.

Patients with prior MPK experience

As described earlier, the responses for this sub-group of Plié users were rather different from those reviewed to this point. They are summarized as follows (see Table 3): Seven of nine subjects reported that walking with the Plié 2.0 was easier than with their prior MPK. The two remaining subjects reported this performance parameter to be the same between the Plié and their legacy MPK. The majority of respondents identified similar performance between the two prosthetic knee joints in the remainder of the functional domains including stumbles and falls (7/9), amount of walking (5/9), confidence during outdoor walking (7/9) and confidence while walking in crowds (6/9). When differences were identified between the two knee systems they were always in favor of the Plié 2.0 (see Table 3). No respondent indicated a worse performance in any of the functional domains with the Plié 2.0 compared to their legacy MPK.

Discussion

Patients with no prior MPK experience

Because the patients in the legacy non-MPK group identified improvements so consistently, it is important to clarify that these improvements stemmed from the knee unit itself rather than improvements in physical rehabilitation independent of the prosthe-

sis. Therefore, it is relevant to acknowledge that the majority of our respondents had considerable prosthetic experience prior to their transition to the Plié, reducing the potential bias in favor of the new knee unit because of rehabilitative improvements. Only 25% of respondents had less than 2 years

of prosthetic experience. Thus, 75% had at least 2 years of prosthetic experience prior to the Plié and, indeed, over 50% had at least 5 years of prosthetic experience prior to the transition.

Responses to the open-ended questions elicited further useful information. Roughly half of the respondents reported the presence

of a new ability or activity following the transition to the Plié 2.0. While these respondents were inherently variable, the most common responses were the newly derived abilities to negotiate hills, stairs and inclines and walk outdoors or on uneven terrains.

other responses gathered with the survey instrument. Again, there was inherent variability in these responses. However, they revolved around improved confidence (n=11), safety, reduced stumbles and falls (n=8) and the ability to negotiate variable, uneven terrains, hills and stairs (n=4).

Patients with prior MPK experience

In summary, the early patient-derived evidence clearly demonstrates improvements in domains of energetics, stumbles and falls and confidence for those patients transitioning from non-MPK's to the Plié 2.0 technology.

Many of the improvements identified by those coming out of non-MPK units were not seen in this second cohort. While improvements in certain domains were inconsistently identified, questions of stumbles, falls, walking amounts and confidence were largely the same as those patients with legacy MPK experience transitioned into the Plié 2.0 system. This may be due to the fact that the safety features so readily identified in existing MPK research had already been experienced by this population. While this data fails to suggest that the Plié 2.0 is safer or facilitates greater confidence than other MPK units, it does suggest that the Plié 2.0 facilitates these safety features to the level already

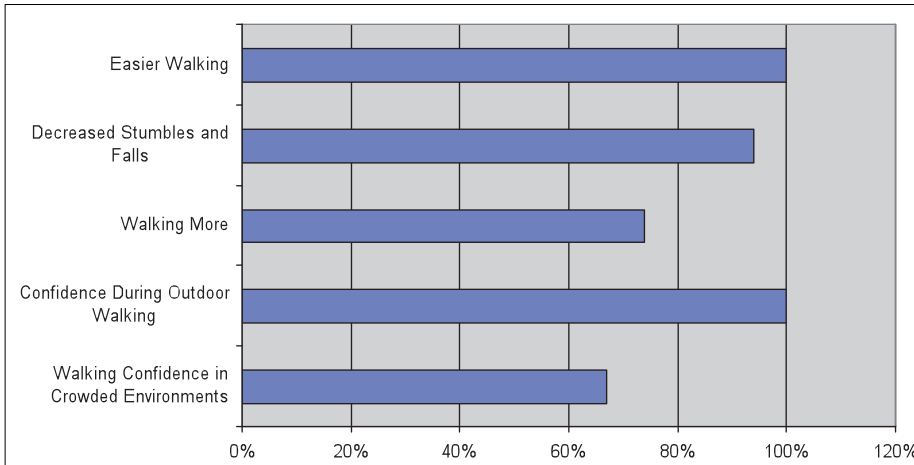


Table 2 Percentage of subjects identifying comparative improvements with the Plié 2.0 versus their previous non-MPK across various functional domains.

The discrepancies between some of these comparative assessments would appear to validate their accuracy. While the improvements in the ease of walking, the number of stumbles and falls and confidence in outdoor walking were fairly universal, the same cannot be said with the amount of walking and confidence in crowded environments.

The literature to date on the ability of an MPK to increase daily walking amounts is equivocal. While some studies suggest an increased amount of walking [2], others suggest that the number of steps taken per day does not change as this is more a product of daily routines and responsibilities. [3, 4]

Similarly, confidence in outdoor walking and confidence in crowded environments represent two very different challenges. The first allows the patient to walk at a self-selected speed while negotiating variable terrains, while the second requires the patient to either maintain the walking velocity of the people around them or adapt to

of a new ability or activity following the transition to the Plié 2.0. While these respondents were inherently variable, the most common responses were the newly derived abilities to negotiate hills, stairs and inclines and walk outdoors or on uneven terrains.

