

SUMMARY OF ACTIVITIES OF THE COMMITTEES ON PROSTHETICS RESEARCH AND DEVELOPMENT AND PROSTHETIC-ORTHOTIC EDUCATION FOR THE PERIOD JULY 1 TO DECEMBER 31, 1972

During the period covered by this report, the activities of CPRD/CPOE broke new ground in various areas. At the same time, the ongoing and highly productive system of workshop panels sponsored by the various subcommittees was continued.

The addition of Dr. Gustav F. Haas to the staff as a full-time specialist in sensory aids gave an additional emphasis to work in this area, while the return of Dr. E. E. Harris on a part-time basis facilitated an evaluation program of nerve/muscle stimulators.

A brief description of the activities of the parent committees and of the subcommittees follows:

ACTIVITIES OF PARENT COMMITTEES

On March 15, 1972, the Committee on Prosthetics Research and Development was transferred from the Division of Engineering to the Division of Medical Sciences, National Research Council—National Academy of Sciences. The Committee on Prosthetic-Orthotic Education continued in the Division of Medical Sciences, in which it had been located since its establishment.

In view of this new alignment, the chairman of the Division of Medical Sciences appointed an *ad hoc* committee to review past and present activities of CPRD and CPOE, and to develop objectives and a plan of organization for continued activity of the two groups. The first meeting of this *ad hoc* committee was held on October 13, 1972, and a second meeting was held on December 15, 1972.

No meetings of the individual CPRD and CPOE committees were held during this report period in view of the organizational transition in progress.

ACTIVITIES OF CPRD SUBCOMMITTEES

Subcommittee on Fundamental Studies

The Subcommittee on Fundamental Studies seeks to stimulate research which will provide basic information prerequisite to the design of

improved prosthetic and orthotic devices, and to provide a better understanding of treatment processes.

Panel on Locomotion and Gait Studies

The Panel on Locomotion and Gait Studies continued its efforts to standardize data-collection procedures, so that data obtained by different laboratories studying gait could be compared.

Subcommittee on Sensory Aids

The Subcommittee on Sensory Aids seeks to encourage and coordinate activities directed to the blind and near-blind, the deaf, and the hard-of-hearing. The Subcommittee is becoming increasingly involved in the evaluation of devices designed to benefit one of the constituent groups.

Clinical Evaluation of Mobility Aids for the Blind

CPRD has played a major role in the evaluation of the Bionic Laser Cane developed under the auspices of the Veterans Administration, and on November 13-14, 1972, CPRD held a conference to try to develop guidelines for the conduct of future projects for evaluation of mobility aids. Also present were key figures in the evaluation of the Kay spectacles. Work in this area will be given high priority.

Clinical Evaluation of Reading Aids for the Blind

With the availability of the Optacon from Telesensory Systems, Inc. and of the Stereotoner from Mauch Laboratories, Inc., it is planned to develop an orderly system for the evaluation of reading machines for the blind. The Subcommittee on Sensory Aids Panel on Evaluation of Ink-print Readers had its first meeting on December 1, 1972, to discuss future work.

Hearing-Aid Performance Evaluation

The Veterans Administration has requested CPRD to form a panel of consultants to advise on hearing-aid performance criteria to be used in the selection of aids for VA purchase. In this connection, the Subcommittee on Sensory Aids intends to pinpoint the areas of research that need to be pursued to identify hearing-aid characteristics that are desirable for various types of hearing impairment.

Eighth Meeting of the Subcommittee

The Eighth Meeting of the Subcommittee was held on December 2, 1972. The results from the other meetings were reviewed. Other topics included a report on staff activities, discussion of the upcoming hearing-aid performance evaluation for the Veterans Administration, and evaluation methodology of sensory aids for the blind.

