

# Studies of the Upper-Extremity Amputee

## IV. Educative Implications

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FROM the foregoing discussions, it will be apparent that one of the major purposes of the Upper-Extremity Field Studies was to introduce certain influences into the professional activities of the several groups (physicians, therapists, prosthetists) concerned with the care of the amputee and his reintegration into society. It was anticipated that changes in methods of patient care arising from these influences would in turn affect the welfare of the amputee group. In this sense, therefore, a major aspect of the Field Studies was the educative process involved in the attempt to change the operational patterns of those responsible for amputee care by strengthening the philosophies, attitudes, and skills which had been taught during the short-term courses of instruction. Continued encouragement, assistance, and guidance were required to habituate these groups to the procedures proposed during the instructional courses.

The second phase of the Field Studies, the results of which will be discussed in the next issue of ARTIFICIAL LIMBS (Autumn 1958, Vol. 5, No. 2), is most properly considered a research activity. The purpose in this phase of the program was to attempt to evaluate the effects of these efforts on the over-all status of the amputee through the use of objective and subjective measurements. To accomplish this second phase, detailed studies were made of the

status of the group of amputees prior to their treatment by the prosthetic clinic and again at a time after the completion of treatment.

In approaching the task of estimating the effectiveness, or lack of effectiveness, of a two-pronged (research and education) program of this type, a number of problems arise. In this particular case, fortunately, we have the opportunity of deferring evaluation of the second phase, the research activities, until after those results are presented in a second installment.

The results of the educative effort are perhaps best considered in terms of Jesus' parable of the sower, as set forth in *The Gospel According to St. Matthew* (Chapter 13):

3 ... Behold, a sower went forth to sow;

4 And when he sowed, some *seeds* fell by the way side, and the fowls came and devoured them up:

5 Some fell upon stony places, where they had not much earth: and forthwith they sprung up, because they had no deepness of earth:

6 And when the sun was up, they were scorched; and because they had no root, they withered away.

7 And some fell among thorns; and the thorns sprung up, and choked them:

8 But other fell into good ground, and brought forth fruit, some an hundredfold, some sixtyfold, some thirtyfold.

9 Who hath ears to hear, let him hear.

In some few places and among some persons, no effects are to be noted. Among others minor temporary changes evolved, and in still other instances important permanent improvements were brought about. We may consider these effects under three broad categories—impact on the medical management of the amputee, impact on public and private rehabilitation agencies, and impact on social attitudes.

## IMPACT ON THE MEDICAL MANAGEMENT of THE AMPUTEE

It has been emphasized consistently throughout the foregoing sections that a "prosthetic-clinic approach" to the problem of the amputee was a basic tenet of the field-studies program. In this approach, the fundamental decisions relating to the rehabilitation of the patient were made in concert by a group consisting minimally of a physician or surgeon, a physical and/or occupational therapist, and a prosthetist. Whenever possible, vocational counselors and other personnel trained in the psychosocial aspects of rehabilitation also were included.

The second aspect of the prosthetic-clinic approach involved an attempt at considerable standardization of the process of patient care and usually included eight more or less formal treatment steps—prescription examination, prescription, preprosthetic therapy, prosthetic fabrication, initial checkout, prosthetic training, final checkout, and follow-up. As a consequence of these efforts, three major changes occurred in the medical care of amputees—introduction of prosthetic-clinic procedures, staff and patient education, and upgrading of existing services.

## INTRODUCTION OF PROSTHETIC-CLINIC PRO- CEDURES

Although similar clinical procedures have been developed and practiced in the treatment of other disabilities, and even occasionally in prosthetics, the attempt at systematic introduction of such procedures on a broad basis was a novel one. In addition, experimental exploration and validation of the essential adequacy of such procedures is hardly ever available. As a major outcome of the Field Studies, however, the basic validity of the clinical procedures in the field of upper-extremity prosthetics has been established. In addition to these accomplishments, certain other changes occurred with respect to the patient-care activities of each of the specific professions—the physician and surgeon, the physical and occupational therapist, and the prosthetist—concerned with the handling of the upper-extremity amputee.

## *The Physician and Surgeon*

As a result of the principles and procedures instituted under the program, the period during which the amputee is considered a patient under medical management was extended significantly. Formerly an amputee was a patient during surgery and through a limited period of postoperative care. Today, the period of medical supervision continues through the entire process of limb prescription, fabrication, training, and evaluation.

As an additional outgrowth, a subspecialty within the fields of orthopedic surgery and physical medicine has been developed. A limited number of physicians have become expert in the field of limb prosthetics. Since the amputee represents a relatively small portion of the total population requiring medical service, it is not feasible for large numbers of physicians to specialize in this field. But in order to provide competent service for amputees it was essential that a few physicians in each major population center be thoroughly equipped to provide the care required. Physician specialization in the very restricted field of prosthetic restoration has come about as a direct result of the program.

