

Exploratory and Analytical Survey of Therapeutic Exercise\*

Official Program

Northwestern University Medical School

Programs in Physical Therapy

July 25 - August 19, 1966

\*Supported in part by grants from: Children's Bureau, Welfare Administration; Mental Retardation Branch, Division of Chronic Diseases, Public Health Service; and, Vocational Rehabilitation Administration; all of the Department of Health, Education, and Welfare, Washington, D. C.



## Exploratory and Analytical Survey of Therapeutic Exercise

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\*The Resident Staff will participate in various ways throughout the four  
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\*Group Leaders with Recorders and Alternate Recorders, and Expositors of  
Methods for Facilitation and Inhibition of Motor Activity with Demonstrators  
of Traditional Methods have been listed on subsequent pages and are not  
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Day 1  
Monday  
July 25  
Morning

8:30 Registration

OPENING SESSION

Chairman: Elizabeth C. Wood, M.S.

9:30 Greetings

10:00 Delineating the Dilemma  
Harry D. Bouman, M.D.

10:30 Objectives of the Project  
Elizabeth C. Wood, M.S.

11:00 Present Practices in the Clinical use of  
Therapeutic Exercise  
Panel Presentation  
Group Leaders:  
Dorothy Pinkston, M.Ed.  
Jeanne Schenck, M.A.  
Helen V. Skowlund, M.S., Chairman  
Wallace S. Strittmatter, B.S.  
Barbara E. Teasdale, M.A.

12:00 Luncheon



Day 1  
Monday  
July 25  
Afternoon

### NORMAL MOTOR BEHAVIOR

Chairman: Clara M. Arrington,  
Physical Therapy Consultant,  
Division of Health Services,  
Children's Bureau

1:30 Development of Normal Motor Behavior  
Miriam Jacobs, M.S.

3:00 Intermission

3:30 Mechanisms Underlying Normal Motor Behavior  
Alfred J. Szumski, Ph.D.

4:30 Bases for Therapeutic Exercise  
- Susanne Hirt, M.Ed.  
5:00

8:00 Film Theater  
- Developing Motor Behavior  
9:30

Day 2  
Tuesday  
July 26

MECHANISMS UNDERLYING MOTOR BEHAVIOR

Chairman: Carol A. Ethun,  
Physical Therapy Consultant,  
Mental Retardation Branch,  
Division of Chronic Diseases,  
Public Health Service

- 9:00      Peripheral Receptors: Vision and Hearing  
            Harlow W. Ades, Ph.D.
- 10:30     Intermission
- 11:00     Skin, Muscle, and Joint Receptors  
            Earl Eldred, M.D.
- 12:00     Luncheon

Chairman: Florence S. Linduff,  
Consultant, Physical Therapy,  
Division of Training,  
Vocational Rehabilitation Administration

- 1:00      Motor Functions of the Central Nervous System  
            Extensor Reflexes - Postural Mechanisms  
            Demonstrations: Recordings of Sensory Receptor  
                                 and Motoneuronal Discharge Patterns  
                                 (Materials Supplementary to Official Program)  
            Jennifer S. Buchwald, Ph.D.
- 2:30      Intermission
- 3:00      Dr. Buchwald continues.
- 4:00      Questions and Answers  
            - (Related to Days 1 and 2)
- 5:00      Resident Staff and Speakers



Day 3  
Wednesday  
July 27

MECHANISMS UNDERLYING MOTOR BEHAVIOR, contd

Chairman: Dorothy E. Voss, B.Ed.

- 9:00 Motor Functions of the Central Nervous System  
Flexor Reflexes - Avoidance Responses  
Voluntary Movements  
Availability of New Pathways for Reflex or  
Voluntary Movements  
Demonstrations continue.  
Jennifer S. Buchwald, Ph.D.
- 10:00 Intermission
- 10:30 Dr. Buchwald continues.
- 12:00 Luncheon
- Chairman: Ernst Fischer, M.D.
- 1:00 Contraction of Skeletal Muscle  
Sheppard M. Walker, Ph.D.
- 2:00 The Visceral Nervous System and Skeletal Muscular  
Activity  
W. B. Youmans, Ph.D., M.D.
- 3:00 Intermission
- 3:30 Dr. Youmans continues.
- 4:30 Questions and Answers  
- (Related to Day 3)
- 5:00 Resident Staff and Speakers

Day 4  
Thursday  
July 28

NEUROMOTOR MECHANISMS OF VITAL AND RELATED FUNCTIONS

Chairman: Lois M. Wellock, Ph.D.

