LETTERS TO THE EDITOR

Editor *5 July 1977*
Orthotics and Prosthetics
1444 N Street, N.W.
Washington, D.C. 20005

Gentlemen:

Since the publication of "Polypropylene Spiral Ankle-Foot Orthoses" in Orthotics and Prosthetics, Vol. 29, No. 2, pp33-35, June 1975, an improved technique for vacuum forming polypropylene has been worked out.

The talcum powder mentioned previously was found to be especially troublesome from the safety standpoint—breathing of airborne material, and also a great deal of time was wasted removing the powder from *everywhere*. We even received complaints from other departments. The oven was the prime culprit here, causing the dust-filled air to circulate.

Aside from esthetics, the procedure was also made more functionally stable. We found a steady state temperature that allows the polypropylene material to remain in the oven beyond the time it is actually soft enough to be moulded. We found this most useful from the practical standpoint since the staff could attend other matters and not have to be concerned about overheating the material.

In conjunction with this critical temperature, good heat distribution and better support of the material is had if the polypropylene blank is placed on a bare aluminum sheet. This prevents the edges from being too soft and the center, especially of the footplate, from being too hard. At the critical temperature sticking of the material to the aluminum is not much of a problem, but to be certain no sticking occurs, silicone is sprayed lightly on the aluminum sheet or the plastic blank.

In our oven, Grieve, Model HB-500, the critical temperature was found to be 162° ± 2°C; and the time interval for heating the blanks, 20 minutes or longer. It is important that the oven door remains closed throughout the heating cycle.

It is expected that different ovens will have different critical temperatures because of discrepancies in thermostat calibration and other reasons. Your readers might try a few small samples first, starting with the suggested temperature. The way to be sure the critical temperature for a particular oven has been reached is to watch for these characteristics:

- the polypropylene does *not* turn clear
- it can be formed to complex surfaces without exerting much pressure
- it does not stretch and thin out like chewing gum due to its own weight
- it does not readily stick to various materials

One more change can be made in the procedure for the sake of simplification. The placement of felt between the hot blank and the PVA bag can be eliminated. However, the bags would have to be replaced more often.

We hope these suggestions will make this vacuum forming procedure more useful to your readers.

Sincerely,

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The Editor
Orthotics and Prosthetics
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June 20, 1977

Dear Sir:

I would like to up-date your editorial entitled "Present Use of Orthoses for Persons with Paraplegia" in volume 31, number 1, March 1977, page 31.

You quote me as stating in 1948 that one hour of standing each day will prevent osteoporosis in the lower limbs (1). That article was significant in that it stimulated a spate of studies which demonstrated that the effect of weight bearing was minimal as compared to the effects of muscle contraction which stressed the skeleton to a far greater degree. These studies were summarized in a paper by myself and Delagi (2).

In addition, the use of the 10th thoracic vertebra as a landmark when describing orthoses and the lack of need for using pelvic band and Knight spinal attachments were analyzed by myself in papers (3,4).

Sincerely yours,

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1) Abramson, A.S.: Bone disturbances in injuries to the spinal cord and cauda equina: Their prevention by ambulation. J. Bone Jt. Surg. 30-A: 982, 1948
2) Abramson, A.S., Delagi, E.F.: The Influence of Weight-bearing and Muscle Contraction on Disuse Osteoporosis. Arch. Phys. Med. 42: 147, 1961
3) Abramson, A.S., Principles of Bracing in the Rehabilitation of The Paraplegic. Bull. Hosp. Jt. Dis. 10:175, 1949
4) Abramson, A.S., Principles of Bracing the Paraplegic. Orth. Pros. Appl. J. 28:35, 1955