In response to upper extremity assistive devices, many respondents left the answer blank. Sever-

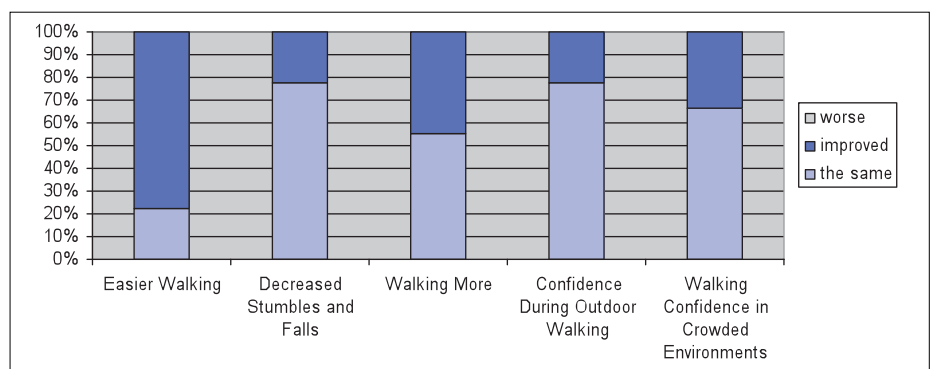


Table 3 Number of respondents identifying "worse," "the same" or "improved" performance across multiple functional domains with their Plié 2.0 compared to their prior MPK.

al more clarified that they have never required such devices. However, eight subjects indicated a decrease in their reliance on a given upper extremity device with the transition to the Plié 2.0.

The responses to the most notable benefits associated with the knee are in keeping with the

established by prior MPK systems. In contrast, a large percentage of this sub group of respondents with prior MPK experience reported that walking with the Plié 2.0 was easier than walking with their previous MPK.

The answers to the open ended questions were more diverse from

this latter group. This is not surprising as they had already experienced the benefits we associate with MPK technologies and their needs and perceived advantages were less immediate. In this group, respondents identified the lighter weight of the Plié 2.0, the expanded foot options and comfort in using the knee unit around water.

In summary, the only consistently identified advantage of the Plié 2.0 for those respondents who had already utilized MPK technology was the perception that walking was made easier. However, the exact causes of this apparent advantage are uncertain. Responses suggest that the reduced weight, improved feet and general responsiveness of the knee unit may contribute.

Conclusion

The domains of these comparative assessments were selected

because of their adherence to the POEMs criteria outlined earlier. They represent questions that prosthetic clinicians encounter and outcomes that patients care about. Among patients with no prior MPK experience, subjects reported improvements in ease of ambulation, stumble and fall rates, walking amounts and confidence in outdoor and crowded environments. Differences were less pronounced within the smaller subgroup of those respondents with prior MPK experience. The most consistently identified improvements were in ease of walking. There were no responses in either group to suggest a decline in performance with the Plié 2.0.

Author contact information:

David Baty, CPO/LPO
Freedom Innovations
30 Fairbanks, Suite 114
Irvine, CA 92618
USA

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Orthotics

J. M. Gómez

Treating x-rays or patients? Re-establishing balance

For decades, the conservative management of scoliosis has focused around the patients' x-rays. Clinicians are able to see a still shot of each patient's spine and assess the location and degree of each deviant curve. However, as the industry has focused on the x-ray and the information it contains, they may have overlooked some of its limitations and over estimated its relative worth.

The modern era of conservative management of scoliosis began with the development of the Boston Brace at The Boston Children's Hospital in the early 70s. At the time of its development, braces were plastic girdles molded over individual patient casts. One of the developers of the new system, William Miller CPO, reasoned that when you purchase new shoes, a

reasonable fit is obtained without individual castings. Rather, your feet are measured and you are fit with an existing module.

This was the beginning of the use of symmetrical standardized models that could be modified to fit most patients. In the absence of an individual casts, steps were needed to ensure that modules were adequately modified to address the needs of each patient. Evaluation of patient x-rays became an important component of such customizing. Clinicians could visualize the location of individual vertebrae and use the information to determine where corrective forces should be applied. Customized pads could then be applied to the inside of the generic module, applying the desired pressures to the spine. This x-ray based "blue printing" has become an integral

part of modern scoliosis bracing.

The radiological signs gained from patient x-rays are certainly invaluable. The size and severity of each curve, the amount of rotation in the spine, and the degree to which the head and pelvis are aligned can be observed. In addition, aspects of each x-ray help treating physicians determine the skeletal maturity of each patient, influencing how long the brace will need to be utilized.

In fact, so much information can be derived from a good x-ray, that a competent central fabrication facility can produce a reasonable brace with selected anthropometric measurements and appropriate radiographs, without ever actually seeing the patient.

Unfortunately, this has created the risky mindset, that by supplying accurate measurements and a

