

prevent the shoe insert portion of the orthosis from rocking. An immediate post-op foot can be used.

2) Vacuum mold the SACH foot with ¼-inch low density polyethylene. Polyethylene is ideal since it provides good strength and flexibility.

3) When the plastic has cooled, remove it from the SACH foot and initially trim it so that it does not protrude beyond the borders of the shoe. Refer to Figure 3.

4) Use standard methods and techniques to fabricate the orthosis.

5) Place the orthosis on the patient. Then place the orthosis on the patient into the shoe and shoe filler while ensuring that the shoe filler does not hinder this process.

6) Further trim the shoe filler along its medial and lateral sides, behind what would normally be the metatarsal heads of the sound foot. This allows the normal toe break of the shoe to function

properly and thereby ensure unrestricted motions of the ankle and foot.

Notes

To prevent the orthosis from slipping forward in the filler, the filler should curve around slightly, onto the dorsum of the foot. Refer to Figure 3. This trim, together with a properly laced shoe or a shoe laced with velcro straps, should provide the required counterforce to prevent the orthosis from slipping forward in the filler. It is further noted that one patient, who had worn the new orthotic system for one month, required foam padding that was placed anteriorly into the filler to prevent the orthosis from slipping.

Summary

The design and development of a shoe filler when bracing the

shortened foot is cosmetically appealing and financially beneficial to the patient who is consequently required to purchase only a single pair of ordinary shoes. In addition, fabricating the filler is a relatively simple procedure for the orthotist.

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Footnotes

¹Orthotist, Veterans Administration Prosthetics Center, 252 Seventh Avenue, New York, NY 10001

²Orthotist-Prosthetist, Veterans Administration Prosthetics Center, 252 Seventh Avenue, New York, NY 10001

This article is reprinted with authors permission from the Feb. 1979 issue of "The Amp." Doctor Rubin discusses Phantom Limb Pain on a basic and objective level that is easily understandable, especially to the amputee.

Phantom Limb Pain

by

Gustav Rubin, M.D., FACS
V.A. Prosthetics Center

This column was prompted by a letter from John Riegel, N.S.O., of Cleveland, Ohio. Let me expand on some of the points he wanted discussed.

First: A definition of terms. *Phantom Sensation* is the feeling that the absent limb is still there but not necessarily painful. *Phantom pain* is the same feeling but the absent limb (or part of it) is painful. Almost every amputee experiences phantom sensation but statistically only five to ten percent have varying degrees of phantom pain.

Second: Some of my medical colleagues still think that this type of pain is imagined by the amputee. It is not. It is a very real pain and can sometimes be so severe and continuous as to be disabling. However, in the great majority of instances it is intermittent, although it may last for days (and nights) at a time.

Third: The cause and cure are unknown, just as the cause and cure of the common cold, and even cancer, are unknown. We have difficulty satisfactorily treating such ordinary conditions as chronic arthritis and severe flat feet, so the difficulty in adequately treating phantom limb pain should not be surprising.

Fourth: The Cause. There are many theories about the cause. None is completely explanatory. As a working basis, the theory most acceptable to me is based on the fact that there is an area in the central nervous system which is a sort of way-station for messages on the way to our consciousness where they can be interpreted,

in this specific case, as pain. Signals can either go up from the absent limb, or down from the conscious part of the brain (cortex) and affect the way-station. Sometimes if an amputee talks about or thinks about phantom pain he will trigger an episode. The signals that go up can be described as either "excitatory" or "inhibitory." These terms require no explanation. The inhibitory effect is partly *maintained* by messages from the skin. If a leg is amputated then a large part of the inhibitory messages that would ordinarily come from the skin of that part will be absent. The excitation messages will dominate and pain could be experienced. A way of thinking about the effect of inhibitory messages from the skin could be exemplified by the instance of the person who bumps his shin and then *rubs the skin* over a broad area to relieve the pain. He sends skin inhibitory messages to the brain to relieve the pain.