Through the program the physician has learned much concerning the technical specifics of prosthetic restoration. As a result of this education, his respect for the contributions made by the skill and experience of the therapist and prosthetist in the process of amputee rehabilitation has increased. The interdisciplinary approach to the problem of amputation and prosthesis has become accepted and appreciated as a significant forward step in the medical management of the amputee. As a general consequence, the physician has been able to acquaint himself with, adapt, and then apply modern—and gradually higher—standards of prosthetic care for his patients. Knowing, perhaps for the first time, what constitutes and what is involved in providing a good prosthesis, the physician is now able to require a standard of service not previously possible.

## *The Physical and Occupational Therapist*

For the therapist, the short-term courses in upper-extremity prosthetics filled a gap left

by the usual curricula in schools of occupational and physical therapy. Perhaps for the first time, a systematic approach to the amputee problem was taught and practiced. As a result, the therapist has been able to carry out the major responsibility of amputee training with a background of general technical knowledge directly relating to artificial limbs. In addition, closer professional liaison developed between the therapist, the physician, and the prosthetist with regard to the amputee. As a result, in most instances upper-extremity amputees are now routinely referred to the therapist for instruction in the use of the artificial limb, whereas in the preprogram days the number of therapists qualified to give this service and the number of amputees availing themselves of it were both insignificant.

#### *The Prosthetist*

The program sought and helped to provide a proper professional role for the prosthetist. As a group, prosthetists were for the first time exposed to formal university instruction and to closer relations with medical, paramedical, and psychosocial disciplines. Thus the prosthetist has been helped toward a redefinition of his status on a higher professional level.

This progress in the direction of a more professional role was aided in no small measure by the acquisition of a new technology involving the use of biomechanical principles, plastics fabrication, and principles of harnessing and controlling artificial limbs. This improved knowledge has resulted in improved service, increased status, and greater interprofessional satisfactions.

One cannot say at this early stage in the evolution of this field just what the ultimate or proper interrelations may be between the professions concerned. Certainly the appropriate relationships will tend to vary from location to location, depending upon personnel and situational considerations. There can, however, be no gainsaying the facts that a period of growth has been stimulated, that the adequacy of the present treatment situation far surpasses that of the old, and that there has been developed a climate which gives every indication of providing additional professional status for the prosthetist.

#### STAFF AND PATIENT EDUCATION

A second value provided by the studies relates to the matter of staff and patient education. It is as true in limb prosthetics as in the other healing arts that there are no standard procedures which will apply with equal effectiveness to every patient. Moreover, limb prosthetics is still a field in which the contributions of each of the specialists are but partially understood by the others. Consequently, there is an important need for a cross-fertilization of ideas and a distillation of the best thinking for a given patient by the process of group activity. In this sense, an important achievement of the prosthetic clinic may be considered the intraclinic education of the team members.

Equally important is the role that the clinic must play in the education of the patient. Most amputees, when arriving for prosthetic care, are subject to wide and varied misunderstandings and misinterpretations as to the procurement and ultimate use and value of a prosthetic device. Clinic personnel have become more effective in educating the patient concerning realistic goals and anticipations, in addition to providing him with the best type of prosthesis for his particular needs.

#### UPGRADING OF EXISTING SERVICES

In the process of applying and studying clinic procedures experimentally, the last important result evolved—that of an upgrading of existing services, as well as the establishment of services where none had existed previously. In this respect, the major contribution apparently has grown out of the introduction of a coordinated pattern of treatment.

Previously, it had not been uncommon for a prosthetist, physician, and vocational counselor, for example, to proceed with the care of an amputee independently of one another. This procedure was often adopted in spite of the fact that in any situation where an individual is receiving treatment from more than one specialist, and where the anxieties are such as to provoke some degree of patient discontent, there is a noticeable tendency for some patients to distort the intentions and contributions of each profession in relation to the others. Such problems are further aggravated in those instances where the patient himself is called

upon to act as the means of communication between the professions involved, since we may be sure that there will always be a certain degree of distortion of the patient's perceptions of the treatment processes. The clinic procedures were especially effective in reducing this troublesome method of communication between the specialists.

We may also anticipate that the behavior and demeanor of the patient toward the prosthetist will differ from that he exhibits toward the physician, therapist, or counselor. These differences in overt behavior patterns may easily and logically suggest different patterns of treatment to each of the individual professions. Yet it should be clear that these varying behaviors on the part of the patient are transitory and that the real solution lies in a uniform treatment plan rather than in a number of discrete ones. It therefore becomes clear that, in order to provide amputees with the best available medical and prosthetic service, the contribution of each of the professional specialties is best coordinated and amalgamated with that of each of the others. The prosthetic-clinic procedures, introduced through the studies, permitted a more uniform evaluation of the patient and assisted in circumventing the problems inherent in uncoordinated care.

#### IMPACT ON PUBLIC AND PRIVATE REHABILITATION AGENCIES

Many groups who have as their adopted or assigned mission the reintegration of the handicapped individual as a productive member of society have long been aware of the significance of the process of prosthetic restoration as a link in the over-all process of rehabilitation. As a direct consequence of this awareness, and as a necessary outgrowth of their over-all responsibilities in the rehabilitation field, federal agencies such as the Veterans Administration, the Armed Forces, and the Department of Health, Education, and Welfare, the state divisions of vocational rehabilitation, workmen's compensation, and health and public welfare, and such nongovernmental agencies as the state societies for crippled children and adults, rehabilitation centers, insurance companies, and a number of other

private agencies have become the largest purchasers of prosthetic services in the United States.

