

## SOME NEW CHALLENGES

... *guest editorial*

George T. Aitken, M.D.<sup>a</sup>

College Avenue Medical Building  
50 College Avenue S.E.  
Grand Rapids, Michigan 49503

Orthopedic Surgeon  
Mary Free Bed Guild Children's Hospital  
920 Cherry Street S.E.  
Grand Rapids, Michigan 49506

Prosthetic and orthotic research and development are entering a new decade.

In 1970 the Committee on Prosthetics Research and Development and the Prosthetic and Sensory Aids Service of the Veterans Administration jointly celebrated their twenty-fifth anniversaries. In those twenty-five years great advances were made, primarily in the area of prosthetics. New materials were introduced; fitting and fabrication techniques were improved; socket design was altered; and the design and fabrication of shelf item components were radically altered.

All concerned with this field have become aware of such items as SACH feet, improved elbows, hydraulic-knee mechanisms, quadrilateral-shaped sockets, patellar-tendon-bearing sockets, and, more recently, the patellar-tendon-bearing socket with supracondylar suspension. As many of the recurrent everyday problems have been at least reasonably resolved, efforts, energies, and monies have been available to explore the more esoteric aspects of prosthetics and orthotics.

The activities in recent years have been focused on external power, and principally on improvement in functional regain for upper-limb problems. There exist at the present time multiple prototypes of externally powered upper-limb components. Many of these show great promise. Unfortunately, there is no mechanism at the present time to develop suitable numbers of test items to do a satisfactory preliminary

---

<sup>a</sup> Chairman, Subcommittee on Child Prosthetics Problems, Committee on Prosthetics Research and Development, National Research Council. Immediate Past-President, American Academy of Orthopaedic Surgeons.

clinical survey of these prototypes. As a result, only a very limited number of such items are commercially available.

The introduction of external power has also produced a problem in the area of prosthetic fabrication and service. Because the power source most frequently used is electricity, it is now necessary in order to offer good prosthetic service that there be available in the local limb shops people qualified to do electronic-type repairs on externally powered prostheses. People with these skills are not available in the volume necessary, and so, widespread use of these types of limbs is potentially defeated by the lack of readily available services.

It is unfortunate that we have to date failed to muster the resources necessary to manufacture suitable numbers of what appear to be promising prototypes. This is a difficult problem. It is one, however, that must be solved if we are to continue sophisticated research and development in this area.

It also will be necessary to develop adequate personnel to service externally powered prostheses. Our current educational efforts in our prosthetic and orthotic schools will have to be expanded to include training in these areas if such limbs are to become practical. The whole concept of functional lower-limb plaster cast orthotic devices for the early ambulation of patients with lower-limb fractures has introduced a new element in the field of orthotics. This is as radical a change as was the concept of immediate postsurgical fittings of amputations. It, too, will require alterations in prosthetic education in order to accommodate for this type of multidisciplinary approach to a motor-skeletal problem.

The new decade promises to be interesting, stimulating, and it warrants our continuing interest and activities.