

Historical Perspective

The department of rehabilitation medicine at the University of Pennsylvania is the oldest in the country. Its development was central to the development of rehabilitation medicine as a specialty nationwide.

This report traces the history of rehabilitation medicine at the University of Pennsylvania from its beginnings in 1897 to the present time. It does so in the context of the influential role played by the department in that specialty elsewhere. Because of the dispersion of the department's concepts and practices by graduates of its programs, this history may be of interest not only to those vested in the University of Pennsylvania but also to others concerned with the evolution of Rehabilitation Medicine during the past 100 years.

Table of Contents

- I. Rehabilitation Medicine (1897-1914)
 - a. The Advent of R. Tait McKenzie
 - b. McKenzie at the University of Pennsylvania
 - c. Rehabilitation Medicine Before World War I
 - d. The Orthopedic Surgeons Sponsor Physiotherapists

- II. Rehabilitation Medicine at the University of Pennsylvania (1914-1919)
 - a. R. Tait McKenzie (Continued)
 - b. Rehabilitation Medicine - World War I
 - c. Growth of Physical Therapy as a Profession
 - d. Physical Therapy Physicians Become "Physiatrists"
 - e. Physical Therapy Department and Laboratory at the Hospital of the University of Pennsylvania (HUP)

- III. Rehabilitation Medicine (1940-1987)
 - a. The Military Prepares
 - b. Howard A. Rusk
 - c. The Poliomyelitis Epidemic
 - d. Franklin Delano Roosevelt
 - e. Rehabilitation Medicine Becomes a Specialty
 - f. George M. Piersol
 - g. The University of Pennsylvania Rehabilitation Commission
 - h. The National Foundation for Infantile Paralysis
 - i. The Piersol Rehabilitation Center
 - j. Education in Rehabilitation Medicine at Penn
 - k. The School of Auxiliary Medical Services
 - l. William J. Erdman, II

- IV. Rehabilitation Medicine (1987-Present)
 - a. The Department Deteriorates
 - b. The "Penn Center for Rehabilitation"
 - c. A New Chair is Appointed
 - d. Rebuilding the Department

Postscript

Acknowledgements

References

REHABILITATION MEDICINE (1897-1914)

The first signs of rehabilitation medicine at the University of Pennsylvania are contained in a report of the Children's Orthopedic Department to the Board of Managers of the University of Pennsylvania Hospital in 1894. The report calls attention to the need for an "orthopedic gymnasium" in a proposed new surgical building. When the new facility, the Agnew Building, was opened in 1897, it did indeed contain a room under the children's orthopedic ward for "the development of muscular power with apparatus for both mechanical and hot air massage, gymnastics and Swedish movement." The gymnasium was supervised by Miss A.S. Kite under the direction of the hospital's orthopedic surgeon, deForest Willard, M.D. By 1898, Kite was able to report that approximately 2,000 patients, with problems ranging from flat feet to infantile paralysis, had been registered in the Orthopedic Gymnasium for Children. The number of patients treated in the Orthopedic Gymnasium increased steadily thereafter, from 3,700 in 1899 to 6,738 in 1900 to 8,851 in 1903.¹

From 1904 through 1906, the reports to the Board of Managers were submitted under the heading "Orthopedic Ward," i.e., the children's designation was dropped. These reports were submitted by George M. Piersol, M.D., resident in orthopedic surgery under Willard, and marked the beginning of George Morris Piersol's long association with physical medicine and rehabilitation at the University Hospital. In his 1906 report, Piersol lists 7,475 visits to the Orthopedic Ward.²

The Advent of R. Tait McKenzie

The development of rehabilitation medicine at the University of Pennsylvania was sparked by the arrival of Robert Tait McKenzie, M.D. in 1905. McKenzie came to Philadelphia to direct the University's new Department of Physical Education. McKenzie's appointment was intended to improve the health of the undergraduate



college students and was part of a larger initiative which included the construction of an indoor gymnasium (Weightman Hall) and an outdoor athletic field and stadium (Franklin Field).

McKenzie was an extraordinary individual. After receiving his medical degree, he remained at McGill University in Montreal, Canada, for about 15 years, first as a demonstrator in anatomy and subsequently as Director of Physical Training and Instructor in Gymnastics, all the while conducting a private practice in orthopedic surgery.³

Following presentation of his paper on facial muscles under stress to the American Society of Anatomists in 1899, McKenzie was approached by George A. Piersol, Professor and Chairman of Anatomy at the University of Pennsylvania, with an offer to become his assistant. McKenzie turned the offer down, feeling that his interests were better reflected in the newly formed Society of College Gymnasium Directors and in his activities as Medical Director of Physical Training at McGill University. McKenzie thus chose physical education over anatomy.

