Physical Therapy Services in the Developmental Disabilities

SIXTH PRINTING

Edited by

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With a Foreword by

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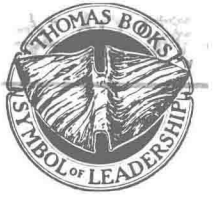

CHARLES C THOMAS · PUBLISHER
Springfield · Illinois · U.S.A.

Published and Distributed Throughout the World by
CHARLES C THOMAS • PUBLISHER
BANNERSTONE HOUSE
301-327 East Lawrence Avenue, Springfield, Illinois, U.S.A.

ISBN 0-398-02377-8
Library of Congress Catalog Card Number: 78-180820

First Printing, 1972
Second Printing, 1975
Third Printing, 1976
Fourth Printing, 1976
Fifth Printing, 1977
Sixth Printing, 1978

Printed in the United States of America
N-1

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This book is dedicated to all who work for the welfare of children.

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FOREWORD

In this book, it is good to see emphasis placed on evaluation of developmental progress early in infancy. Enough detail is given in the various presentations of modes of intervention to provide the therapist with a working knowledge of each approach described. Though the title suggests that the book is directed to the physical therapist, perusal of the volume reveals detailed modes of evaluation and management which should be of equal interest to the occupational therapist, the speech pathologist, and nurses and physicians concerned with developmental disabilities. In respect to the infant and very young child, members of all these disciplines should be familiar with the developmental reflex continuums which are so clearly described by the various authors. The chapter on feeding and prespeech by a speech therapist provides practical detailed information of special value to all.

In the field of developmental disabilities, the need for the therapist (physical, occupational, or speech) to be skilled in the teaching of parents and others as a way of extending her effectiveness is aptly and amply stressed. The need for the physical therapist to confer with other disciplines is also appropriately stressed. For the infant and very young child, consideration of assigning only one therapist to carry out treatment recommendations for each child was suggested by one author, while other therapists would serve as consultants. Our experience has supported this approach.

In addition to knowledge about motor development, therapists and those dealing with infants and young children need to be familiar with other aspects of normal child development. As indicated by the author of the chapter on residential treatment, sensory and intellectual training are equally important. Sensory input (vision, hearing, kinesthetic and tactile sensations) first enables the infant to come in contact with his environment. The

physical therapist needs to be concerned with sensory input as well as with "handling and positioning." Motivation for initiation of voluntary movement, often being with visual, auditory, or sensory input. Normal reinforcement of movement surely is directly related to success in accomplishing the goal toward which the movement is directed.

Until now, teachers have been involved with learning problems mainly at kindergarten level and above. Increasing knowledge of the tremendous amount of learning achieved before kindergarten age is leading them to take a new look at the infant. By watching therapists in their skillful but frequently frustrating attempts to motivate young children to perform some motion, and by observing the teacher trained in normal child development and experienced with very young children, the special skill of the teacher in motivating the child becomes evident. In order to accomplish the most, the person working with the infant and young child, as well as with the older child, needs to know not only the appropriate intervention but the level of the child's understanding and his personality characteristics. She needs also to be sensitive to the moods of the child and aware of his level of fatigue. The role of teacher is just beginning to become defined. She will need to have a background in normal child development, a fondness for young children, and an ability to handle them. An appreciation for the need to utilize such activities as diapering, potty training, and feeding as training experiences is important. In addition, she must be willing and able to seek and utilize consultants regarding each individual child's needs.

The inclusion in the book of suggestions for the child with minimal physical handicap should prove valuable not only to the physical therapist but also to the physical education teacher. Throughout the book, the many excellent illustrations serve to make the contents more explicit. Authors have been careful to document their contributions, providing good bibliographies. Not included in the references are two which may be of special interest. Prone boards as described by J. U. Bauman,* which as-

*Baumann, J. U.: *Operative Behandlung der Infantilen Zerebral Paresen.* Stuttgart, G. T. Verlag, 1970.

sist in developing weight bearing and head, arm, and hand control for children who do not use long leg braces as well as those who do, have been more useful than the conventional standing boxes in our experience. Another reference relates to music therapy. Nordoff and Robbins,† one a musician and the other a teacher, collaborated on a book for the nontechnician describing techniques for both group and individual training for handicapped children. A demonstration of their approach in working with a group of severely involved cerebral-palsied children at St. Brendan's Clinic in Dublin, Ireland, was so spectacular as to make one wish that a film had been made of the performance.