- 9:00      Film Theater  
            Vital and Related Functions
- 10:00      Intermission
- 10:30      Respiration (1)  
            John Rankin, M.D.
- 12:00      Luncheon
- Chairman: John V. Basmajian, M.D.
- 1:00      Development of Language and Speech  
            David Rutherford, Ph.D.
- 2:00      Relationships between Special Senses,  
            Handedness, and Speech  
            David Rutherford, Ph.D.
- 3:00      Intermission
- 3:30      Summary on Vital and Related Functions  
            - Resident Staff and Speakers
- 4:30



Day 5  
Friday  
July 29

# CHARACTERISTICS OF MATURE MOTOR BEHAVIOR

Chairman: Harry D. Bouman, M.D.

- 9:00 The Supportive Framework of Willed Movement  
Joan C. Waterland, Ph.D.
- 10:00 Intermission
- 10:30 Interaction of the Body and Its Segments  
C. Etta Walters, Ph.D.
- 11:30 Gait as a Total Pattern of Movement  
M. Pat Murray, Ph.D.
- 12:15 Luncheon

Chairman: Barbara F. Randall, Ph.D.

- 1:15 Ingredients of Coordinate Movement  
Alice L. O'Connell, Ph.D.
- 2:30 Intermission
- 3:00 Significance of Mature Motor Behavior in Therapeutic  
Exercise  
Susanne Hirt, M.Ed.
- 4:00 Initial Group Sessions  
- Participants and Group Leaders
- 5:00 Jeanne Schenck, Chairman

Day 6  
Monday  
August 1

# MOTOR LEARNING

Chairman: Eleanor J. Carlin, M.S.

- 9:00      Conditioned Reflexes  
            Ernst Fischer, M.D.
- 10:00     Intermission
- 10:30     Cybernetic Foundations of Rehabilitive Learning  
            Science  
            Karl U. Smith, Ph.D.
- 12:00     Luncheon

Chairman: Harry D. Bouman, M.D.

- 1:00      Motivation and Emotion in Learning  
            B. Claude Mathis, Ph.D.
- 1:40      Control of Individual Motor Units  
            John V. Basmajian, M.D.
- 2:00      Practice in Sensory - Motor Learning  
            Kenneth Cross, Ph.D.
- 3:00      Intermission
- 3:30      Factors Affecting Motor Learning  
            Ernst Fischer, M.D.
- 4:30      Summary on Motor Learning  
            -  
            Resident Staff and Speakers
- 5:00
- 7:30      Film Theater  
            -  
            Motor Learning
- 9:00



Day 7  
Tuesday  
August 2

DEFICIENT MOTOR BEHAVIOR

Chairman: Eleanor M. Flanagan, M.A.

9:00 Disorders of Tone  
David A. Drachman, M.D.

10:00 Intermission

10:30 Disorders of Motion  
Joel Brumlik, M.D.

12:00 Luncheon

Chairman: John V. Basmajian, M.D.

1:00 Pain in Neurologic Disease  
David A. Drachman, M.D.

2:00 The Multiply Handicapped Patient  
Joel Brumlik, M.D.

3:00 Intermission

3:30 Use and Disuse of Neuromuscular Mechanisms  
Ernst Fischer, M.D.

4:30 Summary on Deficient Motor Behavior  
- Resident Staff and Speakers

5:00

7:30 Film Theater  
- Motor Disorders

9:00



Day 8  
Wednesday  
August 3

DEFICIENT VITAL AND RELATED FUNCTIONS

Chairman: Lillian Shotter, M.A.

- 9:00      Respiration (2)  
           John Rankin, M.D.
- 10:00     Intermission
- 10:30     Cardio-respiratory Deficiencies  
           John Rankin, M.D.
- 11:00     Excretory Functions  
           Vincent J. O'Connor, Jr., M.D.
- 12:00     Luncheon

Chairman: Harry D. Bouman, M.D.

