

Newsletter...



Prosthetics and Orthotics Clinic

Vol. 1, No. 2

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The American Academy of Orthotists and Prosthetists is pleased to publish its second issue of the Newsletter and we look forward to receiving the full support and participation of all members of the Clinic Teams in the coming year. We truly desire to have this publication an interdisciplinary vehicle which will allow every profession the opportunity to interchange information.

We strongly encourage all readers to respond to the "Newsletter Questionnaire" and give us your viewpoints. We also solicit individual letters and comments outside of the basic Questionnaire pertaining to any subject matter that has bearing on the treatment of prosthetic and orthotic patients. This can include new versus old treatment methods, the basic structure and procedures used in the Clinic Team (interclinical relationships), vocational counseling objectives and results, physical and occupational therapy training, as well as other pertinent subjects.

- Physicians
- Physical Therapists
- Occupational Therapists
- Vocational Counselors
- Nurses
- Rehabilitation Engineers
- Orthotists
- Prosthetists

Please let us hear from you.
This is Your Publication.

Our first Questionnaire dealt with plastics in Lower-Limb Orthotics and was distributed with our first issue of the Newsletter, which was published in October, 1976. We were quite pleased with the results, which ended up with a total of 73 respondents. This was a fairly good response when the limited circulation of the first issue is taken into account.

The Sources of Responses to the Oct. 1976 Orthotics Questionnaire were:

Independent Orthotists	19
Independent	
Orthotic Facilities	27
Institutions	16
M.D.'s (Private)	3
Unidentified	
(probably Orthotists)	5
Miscellaneous	3
Total	73

We believe that the results of the technical data that follows shows very clear lines of demarcation with respect to the use of plastics in basic Lower-Limb Orthotics. For this reason, we do not plan to solicit further discussions in this area in our next issue, but would like to develop discussions in the area of plastics in fracture brace procedures. May we have your comments on this proposal and can you suggest any alternative topics concerning the use of plastics in orthotics?

Joseph M. Cestaro
Editorial Board

Plastics in Lower-Limb Orthotics



Fitting the Molded Plastic AFO

Our October 1976 Issue of the Newsletter discussed "Plastics in Lower-Limb Orthotics" and requested information from our readers as to their experiences and preferences. The following is the results of the questionnaire on this subject.

Results of the Questionnaire and a Discussion of the Results

1) Does your clinic use custom made orthoses formed from sheet thermoplastic material?

- 1. YES - 71
- NO - 2

One of the respondents who an-

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Newsletter... Prosthetics and Orthotics Clinic

Enclosed is my check for \$8.00 for a 1-year subscription to the Prosthetics and Orthotics Clinics Newsletter. (Foreign Subscription Price is \$9.00)

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swered "NO" is an institution that treats only amputees. The other "NO" came from an orthotics facil-

ity in New England who gave as the reason "We use Ortholene blanks and laminated AFO's."

4. Please give the reasons for the answer you gave to question "3".

Some typical responses were:

"They (preformed) will work on some patients"

"Use (preformed) on easy to fit patients or those not needing the extra support."

"If the doctor specifically prescribes (preformed), or if the patient insists after explaining the advantages and disadvantages."

"I use preformed AFO's for pes equinus only. I use custom made for all other orthotic treatment."

"Because (preformed are) no good; have to reheat and mold to have work properly, so may as well start from scratch and make your own."

"Fitting difficulties — sizes do not fit many patients who are edematous, atrophied, or need support."

"They don't fit."

"Doctors prefer custom-made."

5. If you provide molded plastic orthoses, what type of equipment do you use in fabrication?

The answers given were not always clear but it appears that:

35 used a vacuum machine of one type or another

19 used hand drape with vacuum

14 used hand drape without vacuum

8 used central fabrication

2a) If the answer is "Yes" please name the materials used and show opposite the types of appliances made from the particular material.

