Newsletter

Prosthetics and Orthotics Clinic

Vol. 3, No. 3 / 1979 Autumn (Issued Quarterly)

To Check Out Or Not To?

That Is The Question

By Kurt Marschall, C.P.

It is now over twenty-five years since the introduction of intensive short-term courses in prosthetics and orthotics at New York University, Northwestern, and the University of California at Los Angeles. These condensed courses have benefitted every practitioner, not only in his practical approach to patient management, but also in his inter-relationship with his peers through a unified and common language that we call "nomenclature." In countless cases, these formal educational courses have served as a springboard to successful completion of the certification examination.

It was the Veterans Administration which at that time took the primary responsibility of disseminating and funding prosthetic research programs. Their Clinic Team approach became very popular, leading to the simultaneous education of physicians, therapists and prosthetists/orthotists. Undoubtedly, this close relationship of the three disciplines, working together for one common goal, namely, the rehabilitation of the disabled, has narrowed a gap that formerly was all too visible. I feel it has also helped to lift the field of prosthetics and orthotics out of the dark age, out of its sole "craftsmanship concept" into the more comprehensive classification of "professionalism"—all in all, an appropriate tribute that was long overdue.

Every prosthetist/orthotist, having successfully completed these short-term courses, came out a better person, a better clinician. The physician and therapist, by the same token, gained insight into our field as never before. Now all three disciplines in their deliberations at clinic meetings spoke at the same level through a unified language, and intelligent solutions were arrived at by understanding the underlying problems.

A by-product of this progressive and noteworthy approach was the respect the prosthetic/orthotic practitioner gained from the medical and paramedical professions, once his continued striving for excellence in performance and elevation of standards was realized by them. This respect, however, was not attained very easily. In our quest for sharing the knowledge and insight into our field with the physician and therapist, we also committed a monumental mistake—making them experts in the fitting, alignment and fabrication of every prosthetic/orthotic device there is. Without realizing it at the time, we gave into their hands a powerful tool, even further, a most powerful weapon —*the check-out sheet!!!*

There, in black and white, we developed a questionnaire telling them exactly how to pick a device apart, piece by piece, making them the sole, omnipotent judge of whether to pass or fail it. By setting up this systematic method of examining our devices we have admitted that one cannot trust our professional judgment or technical expertise. I know of no other group in the health care profession that has so mindlessly relinquished its professional prerogatives and intricate understanding of a subject to another discipline, with certainly less knowledge of the particular subject, for its scrutiny. Even today, after 25 years of continuous upgrading, we sheepishly subject ourselves to this procedure. This permits even a therapist fresh out of school, but equipped with a check-out sheet, to suddenly become powerful and to be feared for his or her "judgment" when check-out day rolls around. Countless man-hours and precious components and materials have been wasted when physician and therapist could not see eye-to-eye with the prosthetist/orthotist on alignment, fitting and finishing procedures. A device often had to be altered, sometimes even done over entirely, for rather trivial reasons, not to mention the immense damage inflicted on the patient-prosthetist/orthotist relationship when these so-called "problems" were hashed out in the open, for everyone to hear, rather than in a more private setting.

There is no doubt in my mind that the level of education and the competence of every prosthetist/orthotist has risen tremendously in the last two and one-half decades, especially for one who takes advantage of the continued education process. He is a better person than he was 25 years ago, and his knowledge of the subject, "Prosthetics and Orthotics," is vastly greater than that of a physician or therapist. He is a professional who will, without complaint, work his way

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"Nobody denies the need for a check-out after prosthetic-orthotic device has been completed. But yesterday's check-out sheet should be scrapped in its entirety—the sooner the better."

around a poorly-amputated limb that may not be to his liking for fitting purposes and come up with a functional prosthetic device without asking the surgeon for a revision. He will produce an adequate prosthetic device despite flexion contractures and edema, due to insufficient exercise and lack of proper stump-wrapping.

Nobody denies the need for a check-out after a prosthetic/orthotic device has been completed. But yesterday's check-out sheet should be scrapped in its entirety —the sooner the better—and replaced with one consisting of only three questions:

1. Is the prosthesis/orthosis as prescribed?
2. Is the patient comfortable?
3. Is the prosthesis/orthosis functional?

The above criteria should more than satisfy any physician or therapist.

The decision as to pleasing cosmetic appearance, insofar as possible, should be left to the patient.

