A Summary of Important Activities in Prosthetics During 1953

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A. Research and Development

1. *Newly Available Devices and Techniques:*

(a) The A/K artificial leg with rubber ankle joint, plastic shank, and knee permitting smoother walking and variation of cadence, accepted by the Advisory Committee on Artificial Limbs. (b) The techniques of biceps cineplastic surgery and cineplasty prosthesis fabrication and fitting accepted, to be undertaken only by especially qualified personnel. (c) Outside Locking Elbow Hinge. (d) Variable Ratio Step-Up Hinge. (e) Standard Coloring for Prosthetic Components for the Caucasian shade. (f) Transit Elbow Hinges. (g) Modifications of the Alignment Duplication Jig and the Adjustable Knee for above-knee and below-knee prostheses.

2. *Device and Techniques in varying stages of research and development:*

(a) APRL Below-Knee Wrist Rotation Unit. (b) Standard Coloring for Prosthetics Components — for Negroid shade. (c) APRL No. 9 Hand. (d) Acrylate — Nitrile Glove. (e) Elbow, with separation of controls, improved leverage, and artificial tendons. (f) Electric Elbow Lock. (g) Forearm Terminal Device. (h) Fittings and Hardware — APRL Control System for Biceps Cineplasty for Below-Knee Amputees. (i) Reflex Hand and Hook. (j) University of California A/K leg with polycentric knee linkage and hydraulic control of swing phase friction. (k) Stewart Hydraulic Leg. (l) Henschke-Mauch Hydraulic Leg. (m) University of California Ankle incorporating a spherical bearing which supports vertical load and allows transverse rotation to be independent of the load on the ankle. (n) Below-Knee Soft Socket. (o) Below-Knee Suction Socket. (p) Development of a pressure gauge by staffs of Franklin Institute, New York University, and Prosthetic Testing and Development Laboratory, to measure pressure between a below-knee stump and socket. (q) Armamentarium boards of latest upper extremity devices and components for use by all VA Orthopedic and Prosthetic Appliance Clinic Teams. (r) APRL Hand Sizing Project.

3. *Other Research and Development Activities:*

(a) OALMA New Devices Project — described in Orthopedic and Prosthetic Appliance Journal, June 1953, page 5. (b) Revised transition procedures in the Artificial Limb Program. (c) Initiation of a lower extremity prosthetics clinical study by University of California at Berkeley, with cooperation of Western Orthopedic and Prosthetic Institute, Navy Artificial Limb Shop at Oak Knoll, California, artificial limb shops in Bay Area, Veterans Administration

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Regional Office in San Francisco, and California Bureau of Vocational Rehabilitation. (d) Testing of commercially available knee units and leg set-ups by staff of Prosthetic Testing and Development Laboratory. (e) Continued activities by Prosthetic Testing and Development Laboratory to attain the most durable and functional brace design, capable of standardization, and to determine and improve the most economical and efficient methods of brace fabrication. (f) Investigation of stump sock durability and physical properties of textiles conducted by Prosthetic Testing and Development Laboratory. (g) Child amputee prosthetics program involving Michigan Crippled Children's Commission, NYU, APRL, UCLA, and the Marion Davies Clinic. (h) Improvements to socket duplicator by Prosthetic Testing and Development Laboratory to provide facility for duplicating below-knee sockets in addition to above-knee sockets. (i) Final report by University of Denver on below-knee joints with the recommendation that principles developed be incorporated in existing programs in the below-knee field. (j) Near-completion of energy studies at University of California at Berkeley with a forthcoming final report showing the relation of the energy problem to the mechanical design features and functional characteristics of prostheses. (k) Undertaking of a follow-up program by the staff of NYU Prosthetic Devices Study, as a part of its field test program to evaluate the effectiveness of new upper extremity devices and techniques.

B. Information and Education

1. *Training:*

(a) Suction Socket Course conducted by OALMA and VA during week of March 2, 1953. (b) Suction Socket Course conducted at UCLA by the Prosthetic Devices Research Project, University of California, Berkeley, with cooperation of local industry, during week of August 24, 1953. (c) Advanced Training Course for VA Orthopedic Shop Supervisors held in New York from January 12, 1953 to February 13, 1953. (d) Completion of six sections of the Upper Extremity Courses at UCLA. (e) College-level extension courses at UCLA for local industry, enlarging upon courses previously held at a local technical high school. (f) Regional OALMA educational programs.

