18. Schmidl, Hannes, *The I.N.A.I.L. experience fitting upper-limb dysmelia patients with myo-electric control,* Bull Pros. Res. 10-27, Spring 1977.

19. Scott, R.N., *Myo-electric control,* Science J., 2-7, March 1966.

20. Simpson, D.C., *An experimental design for a powered prosthesis for children,* Health, Scottish Home and Health Department Bulletin, 22:4:75-78, October 1964.

21. Tomovic, R., and G. Boni, *An adaptive artificial hand,* IRE Transactions on Automatic Control, 3-10, April 1962.

22. Wirta, R.W., Taylor, D.R., and Finley, F.R., *Engineering principles in the control of external power by myoelectric signals.* Archives of Physical Medicine, 49:294-296, 1968.

READERS COMMENTS ON:

"Should Functional Ambulation Be a Goal for Paraplegic Persons."[1]

[1]By Michael Quigley, Orthotics and Prosthetics Newsletter, Autumn 1977

The above article, which appeared in the last issue of the Newsletter elicited a great number of responses from physicians, orthotists-prosthetists, therapists, and counselors. More than 90 percent of our respondents agreed with Michael Quigley's position that the majority of paraplegic patients should be fitted with lower-limb orthoses despite the fact that use of such orthoses is extremely inefficient. The major reason for providing these orthoses to patients is to either have the patient prove to himself that he will not be able to walk in a normal manner again, or to make sure that every patient has a chance to walk, inasmuch as few patients are able to use orthoses even for transfer purposes or upright mobility.

The following comments represent a consensus from our respondents:

INDICATIONS FOR FITTING PARAPLEGICS WITH ORTHOSES:

Most respondents agreed that the T_{10} lesion level seemed to be on the border between a functional ambulator and a non-ambulator. One orthotist-prosthetist responded that in his area the L_1 level is used, as this is the most proximal innervation of the major hip flexors and hip hikers.

Margaret Henry, R.P.T., of the Mt. Wilson Center in Maryland stated that the patient must first have abdominal muscles present and have a desire to walk. He is then fitted with trial braces and must be able to complete 200 lattisimus dorsi push-ups before he is fitted with his own braces. This exercise is used to determine if the patient would have the strength and endurance to ambulate functionally.

Another therapist stated, "I enjoyed the article and comply with author. However the reasoning behind Cerney's conclusions or Hussey's conclusions are faulty. Their conclusions are valid only on the type of braces their patients had and type of training. Study should be qualified!"

A rather interesting letter was sent in by Howard V. Mooney, C.P. of Burlington, Massachusetts. Mr. Mooney stated that he had no experience with paraplegics but mentioned similar experiences with bilateral above knee amputations. Mr. Mooney stated "I learned early in the profession that to some there is no such word as 'fail.' " He states that it is his policy to describe the facts and the pitfalls of walking on two above-knee prostheses but if the patient still wants to continue he gives them all the help and encouragement possible.

WHAT ORTHOTIC DESIGNS DO YOU RECOMMEND FOR PARAPLEGIC PATIENTS?

The most commonly mentioned design of orthosis is the Scott-Craig KAFO. The respondents preferred this because of the simplicity of design, the lack of a pelvic band, ease of donning, and control of ankle motion. Those readers that did not use the Scott-Craig system preferred plastic molded knee-ankle-foot orthoses or light-weight designs. No one recommended the use of a pelvic band.

All respondents were quick to point out the indications for orthoses for children and polio patients differed from that for adult traumatic paraplegic patients.

John Glancy, C.O., University of Indiana, Indianapolis feels that rehabilitation practitioners are making a mistake when they assume that present designs of orthoses begin to provide the mechanical aid paraplegics require. Mr. Glancy feels that patient's motivation towards walking is generally poor because they have to work with such inadequate orthotic systems. Mr. Glancy is presently working on a system that uses elastic material as a source of external power and sees this as a possible solution to the problem.

IS IT PRACTICAL TO EXPECT AMBULATION WITH LSHKAFO's (BILATERAL LONG LEG BRACES WITH NIGHT SPINAL ATTACHMENTS)?

A resounding "no!" was given by all to this question. One respondent stated that this type of orthosis is too cumbersome and hard to don and that if the patient is so severely involved that he needs this measure of stabilization he undoubtedly lacks adequate muscular and respiratory reserve to ambulate any

distance and is better off with a wheelchair. Mr. Robert Penny, C.O. of the Shelby State Community College and Leo Betzelberger, R.P.T. of the VA Spinal Cord Injury Center, Memphis, Tennessee stated that we have had 3000 (conservative) spinal-cord-injury patients as of 1948 and gradually abandoned LASKAFO's as they were just thrown in the closet. We found patients could ambulate up to T_{10} with KAFO's in parallel bars. Daily living at home negates KAFO's too. We do try to keep them in metal KAFO's for dorsiflexion and ankle protection.

Probably the most interesting response on this question came from Frank W. Clippinger, M.D., Duke University Medical Center, Durham, North Carolina. Dr. Clippinger stated "from a purely practical standpoint anyone in their right mind won't bother with this. By locking the trunk to the thighs and the legs to the feet is not standing in the true sense. It is lying down vertically. I think this treats the therapist, orthotist and the doctor but not the patient. The same function can be accomplished using a coffin instead of braces as is perfectly evident in the Egyptian section of any museum."

In summary, the vast majority of all respondents felt it was important to give paraplegic persons the chance to stand and ambulate for the many reasons stated above. The term "motivation" ranked very high on everyone's list as one of the major indications for providing orthoses to paraplegic persons. For this reason I think it is proper to finish this synopsis of our readers comments with another quote from Howard Mooney, C.P., "Never underestimate the potential of anyone with unlimited motivation."

NOTES AND COMMENTS

We purposely decided to eliminate our normal Questionnaire from this issue of the Newsletter in the hopes of inspiring more individualized and less regimented responses to all of the subject matter. We can never hear enough from you our readers and again urge you to write us about any subject matter that would be of interest to you and other clinic team members.

Direct your letters to: AAOP Newsletter 1444 N St. N.W., Washington, D.C. 20005.

Joseph M. Cestaro, C.P.O.
Editorial Board

NOTICE OF TECHNICAL MEETINGS AND SEMINARS

Other Agencies and Organizations

1978, June 12-16 American Academy of Orthopedic Surgeons. Advanced Workshop on Spinal Curves.
Memphis, Tennessee

1978, Aug. 8-11 Third Strathclyde Seminar, Rehabilitation of the Disabled — Clinical and Biomechanical Aspects, Costs and Effectiveness.
University of Strathclyde, Glasgow, Scotland (Professor R.M. Kenedi, Bioengineering Centre, 106 Rottenrow, Glasgow Gr ONW)

1978, Aug. 28 - Sept. 1 The Sixth International Symposium on External Control of Human Extremities, Dobrounik, Yugoslavia

American Academy of Orthotists and Prosthetists Seminars

1978, April 22-23 Orthotics and Prosthetics
Marriott Hotel, Los Angeles Airport, Los Angeles, California

1978, May 12-13 "Orthotics and Rehabilitation Engineering in Spinal Cord Injuries," Institute of Rehabilitation Medicine, New York University, New York City, N.Y.

1978, July 10-11 Orthotics and Prosthetics
Goat Island Sheraton Inn, Newport, Rhode Island

1978, Sept. (Tentative Seminar) Orthotics and Prosthetics
Ann Arbor, Michigan