- 1:00      Pregnancy and Labor  
           David M. Danforth, M.D.
- 2:00      Neuromotor Pathologies of Speech  
           Gerald J. Canter, Ph.D.
- 3:00      Intermission
- 3:30      Summary Session  
           - (Related to Days 1-8)
- 5:00      Resident Staff and Speakers



Day 9  
Thursday  
August 4

OBJECTIVES FOR THE TEACHING OF  
THERAPEUTIC EXERCISE

Chairman: Lois M. Wellock, Ph.D.

9:00      Presentation of Plan for the Development of  
                 Objectives  
                 Merrel D. Flair, Ph.D.

10:00      GROUP WORK

Each Group will establish its own schedule of  
work with intermissions and time for luncheon.  
The general session will reconvene in the main  
meeting room at 3:00 P.M.

3:00      Reports on Objectives  
                 -  
                 Group Leaders, Jeanne Schenck, M.A., Chairman  
5:00

Critique of Objectives

Educator  
                 Merrel D. Flair, Ph.D.

Physical Therapist Educator  
                 Sarah S. Rogers, A.M.

Physician Educator  
                 Clay Burchell, M.D.



Day 10  
Friday  
August 5

ANALYSIS OF TRADITIONAL REGIMENS  
AND  
EQUIPMENT USED TO PROMOTE MOVEMENT

Chairman: Lois M. Wellock, Ph.D.

9:00      Presentation of Plan for Analysis  
            Group Leaders, Dorothy Pinkston, M.Ed., Chairman

9:30      GROUP WORK

Each Group will establish its own schedule of  
work with intermissions and time for luncheon.  
The general session will reconvene in the main  
meeting room at 3:00 P.M.

3:00      Reports on Traditional Regimens and Equipment  
-           Group Leaders, Dorothy Pinkston, M.Ed., Chairman  
5:00



## ACKNOWLEDGMENTS

### METHODS FOR FACILITATION AND INHIBITION OF MOTOR ACTIVITY

The following acknowledgments were prepared by the physical therapists who will represent the methods during NU-STEP. The name of the physical therapist, the Expositor of a given method, appears at the beginning of the statement and henceforth in the Program, Days 11-14, 17, and 18. The Expositors were selected by the Planning Committee on the basis of: (1) their close relationship with the education of undergraduate students of physical therapy, and (2) their knowledge of the respective methods.

Expositor: Sarah Semans, M.A.  
Method: Bobath

Karel Bobath, M.D. and Berta Bobath, FCSP, developed their methods of treatment of neurological disorders in England during and following World War II.

Dr. Bobath received his medical education in Berlin, Prague (Pediatrics) and in England (Psychiatry). He is presently in charge of the Cerebral Palsy Unit, Harpenden Hospital (for the mentally subnormal), St. Albans, and is the medical consultant for the Western Cerebral Palsy Centre in London, of which Mrs. Bobath is Principal.

Mrs. Bobath had her training in physical education and physical therapy in Berlin and in London, where she became a Member, and upon presentation of a thesis, a Fellow of the Chartered Society of Physiotherapy.

Their work has been predominantly with adult hemiplegia and cerebral palsy, including the mentally retarded. They conduct post-graduate courses in cerebral palsy and have contributed numerous articles to professional journals.

Expositor: Catherine E. Perry, M.A.  
Method: Brunnstrom

The utilization of associated reactions and reflex training in the treatment of hemiplegia has been developed by Miss Signe Brunnstrom, a physical therapist. Miss Brunnstrom started her investigations at the Kessler Institute, West Orange, New Jersey in 1951-52; she continued developing evaluative procedures and treatment techniques at the Burke Foundation, White Plains, New York in 1954-55; at the Institute of Physical Medicine and Rehabilitation, New York, New York in 1956-58; and is currently at Columbia University.

Dedication and hard work have brought about continuing refinement in this treatment approach. Her publications and short courses have led physical therapists to recognize and respect her outstanding contributions to our field.



ACKNOWLEDGMENTS, contd

Expositor: Dorothy Page, B.S.  
Method: Fay

Temple Fay, M.D., who was a neurosurgeon in Philadelphia, discussed, demonstrated, and wrote of a method of exercise for neuromuscular disorders between 1943 and 1958. He referred to this method, which utilizes phylogenetic patterns of development and stimulation of primitive reflexes, as "neuromuscular reflex therapy." Former colleagues of Dr. Fay have further systematized the method and have proposed additional theories relating to training of visual function, cerebral dominance, laterality, and reading skills. In lay terms the method is known as "patterning exercises".