The decision on whether or not accepted standards and principles have been met in the fitting, alignment and fabrication of the device, should be entirely that of the prosthetist/orthotist.

The field of prosthetics and orthotics has come of age; so have its practitioners. The check-out sheet has not kept pace with changing times and should be abolished in its present form. ■

Guest Editorial

THOUGHTS ON THE AMPUTEE CLINIC TEAM

by Newton C. McCollough, III, M.D.

The Amputee Clinic team as we know it today, evolved during World War II when the Surgeon General of the Army established a number of Amputee Centers within Army Hospitals to upgrade the management of these patients. Impetus to this multidisciplinary approach was given by the Veterans Administration in 1948 when suction suspension was introduced for the above knee amputee and a protocol was developed establishing the Amputee Clinic Team which initially comprised the physician, the prosthetist and the therapist.

Since that time as a more holistic approach to disability developed the team has been enlarged in most clinics to include the occupational therapist, social worker and vocational specialists among other disciplines.

The clinic team approach is comprehensive and unquestionably has resulted in superior management of patients with limb loss over the past thirty years. However, recently questions have been raised regarding the efficiency of such a clinic and whether or not a more streamlined approach is desirable from the standpoint of the logistical management of relatively large numbers of patients. The impersonal nature of such a clinic has also been impugned in recent years, and some have felt that the patient may actually be intimidated by such a host of professional personnel.

Several years ago, at the University of Miami, a compromise approach to amputee management was undertaken. All new patients and patients with identifiable medical problems (including skin breakdown) were seen in the traditional setting with the physician as the amputee team leader in clinic. Routine follow-up visits and problems which were purely prosthetic in nature were seen in "prosthetic clinic" by the prosthetist and therapist with a prosthetist as the team leader or clinic chief. Other clinic personnel including physicians were available for these clinics but were not necessarily in attendance. This approach was far more efficient in terms of man hours and in many ways more practical than imposing the traditional approach upon all patients at every clinic visit.

Two major drawbacks to this system of care slowly became apparent and currently we have resumed the traditional approach to all patients. The first difficulty encountered was that many routine prosthetic visits were also accompanied by concurrent medical problems which could not be identified before the patient was actually seen. Of course, the patient could be referred to the next "full team clinic" but this resulted in undue delay of treatment. Psychological or vocational problems though less frequent were also concurrent in some patients. Secondly, in a major teaching hospital, the education of residents, interns and students suffered from this approach. The critical analysis of prosthetic problems in relation to alignment, gait, suspension, etc. was lost upon students in the absence of interchange between pros-

thetist, physician and therapist. Additionally, innovative techniques in prosthetic management not infrequently result from discussions involving the prosthetist and physician and the presence of all team members in clinic greatly enhances this aspect of the amputee program.

In conclusion, I now feel that the multidisciplinary clinic team approach is sound and has no equal in the educational sphere. Spinoffs from the dialogue created may enhance prosthetic research and thus ultimately patient care. Efficiency in this sytem is less than ideal, but the benefits are greater in the long run. Suitable precautions must be taken to avoid "depersonalization" of the amputee in the multi-disciplinary environment and it is encumbent upon each team member **to insure that the clinic experience is a rewarding one for the patient.**

Meetings and Seminars

January 30-February 3, 1980
AAOP Round Up Seminar, Newporter Inn, Newport Beach, California

April 10-15, 1980
"Third International Congress On Physically Handicapped Individuals Who Use Assistive Devices." Hotel Galleria Plaza, Houston, Texas, USA

June 16-20, 1980
Interagency Conference on Rehabilitation Engineering, Sheraton Center, Toronto, Canada.

June 22-27, 1980
World Congress of Rehabilitation, International Winnipeg Convention Center, Winnipeg, Canada.

September 14-20, 1979
AOPA National Assembly, New Orleans Marriott, New Orleans, Louisiana.

September 28-October 4, 1980
Third World Congress (ISPO), Bologna, Italy.

COMMENT

Dear Sir:

I have just been reading Volume II, Number 4, 1978 of the NEWSLETTER. While I have a lot to say on immediate postsurgical fittings, whose major problem I fear is the inaccurate name since very few people really fit a prosthesis immediately post-surgically, I think that the part of the NEWSLETTER that deserves the most comment is the reprint of the article "Prostheses, Pain and Sequelae of Amputation as Seen by the Amputee" from Prosthetics and Orthotics International.