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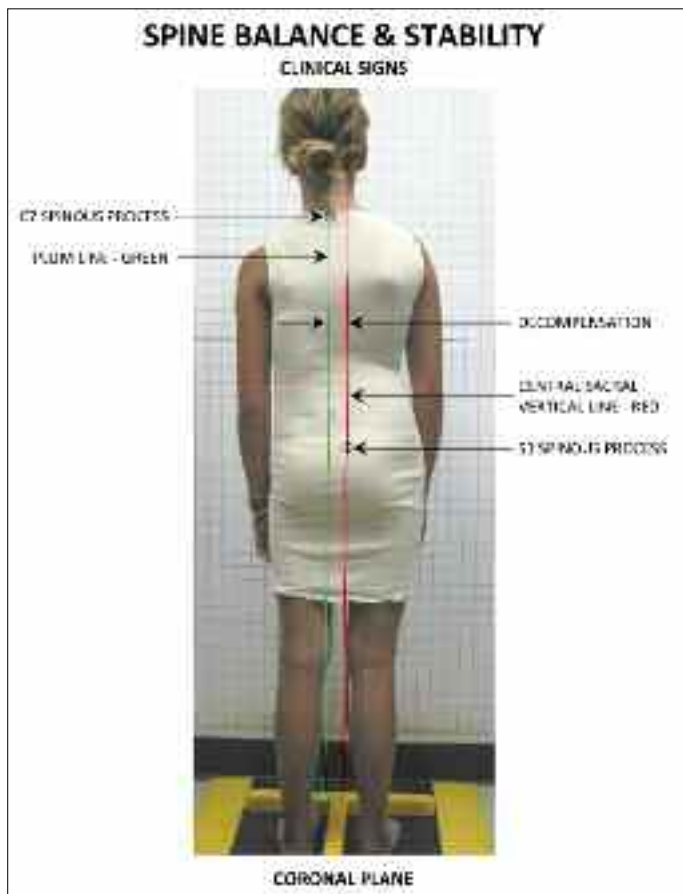


Fig. 1

copy of an x-ray, an orthotist is providing clinical care. Such a position is certainly a disservice to the patients who are being treated.

As valuable as x-rays are, they only represent the patient's alignment at a given instant in time. While certain elements undoubtedly remain constant, others are prone to change. For example, a well intentioned radiology technician who is seeing a scoliosis patient with an extreme de-compensation to one side will likely encourage the patient to "stand up straight" or "straighten up" to get the best picture for the referring physician. Should the patient accommodate the request and actively "straighten up," that x-ray is hardly representative of the patient's day to day balance or the forces that are acting to further deform the spine. What's more, an orthosis built to these inaccuracies may or may not provide adequate correction.

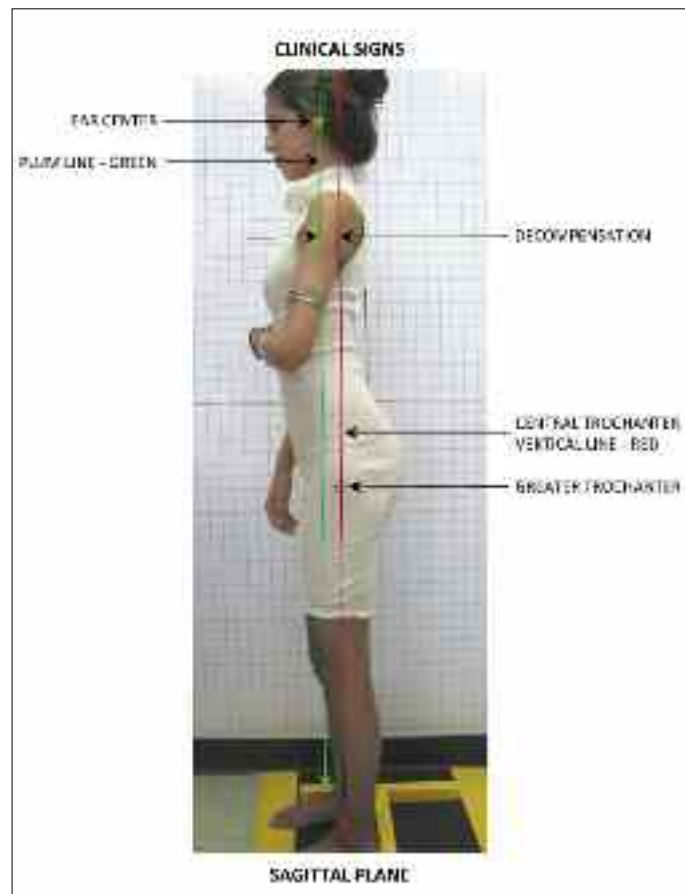


Fig. 2

In the pursuit of taking advantage of every technology that might improve the efficiencies with which patients are treated, clinicians should not lose sight of

their role in the process. Their obligation is to treat the patient, not the x-ray. To do so requires careful evaluation of several clinical signs prior to any examination of an x-ray, and assimilating the findings into the treatment plans.

One of the first clinical signs to observe is the balance of the patient. Simply put, where is the patient's head in relationship to her pelvis? Does it deviate to one side or another? Is it relatively anterior or posterior? Such findings can and should be measured and monitored. They can often be corroborated by x-ray findings, however, the clinical evaluation, with the patient standing before the practitioner is the more reliable assessment.

The relative symmetry of the patient should also be looked at. Is the pelvis level, or is there a leg length discrepancy? When the patient assumes a typical standing posture, is there any obliquity to the



Fig. 3

pelvis? Is there a pronounced rib hump or scapula to indicate rotation? Are the shoulders level, or is one raise higher than the other? Once again, accurate real time assessment is more reliable than the snapshot offered by x-rays.

How flexible is the patient? Without a side bending x-ray, there is no radiological answer to this question. When such an x-ray is available, it provides an answer without specifying the question 'is the displayed flexibility active or passive?' However, clinical manipulation can inform the clinician of the patient's active and passive flexibility in both the sagittal and frontal planes. Such information is vital in gauging the effectiveness of your intervention. It is not until such clinical evaluations are performed and their results considered that a truly comprehensive treatment plan can be developed.