Expositor: Dorothy E. Voss, B.Ed.  
Method: Kabat

The method known as "proprioceptive facilitation" (Kabat), "proprioceptive neuromuscular facilitation" (Knott and Voss), and in the vernacular as PNF, was originated by Herman Kabat, M.D., neurophysiologist and physician, during the mid-forties, and was further developed while he was Medical Director of the Kabat-Kaiser Institutes for Neuromuscular Rehabilitation, 1946 - 1953. Margaret Knott, B.S., joined Dr. Kabat as Head Physical Therapist at the Institute in Washington, D.C., shortly after its inception and worked closely with him through 1953. Many of us owe our initial understanding of the method and the development of our skills to these two persons, a physician and a physical therapist.

Expositor: Shirley A. Stockmeyer, M.A.  
Method: Rood

The approach to treatment originated by Margaret S. Rood, M.A., O.T.R., R.P.T. is introduced in her course entitled "Neurophysiology in the Treatment of Neuromuscular Dysfunction", and expanded in her course entitled "Neurophysiological Response Mechanisms in Therapy."

Miss Rood initiated the work on her approach in the early 1940's as an occupational therapist at Indiana University Medical Center. She undertook intensive investigation and development of this neurophysiological approach to treatment in the early 1950's while working as a therapist with the Elks Mobile Unit in Indio, California.

Miss Rood is now Professor and Educational Director of the Department of Physical Therapy at the University of Southern California.



Day 11  
Monday  
August 8

ANALYSIS OF METHODS FOR FACILITATION AND  
INHIBITION OF MOTOR ACTIVITY

Chairman: Susanne Hirt, M.Ed.

- 9:00 Presentation of Plan for Analysis  
Group Leader: Dorothy Pinkston, M.Ed.  
Expositor: Dorothy E. Voss, B.Ed.
- 9:30 Presentation of Principles  
Expositors of Methods  
Sarah Semans, M.A.  
Catherine E. Perry, M.A.
- 10:15 Intermission
- 10:45 Dorothy Page, B.S.  
Dorothy E. Voss, B.Ed.  
Shirley A. Stockmeyer, M.A.
- 11:45 Luncheon
- Chairman: Dorothy Pinkston, M.Ed.
- 1:00 Use of Developmental Patterns of Movement  
and Posture: Relationship to Function  
(Analysis Forms, Days 11, 12)  
Expositors of Methods
- 3:00 Intermission
- 3:30 Film Theater  
-  
5:30 Methods for Facilitation and Inhibition  
of Motor Activity

Day 12  
Tuesday  
August 9

ANALYSIS OF METHODS FOR FACILITATION AND  
INHIBITION OF MOTOR ACTIVITY, contd

Chairman: Barbara E. Teasdale, M.A.

Demonstrations of Use of Developmental Patterns  
of Movement and Posture  
(Analysis Forms, Days 11, 12)

Expositors of Methods

9:00 Sarah Semans, M.A.

9:50 Intermission

10:20 Catherine E. Perry, M.A.

11:10 Dorothy Page, B.S.

12:00 Luncheon

Chairman: Helen V. Skowlund, M.S.

1:30 Dorothy E. Voss, B.Ed.

2:20 Shirley Ann Stockmeyer, M.A.

3:10 Intermission

3:40 Discussion  
- Resident Staff and  
4:45 Expositors

7:30 Film Theater  
- Methods for Facilitation and Inhibition  
9:00 of Motor Activity



Day 13  
Wednesday  
August 10

ANALYSIS OF METHODS FOR FACILITATION AND INHIBITION  
OF MOTOR ACTIVITY, contd

Chairman: Jeanne Schenck, M.A.

Demonstrations of Procedures for Achieving  
Coordinate Movement  
(Analysis Forms, Day 13)  
Expositors of Methods

9:00 Sarah Semans, M.A.  
9:50 Questions  
10:05 Intermission  
10:35 Catherine E. Perry, M.A.  
11:25 Questions  
11:40 Luncheon

Chairman: Charlene Nelson, M.A.

1:15 Dorothy Page, B.S.  
2:05 Questions  
2:20 Dorothy E. Voss, B.Ed.  
3:10 Questions  
3:25 Intermission  
3:45 Shirley Ann Stockmeyer, M.A.  
4:35 Questions  
-  
4:50



Day 14  
Thursday  
August 11  
Morning

ANALYSIS OF METHODS FOR FACILITATION AND  
INHIBITION OF MOTOR ACTIVITY, contd

Chairman: Mary Ellen Sacksteder, M.A.

