

THE PRESENT USE OF THE UCBL FOOT ORTHOSIS

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In August 1971, the Committee on Prosthetics Research and Development (CPRD) of the National Research Council completed an evaluation of four lower-limb orthoses. They were the VAPC Single-Bar Knee-Ankle-Foot Orthosis (KAFO), the UCBL Dual Axis Ankle-Foot Orthosis (AFO), the New York University Insert Ankle-Foot Orthosis, and the UCBL Shoe Insert Foot Orthosis (FO) (Figs. 1 and 2). The latter two orthoses were considered to be valuable additions to patient services, and it was recommended that they be included in orthotics education programs (2).



Fig. 1. The UCBL foot orthosis.

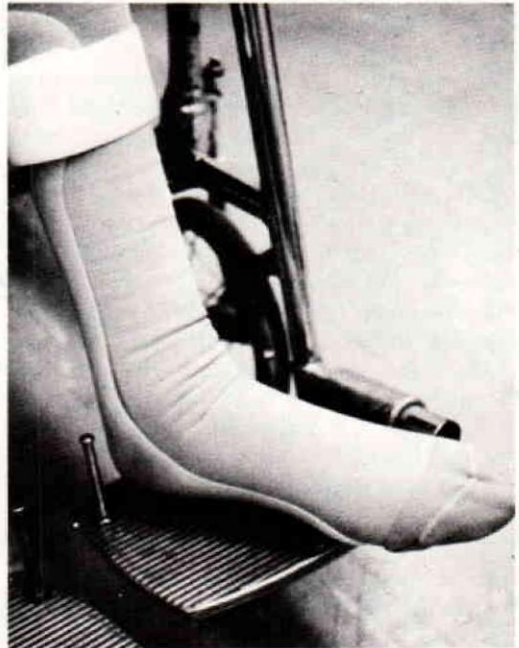


Fig. 2. Principles of the UCBL foot orthosis applied to the foot section of a polypropylene ankle-foot orthosis.

To determine the acceptance of the UCBL shoe insert foot orthosis, how the technique was learned, and something about the experiences in the field, a limited survey was conducted. Thirty-five certified orthotics and prosthetics-orthotics facilities were selected randomly from the 1974 *Registry of Accredited Facilities* (1). This represented an equal distribution of practitioners from twenty cities. The questionnaires (Appendix A) consisted of a section to be completed by the physician and a section to be completed by the orthotist. The orthotist was requested to forward the questionnaire to the physician after his section was completed. The questionnaires were sent out in January 1974. By March 1974, twenty-nine of the forms were re-

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turned. The following information was taken from these forms.

The UCBL foot orthosis was used by 75 percent [21] of the surveyed practitioners. However, only seven of the twenty-one practitioners who use this orthosis do so regularly. Of the remaining fourteen respondents, five use the orthosis only when it is requested by a certain physician, five rarely use it, two use it for special conditions only, and one stated he uses the orthosis only as a last resort.

An attempt was made to determine how the practitioners were made aware of the UCBL foot orthosis. The literature rated as the most common source of information. Articles on the UCBL foot orthosis appeared in the *Bulletin of Prosthetics Research* (3) in September 1969 and in *Orthotics and Prosthetics* (4) in March 1972. In addition, New York University published an evaluation report (5) on the orthosis in 1969. The prosthetics-orthotics education courses were the second most common source of information on the subject. Word of mouth rated as the third main channel of communications, since some respondents stated that orthotists, podiatrists, etc., had informed them of the technique.

PRESCRIPTION CONSIDERATION

Eight areas considered to influence the prescription and use of the UCBL foot orthosis were covered in the questionnaire. The most common prescription was bilateral orthoses for a patient 25-40 years old with pes planus.

The pathologies most commonly treated with the UCBL foot orthosis are pes planus and arthritis. Following these, in order of frequency, are plantar fasciitis, metatarsalgia, polio, cerebral palsy and peroneal palsy.

Respondents indicated that the orthosis is used equally on males and females and is fitted bilaterally the vast majority of the time. The age groups that use the UCBL foot orthosis most often are between 1-12 years of age and between 25-40 years of age.

The major disadvantage of using this orthosis is the expense, a fact that was underscored by half of the respondents. The other disadvantages checked off by the practitioners are that a wider shoe is sometimes needed, that the orthosis slips up and down in the shoe, and that breakage occurs. Two practitioners felt the orthosis is difficult to fit.