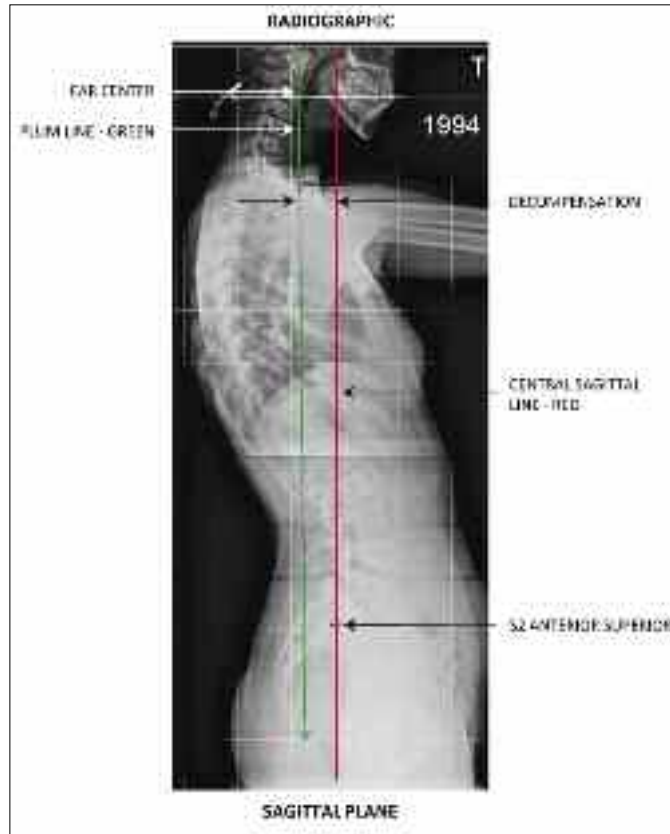


Fig. 4

Once the plan has been developed and initiated with the fitting of an orthosis, the role of the clinician continues. Many elements of a successful intervention can be

Author contact information:
 José Miguel Gómez T., MD, LO
 3734 Tumbling Falls Drive
 Manvel, TX 77578
 USA

reasonably assessed prior to the evaluation of the in brace x-ray. Both symmetry and balance can be observed in the fitting room. Clinical manipulation can provide an indication as to the degree to which the orthosis has provided the maximal correction for a given patient. While these various elements can and should be radiological confirmed, they can be monitored well before the x-ray is taken. Optimal patient care requires the use of every clinical tool available. While technological advancements and central fabrication are both beneficial and efficient, the importance of skilled observation, clinical evaluation and individual consideration should never be overlooked.



G. Fitzlaff, S. Heim:
Lower Limb Prosthetic Components
Design, Function and Biomechanical Properties
 Hardcover, 140 Pages, 200 photos and drawings,
 full colour, Dortmund 2002, ISBN 3-9807268-6-X,
 79 Euros + p&p

"This publication aims to record the construction, function and biomechanical operation of the fitted components for lower limb prostheses which are available for amputees today. The technical possibilities should also be considered against the background of medical and anatomical requirements, different cultural environments and habits as well as the demands made by amputees for the provision of prostheses. Last but not least economic aspects are also considered."
 (From the preface)

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C. G. Saunders

CAD/CAM Technology: Production of Orthopaedic Shoelasts, Insoles and Shoes

Overview

This paper will discuss the history of CAD/CAM for the Orthopaedic Shoe Industry and how the Canfit-Plus FootWare System has evolved over time. An overview of the Canfit-Plus Yeti 3D Foot Scanner – in conjunction with Canfit-Plus FootWare Design Software will be presented. Manufacturing options, including the Canfit-Plus FootWare Carver will also be covered.

New developments in FootWare, including the ability to produce hard and soft insoles, as well as using Canfit-X Design Software as an alternative means for producing custom footwear will be introduced. Finally, the portable scanGogh II Handheld Scanner will be discussed as a tool for producing customs shoes and boots.

History

- 1989: the first digital last library for the orthopaedic shoe industry was created



Fig. 1 Canfit-Plus Yeti 3D Foot Scanner.

- 1991: the first version of Canfit-Plus FootWare Software for orthopaedic shoes was released
- 1995: the Canfit-Plus Yeti foot scanner was developed
- 1996: development of a digital retail shoe last library was initiated
- 2000: in collaboration with

Vorum Research Corporation, the VIAVOR shoe company began providing customized footwear. Using Canfit-Plus technology, thousands of foot scans were collected from Europe, Asia, and North America. These foot scan data were used to create a shoe last database of a wide variety of foot shapes and sizes. VIAVOR uses this database to provide its customers with an optimal fitting shoe

- 2006: Vorum and Selve join forces. Using the Canfit-Plus scanGogh II Handheld scanner, Selve is able to create custom luxury footwear based on the exact dimensions of their customers foot, ankle and calf.

