Position Statement on
Casting Techniques for Custom Foot Orthoses

Custom Foot Orthoses (CFOs) are an essential element used by Pedorthists to relieve foot pain related to biomechanical misalignment of the feet and lower limbs. Orthoses can also accommodate foot deformities and redistribute forces applied to the foot. The aim of this position statement is to help clarify some of the rationale that may be used in choosing one casting technique over another.

It is widely accepted in both the research and clinical literature that a three-dimensional model of the foot is required to fabricate a truly custom made device. Debate continues as to which three-dimensional casting technique is most effective. More specifically, each technique has its own merits and the casting technique chosen by a trained and certified clinician is but one component in a comprehensive treatment protocol.

To choose one specific casting technique as the “Standard” is to ignore the expertise of the clinician and the needs of the patient. It is the opinion of the Pedorthic Association of Canada that it should be the judgement of the clinician as to when to use a specific three-dimensional casting technique.

Casting Techniques

Slipper Casting (Plaster of Paris, Foot Impression Wax, STS Casting Sock)

The use of a slipper cast has been employed for many years in the provision of CFOs. Maintaining a “Subtalar Neutral” or Neutral Calcaneal Stance Position (NCSP) during the casting technique, the clinician is able to reproduce the position typically used to assess foot alignment. A negative cast is taken with either plaster, wax, or a polyurethane embedded sock. This is then used to yield a positive mould for further correction or modification before fabrication. This method works well in capturing the plantar contour of the foot, as well as the forefoot-to-rearfoot relationship. It does require a great deal of skill, and requires considerable training and practice to obtain reliable results from patient to patient.
Semi-Weight Bearing Foam Box Casting

The use of a semi-weight bearing casting technique, employing a low density foam block for capturing the three-dimensional contour of the foot is widely utilized by many foot care practitioners. It also employs the “Subtalar Neutral Position” or NCSP during the capture of the foot contour. This technique requires less cast dressing prior to manufacture of the foot orthosis, and is also useful when the patient requires an accommodative device, or is unable to maintain a prone or supine position due to injury or medical condition. Foam box casting requires a great deal of skill to be performed successfully and reliably and it is necessary for a trained clinician to be involved for casting and manufacture of an appropriate device.

Contact Digitizing

The use of contact digitizing employs the mechanical placement of many small pins to capture the plantar contour of the patient’s foot. When done correctly, the “Subtalar Neutral Position” or NCSP is maintained while the client’s foot is scanned into the software program where all modifications to the image of the foot are executed. This technique uses a milling machine to carve a foot orthosis from the corrected image. As with plaster casting and foam box casting, reliability is improved with education and practice.

Laser Scanning

Recent innovations in the use of optical laser scanning techniques have shown great promise. Combining the techniques employed in Plaster of Paris slipper casting with the functionality of computer modeling is designed to eliminate the reliance on messy plaster as well as speed turnaround times by removing the need to modify models by hand prior to orthosis fabrication.

At this time the accuracy of laser scanning has been shown to be equal to the other techniques, and can be prone to human errors if not completed by a properly trained clinician.

Our Position

While some organizations may be attempting to limit the type of casting techniques used by clinicians and manufacturers of these custom made medical devices, doing so would put a limit on the skills and treatment palette available to the health care provider.
It is the position of the Pedorthic Association of Canada that the limiting of accepted providers to those groups that exclusively dispense orthotic devices in conjunction with a referring practitioner would be a far more effective means of ensuring quality care and in controlling the provision of these devices. This would ensure the treatment of patients by professionals who retain a formal education in foot mechanics, pathology and treatment, and would eliminate the conflict of interest that can arise when the individual prescribing the device is also the individual providing the device.

We hope that this is helpful in understanding the casting procedures, and viewing them as one portion of the treatment of your policy holders. For more information about Pedorthics in Canada, to arrange for a tour of one of our facilities please visit our educational web site at www.pedorthic.ca or call 1-888-268-4404.

05/31/08