There appears to me to be little doubt that the complaints of the amputees are accurate. There is not only poor fitting and poor fabrication, but a tremendous absence of knowledge on what is correct on the part of the medical profession, the amputees, and, unfortunately, sometimes even the prosthetists. We must recognize the fact that many doctors "prescribe" an artificial limb with instructions to the prosthetist to "give the patient a prosthesis" or, if they want to be very accurate, "give the patient an above-knee prosthesis". This leaves the entire prescription, fabrication and sometimes training of the amputee on the prosthesis to the prosthetist, who does the best he can, but is not adequately trained to take over the entire responsibility for the care of the patient. It is the exact equivalent of a doctor "prescribing" a medication for a patient and saying "give heart medicine".

Most of the doctors doing amputation have little or no interest in the aftercare of the amputee once the wound is healed. For that reason, the amputee is required to be responsible for his own care and must seek out amputee clinics in which adequate prescription, checkout and training can be given to assure that adequate prosthetic fabrication has been achieved. The average general or vascular surgeon cannot be

Lawrence W. Friedman

assumed to have been able to keep up with the latest in prosthetic components, fitting and training. While research is important, we are not, at the present, delivering the standard of care which we could have delivered twenty-five years ago had every amputee the access to an amputee clinic team.

It is obvious that the amputees questioned are suggesting checkout procedures, such as x-rays, to measure the accuracy of prosthetic fit which have been available to us and have been used for decades. Unfortunately, it is the "consumer" who determines what is produced in the market place. In my view, the amputees must band together and insist on getting adequate service. When they do so, the competitive market place will give them what they need.

In some areas, there is a problem because there are very few prosthetists and the amputee is, to some extent, at the mercy at that individual. With modern transportation however, any dissatisfied amputee should be able to get to a knowledgeable amputee team for adequate care. I know that there are many problems. In a neighboring state I know that the orthopedic surgeons have inhibited any competitor from coming into the state to challenge what everyone admits is an inadequate prosthetist-orthotist because they like that individual as a person, even though they know that the devices produced are grossly inadequate. While this is beneficial to the individual prosthetist-orthotist, it is to the detriment of his patients.

Part of the problem is that each amputee is concerned with his own welfare, and when his needs are satisfied to a tolerable level, he tends not to band together with his fellows for their common good. This decreases their effectiveness in demanding optimal care. Rehabilitation is a process in which a patient is made responsible for his own well-being. In this regard, we may have made amputees feel so independent that they have lost sight of the power of communal action.

Perhaps the NEWSLETTER format should be duplicated for the amputees as well as for those of us serving the amputees, so that the amputee himself could know what is going on and what devices and techniques are available to him should he need them. Certainly a list of the formal clinics and services would be of help.

While there is much discussion of the advantages and disadvantages of different socket designs and other prosthetic components, it appears to me that these are, to some extent, academic discussions, since even the plug fit socket can be made comfortable for the majority of above-knee amputees, provided it is properly fabricated for the individual. What is needed is to improve the state of prosthetic delivery, even more than the state of the prosthetic art. The situation in prosthetics is the same as the situaiton in general medicine, in which in many places in this country what has been known in the medical literature is not getting to the individual patient.

As far as upper extremity amputees go, the professor is much more satisfied with the appearance of the cosmetic hand cover than are the amputees themselves. I believe that I have the opportunity in this region to see some of the most cosmetic hand covers available. They are, despite all our efforts, still inadequate and rejected by the great majority of amputees. As far as myo-electric hands are concerned, all of my patients want them. Most of them use them for a period of a few months and then discard them, except for rare use as a cosmetic hand, since they are so poorly functional as well as delicate. I believe it is important to prescribe one, if the patient demands a myo-electric hand, because he will never be satisfied of its mediocre function, until he has the opportunity to try it. I think the professor needs to be aware of many of its limitations. We, perhaps, get carried away too often by our favoritism for our own development.

I believe further discussion on this point would be of help to the amputee community and also to the medical community in its broader sense, to give us a proper perspective of where our problems are.

Best wishes for a happy and productive year.

Lawrence W. Friedmann, M.D.

Lawrence W. Friedman is Chairman of the Department of Rehabilitation Medicine at the Nassau County Medical Center in East Meadow, New York.