Type Of Orthosis	FO	AFO	KO	KAFO	HKAFO	ULO	SO
Polypropylene	17	65	2	31	1	13	25
Polyethylene	3	1				5	9
Orthoplast		6				7	2
Vitrathene		1				2	7
Ortholene		6					1
Acrylic Nylon		1				1	
Kydex					1*	4	1
Subortholene		1					1
Polyurethane					1		1
Polycarbonate		1		1			
Nyloplex		11				1	
Roylan	1	1				1	2
Plexidur		2					
Polyform						2	
Resur							1

*Standing frames

3. Do you use preformed "off-the-shelf" AFO's?

Thirty-one used preformed or "off-the-shelf" AFO's. Thirty-six who also used molded AFO's did not use "off-the-shelf" AFO's. Most of the respondents who used the

preformed AFO's stipulated that the use was limited to initial trials or to those relatively few patients that could be fitted adequately. Those that refused to use the preformed unit felt that the better results obtained by custom molding was worth any extra effort necessary.

Some facilities used more than one method, thus accounting for a total greater than the number of respondents that use custom formed orthoses. About the only conclusion that can be drawn from these figures is that vacuum machines are probably worth the investment.

6. *Please give your opinions about the usefulness of sheet thermoplastics in orthotics.*

Nearly every respondent answered this question in some detail. Most cited lightness and cosmetic benefits.

Some typical comments:

"We feel that this is the biggest advance in orthotics in the last few years, providing the patient with a lightweight, hygienic, orthotic system."

"We feel that molded AFO's are far superior to conventional braces in every respect. Most of our orthoses are constructed using the materials and the patients and their physicians are most pleased."

"I am able to obtain excellent fit and control with plastics that would not be possible with a leather-metal orthosis. Also, it is lighter and more cosmetic."

"We find it has great adaptations to orthotics, with unlimited applications."

"It's the only way."

"These orthoses are useful for cosmesis, function, and light weight."

"Unlimited potential, but discretion advised."

"I feel we have uncovered a new dimension to orthotics and look forward to further developments in the future."

"Enables orthotists to apply new ideas toward orthotics."

7. *Have you experienced problems with the quality of the sheet plastic material? If the answer is "Yes", please explain.*

Twenty five respondents indicated that they had experienced problems with the quality of sheet plastic, while 32 said that they have had no problems.

Alan Finnieston of Miami, Florida, who has had a lot of experience in

the use of the sheet plastics offers the following observations:

"In answer to your question #7, we have had many difficulties with the quality of thermoplastic sheet material of various types. For example: Polypropylene, polyethylene, ABS, styrene, and polycarbonate to only mention a few. We have been involved with thermoplastics and the vacuum-forming field for approximately ten years.

Orthotics and prosthetics cannot justify, by virtue of their volume, specific formulations of material to specifications. As an example, most Orthotists or Prosthetists are buying polypropylene on a local level through a distributor. The distributor has no means of controlling what material or formulation of polypropylene he is receiving. Polypropylene is available in homopolymer, copolymer, random or block, plus many variations of grades; extrusion, injection and film, with a multitude of modifiers which can vary specifications of the base material. One then must seek out the reputable extruder with high-quality equipment and technology. This eliminates the problem of the re-ground materials of unknown formulations plus regulation of the extrusion prices."

8. *Are special courses needed to provide orthotists and other members of the clinic team with training in the prescription, fabrication and fitting of molded plastic lower-limb orthoses? Please explain.*

Of the 73 respondents, only 2 said that they felt that special courses for orthotists and other members of the clinic team were not needed. One of these provided only "hard corsets" and "arch supports"; the other stated "No, not in lower limb orthotics, because the basic rationale is unchanged as is the function." An institution that provided only "hand splints" said "Registered occupational therapists who are trained in splinting in their academic and clinical education fabricate all splints in the clinic." One clinic and one orthotics facility both of which provided molded AFO's answered with a question mark, and another clinic did not respond to this question.

However, the remaining 67 respondents felt quite strongly that special courses are needed if orthotists and other members of the clinic team are to make maximum use of the advantages afforded by sheet thermoplastics. The vast majority felt that all members of the clinic team should be offered training, but a few felt that formal training should be restricted to orthotists.

Some of the responses are:

"Yes, any further education is valuable to the entire team."

"Yes — exchange of ideas would be very useful particularly concerning fabrication. I have been making vacuum formed molded orthoses for 2-½ years and I still find it useful to exchange ideas with others who do it; to get the bugs out."