The area of training the atypical child is a most exciting one. New approaches are being developed and more are needed. Knowledge gained from such efforts can be expected to bring information useful for the "normal" population in addition to providing assistance for the atypical children.

MARGARET JONES

†Nordoff, P. and Robbins, C.: *Music Therapy for Handicapped Children*. New York, Rudolf Steiner, 1965.

PREFACE

> Envy wears the mask of love, and laughing sober facts to scorn,
> Cries to Weakest as to Strongest, "Ye are equals, equal born."
> Equal born? Oh yes, if yonder hill be level with the flat.
> Charm us, Orator, till the Lion look no larger than the Cat.
>
> —Alfred Tennyson

The decade of the 1960's showed a tremendous increase in general interest in those who are "unequal born," the child with mental retardation, cerebral palsy, myelomeningocele, or other conditions now being called the developmental disabilities. Stimulated by such voluntary organizations as the National Association for Retarded Children, United Cerebral Palsy Associations, Inc., the National Foundation—March of Dimes, and the Easter Seal Society to name but a few, and given visible leadership by the Kennedys and fueled by an infusion of federal and local funds, the 1960's saw valiant attempts made to overcome decades of neglect for these forgotten citizens.

While most of the attention was focused on mental retardation, and rightly so in terms of sheer numbers, there was also an awakening of interest in those conditions requiring physical rehabilitation. As a result, the pediatrician and family physician, as well as the orthopedist dealing with handicapped children are being required to make more and more decisions which involve the use of the allied health professions and the physical therapist in particular.

The great majority of physicians and physical therapists now in practice were not exposed during their training to many of the techniques now in use and to the more optimistic attitudes accompanying them. The editors, therefore, have attempted in this book to provide information on physical therapy services for children with developmental disabilities which would orient and

guide the physician to more effective use of the physical therapist and provide for the interested physical therapist an introduction to the newer treatment concepts and techniques.

Traditionally, the greatest use of physical therapy in the developmental disabilities of children has been in the assessment and treatment of cerebral palsy. Increasing recognition that below normal intelligence was not a valid reason for exclusion from treatment has gradually resulted in greater acceptance into the clinical practice of physical therapy of other physical handicaps such as arrested hydrocephalus, myelomeningocele, Down's anomaly, and even simply motor delay secondary to severe mental retardation. Recently, some physical therapists have expanded their areas of interest to include diagnostic and remedial procedures for those children with perceptual-motor and visual-motor disabilities. Since many of the numerically large group of mildly retarded have these more subtle, yet serious, functional handicaps, the physical therapist's contribution to the management of children with developmental disabilities should increase considerably in the future.

Physical therapy is one of the youngest of the health professions. During World War I the United States Army employed women as "restoration aides" to care for the tens of thousands of war casualties. Over the years more formalized training programs developed and the scope of their activities broadened along with the growth of physical and rehabilitative medicine. Perhaps because their origins were in rehabilitative care, physical therapists in this country, when treating cerebral palsy, have tended to borrow from techniques developed from orthopedic surgery, post-traumatic paraplegia, poliomyelitis, and so forth. In classic training, this would involve manual muscle testing, range of motion measurements, electrical diagnostic procedures, sensory tests, measurement of respiratory function and assessment of functional and daily living skills; treatment procedures included passive stretching, range of motion exercises, muscle reeducation and strengthening.

The lack of success from these essentially "peripheral" approaches to the treatment of symptoms of central or develop-

mental origin may account in part for the lack of enthusiasm on the part of many physicians for physical therapy in the early treatment of cerebral palsy. It seems clear that there should be a basic difference in the requirements, both diagnostically and therapeutically, for those conditions arising from damage to the developing fetal or infant brain and those resulting from injury to more peripheral structures under the influence of a developed or normally developing brain.

Temple Fay (1946) was perhaps the first to take a *central* developmental approach to the treatment of cerebral palsy. Based on the neurophysiologic principle that normal postures and patterns of movement are arrived at through a series of ontogenetic developmental steps, he recommended the use of the amphibian crawl as a "necessary step in the long series of levels, through creeping, crawling, and scampering, to eventual standing and walking." It should be pointed out that Fay (1946) presented this recommendation as simply "an additional technique of training for certain cerebral palsy types. . . ."