Canfit-Plus FootWare System

The Canfit-Plus Yeti 3D Foot Scanner (Fig. 1) is an opto-electronic imaging device that is designed to capture the 3-dimen-

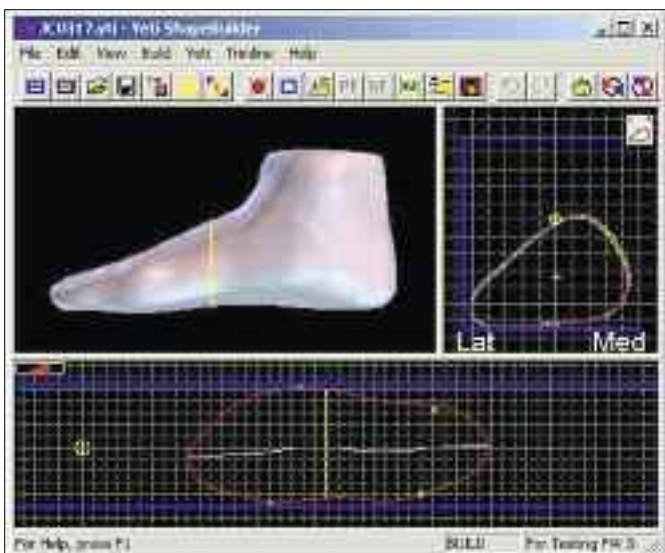


Fig. 2 Yeti Shape Builder Software.

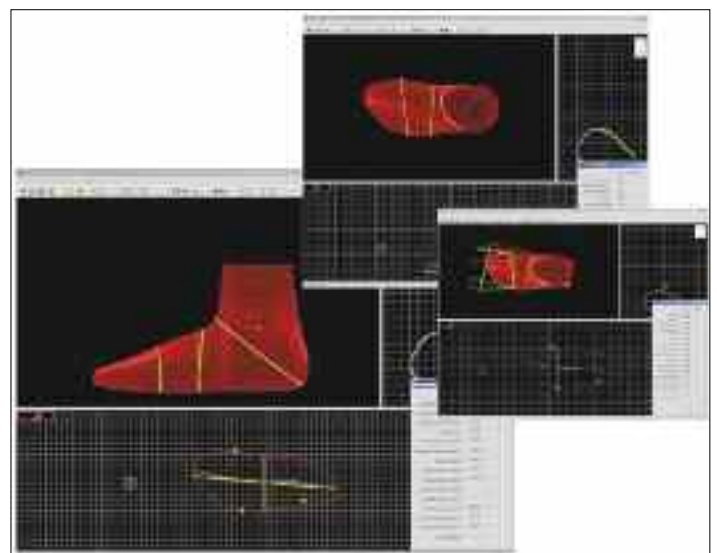


Fig. 3 Yeti Shape Builder Software.



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- automatic adjustment to the personal axis of rotation
- secure fit and excellent wearing comfort

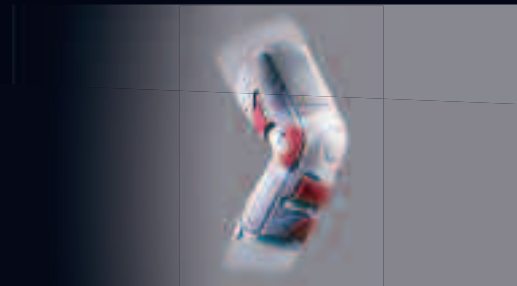




Fig. 4 Canfit-Plus Yeti 3D Foot Scanner with Customer Display Screen.



Fig. 5 Canfit-Plus FootWare Design Software.

sional shape of human feet, physical casts, moulds and shoe lasts. It allows users to quickly and effectively measure a customer's foot. By completing a scan in less than 4 seconds, and using 320,000 data points per scan, the Canfit-Plus Yeti is able to capture an image to an accuracy of ± 0.5 mm. Employing 8 cameras and four lasers, this easy-to-use scanner, is pre-programmed with the Canfit-Plus Yeti Shape Builder scanning software (Fig. 2 + 3). The Canfit-Plus Yeti scanner includes a customizable display (Fig. 4) which allows the customer to view the scan immediately after it has been taken. Like all the Canfit-Plus Scanners, the Canfit-Plus Yeti puts customer safety first; by using an eye-safe laser system, and a stable platform.

After the foot scan has been captured, it is imported into the Canfit-Plus FootWare Design Software program (Fig. 5) (Fig. 6). The software integrates the 3-dimensional image of the patient's foot, captured using the Canfit-Plus Yeti, weight-bearing imprint information and clinical requirements of the footwear into a computerized design process. Next, the shoemaker lets the system recommend the best fit, selects a last from a library of existing lasts, or works directly on the scanned shape. Additionally, the last designer has the ability to modify the digital last, optimizing it to fit the foot.

Once the shoemaker is satisfied with the last design, he/she can send their design files to a central fabrication facility or use the Can-

fit-Plus FootWare Carver, to carve out the custom last.

The Canfit-Plus FootWare Carver (Fig. 7) has the capability to carve shoe lasts, positive orthotic moulds and soft insoles. This 4-axis machine has been designed for high volume and rapid carving of shoe lasts in high density polyethylene or wood. Using Canfit-Plus 4-Axis CAM carving software, the operator has full control over the choice of carving blank and the positioning of the designed shape within the blank. On this powerful machine, a typical last can be carved in as few as 10 minutes, and a pair of insoles in 6 minutes.

With the Canfit-Plus FootWare System, custom lasts for orthopaedic and retail applications can easily be achieved (Fig. 8).