Fifth: Treatments. Many different methods of treatment have been used. It is a simple fact that, when there are many ways to treat a condition, not one of them is much good. If there was one good way that would be the method used.

Treatments attempted have ranged from the use of a freezing spray, to injections of novocaine, either locally or into the lower spine, cutting the nerves to the stump, cutting the roots of the nerves near the spinal cord, cutting the nerve pathways in the spinal

cord itself, and even cutting out parts of the brain. Drugs, acupuncture, biofeedback, hypnosis, electrically stimulated implants around the nerve or in relation to the spinal cord; and even reamputation have been employed as methods of treatment.

The most recent, and, at this writing, the most popular approach has been the use of transcutaneous electrical nerve stimulation (TNS or TENS). In contrast to many of the other previously mentioned

methods it is harmless to the amputee. It is not destructive. Sometimes wrapping the stump tightly with an Ace bandage or percussing the stump will help. Putting the leg back on will often help. As one amputee said he wraps the stump and just "lies there and curses."

If the pain is unrelieved by simple, non-destructive, non-damaging techniques, the amputee should be referred to one of the highly specialized pain centers. There are now many of these throughout the country.

Editorial for AAOP Newsletter

The significance of the psychological aspects of prosthetic/orthotic restoration are well appreciated by most prosthetists/orthotists. Conversely, these underlying principles are not as completely understood as they might be. A major part of the problem is that the subject matter of psychology and its guiding principles are far less specific and concrete than the biomechanical principles which underlie the technical aspects of the prosthetic/orthotic field. For example, the optimal weight bearing areas on the above knee stump are far more precisely defined, measured and utilized than are such psychological mechanisms as hostility, rationalization, projection, compensation, etc.

Nonetheless, the psychological attributes of the patient exert a critical influence on the outcome of the prosthetic/orthotic restoration process. Whether the prosthetist/orthotist is comfortable in doing so or not, he must, to the best of his ability, assess the causes of unsuccessful or problem fittings be they rooted in the physical, mechanical, biological, or psychological realm.



Sidney Fishman

dependent upon (1) individual personality, (2) cultural background, (3) economic and vocational status, and (4) social class. In the overwhelming number of cases, the patient can be expected to respond in line with these aspects of his background.

If we consider rehabilitation associated with a serious physical disability as a response to a "crisis," the success of the rehabilitation process will depend upon the individual's motivation to "cope with" and "resolve the crisis" along the

utilization of prosthetic/orthotic devices is most common in the industrialized, competitive societies of Northern Europe and America where the ability to cope and produce is treasured and respected. In contrast, there are other cultures with fundamentally different and less demanding value systems for the handicapped, thereby placing a substantially lower significance on rehabilitation. Normally the culture in which an individual grows and is nourished sets the limits of acceptable behavioral responses to a given crisis. Within these limits the individual is free to pursue his unique, individual adaptation.

In the absence of the prosthetist/orthotist's opportunity to thoroughly study the dynamics of human behavior, articles such as that prepared by Ms. Novotny serve an important role in sensitizing the practitioner to the various psycho-social factors which so significantly influence the success or failure of his work. Certainly the self-image and its ramifications are dependent on the influences which have been described above.

"The more familiar the practitioner is with the fundamental principles of the psychology of patient adjustment, the more accurate will be his analysis and the solution of the problem."

Therefore the more familiar the practitioner is with the fundamental principles of the psychology of patient adjustment, the more accurate will be his analysis and solution of the problem.

It is clear that the reaction of each patient to the prosthetic/orthotic rehabilitation process is

same lines that the treatment team considers desirable. Consequently, if an individual's social and cultural background permits him to withdraw from productive and competitive activity as a result of disability, his will to "overcome" is correspondingly dissipated. This observation may help explain why

As such, it serves as a useful concept and tool in comprehending the adjustment of the prosthesis-orthosis wearer.

by
Sidney Fishman, Ph.D.
New York University