

POST GRADUATE TRAINING IN PROSTHETICS AND ORTHOTICS



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In March of 1956, just over four years ago, the Prosthetics Education Program of the New York University Post-Graduate Medical School offered its first course for a group of thirteen prosthetists studying above-knee prosthetics. With this course, a new and important area of endeavor was added to the University's activities in the field of prosthetics and orthotics.

The purpose of this new prosthetics education program can be stated simply. Basically, it is the dissemination of information pertaining to prosthetic restoration and amputee rehabilitation to individuals concerned with the management of such patients. This objective was, and remains today, closely related to the nation-wide artificial limb research program which had been carried out for some ten years prior to the start of the education program. It must be remembered that since World War II a veritable revolution in prosthetic procedures has taken place, due in no small degree to the research program supported by the V.A. and other government agencies and the leadership supplied by the appropriate committees of the National Research Council-National Academy of Sciences. This period of rapid change saw the introduction and widespread use of plastics in upper-extremity prostheses, the development of terminal devices, elbows, and other arm components, SACH feet for lower-extremity prostheses, quadrilateral sockets for above-knee amputees, and more recently, patellar-tendon-bearing sockets and soft liners for below-knee amputees, to mention a few of the significant developments. These changes, along with new concepts in such areas as biomechanics, prosthetic evaluation, and amputee management made it imperative to find a channel of communication between the professional people treating amputees and the new information emanating from the re-

search laboratories. This communication channel is the function which prosthetics education has fulfilled.

To accomplish this objective, a series of short, intensive courses were developed for the four professional groups most intimately concerned with these matters: physicians and surgeons, physical and occupational therapists, prosthetists, and rehabilitation counselors. The courses for each of these groups contain both lecture and laboratory sessions so that students receive not only a theoretical grasp of the subject matter but also practical experience in working with amputee subjects. The particular courses offered for each group and the number of students who have attended since March, 1956, are summarized in the accompanying table.

STUDENT ENROLLMENT 1956-1960

	Physicians				Therapists				Prosthetists			Rehab. Coun- selors	Total
	UE	AK	BK	LE	UE	AK	BK	LE	UE	AK	BK		
Spring 1956	26	36	—	—	20	34	—	—	14	22	—	—	152
1956-1957	27	109	—	—	37	93	—	—	9	89	—	—	364
1957-1958	35	58	—	—	30	58	—	—	15	60*	—	54	320
1958-1959	62	84	—	—	61	63	—	—	14	35	—	63	382
1959-1960	38	—	41	84	38	—	43	65	15	15	76	56	471
	188	297	41	84	186	248	43	65	67	221	76	177	1,689

*Includes 28 prosthetists who completed the Advanced Seminar on Above-Knee Fitting Problems.

Several points of interest which are brought out in the table should be mentioned. First of all, among the physicians and surgeons, the number of orthopaedic surgeons and physiatrists are about evenly divided. In contrast to this, physical therapists make up an almost exclusive majority in the courses dealing with lower extremity prosthetics, while the occupational therapists are a majority in upper extremity courses. Also worthy of note is the fact that among the prosthetists, most of the students attending these courses have already been certified by the American Board for Certification. Finally, the surprisingly large number of students who have completed courses during the past four years (1,689) is indicative of the widespread interest and ever growing concern with the field of prosthetics and orthotics. Geographically, these students come from 38 states, the District of Columbia, and 22 foreign countries and territories: Australia, Burma, Canada, Chile, China, England, Greece, Guatemala, India, Iraq, Ireland, Israel, Japan, Korea, Phillipines, Poland, Portugal, Puerto Rico, South Rhodesia, Spain, Turkey and Vietnam.

Since amputee rehabilitation can properly be thought of as a process of adjustment and interaction between a man (the amputee) and a machine (the artificial appliance), the content of courses dealing with this subject must draw upon the biological, psychological and physical sciences. This multi-disciplinary approach requires the cooperation of individuals from many fields and many departments of the University.

A guiding committee responsible for the overall planning of the program meets on a regular basis and is composed of Dr. Donald Covalt of the Department of Physical Medicine and Rehabilitation, Dr. Walter Thompson of the Department of Orthopedic Surgery, Mr. Renato Contini of the College of Engineering, and Dr. Sidney Fishman of Prosthetics Education. Included on the teaching staff are representatives of the fields of medicine, engineering, prosthetics, orthotics, physical and occupational therapy, vocational counsel-

ling, and psychology. Several of these people are on the full-time staff of the program, while the larger number are drawn from the Departments of Physical Medicine, Orthopedic Surgery, Physical Therapy, Occupational Therapy, and the College of Engineering within the University, as well as from various sources outside the University. Each of the groups that study Prosthetics Education are thus exposed to a curriculum planned and taught by representatives of various fields of knowledge.

Under the overall supervision of Dr. Fishman and Mr. Berger, each of the courses offered by Prosthetics Education is directed by a particular individual. Serving as the chief instructor for prosthetics courses is Mr. Ivan Dillee, the therapists' curricula are supervised by Mr. Warren Springer, and the physicians', and rehabilitation personnel curricula are under Mr. Norman Berger. In addition, Mr. Charles Fryer makes a major contribution to the teaching program for all four groups.