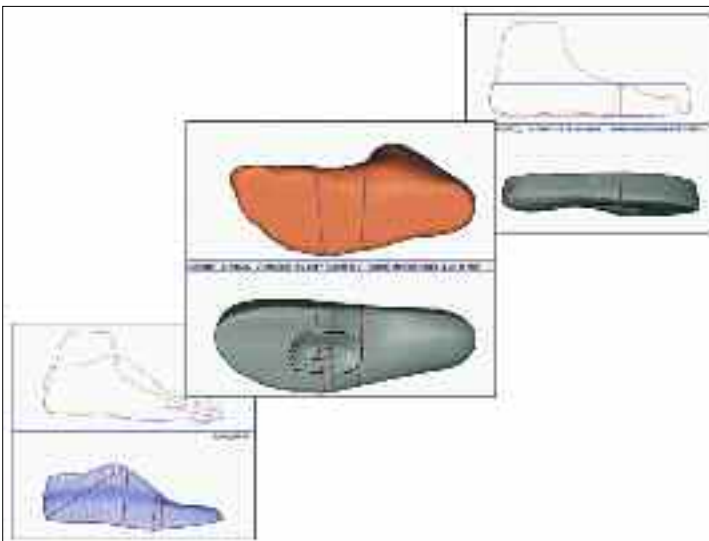


Fig. 6 Canfit-Plus FootWare Design Software.



Fig. 7 The Canfit-Plus FootWare Carver.

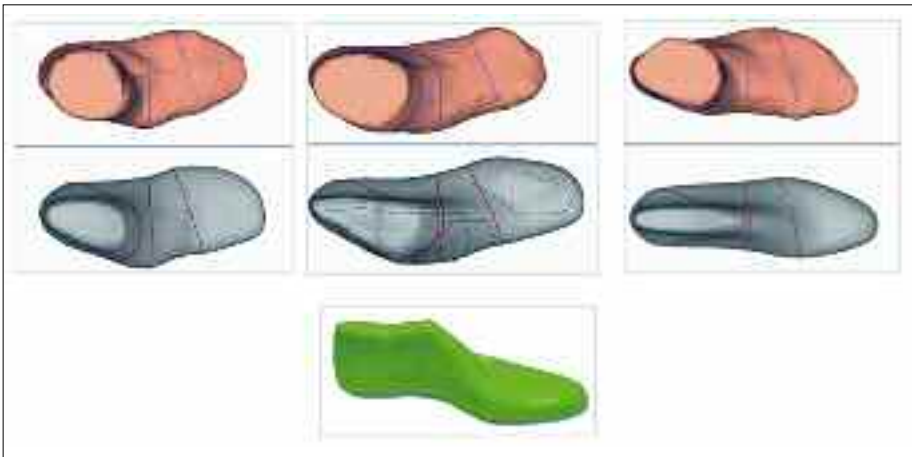


Fig. 8 Custom Lasts created using the Canfit-Plus FootWare System.



Fig. 9 Hard Insoles manufactured on the Canfit-Plus FootWare Carver.

New Developments in FootWare

Hard & Soft Insoles

Hard and soft insoles (Fig. 9 + 10) can now be created using the Canfit-Plus FootWare Design software. To start the process using scan data, the user first selects from library of insoles. Next, he interactively refines the insole to fit the foot, by using the different modification tools found within the software. Some of the different shape modification options include: heel height adjustments, heel pitch adjustment, rear-foot and forefoot posting.

Canfit-X Design Software

An alternative method to creating custom lasts and insoles is provided by the Canfit-X Design Software (Fig. 11). This powerful software allows designers to view their modifications in real-time –

enabling quick editing and instant feedback. A further benefit of Canfit-X Design Software is the ability to integrate and align foot imprints, photos, x-rays and MRI Images (Fig. 12). Within the soft-



Fig. 10 Soft Insoles manufactured on the Canfit-Plus FootWare Carver.

ware, a Patient and Library Management System exist, which makes storing and locating important information quick and easy. Finally, the software provides its users with the option to view and edit trimlines, as well as preview the finished product. These tools

help designers ensure they have designed a product to suit their patient's needs, before it goes for carving.

scanGogh II Hand-held Scanner

The scanGogh II hand-held scanner (Fig. 13) is used to record the external surface of the human body. It is a compact, portable system that is practical for practitioners on the go. The scanner transmits measurement data to the computer and displays the 3-dimensional shape data on the computer screen in real-time (Fig. 14).

The data from the scanGogh II handheld scanner can be used to design custom footwear. Users are not limited to shoe design only; with the AFO application within the Canfit-X software, custom boots can also be created right up to knee height.

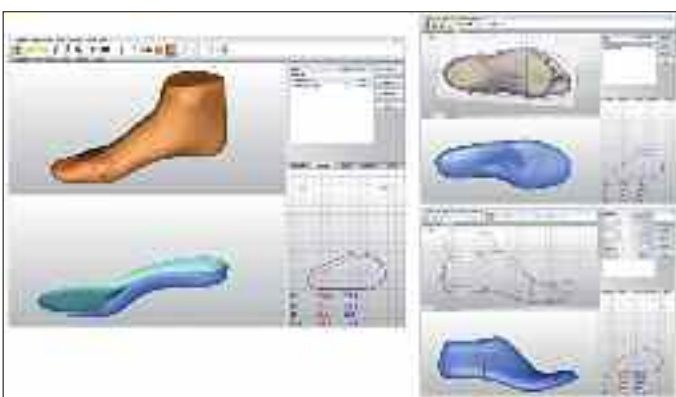


Fig. 11 Canfit-X FootWare Design Software.