2. *Certification:*

(a) Procedures for certifying suction socket limbfitters revised and strengthened — see "The OALMA Almanac", July 30, 1953. (b) Steady growth in number of individuals certified.

3. *Films:*

(a) "Upper Extremity Prosthetics" reviewed and accepted by the American College of Surgeons; shown routinely at each section of UCLA's courses; seen by a number of OALMA Regional Groups, rehabilitation agencies, hospitals, as well as by VA personnel. (b) Work begun on script for a second film on research and development aspects of upper extremity prosthetics. (c) Continued showings of "Suction Socket Artificial Limb" and other specialized prosthetic films.

4. *Selected Reports and Books:*

(a) *Manual of Upper Extremity Prosthetics prepared* by UCLA, widely distributed by OALMA. (b) *Orthopedic Appliances Atlas — Volume I* distributed to all VA stations and to other interested people and agencies, and widely purchased by surgeons, orthotists, etc. (available from OALMA). (c) *Human Limbs and Their Substitutes*, prepared under the supervision of ACAL, scheduled to be published in January, 1954; galley proofs reviewed. (d) Final Report on "A Program for the Improvement of

the Below-Knee Prosthesis with Emphasis on Problems of the Joint", submitted by Denver Research Institute of University of Denver. (e) *Construction Manual for the U. S. Naval Soft Socket for Below-Knee Artificial Limbs*, published by U. S. Naval Hospital, Oakland, California. (f) *The Functional and Psychological Suitability of an Experimental Hydraulic Prosthesis for Above-the-Knee-Amputees*, by the staff of the NYU Prosthetic Devices Study to cover tests of Stewart-Vickers leg. (g) Revision of the Brochure on Above-Knee Suction Socket Prosthesis by OALMA and University of California at Berkeley; publication expected in January, 1954. (h) *Studies of Eleven Below-Knee Amputees Fitted with Soft Socket Prostheses* — Special Report 1-4 prepared by Prosthetic Testing and Development Laboratory.

5. Exhibits, demonstrations, National Assembly of OALMA and American Board for Certification, and Regional OALMA meetings.

5. Prosthetics Reference Exhibit at Veterans Administration Regional Office in New York; distribution of prosthetic literature to many interested people and agencies.

Wearers of Leg Braces Voice Approval

General satisfaction with the design and function of their leg braces was voiced in answers to a questionnaire survey sent to 1200 males.

The questionnaire was developed by Dr. Lawrence Frederic Abt of VA's Prosthetic and Sensory Aids Service. State directors of the U. S. Office of Vocational Rehabilitation distributed the questionnaire forms to male leg brace wearers between the ages of 20 and 60.

The principal findings were:

1. The majority have a highly favorable reaction to their present braces.
2. Most of those answering stated that their leg braces were comfortable.
3. There is a considerable preference expressed for lighter, and at the same time equally strong, braces.
4. Leg braces cause constant and considerable damage to clothing, but this is not regarded by wearers as serious.
5. Breakage of the brace is common but is expected.
6. Braces show wear, but the average wearer is prepared for dealing with this problem.
7. Noises caused by braces are common but not usually embarrassing or bothersome.
8. Questionnaire respondents report that leg braces have been extremely helpful in minimizing their disabilities.

Commenting on the survey, Dr. Abt declared that "Very few of the respondents consider that their braces are poor or very poor, and in this fact can lie a great deal of satisfaction for all those concerned with the design and fitting of leg braces."

Copies of the complete report on the questionnaire may be borrowed from the Headquarters Library of OALMA and the American Board for Certification.

• PAUL E. LEIMKUHLER gave a lecture and demonstration on U/E prosthetics before the North Eastern Ohio Physical Therapy Assn. at their recent meeting in Cleveland, Ohio.

• THE S. H. CAMP COMPANY of Jackson, Mich. has introduced a new pelvic binder for men and women. This features a new "contour cut" for better fitting and comfort.