The major advantages of using this orthosis is that it provides proper foot support, allows the patient to change shoes, eliminates shoe modifications and the need for orthopedic shoes. The practitioners also felt that the UCBL foot orthosis provides improved cosmesis and gives consistent relief from pain.

Most of the respondents indicated that the orthosis usually lasts longer than a year before replacement is necessary, although a few practitioners stated that it only lasts up to one year. The major reason that the UCBL foot orthosis needs replacement is a loss of fit with time. Breakage is the second most common reason replacement was needed. One practitioner stated that he replaces the orthoses in cases when he wants to increase progressively the amount of foot correction.

CASTING, FABRICATION AND FITTING

This part of the survey was structured to determine if the original technique is still practiced, what materials and methods are presently used for fabrication, fitting problems encountered and solutions to these problems.

Nearly every practitioner stated that he uses the same method of wrapping to obtain the mold as was described originally in the literature. Manual alignment of the foot and ankle is practiced by all respondents, as is the use of the contoured casting boards for positioning the patient. One-quarter of the orthotists use standard plaster bandage rather than the elastic type originally recommended, and one-third of the orthotists no longer use the balloon method for casting.

Polyester resin is used exclusively by eight of the orthotists, four use both polyester resin and polypropylene, five use polypropylene exclusively, one uses polyethylene and one uses acrylic.

It is interesting that of the seven practitioners that had breakage problems, six use polyester resin for fabrication and one uses polyethylene. None of the orthotists that utilize polypropylene exclusively mentioned breakage problems.

The most common fitting problem is pain at the location of the navicular (scaphoid) bone, which is located medially at the apex of the arch of the foot. Shoes being too tight when the orthosis is worn is the next most common problem, followed by pistoning of the foot in the shoe, and difficul-

ties in establishing the trimline at the metatarsal area. One practitioner stated that he has his patients acquire a pair of shoes that will accommodate the orthosis.

None of the orthotists do any shoe modifications in addition to using the UCBL foot orthosis.

Six orthotists consistently modify the foot orthosis. Wedges and metatarsal relief pads are added by two practitioners. One orthotist uses Spenco² buildups, presumably for better weight distribution and reduction of shear stresses. Another adds a Velcro strap over the dorsum of the foot to prevent the foot from pistoning. To decrease the sliding of the foot orthosis on the insole of the shoe, one orthotist lines the bottom surface of the orthosis with moleskin or thin non-skid rubber.

DISCUSSION

The UCBL foot orthosis was first publicized in September 1969, and introduced in the education programs in late 1971. The fact that 75 percent of the surveyed practitioners had used the orthosis by January 1974 is a testimony to the speed that proven research in this field is applied to the

²A foam rubber that is impregnated with nitrogen bubbles.

patient. Probably no other medical or paramedical specialty can realize these patient benefits from research only four and one-half years after the initial introduction of a technique.

The utilization of this orthosis may decrease in the future as thermoplastic, thermoformed lower-limb orthoses gain acceptance. However, the UCBL foot alignment principles still apply to the foot section of thermoplastic ankle-foot orthoses and knee-ankle-foot orthoses, and should be used whenever possible.

REFERENCES

1. American Board for Certification in Orthotics & Prosthetics, Inc., *1974 Registry of Accredited Facilities and Certified Individuals in Orthotics and Prosthetics*, Washington, D.C., 1974.
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3. Henderson, W. H., and J. W. Campbell. UC-BL shoe insert: casting and fabrication. *Bull. Pros. Res.* **10-11**:215-235, Spring 1969.
4. LeBlanc, Maurice A., A clinical evaluation of four lower-limb orthoses. *Orth. and Pros.* **26**:1:27-47, March 1972.
5. Mereday, C., C.M.E. Dolan, and R. Lusskin, *Evaluation of the UCBL Shoe Insert in "Flexible" Pes Planus*. New York University, September 1969.

**COMMITTEE ON PROSTHETICS RESEARCH AND DEVELOPMENT
DIVISION OF MEDICAL SCIENCES—NATIONAL RESEARCH COUNCIL**

**FOLLOW-UP SURVEY OF THE
UCBL SHOE INSERT ORTHOSIS EVALUATION**

Name of Clinic _____

Name of Physician _____

Name of Orthotist _____

I. Clinical Application

A. How often is this orthosis used in your clinic?

- _____ 1) Used regularly
 _____ 2) Used only for special conditions as a last resort
 _____ 3) Used only when requested by a certain physician
 _____ 4) Used for one specific problem only
 _____ 5) Rarely used
 _____ 6) Never used