The major systems of physical therapy chosen for inclusion in this book are the Bobath or neurodevelopmental approach, the Kabat or proprioceptive neuromuscular facilitation, and the Rood or sensorimotor approach to treatment. Critics have questioned the scientific basis for these systems (Mead 1968). Nevertheless, they have gained advocates among those working with cerebral palsy and the other developmental disabilities. The Bobath approach, in particular, is rapidly gaining international acceptance as the most effective approach to the treatment of cerebral palsy, especially in the very young child (Ellis 1967, Kong 1966). Their techniques, and to a lesser extent, the Rood techniques, are particularly attractive to those working with the mentally retarded and the very young since they do not require that the patient be able to consciously cooperate or be particularly attentive. The proprioceptive neuromuscular facilitation techniques employ passive, active, and resistance motions requiring more understanding and cooperation on the part of the patient.

For the physician, one of the sharpest criticisms that can be directed towards any therapy is that it is based on incorrect in-

terpretations of physiologic principles. There is no doubt that the theories offered in support of these lines of therapy may be difficult to justify on known neurophysiologic grounds. Nevertheless, as pointed out by Sedgwich Mead (1968) in his 1967 presidential address to the American Academy of Cerebral Palsy, "Neurophysiologic doctrine is a most perishable commodity and it is a mistake to pin one's hopes on a current interpretation."

Ellis (1967) argues that particularly "in the case of the Bobaths' method of treatment, a theoretical explanation had to be found for the method of treatment which was successful in practice. Our knowledge of the function of the higher levels of the central nervous system may still be inadequate to explain observed facts."

Commenting on the very early treatment of cerebral palsy, Dennis Browne (1966) put forward two principles:

> (1) When the outcome of doing nothing is uncertain, all cases should be treated without exception. This applies just as much to cerebral palsy as to congenitally unstable hips or to scoliosis of the newborn. Most of these correct themselves spontaneously, but if they are left to see which will and which won't, there is a residue of disasters.
> (2) In any congenital abnormality, the earlier treatment is started, the better the results.

It can also be pointed out that while there is no doubt that the basis of these lines of therapy may be difficult to justify on present neurophysiologic knowledge, explanations which are not accepted as dogma in themselves may be the stimulus for fruitful investigations, debate, and discussion and lead to better understanding. There is a wide gap between dogma and a questioning eclecticism. At the same time, to deny available methods when the outcome of doing nothing is uncertain will, as Dennis Browne says, leave a residue of disasters.

The editors take full responsibility for the selection of those systems of treatment included and for those omitted. Space limitations combined with personal judgement, or bias, dictated the selection of the material included. On this point, some criticism could be made for including a chapter on speech therapy in a book on physical therapy services. The decision to include Miss

Mueller's chapter was dictated both by the desire to familiarize the American reader with her work as well as the possibilities this chapter contains for direct application by physical therapists.

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REFERENCES

Browne, D.: Very early treatment of cerebral palsy. *Develop Med Child Neurol, 8:*473, 1966.

Ellis, E.: *The Physical Management of Developmental Disorders.* Little Club Clinics in Developmental Medicine, No. 26. The Spastics Society, Medical Education and Information Unit. London, Heinemann, 1967.

Fay, T.: Observation on rehabilitation of movement in cerebral palsy problems. *W Virginia Med J, 42:*77, 1946.

Kong, E.: Very early treatment of cerebral palsy. *Develop Med Child Neurol, 8:*198-202, 1966.

Mead, S.: Presidential address. The treatment of cerebral palsy. *Develop Med Child Neurol, 10:*423-426, 1968.

ACKNOWLEDGMENTS

We first wish to thank the contributors to this volume for their patience with the editors and their editing. The considerable contributions of Mrs. Leila Green and Mrs. Nancy Fieber in the editing process also must be acknowledged. We are equally indebted to Judy Welk, artist and friend, who prepared the illustrations for Chapter Ten. Last, but not least in importance, was the cheerful forbearance of Miss Kathy Moore who typed and retyped the manuscript.

P.H.P.
C.E.W.