- 9:00      Adjunctive Physical Agents and Adjunctive Equipment  
            (Analysis Forms, Day 14, Morning)  
            Expositors of Methods  
                Sarah Semans, M.A.  
                Catherine E. Perry, M.A.  
                Dorothy Page, B.S.
- 10:00      Intermission
- 10:30      Dorothy E. Voss, B.Ed.  
            Shirley Ann Stockmeyer, M.A.
- 11:10      Similarities and Differences, and Hazards of Adjuncts  
            Expositors of Methods  
            Physiologist  
                Ernst Fischer, M.D.  
            Physician  
                Harry D. Bouman, M.D.
- 11:40      Questions and Answers
- 12:30      Special Luncheon  
            Chairman: Elizabeth C. Wood, M.S.
- The Lay Approach to Therapeutic Exercise  
            Guest Speaker: Theodore R. Van Dellen, M.D.  
                Assistant Dean, and Attending Physician,  
                Northwestern University Medical School;  
                and Medical Editor, Chicago Tribune



Day 14  
Thursday  
August 11  
Afternoon

ANALYSIS OF METHODS FOR FACILITATION AND INHIBITION  
OF MOTOR ACTIVITY, contd

Chairman: Helen V. Skowlund, M.S.

- 2:30 Identification of Common Denominators  
Resident Staff and  
Expositors of Methods
- 3:15 Intermission
- 3:30 Scope of Application in Treatment  
(Summary Form, M-2)  
Resident Staff and  
Expositors of Methods
- 4:15 Integration of Treatment  
-
- 5:00 Resident Staff and  
Expositors of Methods
- 7:30 Film Theater  
-
- 9:00 Portrayal of Application for Cerebral Palsy

Day 15  
Friday  
August 12

CONSIDERATION OF SELECTED CONTENT AREAS OF THE CURRICULUM  
RELATED TO THERAPEUTIC EXERCISE

Chairman: Wallace S. Strittmatter, B.S.

9:00      Presentation of Plan for Group Discussion  
            Group Leaders, Barbara E. Teasdale, M.A., Chairman

9:30      GROUP WORK

Each Group will establish its own schedule of  
work with intermissions and time for luncheon.  
The general session will reconvene in the main  
meeting room at 3:00 P.M.

3:00      Comments and Questions to Resident Staff

-  
4:00



Day 16  
Monday  
August 15  
Morning

# EPILOGUE AND PROLOGUE

Chairman: John V. Basmajian, M.D.

9:00 Dialogue: Bases for Therapeutic Exercise  
Harry D. Bouman, M.D.  
C. Etta Walters, Ph.D.

Critique of the Analyses of Therapeutic Exercise

Objectives  
Elizabeth C. Wood, M.S.

10:00 Intermission

10:30 Traditional Regimens and Equipment Used to  
Promote Movement  
Dorothy Pinkston, M.Ed.

Methods for Facilitation and Inhibition of  
Motor Activity  
Eleanor M. Flanagan, M.A.

11:30 Questions and Answers

11:45 Luncheon

BANISHING BARRIERS IN COMMUNICATION

Day 16  
Monday  
August 15  
Afternoon

Chairman: Harry D. Bouman, M.D.

1:00

Terminology

Anatomy

J. V. Basmajian, M.D.

Physiology

Ernst Fischer, M.D.

Psychology

Merrel D. Flair, Ph.D.

Motor Development

C. Etta Walters, Ph.D.

Medicine

Louis B. Newman, M.D.

Physical Therapy

Kathryn J. Shaffer, M.S.

2:00

Research

Carmella Gonnella, Ph.D.

3:00

Intermission

3:30

The Prescriptive Relationship  
Physicians

Henry B. Betts, M.D.

Cyril Hauser, M.D.

Physical Therapists

Wilma Hall, Major, AMSC

D. LaVonne Jaeger, M.A.

Meredith Nordschow, B.S.

4:30

Pitfalls of Oversimplification

-

Resident Staff and

5:00

Speakers

7:30

Film Theater

-

Developing Motor Behavior

9:00



Day 17  
Tuesday  
August 16

DEMONSTRATIONS OF THERAPEUTIC EXERCISE FOR SELECTED PATIENTS

Chairman: Eleanor M. Flanagan, M.A.