Through the NYU Field Studies these groups have been made increasingly aware of the potentialities of prosthetic restoration and have responded by raising their standards in the field of upper-extremity prosthetics. Having been provided with professionally competent avenues for the processing of their beneficiaries through prosthetic prescription, fabrication, training, and evaluation, these agencies have begun to insist that their clients be treated by special amputation teams headed by physicians who are experts in the field. Since these agencies may be considered "consumers" in the sense that they most frequently pay for the prosthetic services provided, they have been instrumental in raising the standards by rejecting prostheses and services that do not meet the minimum standards first set up through the program.

A by-product is that the groups mentioned tend more and more to order prostheses from those prosthetists who have fully qualified themselves by virtue of training and experience. In a good many instances, these agencies have shown themselves willing to spend the additional monies required to obtain services of the highest quality. In some instances the program has been instrumental in stimulating the inauguration of local services to avoid the necessity for these rehabilitation agencies to contract for prosthetic services from distant sources. The widespread introduction of the clinic-team concept to the field of limb prosthetics provided the means for greater liaison between rehabilitation agencies and those persons medically responsible for the process of prosthetic restoration. Since the clinic-team meetings ordinarily involve a conference of all of the participants in a given case, the agency itself is frequently represented at such conferences by a professional staff member. This, of course, makes for considerable improvement in the continuity of the rehabilitation process.

#### IMPACT ON SOCIAL ATTITUDES

Beyond their influence on the medical and rehabilitation agencies, the effects of the

Upper-Extremity Field Studies also permeated through other facets of our social structure, although as one departs further and further from the professional groups directly responsible for the care of the amputee the impact of the effort becomes more diffused and less specific. Nonetheless, a number of significant effects remain to be noted. They may be viewed as influencing the attitudes and thinking of sponsoring agencies, scientists concerned with physical disability, other groups of disabled, and society at large.

#### SPONSORING AGENCIES

Perhaps one of the most important contributions was the demonstration that within a relatively brief period of time research and development can be accomplished and the benefits therefrom made available to the average patient with a disability. It should be recalled that the entire upper-extremity research program did not get under way until several years after the close of World War II and that the major prosthetic design improvements depended upon several years of fundamental biomechanical research. Thus the entire concept and technology of the care of the upper-extremity amputee has been revolutionized within a remarkably brief period of six or seven years.

Such demonstrable progress is of inestimable value to those whose prerogatives require that they decide where substantial private or public monies should be spent in medical or rehabilitation research. Although it is always important to verify or evaluate the results of a broad program of research, this is not always possible. Yet this is precisely what the Upper-Extremity Field Studies have done.

In the first instance, scientific evidence has been provided concerning the over-all value and contribution of the six or seven years of research and development. Secondly, and from a more technical point of view, information was brought forth concerning those aspects of the care of the upper-extremity amputee which had progressed most satisfactorily and those phases which require continuous improvement and attention.

#### SCIENTISTS CONCERNED WITH PHYSICAL DISABILITY

The program of research and education also assisted in the general growth of scientific thinking on problems of human disability. Some detailed discussion of these research considerations will be included in the next issue of *ARTIFICIAL LIMBS* (Autumn 1958, Vol. 5, No. 2), which will deal with the research aspects of the studies. The discussion of the educative aspects of the Upper-Extremity Field Studies would be incomplete without note being taken of the progress that has occurred in the attitudes and thinking of researchers in the field of physical disabilities. These advances have been summarized at the recent conference on the *Contributions of the Physical, Biological, and Psychological Sciences in Human Disability* sponsored by the New York Academy of Sciences (page 125).

#### OTHER GROUPS OF DISABLED

It is clear that a special service was performed for those individuals who have incurred disabilities related to, but not identical with, amputation. These groups are perhaps best typified by those disabilities which require functional restoration by use of braces or other orthopedic appliances.

Until the time of these studies, there was very little overt expression of the need for progress in the field of bracing. The prevailing situation was one that had remained static for decades. With limited exceptions, personal unvalidated opinion, professional and otherwise, pervaded and still characterizes the entire field.

Partially as a consequence of the broad educative aspects of the Upper-Extremity Field Studies, a spontaneous development of interest and desire for systematic progress arose in this related field, which is often served by the same doctors, therapists, and prosthetists-orthotists. People who were suffering from these types of disabilities and those who cared for them generated a new feeling of hope and enterprise. The results of these changes in attitudes are just now being translated into planning for active research and education.

**SOCIETY AT LARGE**

Further evidence was provided that the systematic treatment of the disabled is a fundamentally effective and socially desirable process. The "collective concern" which society experiences concerning the physically handicapped tends to be reduced with the knowledge

that constructive things can be done, and have been done, for this group in an orderly, scientific manner. Associated with this growth in knowledge is a reduction in anxiety and prejudice concerning the physically handicapped and a corresponding increase in their acceptance by society.