BOOK REVIEWS

Fabrication Procedures for the ISNY Above-Knee Flexible Socket. By Staff, Prosthetics and Orthotics, New York University in collaboration with Ossur hf (Iceland) and Een-Holmgren AB (Sweden). New York: New York University Post-Graduate Medical School, 1984. 18 pp. Paper, $7.50

The Icelandic-Swedish-New York (ISNY) socket system consists of two structures: a thin, pliable, translucent socket and a rigid frame. Originated in Iceland, the system has become increasingly popular throughout the United Sates and in many countries throughout the world. The new approach provides the amputee with such advantages as improved comfort in walking and sitting, lighter weight, faster heat dissipation, increased sensory input, and greater freedom for muscle activity. The manual is intended as a complement to an instructional course on ISNY socket fabrication.

The four steps in socket fabrication are model preparation; vacuum-forming the socket; lay-up of the supporting frame; and lamination, trim, and completion. Conventional procedures are used to prepare the modified plaster model of the amputation limb, except that the medial and posterior socket brims should be slightly wider than usual. A special procedure is used to apply the suction valve to the model. Vacuum-forming involves heating and applying Ethylux polyethylene or Surlyn over the model, and at the appropriate point of plastic stretch, applying vacuum to create a transparent replica of the model.

The supporting frame is composed of a lamination of nylon stockinette, carbon fiber tape, fiberglass, and Dacron felt at the distal end. The sequence and orientation of each material are illustrated. If a pelvic belt is to be included in the prosthesis, the proximal border of the frame surrounds the limb; otherwise, the frame covers only the anterior, medial, and lateral portions of the upper section of the socket.

The finishing steps of lamination, trim, and completion of the frame are to be accomplished with rigid polyester or acrylic resin. Procedures for removing the laminate from the model and for accommodating for any shrinkage of the polyethylene socket are described. The remainder of prosthetic fabrication including socket extension, dynamic alignment, and prosthesis completion are to be done conventionally.

The manual concludes with suggested sources of equipment and supplies. Because the ISNY above-knee prosthetic socket is enjoying increasing popularity, it is especially important that prosthetists be adept in its fabrication. This manual, generously illustrated with clear photographs, is a most effective way of enhancing prosthetic skill, and is therefore to be considered an important part of the prosthetists's library.

An Introduction to Myoelectric Prostheses. By R. N. Scott. Fredericton, New Brunswick: The Bio-Engineering Institute, University of New Brunswick, 1984. 17 pp. Paper.

Myoelectrically controlled upper-limb prostheses are attracting a considerable amount of attention in professional and popular circles. Many articles on the topic are scattered in biomedical, engineering, and medical journals worldwide, yet no consolidated text has been published. To remedy this defect, the University of New Brunswick Monograph Series has been created. The monographs are addressed to professional workers, students, and prosthesis users. The current monograph is the first in a series of publications intended to consolidate information on myoelectric control.

The opening historical perspective dates the first practical myoelectrically controlled prosthesis as the one demonstrated in Hannover in 1948 by Reinhold Reiter. The concept lay dormant until Kobrinski displayed his version in Moscow 1960. An increasing number of investigators in the United States, England, Denmark, Sweden, Japan, Canada, Germany, and Austria have conducted research designed to refine the approach, in several instances culminating in commercially available devices.

Scott, who is the Director of the Bio-Engineering Institute at the University of New Brunswick, proceeds with a detailed analysis of the constituents of the prosthesis. He notes that the concept of myoelectric control is very simple: the wearer uses an electric signal from a muscle to control the flow of energy from a battery to a motor. The below-elbow prosthesis which is the most popular example of myoelectric control involves five elements, namely the myoelectric signal, electrodes, controller, battery, and appliance, such as a prosthetic hand.

Clinical considerations are described in terms of patient selection. While no one in the author's experience was unable to operate a myoelectric prosthesis, some individuals do not derive much benefit from the type of control. The most likely candidate is a unilateral below-elbow amputee, especially one with congenital anomaly who is younger than 3 years of age. Whether myoelectric prostheses should be reserved

for clean, light work or whether the greater grip strength should be used in industry are debatable issues. Prosthetic considerations focus on the need to keep electrodes in constant, firm contact with the skin. Therapy depends on the therapist's understanding of the mode of control. The ability to operate a prosthesis is not synonymous with functional proficiency in daily activities. Teamwork is essential to enable the wearer to derive the maximum benefit from the myoelectrically controlled prosthesis.

The monograph concludes with an extensive bibliography, list of manufacturers and distributors, and basic electrical terminology and concepts.

Scott has fulfilled his goal admirably, providing the reader with a comprehensive introduction to the field, without dwelling on the attributes of any one system. The illustrations, particularly the line drawings, enhance the text. While details of content and publication date of future monographs do not appear in this issue, their publication will be a welcome complement to the series. In the meantime, clinicians and investigators concerned with upper-limb prosthetics will find *An Introduction to Myoelectric Prostheses* most worthwhile.

JOAN E. EDELSTEIN