Bilateral Knee Disarticulation

Immediate Post-Surgical Fitting:
An Unusual Case Study

By William Susman

There are certain specific indications for utilizing immediate Post-Surgical Fitting (IPSF) in the post-operative management of the amputee. Clinical observations have substantiated that the constant even pressure provided by the immediate application of a rigid dressing to the residual limb helps control edema, supports circulation, and immobilizes tissue, subsequently minimizing the inflammatory process within the traumatized tissues, promoting wound healing, aiding good shaping of the limb and decreasing intrinsic pain and phantom sensations.

The attachment of a pylon and prosthetic foot to the rigid dressing either immediately after the residual limb is wrapped or within a short post-operative period has been shown to enhance the positive effects of the rigid dressing and provide additional functional and psychological benefits. The gentle compression of residual limb tissue provided by closely monitored weight-bearing promotes wound healing by further decreasing edema. Ambulation resumes with a prosthesis sooner than with more conventional post-operative management approaches. Hospital stay is shortened, resulting in a more rapid return to previous personal, social and vocational activities. The amputee experiences an almost immediate resumption of function and although he or she will most likely undergo mourning for the lost limb, the actual commencement of rehabilitation is also experienced. In addition, the patient may be told pre-surgically the sequence of post-operative events so that the immediate introduction of functional prosthetic restoration can be hopefully, although cautiously, anticipated.

It is readily acknowledged that IPSF is not appropriate for all circumstances. Cooperation among the rehabilitation team members from prosthetics, physical therapy, surgery, physiatry, and nursing, and a shared understanding of the technical aspects and goals of treatment, as well as individual proficiency in treatment procedures are necessary. The patient's understanding of the treatment approach and a willingness to adhere to treatment protocol are also essential. Lowered standards in any one of these areas may lead to injury of residual limb tissue, pressure sores, wound infection, hematoma, or necrosis and ultimately failure of the procedure and a real physical and psychological set-back for the patient. In addition, such complications are more difficult to perceive since the wound cannot be directly observed without disruption of the rigid dressing.

Patient History

With the above general review of the clinical advantages and precautions of IPSF in mind, it may be illustrative to present a case which is representative of these aspects of this treatment approach and yet extraordinary in view of the history and personal motivation for seeking treatment. The patient was a 28 year old woman who had contracted anterior poliomyelitis at the age of 16 months. She presented with stunted lower limbs, and muscle power at both hips was below functional levels except for the ability of the Sartorious muscle to withstand moderate resistance bilaterally. The knees and ankles were essentially flaccid. Sensation throughout the lower limbs was within normal limits. No contractures were evident and upper body strength was above normal.

The patient wore bilateral, conventional KAFO's with knee locks and both ankles set in plantarflexion. Her feet rested on approximately nine-inch cork lifts set inside the calf sections of tall leather boots. (See Fig. 1) The patient related that as an adolescent she increased the lift height periodically to compensate for the lack of normal lower limb growth. She displayed excellent balance and body awareness, ambulated and climbed stairs and curbs independently with axillary crutches, and was able to negotiate sitting and rising from most types of seating. She led an active life as a college instructor and graduate student.

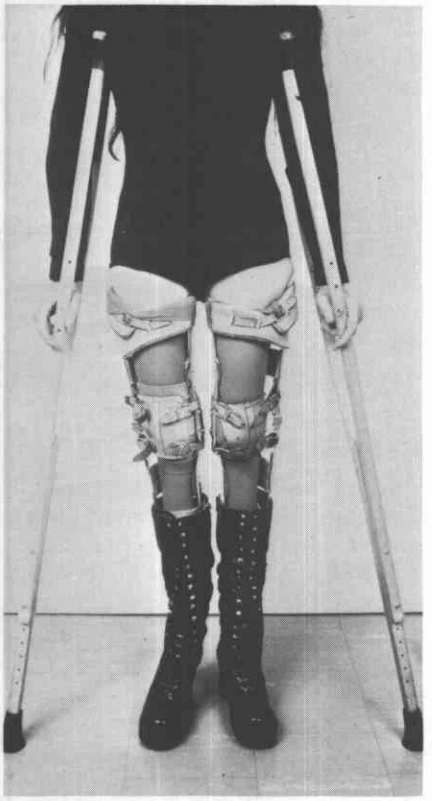

Fig. 1

The patient had a history of multiple surgical procedures during her teen-age years including a spinal fusion for scoliosis, subtalar arthrodeses, transplantation of hamstring tendons to the quadriceps mechanisms, and Achille's tendon releases bilaterally. She also had a history of left patella

and right tibial fractures because of falls.