"Yes. It would be most help to attend a course in KAFO's."

"Definitely. Many problems can be circumvented with previous training."

"Yes, I believe this would be very helpful. I think this could be done in the curriculum of the schools already teaching Orthotics and Prosthetics. Seminars are helpful but only touch upon the surface. I think this area has already been covered in the last 5 years and needs more advance hands-on courses and experiences by physicians, therapists, orthotists and prosthetists."

"Yes. So many doctors still want to use old methods."

"Orthotists only should have courses, and then show the latest uses and methods. I feel that he should be the one to explain the advantages to the other team members."

"I think courses stressing cast modification, preparation, hand layup, and fitting problems would be helpful to the whole team. Personally, I have seen all the vacuum layup films I can stand."

OVERALL CONCLUSIONS

Thus, it seems obvious that sheet thermoplastics have a great potential in all aspects of orthotics and that appropriate education programs are needed and wanted.

Alan Finnieston included in his reply an announcement that his firm intends to offer "a series of instructional programs on the correct use of plastics in contemporary orthotic

practice" and suggests that those interested in attending contact him at 1901 N.W. 17th Avenue, Miami, Fla. 33125.

The results of this survey have

been forwarded to the formal education programs in this country and abroad with the hope that the faculties will be stimulated to initiate programs in this area.

The Geriatric Amputee¹

Florence T. Leist, P.T.



Florence T. Leist, R.P.T.

The purpose of this presentation is to challenge each of you to become an advocate for the geriatric amputee, and to evaluate his potential on factors other than his age.

To dispel the theory of a person being too old to use a prosthesis I would like to share a couple of real situations.

We had a dear 77-year-old man receive his prosthesis at our clinic at Deer's Head in the spring. Last summer I met his grandson, and when I asked him how his grandfather was, he replied, "oh, he's fine now that he has his new leg. He's even courting a girl friend." Then there is the 85-year-old woman who received a new prosthesis and yet another new one at the age of 87 to enable her to continue caring for and babysitting her great grandchildren.

This afternoon I would like to talk first about factors to be considered in the management of the geriatric lower-limb amputee, and then pre-

sent some statistics gathered from a review of the amputees who received their prostheses through the clinic at Deer's Head Center during its first two years of operation.

The management of the amputee can be divided into three phases:

1. Post amputation and/or pre-prosthetic training.
2. Prescription.
3. Post prosthetic training.

One of the problems we had in the management of the geriatric amputee was the scarcity of information provided by the referring physician. We sometimes got little more information than that the patient had had an amputation — not even a mention of whether it was an AK or BK, or whether it was on the right or the left.

To help overcome this situation we developed a questionnaire to develop not only the necessary basic history, but, more importantly, information such as cardiac status and the condition of the remaining lower limb. We also included the question "is he able to increase exertion 50 per cent more than is required for normal walking or wheelchair use."

We used the reference "On energy requirements for prosthesis use of geriatric amputee" to establish that question (2).

Depression

In the pre-prosthetic period there are many aspects to consider. From our first contact with the geriatric amputee we usually get a definite

feeling about his general mental status. We often find that he is depressed: his self-image has been shattered; he is suddenly unable to walk, work, or even get out of the house; he is faced with a great fear of the future. "What," he asks, "is going to happen to me and my family?"

To help him cope with these many frightening problems, the social worker, who we feel is an important member of the team, can be of value from the beginning by helping him face reality, helping solve some of his problems, and by giving him added encouragement.

Range of Joint Motion

Loss of range of motion is more rapid in the geriatric patient because of loss of tissue elasticity. Management is to institute bed positioning and range of motion exercises and encourage freedom of movement as soon as possible. Our goal to have not more than 10 deg. of flexion contracture in hip and knee. Stretching exercises must be carried out if contractures have developed, but one must remember that the older patient tolerates stretching poorly.

Muscle Strength

There is a generalized decrease in strength with age which is compounded by the effects of surgery and forced inactivity. Management is through general strengthening exercise, but the cardiac status and other systems must be considered in planning the exercise program. Usually we must accept less than what is considered as ideal strength. The goal is that the patient be able to support himself by a walkerette or crutches.