McKenzie at the University of Pennsylvania

When McKenzie was offered the directorship of the new Department of Physical Education at the University of Pennsylvania, the structure of the University was unlike that of any other university either in the United States or Europe. It was essentially a corporation loosely organized into departments rather than schools. Each department had its own faculty; the provost was a member and president of each faculty. McKenzie insisted on "a full professorship on the medical faculty, payment of a reasonable but not large salary directly by the University and not through or by the athletic association, responsibility to the university alone and not a committee or association" and time to continue his medical practice.⁴

Despite McKenzie's insistence on a position on the medical faculty as a condition for accepting his appointment, he initially appears in the University catalogs as a Professor of Physical Therapy in the Department of Physical Education. Second year medical students could, however, take a physical therapy course with McKenzie in the University's Department of Physical Education and Physical Therapy even though no such course was formally part of the medical curriculum.

In 1906, McKenzie gave his first lectures to third and fourth year medical students. In five lectures that dealt with the application of exercise to medicine, he reviewed the role of exercise in treating faults of posture and flat feet, lateral curvature of the spine, diseases of the nervous system, diseases of nutrition, and diseases of the heart and circulatory system. Soon after arriving at the University of Pennsylvania, McKenzie decided that there was a need for a scientific textbook on exercise. He believed that too many modalities were being left in the hands of masseurs. The medical profession regarded the use of electricity with suspicion. The use of radiant light and heat had just begun to attract attention and hydrotherapy was still

confined to spas and Turkish baths. No attempt had been made to give a comprehensive view of the whole specialty of physical medicine with particular attention to the possibilities, and especially the limitations, of these methods which were apparently new but were, in reality, old and fundamental methods of medical treatment.⁵ McKenzie's treatise "Exercise in Education and Medicine" was published by W.B. Saunders in 1909. In his preface, McKenzie wrote:

Exercise and massage have been used as remedial agencies since the days of Aesculapius, but definite instruction in their use has seldom been given to medical students. Perhaps a certain laziness inherent in both patient and physician tempts to the administration of a pill or draught to purge the system of what should be used in normal muscular activity, but there is a wide dearth of knowledge among the profession of the scope and application of exercise in pathologic conditions and the necessity of care in the choice and accuracy of the dosage will be emphasized throughout the second part of the book.⁶

In Part II, entitled "Exercise in Medicine," McKenzie describes the use of exercise in treating physical defects, such as flat feet and scoliosis, and also diseases of the circulation and nervous system, obesity, and locomotor ataxia. He states that the purpose of exercise in pathologic conditions should be to change anatomic structure and to stimulate physiologic function. The relation between form and function was the foundation of McKenzie's medicine as well as his art.

By 1910, the Department of Physical Education was offering a course of lectures to third and fourth year medical students which dealt with the use of exercise for defects of posture and development, for diseases of nutrition, the circulation and the nervous system. In 1911-1912, a course dealing with exercise and massage in disease was offered by the Department of Physical Education for second year medical students. The class met twice per week for 12 weeks and the course was also listed in the School of Medicine catalog with the additional information that fourth year medical students are given supplementary lectures on the therapeutic use of temperature, light, and electricity.

Rehabilitation Medicine Before World War I

Prior to World War I, physicians who used physical modalities or advocated simple treatment with fresh air, water, exercise and dietary modification were considered quacks by others in the medical profession. Across the United States, as at the University of Pennsylvania, the orthopedic surgeons were often the first to recognize the need for new approaches in the treatment of disabling conditions, from fractures and dislocations to arthritis and paralysis. The first Professor of Physical Therapy at the University of Pennsylvania, R. Tait McKenzie, had a private practice in orthopedic surgery throughout his career.