The patient had been interested in seeking elective amputation of her legs for some time. Her chief reasons were of both a physical and a psychological nature. Pain in her feet resulting from the prolonged standing teaching required, and concern over the vulnerability of her legs to fractures from falling were related. Nevertheless, her foremost concern was for her appearance. Due to the devices she used to provide height and function she always felt compelled to wear floor-length dresses and was unable to interchange footwear (see Fig. 1 & 3). She wanted greater freedom in dress and to be able to have her legs seen without embarrassment over their appearance. She also found the braces and boots cumbersome and loose on her legs. Therefore, the patient came to the clinic seeking amputation primarily for reasons of cosmesis and self-image.

Pre-Surgical Management

The rehabilitation team's decision to recommend bilateral knee disarticulation amputations was based upon the less traumatic nature of the surgical procedure, the good weight-bearing tolerance that has been demonstrated at this level, and another factor unique to this case. Due to the diminished growth of the patient's femurs, knee disarticulations would leave the amputation level proportional in length to long above-knee amputations. This level would provide a long lever arm for prosthetic control, yet not disturb anthropometric placement of the prosthetic knee and, consequently, proportional thigh and shank length.

Fig. 2

The IPSF approach was selected due to the patient's psychosocial background and to avoid the abrupt prolonged change in function that can result from bilateral surgery. With IPSF the patient would have a shorter period of disruption of her social and vocational success and her proud independence in activities of daily living. It would limit her experience as a wheelchair-dependent individual since two-legged function would never be completely interrupted.

To determine whether or not knee disarticulation prostheses would provide function comparable to her presenting situation, temporary prostheses were fabricated to simulate post-surgical restoration. Plaster quadrilateral sockets with polyvinyl chloride (PVC) thermoplastic pylons, SACH feet and shoes were used. A cut-out in the posterior wall of each socket allowed the patient's shanks to protrude in the flexed-knee position, thus mimicking knee-disarticulation amputations (see Fig. 2). A full functional evaluation showed no deficit in the patient's function from that previously demonstrated. Her ambulation pattern remained unchanged.

From a psychological standpoint the patient was instructed to seek psychiatric consultation to closely examine her motivations for electing this treatment and to investigate her feelings regarding the possible failure of adequate functional prosthetic restoration. In addition, the patient discussed at length with team members the pros and cons of her decision and the possible sequela of amputation surgery such as wound-healing difficulty, residual limb pain, phantom sensations, less than optimal function, and prosthetic maintenance.

Post-Surgical Management

After closure of the amputation wounds and placement of drains, stump socks were applied over the surgical dressings on both limbs. A distal pad was held in place while a plaster wrap of each residual limb was done. Each plaster socket was hand-molded to provide a quadrilateral shape and ischial seat. Supracondylar purchase and belts over the iliac crests provided suspension. Pylons were not added at this time since the PVC tubing to be used requires heating before application.

Fig. 3

On post-operative day (POD) #2 the surgical drains were removed. On POD #5, PVC pylons and SACH feet with shoes were applied. To control and monitor the degree of weight-bearing, a tilt table and two scales were used (see Fig. 4). Two five minute-periods at ten pounds of weight-bearing were allowed initially. On POD #6 the patient was seen twice during the day and stood on scales in the parallel bars (see Fig. 5). Two daily sessions were continued and weight-bearing was increased to 20 pounds on the right limb and 15 pounds on the left, being limited due to pain. Throughout this period the patient complained of phantom sensations and residual limb pain which increased markedly at night. The first cast change was done on POD #12 at