B. Why did your clinic decide to use this orthosis?

- _____ 1) Involved in research or evaluation of the orthosis initially
 _____ 2) Informed through literature
 _____ 3) Informed through courses
 _____ 4) Informed from other source. Source: _____

II. Prescription Considerations

A. Which of the following pathologies are most commonly treated with this orthosis? Check all that apply.

- | | |
|---------------------------|-------------------------|
| _____ arthritis | _____ polio |
| _____ flat feet | _____ peroneal palsy |
| _____ metatarsalgia | _____ plantar fasciitis |
| _____ other, define _____ | |

Comments: _____

B. Is this more commonly used on males or females?

_____ males _____ females _____ equal usage

C. Is this orthosis more often used unilaterally or bilaterally?

_____ Unilaterally _____ Bilaterally _____ Equal Usage

D. What age group uses the orthosis most often?

_____ 1-12 _____ 25-40 _____ over 60
 _____ 12-25 _____ 40-60

Comments: _____

E. What are the main disadvantages to this orthosis?

- | | |
|---------------------------------|---------------------------------|
| _____ difficult to fit properly | _____ expensive |
| _____ not cosmetic | _____ difficult to fabricate |
| _____ perspiration problems | _____ becomes loose with wear |
| _____ wider shoe needed | _____ breakage |
| _____ doesn't relieve pain | _____ slips up and down in shoe |

Comments: _____

F. What are the main advantages to this orthosis?

- | | |
|---|--|
| <input type="checkbox"/> easy to fit | <input type="checkbox"/> consistent pain relief |
| <input type="checkbox"/> cosmetic | <input type="checkbox"/> proper foot support |
| <input type="checkbox"/> ability to change shoes | <input type="checkbox"/> light weight |
| <input type="checkbox"/> orthopedic shoes not necessary | <input type="checkbox"/> eliminates shoe modifications |

Comments: _____

G. How long does this orthosis wear before replacement is necessary?

- | | |
|---|---------------------------------------|
| <input type="checkbox"/> up to 3 months | <input type="checkbox"/> up to 1 year |
| <input type="checkbox"/> up to 6 months | <input type="checkbox"/> over 1 year |

H. What is the most common reason the orthosis needs replacement?

- | | |
|--|---|
| <input type="checkbox"/> breakage | <input type="checkbox"/> pain reoccurs |
| <input type="checkbox"/> loss of fit with time | <input type="checkbox"/> other; explain _____ |

Name of Orthotist _____

III. Casting, Fabrication and Fitting

A. The instruction manual for the orthosis described a specific method of wrapping the cast:

- (1) Do you use this method? Yes _____ No _____

If no, why? _____

- (2) What bandage do you use? Elastic _____ Standard _____

- (3) Do you use the balloon method? Yes _____ No _____

B. Do you manually align the foot/ankle during casting? Yes _____ No _____

C. Do you use the casting boards to stand the patient on after casting?

- Yes _____ No _____

If no, why? _____

D. What materials do you use in fabrication:

- | | | |
|--|--|--------------------------------|
| <input type="checkbox"/> polyester resin | <input type="checkbox"/> polypropylene | <input type="checkbox"/> other |
| <input type="checkbox"/> acrylic | <input type="checkbox"/> polyethylene | |

E. Do you use vacuum forming for this or any other fabrication techniques?

- Yes _____ No _____

F. What is the most common fitting problem?

- | | |
|--|---|
| <input type="checkbox"/> metatarsal trimline | <input type="checkbox"/> up and down motion in shoe |
| <input type="checkbox"/> navicular (scaphoid) pain | <input type="checkbox"/> shoe too tight |
| <input type="checkbox"/> other; explain _____ | |

G. Do you modify the shoes in addition to using the UCBL insert orthosis?

- Yes _____ No _____

If yes, for what reason? _____

H. Do you add wedges or other modifications to the insert? Yes _____ No _____

If yes, for what reason? _____

I. Do you have any other consistent modifications on the insert?

Example: Extending it over the instep to prevent slippage between insert and foot. Yes _____ No _____

If yes, explain _____

What methods do you use to aid similar problems if you do not use the UCBL shoe orthosis?

- | | | |
|--|--|--|
| <input type="checkbox"/> heel wedging | <input type="checkbox"/> metatarsal bars | <input type="checkbox"/> metatarsal pads |
| <input type="checkbox"/> scaphoid pads | <input type="checkbox"/> Thomas heels | <input type="checkbox"/> shoe plates |
| <input type="checkbox"/> others; explain _____ | | |