²Peizer, E. *On the energy requirements for prosthesis use by geriatric amputees*, in "The Geriatric Amputee," Committee on Prosthetics, Research and Development, National Academy of Sciences, 1961.

¹Presented at the Annual Meeting of the American Physical Therapy Association of Md., Inc., November 13, 1976.

Often times the geriatric amputee has poor balance and is fearful of falling. He has to be encouraged to try walking with crutches or walkerette and must be well guarded to prevent falling. Ideally our highest pre-prosthetic goal is independence in walking with crutches, however, as we are more concerned with safety and realize the older person does not have the agility and balance of a younger person, walking independently with a walkerette is acceptable. Our chief concern is the safety of the patient and his ability to function. We emphasize the specific stump exercises for extension and abduction of the hip for the AK and the quadriceps for the BK.

Shaping the Stump

In the older amputee generalized soft tissue atrophy is already present and stump wrapping should be monitored carefully. The patient and his family usually lack a clear understanding for the need of stump wrapping, so clear explanations and instructions should be given to insure proper shaping of the stump.

Length of Time Before Prescription

We usually find that most new amputees are presented at our Prosthetic Clinic about 2 months post amputation. Sometimes it is more than that and once in a while less. If it has been 2 months or longer, usually there has been adequate time for reduction of contractures, an increase in strength, proper shaping of the stump, and for learning to walk with assistive devices. If the time is shorter and the patient is able to handle himself on crutches or walkerette but still lacks range of motion or has not stabilized in the shrinking process, we usually go ahead and present him at clinic. The physician in charge of the clinic at DHC has at times given a provisional prescription, stating that when the contracture has been reduced or shrinkage has stabilized the prosthetist may proceed with fabrication of the prosthesis.

The team approach is used at the clinic at DHC. The team consists of the physician in charge, the prosthetist, the physical therapist, the

occupational therapist, the social worker, counselors from the Division of Vocational Rehabilitation, the patient, and his family, whenever possible.

Prescription for the Geriatric Amputee

Usually, when a patient has worn a prosthesis previously, a prescription for a duplication of the present prosthesis is made, i.e., when a person has a plug socket or a thigh corset, it is duplicated as closely as possible. For a new amputee, we try to prescribe components to meet the criteria which we developed during our evaluation.

Sockets

Quadrilateral sockets with partial suction and valve, usually fitted with a heavy cotton sock, is the design of choice unless there is extensive soft tissue atrophy, when a 5-ply woolen sock is used.

Suspension

A hip joint with pelvic band gives greater security. Suction is generally not prescribed for the geriatric patient because he does not have the muscle strength or tone to use it. At times a "Silesian bandage," or belt, is prescribed, but the patient often has difficulty with internal rotation of the prosthesis when he pulls the "bandage" tight. We recently had to change a "Silesian bandage" to hip joint and pelvic band for a woman.

Knee

Maximum stability at heel strike is necessary for the geriatric patient. The manually locked knee joint provides this stability in ambulation. It does result in gait deviations, but safety with the geriatric patient is our chief concern. It is better to have gait deviations than no gait at all. To help overcome partially the need to circumduct or vault the prosthesis is generally made ½ to 1-in. shorter than the contralateral leg.

Another knee component that is prescribed sometimes is the BOCK safety knee which provides stability through friction upon weight-bearing.

Foot Components

When a locked knee is used a single-axis foot is desirable because it permits the entire plantar surface of the foot to make contact with the floor early in the stance phase. With a person who is not a vigorous walker, such as an older person is apt to be, an extra soft heel bumper is indicated.

When a SACH foot is used with an articulated knee an extra soft heel cushion is desirable.

Post-Prosthetic Training

Post-prosthetic training for a geriatric amputee should be considerably different from that for a young vigorous person. Balance, strength, agility, and endurance will all be reduced greatly and we must proceed more slowly. Goal setting will vary greatly from individual to individual — from limited use in the home to general activities of daily living, to return to work, from walking with no assistive device, to walking with cane or canes, crutches, or walkerette.

We must set realistic goals for the geriatric amputee. Many of these people have not been active for a long period before amputation, and they will probably not regain vigorous strength and agility. But if we can return them to the life style to which they were accustomed then I think we have reached our goal.

