which had been accumulating in the major health science centers out to where the underserved needs were, and some decentralized training of health manpower was a by-product of this. More recently Area Health Education Centers in the model of the Carnegie Report are being tried in several areas of the nation. In this model, major health science centers undertake to carry out training programs for interns and residents in primary care specialties and clinical training for medical students in underserved areas in the expectation of attracting physician manpower to the area and of improving both the quantity and the quality of the services. This model is now being tested, and how successful it will be is not yet known. It is worth noting in passing that in each of these approaches a major health science center, often a university medical center, seems to play a significant if not an essential role.

As reported elsewhere in this issue, the states of Washington, Alaska, Montana and Idaho (WAMI) have now banded together in yet another experiment in bringing medical education to underserved areas. In this model the University of Washington School of Medicine plays the central role and ways have been found to conduct both preclinical and clinical instruction of medical students in underserved areas, yet under the aegis and supervision of the medical school. As the program gets underway it should serve effectively to decentralize a number of aspects of medical education, and so permit a larger number of students to be enrolled. It also should upgrade the quality of care in underserved areas and make practice there more attractive to physicians. And it will certainly provide a better opportunity for young Americans in these areas to embark on a career in medicine. If the program succeeds, the University of Washington will have taken another pioneering step not only in medical education but in identifying a role for a university medical center in helping to overcome some of the problems of physician distribution in underserved areas.

The WAMI project will be watched with interest.

—MSMW

Myelomeningocele

REVOLUTIONARY CHANGES have occurred in the management of myelomeningocele during the past 15 years. This disease is the second most common chronic disabling condition of childhood, occurring with a frequency of about 1 per 800 births. The current concepts and therapeutic recommendations of a group active in this field are presented in this issue.

Basic to rational treatment of any disease is an understanding of its cause, mechanisms and natural history. The cause of myelomeningocele is unknown although it is clearly linked to other neural tube defects and has a familial incidence with about a 5 percent recurrence risk. Studies suggesting a causative link with potato virus need further confirmation.[1]

The embryologic insult occurs early in gestation, probably between the 21st and 28th days and is characterized by leakage of spinal fluid and a discrepancy between growth of mesodermal and ectodermal tissue. If spinal fluid leaks into the amniotic fluid it is detectable by the presence of alpha-fetoprotein. Amniocentesis is recommended for mothers known to be "at risk."[2] A further important concept sometimes not well appreciated is that the neurological lesion is not simply a lower motor neuron lesion. Rather, isolated cord segments may exist producing a mixture of spasticity and flaccidity which affect not only the peripheral muscles but the bladder as well.

Before present-day treatment programs, disability was severe and long-term survival was rare. It remains true that chances for survival past the intrauterine period are limited but the rate of survival from birth to age two is now around 60 percent. Considering the multiple handicaps and hazards of surgical operation and sepsis, this is a remarkable achievement. These children face odds of hydrocephalus in about 75 percent of cases, severe retardation in about 10 percent, urinary tract infection in most and variable degrees of motor dysfunction in nearly all.

Perhaps the most controversial issue in treatment has been whether to do immediate closure or delay this procedure.[3,4] The case for closure within the first 24 hours to prevent further neuro-

logical damage is shaky at best, but closure of the persistent meningocoele is clearly desirable. Surgical correction of a kyphotic deformity at the time of initial closure has proven to have substantial mortality and recurrence risk, yet it may prove justifiable as techniques improve.

Urinary tract failure remains the most common cause of death after infancy. It is now well recognized that only a few children with myelomeningocele have normal bladder function at birth and reflux in the newborn has been reported as high as 25 percent.[5] Reflux in the presence of persistent sepsis may require ileal or colonic loop diversion, improving chances of survival for all and creating an improved social situation for girls.

Management of skeletal deformities has undergone considerable change. Some operative procedures initially greeted with enthusiasm have proved to be of questionable virtue. Multiple fusion procedures in the feet have proved untenable because of trophic ulceration and neuropathic fusion breakdown. The heralded psoas transfer through the ilium to the greater trochanter has been shown to have limited function and has not consistently achieved hip stability.[6] External appliances to control scoliosis have been unsatisfactory, requiring use of both anterior and posterior stabilization procedures on the spine. Newer procedures such as Achilles tenodesis to the fibula to correct calcaneus deformity show promise.[7]

The concept that emerges from the collective experience is that this condition needs to be treated very well or not at all. Surgical procedures are used first to enhance survival and for early control of hydrocephalus. Early detection and treatment of urinary tract sepsis is the next priority. Procedures to produce a straight spine, straight knees and mobile hips and feet follow. The need for these procedures is reasonably predictable so they may be carried out early to allow maximum social and educational opportunities.

Successful treatment demands a multiple discipline approach. The challenge of developing a well-functioning team of specialists, which includes social workers, public health nurses and psychologists as well as physicians, requires a significant commitment of all involved in addition to administrative skill.

In spite of a large collective experience many questions remain unanswered. Treatment programs differ in philosophy and methods, and each center continues to alter its program.

Superimposed on the medical challenges has been the moral issue of whether treatment should be withheld. Sophisticated evaluation of motor, sensory, intellectual and urinary systems in a sick newborn child are impossible. A variety of clues have been used to prognosticate and it is clear that selection is being practiced to varying degrees in all centers dealing with this condition. Considering the advances in management during the past 15 years and the uncertainty of prediction, caution should be exercised in this endeavor to be merciful.

RODNEY K. BEALS, MD
Professor of Orthopedics
University of Oregon Medical School
Portland

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National Health Insurance

An Opportunity for a New Approach

At this writing National Health Insurance (NHI) now seems unlikely to be passed into law by this Congress. It may be significant that even behind closed doors and pressured by its powerful chairman, the Ways and Means Committee did not come together on an NHI bill to place before the House of Representatives at this time. The matter has been under discussion for decades. But somehow the approach used has not yet worked. But if there is in fact a need for some form of NHI, and it is generally believed that there is, then a problem exists which should be solved.

The approach that has been used at the national level appears to be the adversary approach that has now come to characterize so much of the American way of trying to solve problems and disagreements. (This adversary approach is to be