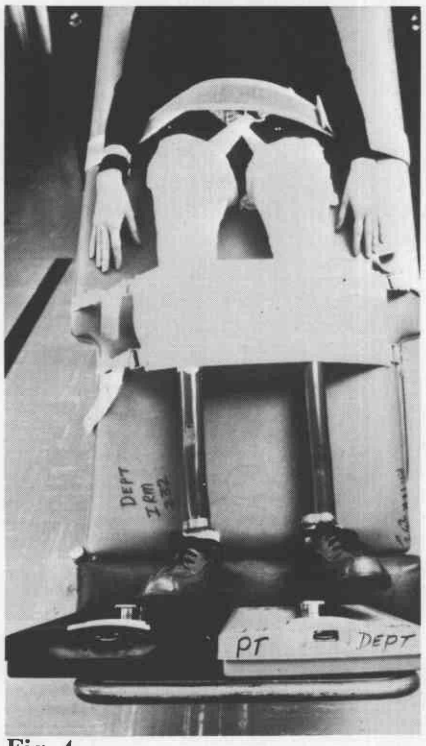

Fig. 4

which time the stitches were removed. The following day the patient began ambulation in the parallel bars with weight-bearing to tolerance. On POD #15 the patient was given a walker for bedside use and on the following day was able to ambulate independently outside the parallel bars with axillary crutches and a four-point gait, testimony to her long-standing adaptation to her physical deficits and her determination to succeed. At this time the patient was transferred from the acute care setting to an inpatient rehabilitation bed.

Four weeks after surgery the patient was casted for her definitive prostheses. At five weeks she was fitted with the sockets and locked knees and returned to the parallel bars for ambulation training. During the sixth week, first one and then both prostheses had safety knees added. By the ninth post-operative week the patient had returned to the use of crutches and had received training in elevation activities and ambulation on different terrains.

The prostheses were delivered at the end of the ninth post-operative week and consisted of quadrilateral total contact sockets with semi-suction and supracondylar suspension. Windows were not cut in the sockets for donning but rather a soft insert was fabricated which was compressed during donning and re-expanded within the socket to grip the femoral condyles. The patient rejected the use of any suspension belts as uncosmetic. Otto-Bock's modular endoskeletal safety knees and components, and SACH feet were used. (See Fig. 6).

Follow-Up

The patient returned to her former daily interests and activities and maintained her ambulatory status. Having worn the prostheses for approximately a year and a half she returned for re-evaluation. Changes in residual limb shape due to shrinkage necessitated the fabrication of a second pair of prostheses which she currently uses.

Summary

This case well illustrates the advantages and appropriate application of the IPSF approach to amputee management. The patient was able to have both limbs amputated at once and yet hasten the rehabilitation process. The physical debilitation and psychological shock associated with such a radical intervention was minimized by her youth, determination, and cooperation with the rehabilitation team. A deeply felt desire to improve her quality of life was satisfied with minimal disruption of what was an already successful life style in the face of life-long physical difficulties.

Fig. 5

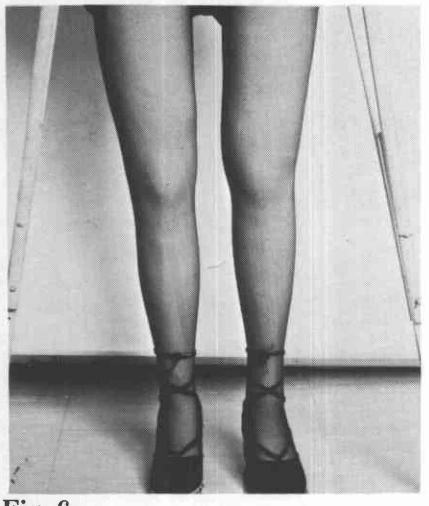

Fig. 6

Newsletter Questionnaire

1) Do you feel checkout procedures are appropriate as presently practiced. Yes _____ No _____.

2) Do you feel the term "check out" should be maintained or should another term be used to represent this procedure.
e.g., "prosthetic functional evaluation," "prosthetic performance evaluation" (to complement pre-prosthetic evaluation.)

_____

_____

_____

Send responses to: *Gary Fields*
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AAOP Newsletter Honorarium

Congratulations to **William Susman** for his outstanding article entitled "Bilateral Knee Disarticulation; Immediate Post-Surgical Fitting" which appears in the current issue of the *Newsletter, Prosthetics and Orthotics Clinic*. Mr. Susman will receive a check in the amount of $100.00 as the award for his exceptional written contribution to the Newsletter.

The AAOP Editorial Board will select the recipient of this award for every future issue of the *Newsletter*. You are invited to submit articles for consideration for future publications. All correspondence should be directed to AAOP *Newsletter*, c/o National Office, 1444 N St., N.W., Washington, D.C. 20005.

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