As I have said several times before, we are concerned with safety. While we would like to have a perfect gait, without any assistive device, we settle for safe gait with an assistive device. But when a 75-year-old man can climb on and run a tractor on the farm, what difference does it really make if he uses a cane? Or, if a 75-year-old woman is taking care of herself, staying by herself most of the day and performing household chores, is it so awful she uses a walkerette?

Last year we conducted a review of the patients who received a prosthesis through our clinic during the first 2 years of its existence. The purpose of this was to ascertain whether or not the clinic was meeting the needs of the patient; i.e., were we prescribing the proper kind

of prosthesis for the individual? And, we felt, this would be partially determined by the use the patient made of his prosthesis. All patients had had their prosthesis for at least a year.

We interviewed each of these 24 patients on the day of the clinic, having them complete a questionnaire. Level of amputation, age

group, and cause of amputation are given in Table I. Five of these questions with the result are given in Tables 2-6.

It was apparent to us from these statistics that we evidently were meeting the needs of the patients and that the amputees over 60 years of age function about on the same level of those under 60.

Table 1
Classification of Patients

Under 60	Over 60
A/K — 9	A/K — 5
B/K — 5	B/K — 5
Vascular — 5	Vascular — 9
Trauma — 9	Trauma — 1

Table 2
I Wear My Artificial Limb:

Under 60 - 14			Over 60 - 10	
No.	%		No.	%
12	85	a. Every day	9	90
1	7	b. Almost every day		
		c. A few times each week	1	10
1	7	d. A few times each month		
		e. Hardly ever		
		f. Never		

Table 3
When I Wear My Limb It Is On:

Under 60			Over 60	
No.	%		No.	%
12	85	a. 7 or more hours a day	9	90
1	7	b. 4 to 6 hours a day		
1	7	c. 1 to 4 hours a day	1	10
		d. less than 1 hour		

Table 4
When My Limb Is On I Can:

Under 60			Over 60	
No.	%		No.	%
1	7	a. Only sit		
13	93	b. Walk in the house	10	100
13	93	c. Go up and down stairs	9	90
13	93	d. Go shopping, church or visit	9	90
8	57	e. Work	5	50 ¹
6	42	f. Drive a car	4	40 ²
3	21	g. Dance	0	0

¹plus one who performs house chores

²one also drives a tractor

Table 5
When I Walk I Use:

Under 60			Over 60	
No.	%		No.	%
4	28	a. A cane	6	60
2	14	b. A walkerette	2	20
0	0	c. Crutches	0	0
8	57	d. Nothing	2	20

Table 6

I Need Someone To Assist Me When I Walk:

Under 60			Over 60	
No.	%		No.	%
3	21	a. Yes	1	10
11	78	b. No	9	90

Literature Cited

1. Burgess, Ernest M., Robert L. Romano, and Joseph H. Zettl, *The management of lower-extremity amputations*, Prosthetic and Sensory Aids Service, Veterans Administration, TR 10-6, August 1969.

The Current Issue

Much has been expressed orally and written concerning the special needs of the elderly, or the geriatric, or the infirm lower-limb amputee, but very little formal attention seems to have been given to the problem

except for the surgical and immediate aftercare techniques set forth by Burgess and others (1). Your comments on Mrs. Leists' article along with your experiences, observations, and recommendations will

be most welcome. For your convenience and to make correlation of the replies easier a questionnaire is included. However your replies should by no means be limited to the questionnaire.

NEWSLETTER QUESTIONNAIRE

(Return to AAOP, 1444 N Street, N.W., Washington, D.C. 20005)

In your experience in management of lower-limb geriatric amputees:

1. Should the prosthesis weigh less than conventional prostheses?

- AK Yes No
 BK Yes No

Please comment:

2. What type of knee do you generally use for above-knee cases?

- Manual lock
 Weight-bearing (Safety) Knee
 Other (please specify)

Please comment:

Continued next page

3. In your opinion is the use of stubbies for bilateral AK cases desirable?

Yes No

Please comment:

4. In your opinion is immediate postsurgical fitting of prostheses desirable for geriatric cases?

Yes No

Please comment:

5. In your opinion what is needed to improve the function of geriatric amputees?

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