A great many other individuals contribute to the instructional program on a part-time basis. Representing the prosthetist group and serving primarily as instructors in the courses for prosthetists are Mr. Basil Peters and Mr. Carlton Fillauer, each of whom conduct their own prosthetic facilities; Mr. William Tosberg, who directs prosthetic services at the Institute for Physical Medicine and Rehabilitation; Messrs. Martin Durec, Robert Mitchell, and Charles Goldstine from the Institute for the Crippled and Disabled; and Messrs. Henry Gardner and Thomas Pirrello of the Veterans Administration Prosthetic Center. Among the physical therapists are Miss Irene Waters of the Institute for Physical Medicine and Rehabilitation, Mr. Larry Villalobos, who is in private practice, Mr. Hy Dervitz from the New York State Rehabilitation Hospital, and Mr. Ted Childs from the Brooklyn Veterans Administration Hospital. On the part-time medical faculty are Drs. Ernst Bergmann and Alvin Hulnick from the New York University Department of Orthopedic Surgery and Dr. Allan Russek of the Department of Physical Medicine and Rehabilitation. The staff of the Prosthetic Devices Studies of the College of Engineering also contributes a number of lecturers including Dr. Edward Peizer and Messrs. Hector Kay, Robert Burtch, Herbert Kramer, Earl Lewis, and Bertram Litt. Finally, representing and lecturing in the field of clinical psychology are Dr. Sidney Fishman and Dr. Samuel Weiss.

In addition to its major task of offering courses, Prosthetics Education has sponsored and engaged in various other activities.

Orthotics

In the summer of 1958, Prosthetics Education and the OALMA jointly invited a group of the leading orthotists in the country to an orthotic seminar, the purposes of which were: a) the definition of currently accepted practices and standards in the field, and b) the formulation of problems in orthotics which might be amenable to research. The eleven participants in the seminar spent five days in discussion of these matters and were able to achieve agreement on many aspects of orthotic practice. Since the seminar, staff members of prosthetics education have been engaged in preparation of materials covering anatomy, biomechanics, normal and pathological locomotion, and fabrication of short and long-leg braces of various types. Further information regarding orthotics will be found in the article by Dr. Edward Peizer, who supervises this work.

Written Materials

To serve as reference and textual material, Prosthetics Education makes use of a number of manuals and books written and published by various groups engaged in prosthetics research around the country. It has been



Physicians and Surgeons studying Above-Knee Gait Patterns with Mr. Charles Fryer, Instructor.

found necessary, however, to prepare and print various additional materials covering several subjects.

For use in courses dealing with above-knee prosthetics, two manuals have been written. The first of these, "Management of the Above-Knee Amputee" contains chapters dealing with clinic team procedures, prescription principles, checkout, gait analysis, and gait and activity training. The second, which is used particularly in the prosthetists' course is primarily a discussion of socket problems under the title "Notes on the Diagnosis and Solution of Above-Knee Fitting Problems."

For use in the rehabilitation counsellors' course, a manual was printed which surveys the entire field of both upper and lower extremity prosthetics as well as lower extremity orthotics.



Dynamic Alignment using the B/K Adjustable Leg.

In the below-knee area, articles have been written for distribution to the students on the topics of fabrication, checkout, gait analysis, and biomechanics. In addition to these written materials the instructors in all courses make use of slides, film loops, charts and working models to assist in the teaching program. To help the students organize their thinking and note taking and to provide reference materials at home, approximately 45 work sheets are used in the various courses.

Teaching Services Outside of NYU

As an outgrowth of the courses for rehabilitation counsellors, a number of state divisions of vocational rehabilitation have become interested in prosthetics and orthotics training for all of the counsellors on their staffs. To date four states have conducted their own workshops and seminars for this purpose. Prosthetics Education personnel have, in each case, provided assistance in both the planning and teaching of these courses. Staff members have cooperated with the Mississippi, Alabama, Georgia, and Florida divisions of vocational rehabilitation in conducting such programs.

In cooperation with AOPA, staff members have been active in providing technical lectures to the 11 regions comprising the national organization. Each of these regions holds an annual meeting which is open, not only to the prosthetist members of the association, but to physicians, therapists, and other interested people as well. A number of three-hour presentations have been developed and presented at these meetings.

It should also be mentioned that with some frequency, hospitals, rehabilitation centers, and various graduate and undergraduate programs call upon Prosthetics Education to provide lectures for their teaching programs.

Future Plans

For the immediate future, Prosthetics Education will engage in much the same kind of activity as it has in the past, and will continue offering the same courses. The number of inquiries and applications which are received from physicians, therapists, prosthetists, and rehabilitation counsellors are a clear indication of continuing, widespread interest in specialized training in prosthetics. Though the educational program has gone a long way toward reducing the backlog of candidates for training which accumulated in the years prior to the inauguration of university courses, much yet remains to be done. It is likely that as new, young physicians, therapists, prosthetists, and counsellors enter their chosen profession, the demand for at least one or two courses per year in both upper and lower extremity prosthetics will continue on a rather permanent basis. This is particularly true in view of the increasing proportion of older people in our population and the concomitant rise in the number of amputations.

Looking slightly further ahead, we can anticipate developments from another source. Despite the significant progress achieved in the last ten years, it is apparent that all of the problems in prosthetics and orthotics have not yet been solved. It is reasonable to assume that the continuing nation-wide research program which has contributed heavily to past progress will achieve further breakthroughs and produce significant advances in one field or another. What these advances may be is difficult to guess. The possibilities include the use of external power to motivate artificial limbs, new understandings in anatomy and biomechanics which may alter current concepts of socket shape and alignment, and new surgical techniques which may produce weight bearing stumps. Whatever the next significant step is in this field, Prosthetics Education is the logical vehicle for transmission of the new developments to the personnel of the amputee treatment team.