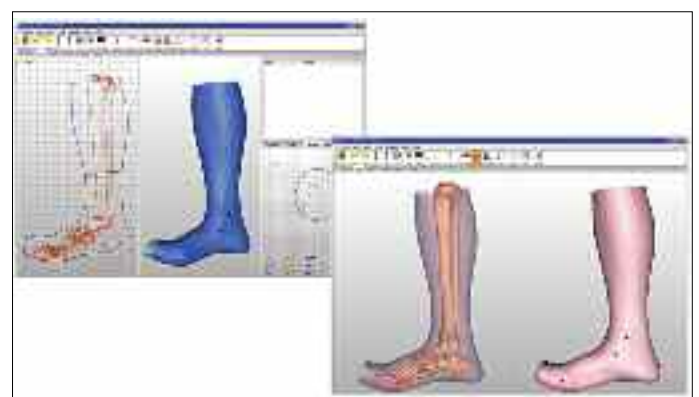


Fig. 12 Canfit-X Design: New Developments in FootWare Align foot imprints, photos, -x-rays and MRI Images.



Fig. 13 scanGogh II Handheld Scanner.



Fig. 14 scanGogh II Handheld Scanner.

The Canfit-X Design Software provides real-time design and editing functions, and enhances design capability by enabling users to import foot imprint data, photos, x-rays and MRI images.

Finally, the Scangogh II Handheld Scanner provides a portable scanning solution. Scanned data can be imported into Canfit-X design software, creating a starting point for the design of custom footwear and boots.

Summary

The Canfit-Plus FootWare System is a complete system – scanning, modification and carving – which allows users to create cus-

tom lasts for orthopaedic and retail applications.

New developments enable users to create hard and soft insoles, including those with complicated shapes and high heel heights.

Author contact information:

Carl G. Saunders
 Vorum Research
 8765 Ash Street, Suite 6
 Vancouver, B.C. V6P6T3
 Canada

3D Design

R. Massen, D. Rutschmann

Optimized production and selection of orthopaedic and sports footwear with a multi-sensorial 3D foot scanner

A new low-cost photogrammetric 3D foot scanner integrates a sole pressure map scanner to produce in one run a 3D model combining registered (aligned) geometric and pressure data of the patient foot. This allows for precise and fast production of customized shoes including a personalized foot-bed.

Introduction

Optical foot scanners are limited to the generation of geometric information: the spatial 3D foot model, 2D foot silhouettes etc. Whereas this information is sufficient for a crude computer-based search for a best-fit last from a database, the equally important information on the foot sole pressure distribution is missing. If a separate sole pressure measuring device is used, the sole pressure data are independent from the geometric 3D foot model: both data sets are not aligned and scaled within a common coordinate system, they are measured under different postures, body balance, etc. Orthopaedic shoemakers agree that both the 3D foot geometry and the sole

pressure distribution should be used for producing customized or for selecting best-fit footwear with an appropriate foot bed. The actual 3D foot scanners are not able to generate a „multi-sensorial“ digital foot model, i. e. a single model which integrates both the geometric foot shape and the spatial sole pressure distribution.

Methods

The foot of the patient is covered with an elastic sock marked with a special code. The patient stands upright on a code-marked platform with a built-in sole pressure sensor (Fig. 1). A digital camera viewing both the platform and the foot is moved under computer-control on a circular trajectory around the

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Fig. 1 Patient standing on a code marked platform with built-in pressure sensors.

patient, generating via photogrammetry a dense geometric 3D model of the foot and simultaneously a sole pressure map, registered and aligned to the foot model. Both data sets merged into a digital „multi-sensorial“ foot model which is used in three different ways: A) for a best-fit selection of a suitable last from a digital last database enabling the production of a customized shoe and including a best-fit selection of a suitable foot bed from a database of pre-produced models. B) for the production of an individual last through

multi-axis numerical milling and the milling of an individual foot bed fitting with to the last and the produces shoe (C) for any combination of (A) and (B).

Results

The new multi-sensorial scanner technology has first been tested in a high-end customized skiing boot since mid 2008. It has been operating in daily business during the winter 2008/2009 skiing period in three high-end skiing shops in Bavaria. The scanning of the feet of the customer generates two distinct left/right multi-sensorial digital 3D models which are then used for customized shoe production including a customized foot bed. This foot bed fills up in an optimal way the space between the foot convex hull and the inner concave hull of the boot.

The new scanner is currently also used for the production of customized bicycle shoes by a leading producer in a number of shops and will be introduced shortly for the customization of best-fit hiking footwear.

The strategy is to motivate the traditionally hesitant and sceptical orthopaedic footwear craft by demonstrating the acceptance of this technology within the more R&D driven world of sports footwear. This strategy is not really a deviation, as many of the tech-

nological challenges for producing customized shoes or for selecting best-fit shoes are common both to the orthopaedic and to the sports/leisure shoe business.

Conclusions

The novel, Internet-based „multi-sensorial“ 3D foot scanning technology has proofed its benefits and new potentials in the business of customized sports footwear. These results are now about to be transferred to orthopaedic . The required very low in-shop investment makes it easy for the orthopaedic shoemaker to move beyond his traditional subjective „feeling art“ to a more precise, more rapid and more repeatable orthopaedic expertise supported and guided by objective physical measurements. It opens a broad potential for new orthopaedic business ideas, from shop-based to Internet-linked services, from pure customization via mass-customisation over to database-supported best-fit selection of footwear with a matching foot bedding.