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Subcommittee on Design and Development

Under the sponsorship of the Subcommittee on Design and Development, periodic conferences are held in five areas: upper-limb prosthetics, lower-limb prosthetics, upper-limb orthotics, lower-limb orthotics, and spinal orthotics. From time to time, the Subcommittee also sponsors conferences and seminars on topics of special interest. During the period of this report meetings held were:

Upper-Limb Prosthetics

The Tenth Workshop on Upper-Limb Prosthetics was held in Atlanta, Georgia, September 21–22, 1972. At this meeting the focus was on the immediate and early fitting of upper-limb prostheses. Surgeons and prosthetists active in this area presented papers on their techniques and results. A report which will serve as a guide for others wishing to enter this field is being prepared for publication.

Lower-Limb Orthotics

The Eighth Workshop Panel on Lower-Limb Orthotics was held in Los Angeles, California, October 2–4, 1972. Emphasis at this meeting was on above-knee (knee/ankle) orthoses and orthotic knee joints providing knee stability. A variety of designs in current use were presented and recommendations for future activity were prepared.

Subcommittee on Evaluation

The Fourteenth Meeting of the Subcommittee on Evaluation was held in Annapolis, Maryland, August 21–22, 1972. A wide variety of subjects was discussed, including the results of the clinical use of the technical analysis forms (AAOS), prescription forms (CPOE), and disability classification forms (IRM). The status of ongoing clinical evaluations was also reviewed, the items being: three ankle/foot orthoses, the Ljubljana Functional Electrical Stimulator, and the VA externally powered upper-limb prostheses. A report on the laboratory study of 12 ankle/foot orthoses at Moss Rehabilitation Hospital was also presented.

An orientation course for the Application and Evaluation of the Medtronic-Rancho Implanted Peroneal Stimulator was held at Rancho Los Amigos Hospital, Downey, California, August 10–11, 1972. This implant system, designated NMA (Neuromuscular Assist), will undergo clinical evaluation in a number of selected treatment centers.

On August 23, 1972, an *ad hoc* Meeting on Upper-Limb Orthotics Systems was held in Annapolis, Maryland. Three different upper-limb orthotics systems are commercially available and each of the prosthetics-orthotics schools (New York University, Northwestern University, and the University of California, Los Angeles) teaches a different system. The

purpose of this meeting was to consider the principles underlying the three systems and to make recommendations for future action.

Subcommittee on Child Prosthetics Problems

The Subcommittee on Child Prosthetics Problems maintained an active research program in prosthetics for children throughout the year and took steps to initiate a research program in children's orthotics. Thirty-one clinics specializing in the treatment of the child with limb deficiencies are now participating in the cooperative research program. Three clinics have been recruited for the initial venture into orthotics. The Assistant Executive Director maintains close contact both with clinics in the program and with those which may participate in the future.

The Assistant Executive Director continued to serve as editor of the publication *Inter-Clinic Information Bulletin*, which is published in cooperation with New York University. Approximately 3000 copies are distributed monthly to physicians, prosthetists, therapists, and others interested in the care of the child amputee.

CPOE EDUCATION ITEMS

The Task Force on Standardization of Prosthetic-Orthotic Terminology

The Task Force on Standardization of Prosthetic-Orthotic Terminology was established by CPOE in March 1971. To date, four workshops have been held to: 1. establish a master prosthetic and orthotic nomenclature system with a functional and anatomical orientation designed for current use, but with sufficient flexibility to allow for future enlargement; 2. classify and define basic prostheses and orthoses; 3. develop subclassifications for the purpose of identifying differences in function, materials, and design; 4. define terminology derived from the master system and its subclassifications; and 5. incorporate terms and definitions in a prosthetics-orthotics glossary.

The fourth workshop of the Task Force was held on July 28, 1972, in Washington, D.C. In prosthetics, the extensive list of terms developed and defined at earlier workshops was reviewed, and the CPRD-CPOE staff agreed to check the list for completeness and to develop definitions for all listed terms—which would then be submitted to selected members of the Task Force for further review. Prosthetics headings and flow charts developed at a previous workshop were also considered, and a prosthetics prescription similar to one produced for orthotics was drafted.