In 1912, the medical staff at the Hospital of the University of Pennsylvania was reorganized. McKenzie is described briefly as a "physical therapist," a title that was later adopted by non-physician health professionals. That year, Josef B. Nylin, M.D., a Swedish physician, was also named "Assistant Physician" for a new facility, the Laboratory of Physical Therapy. The following year, Physical Therapy appeared for the first time as a hospital department. Nylin's Laboratory of Physical Therapy accumulated 3,587 cases and the Orthopedic Gymnasium recorded 5,108 treatments. The diseases were categorized as circulatory, digestive, nervous or bone and joint.⁷

The Orthopedic Surgeons Sponsor Physiotherapists

The late 19th and early 20th centuries saw the establishment of special facilities in hospitals to administer massage, exercise and hydrotherapy, always under the direction of an orthopedic surgeon. As has previously been discussed, the University of Pennsylvania Hospital opened its facility, the "Orthopedic Gymnasium," in 1897. At the Massachusetts General Hospital, a "Medicomechanical" department was established in 1904 with technicians performing the needed therapy under the guidance of Joel Goldthwait, M.D., Chief of Orthopedic Surgery. In 1911, the Mayo Clinic authorized a Section in Orthopedic Surgery and recognized that as the work of the Section increased, "physiotherapists" (allied health professionals) would be needed. Formal training in physiotherapy was not available to allied health professionals until the Mayo Clinic organized a program in 1918.⁸

REHABILITATION MEDICINE AT THE UNIVERSITY OF PENNSYLVANIA (1914-1919)

From 1914-1919, the course Physical Therapy at the University of Pennsylvania Medical School, was described as consisting of 18 lectures given by McKenzie, plus six hours of demonstrations in hydro- and thermotherapy given by Nylin. Nylin, a trained masseur, was a University of Pennsylvania graduate who served as McKenzie's assistant and succeeded him at the University Hospital when he retired.

From 1914-1918, the Physical Therapy Department of the Hospital of the University of Pennsylvania continued with the Orthopedic Gymnasium supervised by Miss Kite and the Laboratory of Physical Therapy directed by Nylin. These two facilities treated from 9,000 to 10,000 patients per year. From 1917-1919, for the first time, a report was not issued because of the influenza epidemic which raged throughout the City of Philadelphia.

R. Tait McKenzie (continued)

At McGill, McKenzie had demonstrated considerable talents as a painter and sculptor. It is as a sculptor that McKenzie attained everlasting fame.³ During these early years at the University of Pennsylvania, McKenzie continued to develop as a sculptor. His first work in the field of commemorative sculpture was completed in

1914. The work, entitled Youthful Franklin, still stands outside Weightman Hall on the campus of the University of Pennsylvania. This wonderfully conceived statue represents Benjamin Franklin beginning his youthful journey to the City of Philadelphia and the fame that would be his as one of the founding fathers in this country. McKenzie's understanding of human form and function is shown in this earliest work. His later magnificent athletic sculptures and reliefs would be put to use in his work with soldiers during and after World War I.

World War I had an enormous impact on rehabilitation medicine in general and at the University of Pennsylvania in particular. In 1915, McKenzie applied for a leave of absence from the University in order to join the British Royal Army Medical Corps as a surgeon. His reputation and writings preceded him and he was assigned to the Department of Physical Training under the Inspector of Gymnastics. McKenzie set about reorganizing and revitalizing the way in which the British Army dealt with soldiers disabled by combat as well as those deemed unfit to serve. His planned series of command "depots" where soldiers could be examined, diagnosed and treated was instituted. Treatment included massage, electricity, heat (wet and dry), and courses in physical exercise and training.

McKenzie returned to the University in 1916 but remained in the British Royal Army Medical Corps. He was briefly transferred by the British to his native Canada with duties similar to those he had in England. The energetic McKenzie subsequently wrote a short, 122-page book published in 1918, "Reclaiming the Maimed." In this book he describes his methods and equipment for the "gradual coaxing back toward normal" of those who had suffered in the war. He also felt "we must consider the whole field of physical therapy as applied to and affected by the Great War."⁹

"Reclaiming the Maimed" presents McKenzie's understanding of physical therapy and rehabilitation based on his experiences with disabled veterans in Britain and Canada. His chapters on electrotherapy, entitled "Medical Electricity," included accurate illustrations of the equipment used. They attempted to move electrotherapy out of the realm of quackery into that of science. McKenzie emphasized the importance of occupational therapy as a necessary part of the rehabilitation process, both for the physical and mental well-being of the disabled.¹⁰ This book stands as a review of the field of rehabilitation medicine as of 1918.

After World War I, orthopedic surgeons who had been active in the United States Medical Service published a summary of their activities which included rehabilitation as well as surgical services. They also indicated their intent to go beyond surgery and include general health, education, and vocational rehabilitation.¹¹ Although they did not credit McKenzie directly, it is clear that his plans for making recruits physically fit and restoring the wounded to duty served as guidelines. Goldthwait, Chief of Orthopedics at Massachusetts General Hospital and Chairman of The War Reconstruction Committee of the American Orthopedic Association, spent months abroad studying the British system of treating the disabled, a system largely conceived by McKenzie.