Author contact information:

Prof. Dr.-Ing. Robert Massen
corpus.e
Senefelder Str. 8
70178 Stuttgart
Germany

News

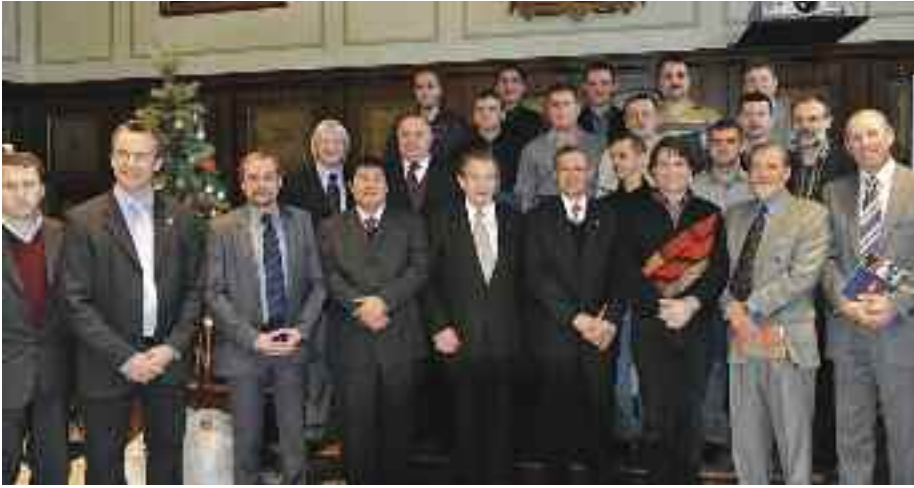
The Balkans: ISPO Category II examinations of first cohort

In December 2010 Human Study e.V. underwent an evaluation by the prestigious International Society of Prosthetics and Orthotics (ISPO) in order to achieve accreditation for the first-ever prosthetic – orthotic, distance learning curriculum used successfully in Eastern Europe. The DLE curriculum is designed for advanced training of the rehabilitation specialists known as Prosthetists and Orthotists who clinically treat those who have had limbs amputated or who require orthopedic braces. The need for

such a Program originated from the tragic consequences of war including land-mining and/or other natural catastrophe as well as the severe absence of professional clinical accreditation or competency in many developing countries.

Final clinical examinations and graduation ceremonies for students enrolled in the Human Study-University Don Bosco, 3-year Distance Learning Education Program were hosted by the German Meister School for Prosthetics and Orthotics at the Kerschensteiner Berufs-

bildungszentrum and the city of Munich from November 24 through December 12, 2010. Practical laboratory and actual patient management interaction skills were closely observed and scrutinized by the Human Study and Meister School clinical instructors followed by intensive written examinations which were then followed by an additional three days of oral-practical clinical interrogation and scrutiny conducted by a renowned international team of rehabilitation specialists which included orthope-



Graduates with Dan Blocka, Andreas Diehm, Irfan Murtezani, Christian Schlierf, Jens Franke, Pbro. Lic. Victor Bermudez Yanez, Sepp Heim, Dr. Jose Rolando Panameno, Christian Hartz, Bill Neumann, Primarius Dr. Jelic

dic surgeons, physiatrists and prosthetists-orthotists. This was as much a scrutiny and examination

of the Human Study's expertise and mission as it was for the students. Each of the 12 initial stu-

dents work at various rehabilitation facilities throughout The Balkans and each one supports their family while accepting the responsibilities for completing this intensive 3-year program in addition. The entire Human Study Staff has also labored intensely to adhere to the highest ethical standard and practice and will continue to do so.

Only time will tell if The Human Study stated mission, Knowledge for a Better Life, has been achieved. Congratulations to the original 12 and welcome to the new intake of 28 students from the Balkans. If any additional information is desired please feel free to contact us.

*Human Study e.V.
Herdegenweg 2
90427 Nuremberg
Germany*

Valencia, Spain: ORPROTEC rehab fair claims to re-invent itself for next October

ORPROTEC will re-invent itself in order to present in one single event all the different activities and the whole range of goods and services used in the Rehabilitation and Personal Autonomy sector. Its new mission is to act as a meeting place for the myriad of related professionals: specialists in functional evaluation, rehabilitation, physiotherapy, orthoprosthesis, technical aids, chiropody, occupational therapy, adapting surroundings and equipment used by people in their everyday activities.

The range of products and services used in the rehabilitation and personal autonomy sector cuts across pharmaceutical and electro-medical companies, manufacturers and distributors of orthoprosthesis products, technical aids (support technologies), furniture, footwear, domotics, etc., as well as businesses who offer services based on the use of the above products and services, such as hospitals, clinics, orthopaedics, and homes.

The high specialisation required from professionals and associations in this sector has led to the appearance of numerous seminars and congresses which – each from its own professional perspective – address the problems faced by specialists working in the field. Never-



theless, the lack of scientific events looking for solutions to these problems from an multidisciplinary approach has been a drawback, preventing professionals from garnering a broad overview and the complete range of information required to develop their work as effectively and efficiently as possible.

For this reason, together with the exhibition of the most innovative and advanced products and services available on the international market, ORPROTEC has pre-

pared, for the very first time in Spain, various scientific events where the professional processes affecting the area of rehabilitation and personal autonomy will be analysed from an advanced multidisciplinary perspective, counting on the cooperation of the various related professional associations and colleges, besides the active participation of the main R&D centres which are working at the service of innovation in this sector.

*ORPROTEC, Valencia, Spain
October 20-22, 2011*

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