In orthotics, while considerably more work was needed to be done in compiling and defining orthotics terms, a technical analysis form for the lower limb had undergone extensive clinical trials and would soon be

ready for routine use. The analysis form for the upper limb was less well-advanced, but the forms were being readied for clinical trials at selected centers. The previously developed orthotics prescription chart and directions for its use were reviewed and slight revisions suggested. Appropriate prescription charts are now included in the technical analysis forms for both lower and upper limbs.

Standard prosthetic and orthotic nomenclature is essential to the work of CPOE's *ad hoc* Committee on Information Retrieval. These terms are needed: 1. for inclusion in existing retrieval systems, such as the Medical Literature Analysis and Retrieval System (MEDLARS) of the National Library of Medicine and 2. for development of a complementary system to permit retrieval of literature not analyzed and included in MEDLARS. In this latter connection, a list of prosthetic descriptors has been developed and a three-digit code system assigned to these terms. Work has progressed so that immediate action may now be taken to: 1. review and test the proposed terminology list and 2. prepare definitions and cross-references for the terms.

On November 28, 1972, the Assistant Executive Director and Staff Surgeon met with the Chairman of the *ad hoc* Committee on Information Retrieval and other interested parties, including a representative of the Prosthetics and Orthotics Research and Development Unit of the Sanatorium Board of Manitoba who operates a data retrieval system in Winnipeg, Manitoba, Canada. A prime purpose of this meeting was to relate the United States effort under CPOE to activities in this area elsewhere in the world.

Newsletter . . . Amputee Clinics

Newsletter . . . Amputee Clinics, the bimonthly publication of the Committee on Prosthetic-Orthotic Education (CPOE), has been well-received in the 3 years since its inception. A steady increase in circulation (from 1500 to approximately 4000), plus a better-than-average response to frequent survey-questionnaires, evidence reader interest and enthusiasm.

The *Newsletter* is an effective vehicle for communication between amputee clinic chiefs and others involved in the care and management of amputee patients. The three issues published during the period July 1 to December 31, 1972, have reported on such diverse subjects as the current status of immediate postsurgical prosthetic fittings and problems concerning modular endoskeletal prostheses.

SPECIAL MEETINGS AND ACTIVITIES

Rehabilitation Engineering Centers

The Executive Director and members of the Committee on Prosthetics Research and Development participated in a meeting of the Rehabilita-

tion Engineering Advisory Committee of the Social and Rehabilitation Service on October 11, 1972. On October 12, CPRD personnel also participated in an orientation session for Rehabilitation Engineering Centers.

Educational Activities

The Assistant Executive Director continued to serve as honorary secretary of the University Council on Orthotics-Prosthetics Education (UCOPE) and the Conference on Orthotics-Prosthetics Education (COPE). A meeting of members attending the AOPA Assembly was held in St. Louis, Missouri, on October 24, 1972. Together with the chairman of these educational committees, the Assistant Executive Director also attended a meeting of Rehabilitation Services Administration on guidelines for educational training programs.

Hemophilia

In collaboration with the University of Miami, the Committee on Prosthetics Research and Development sponsored a Workshop on the Comprehensive Management of Musculoskeletal Disorders in Hemophilia. This meeting was held in Miami, Florida, on October 12-14, 1972.

American Orthotic and Prosthetic Association (AOPA)

Continued close liaison was maintained with AOPA, the American Board for Certification (ABC), and the newly formed American Academy of Orthotists and Prosthetists (AAOP) by personal contact and by staff participation in various association activities. The Assistant Executive Director attended the AOPA National Assembly on October 22-25, 1972, in St. Louis, Missouri.

Workshop on Injuries of Adolescents in Sports and Recreation

The Committee on Prosthetics Research and Development, in collaboration with the American Academy of Orthopaedic Surgeons and the Rainbow Foundation, sponsored a Workshop on Injuries of Adolescents in Sports and Recreation, held in Cleveland, Ohio, December 4-5, 1972.

International Activities

The Assistant Executive Director attended the ISPO Symposium on Lower-Limb Prosthetics and Orthotics in Sydney, Australia, August 20-24, 1972, and presented two papers. He also attended an ISPO committee meeting held in conjunction with the symposium.