9:00 Patient: Hemiplegic Adult  
Demonstrators  
Eleanor J. Westcott, B.A., Traditional Method  
Sarah Semans, M.A., Expositor

9:50 Intermission

10:20 Catherine E. Perry, M.A., Expositor  
Dorothy Page, B.S., Expositor  
Dorothy E. Voss, B.Ed., Expositor  
Shirley Ann Stockmeyer, M.A., Expositor

12:00 Luncheon

Chairman: Dorothy Pinkston, M.Ed.

1:30 Patient: Cerebral Palsied Child  
Demonstrators  
Althea M. Jones, B.S., Traditional Method  
Sarah Semans, M.A., Expositor  
Catherine E. Perry, M.A., Expositor

3:00 Intermission

3:30 Dorothy Page, B.S., Expositor  
- Dorothy E. Voss, B.Ed., Expositor  
5:00 Shirley Ann Stockmeyer, M.A., Expositor

Acknowledgments to Originators of Methods for Facilitation and Inhibition of Motor Activity Appear in advance of Day 11.

7:30 Film Theater  
- Methods for Facilitation and Inhibition of Motor Activity  
9:00



Day 18  
Wednesday  
August 17

DEMONSTRATIONS, contd

Chairman: Kathryn Young, M.A.

- 9:00 Patient: Arthritic Adult  
Demonstrators  
Joe C. Finnell, B.A., Traditional Method  
Dorothy E. Voss, B.Ed., Expositor  
Shirley Ann Stockmeyer, M.A., Expositor
- 10:00 Intermission
- 10:30 Patient: Parkinsonian Adult  
Demonstrators  
Jessie M. Ball, M.S., Traditional Method  
Dorothy E. Voss, B.Ed., Expositor
- 11:10 Summary on Common Denominators  
Resident Staff and Demonstrators
- 11:45 Luncheon

FORMULATION OF A DESIGN FOR THE TEACHING OF  
THERAPEUTIC EXERCISE

Chairman: Sarah S. Rogers, A.M.

- 1:00 Definitions of Therapeutic Exercise  
Group Leader, Helen V. Skowlund, M.S.
- 1:30 Creating a Design for Course Content  
Merrel D. Flair, Ph.D.
- 2:00 Reconsideration of Objectives for the  
Teaching of Therapeutic Exercise  
Group Leaders, Jeanne Schenck, M.A., Chairman

GROUP WORK

- 4:00 Reports on Reconsideration of Objectives  
Group Leaders, Jeanne Schenck, M.A., Chairman
- 4:30 Prologue to Creation of a Design  
Merrel D. Flair, Ph.D.
- 
- 5:00



Day 19  
Thursday  
August 18

FORMULATION OF A DESIGN, contd

Chairman: Jeanne Schenck, M.A.

9:00      Creation of a Design  
            Group Leader, Jeanne Schenck, M.A., Chairman

GROUP WORK

Each Group will determine appropriate  
time for intermission.

12:00      Luncheon

Chairman: John V. Basmajian, M.D.

1:00      Reports of the Groups

2:00      Evaluation: Relationships between Objectives and  
            Curriculum Content  
            Merrel D. Flair, Ph.D.  
            Sarah S. Rogers, A.M.  
            Group Leaders

3:00      Identification of Selected Content Areas of the  
-          Curriculum That May Require Alteration or Expansion  
5:00      Group Leader, Wallace S. Strittmatter, B.S., Chairman

GROUP WORK

Day 20  
Friday  
August 19

Chairman: Lois M. Wellock, Ph.D.

9:00 Reports of the Groups  
Group Leaders, Wallace S. Strittmatter, Chairman

10:00 Intermission

#### SUMMARY SESSION

Chairman: Elizabeth C. Wood, M.S.

10:30 Summary on Exploration of Therapeutic Exercise  
Resident Staff

11:30 Assessment of the Project  
Josephine T. Buca, B.S.  
James E. Griffin, Ph.D.  
Marjorie K. Ionta, B.S.  
Nancy T. Watts, M.A.

1:00 Luncheon

Chairman: Elizabeth C. Wood, M.S.

Pattern for Progress  
Harry D. Bouman, M.D.



May

our

diverging

pathways

lead

to

convergence.