The Assistant Executive Director also attended the ISRD Symposium

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held in Sydney, August 27—September 1, 1972. En route to and from these meetings, he visited rehabilitation centers and limb shops in Japan, Australia, and New Zealand.

On October 19–21, 1972, the Executive Director, the Chairman, and selected members of CPRD served on the faculty of the 7th Annual International Course in Prosthetics and Orthotics of the Swiss Association of Prosthetics and Orthotics (APO) held in Davos, Switzerland. They also participated in the international working group on Specifications for Lower-Limb Modular Prostheses, held in Ascot, England, October 29—November 4, 1972.

A meeting on Functional Electrical Stimulators, held in Ljubljana, Yugoslavia, November 8–12, 1972, was attended by CPRD members and staff.

Proposals Reviewed on Behalf of Sponsors

A total of 31 proposals in the fields of prosthetics, orthotics, and sensory aids were reviewed and appraised by the committee at the request of sponsors (16 new proposals, 15 continuations).

Site Visits

The Assistant Executive Director made a site visit to Mr. Charles N. Bengtson, a manufacturer of special devices for upper-limb amputees, in El Paso, Texas, July 9, 1972.

In addition, the Assistant Executive Director made visits to several Child Amputee Centers, some already participating in the cooperative research program coordinated by the SCPP and some prospective participants. These centers were: Commission for Handicapped Children Amputee Clinic, Kosair Crippled Children Hospital, Louisville, Kentucky; Children's Rehabilitation Center, Buffalo, New York; Georgia Juvenile Amputee Clinic, Atlanta, Georgia; and Amputee Clinic, D.C. General Hospital, Washington, D.C.

Miscellaneous

The staff responded to more than 1500 requests for publications and technical information.

PUBLICATIONS

July 1—December 31, 1972

Annual Summary Report of Activities for Year Ending June 30, 1972 (Report to the Veterans Administration and the Social and Rehabilitation Service from the Committee on Prosthetics Research and Development covering the Fiscal Year 1971–1972.)

- The Child with an Acquired Amputation*, National Academy of Sciences. Proceedings of a symposium held June 9, 1970, under the sponsorship of the Subcommittee on Child Prosthetics Problems.
- Report of Conference on the Long Cane*, September 10-11, 1971.
- Special Considerations Relating to the Child with a Limb Deficiency*, National Academy of Sciences. Proceedings of a symposium held March 23-24, 1972, under the sponsorship of the Subcommittee on Child Prosthetics Problems. (In preparation.)
- Report of Workshop on Fundamental Studies for Internal Structural Protheses*, April 13-15, 1972. (In press.)
- Report of Workshop on Functional Neuromuscular Stimulation*, April 27-28, 1972.
- Report of Conference on Standards for Low-Vision Aids*, May 9, 1972.
- Report of Fourteenth Meeting of Subcommittee on Evaluation*, August 21-22, 1972.
- Report of Ad Hoc Meeting on the Education and Use of Upper-Limb Orthotic Systems*, August 23, 1972.
- A Clinical Evaluation on Below-Knee Orthotics*, Report E-6, 1972.
- Report of Tenth Workshop on Upper-Limb Prosthetics*, September 21-22, 1972. (In preparation.)
- Report of Eighth Workshop Panel on Lower-Limb Orthotics*, October 2-4, 1972. (In preparation.)
- Report of Workshop on the Comprehensive Management of Musculoskeletal Disorders in Hemophilia*, October 12-14, 1972. (In preparation.)
- Report on Conference on The Child With an Orthopedic Disability—His Orthotic Needs and How to Meet Them*, November 19-21, 1972. (In preparation.)
- Artificial Limbs*, Vol. 16, No. 1, Spring 1972.
- Inter-Clinic Information Bulletin*. (Published monthly under the sponsorship of the Subcommittee on Child Prosthetics Problems, 6 issues.)
- Newsletter . . . Amputee Clinics*. (Published bimonthly by the Committee on Prosthetic-Orthotic Education, 3 issues.)