As the United States prepared to join its European allies in the fighting of World War I, problems in organizing care for the expected number of the disabled soldiers became evident. Prior to the war, private and governmental support for the disabled had been growing gradually. The influx of young, acutely disabled soldiers drew attention to the medical and social problems created by physical disability.

Rehabilitation Medicine - World War I

The Medical Department of the United States Army, under the guidance of the Surgeon General, Merritte W. Ireland, M.D., had two divisions which were destined to be important to rehabilitation medicine: the Division of Orthopedic Surgery and the newly-created Division of Physical Reconstruction.⁹ The report on the Division of Orthopedic Surgery, given by its head, Elliott Brackett, M.D., a Harvard-trained orthopedic surgeon, called for the establishment of



hospitals for the reconstruction of disabled soldiers. These hospitals could be "devoted to the medical care of all men who should be returned, also planned and equipped to reinstate the disabled soldier in the industrial world and allow him to become an independent wage earner."¹²

Under the physiotherapy section, the report stressed the need for massage and mechanical hydrotherapy and, more importantly, for a national training corps for personnel (therapists). It suggested that the personnel be drawn from schools of physical training and allied therapies. As a follow-up several schools were chosen: the Boston School for Physical Education; the New Haven Normal School in Connecticut; the Normal School for Physical Education in Battle Creek, Michigan; Posse Normal in Boston, Massachusetts; the Teacher's Physical Education Program at Oberlin College, Ohio; and the Physical Education Department of Leland Stanford Junior University in California. The report also suggested that standards be developed by the schools and that the trainees be designated "physical reconstruction aides." The work of these aides would subsequently be transferred to a new Division of Physical Reconstruction. Frank B. Granger, M.D., an early advocate of adding physical therapy techniques to general practice, was influential in planning the training program for the reconstruction aides.¹³

As Chief of the Division of Physical Reconstruction, Col. Frank C. Billings, M.D., established three special sections: one for education; one for physiotherapy including equipment, gymnasiums and other construction; and one for clinical work such as surgery, orthopedic surgery, head surgery and neuropsychiatry. The clinicians prescribed the types of occupational therapy and physical therapy to be

carried out by the reconstruction aides. By 1919, 45 hospitals throughout the country had physiotherapy facilities and employed more than 700 reconstruction aides. Nearly 50,000 veterans, about half of the 125,000 disabled during World War I, are said to have been treated at these facilities.¹⁴



The rehabilitation of disabled veterans was the focus of a prolonged struggle for control between the Surgeon General and the Federal Board for Vocational Education. The Surgeon General established the Division of Physical Rehabilitation. The Federal Board for Vocational Education had been formed in 1917 to oversee the vocational rehabilitation of disabled veterans. The Board planned to

place civilian vocational experts in hospitals to supervise testing, to evaluate prostheses and to prescribe occupational therapy. Physicians and vocational experts vied for authority in the field of and fought for special provisions to the Vocational Rehabilitation Act which was before the Congress in 1915. The Act legislated that each hospital under the Physical Reconstruction Division would have an agent of the Board for Vocational Education to serve the "compensable disabled." These provisions resulted in a sharp division between "medical" and "vocational" rehabilitation. According to the report, The Medical Department of the United States Army - World War I, the Federal Board for Vocational Education cooperated with the Physical Reconstruction Division's efforts but noted that there was a shortage of vocational/occupational instructors.¹⁵

McKenzie's book, "Reclaiming the Maimed," recognized the importance of vocational rehabilitation with an 11-page chapter entitled, Treatment by Occupation. In it he writes:

"Treatment by occupation differs from all other forms already described in that the remedy is given in increasing doses with the patient's improvement. It is the final page in his progress, to which all others lead up." ¹⁶

McKenzie further insists that the direction of treatment, with certain medical restrictions, be put in the hands of an officer trained in vocational guidance. After review by a Board, the patient, still under military discipline, should register and report to classes. A list of suggested courses includes school work, mechanical drawing, printing, woodworking, mechanics, electricity, motor car repair and farming. Affiliation with local technical schools and colleges was suggested.¹⁷

In 1920, a civilian Vocational Rehabilitation Law was passed which did not mention medical services. Physicians interested in rehabilitation changed their designation from physiotherapists to physical therapy physicians in order to separate themselves clearly from physiotherapists whom they considered to be "technicians" operating under the physician's direction.

Growth of Physical Therapy as a Profession

During the 1920s and 1930s, physical therapy physicians struggled to organize so that they could have a voice in the American Medical Association (AMA). In 1921, the AMA endorsed the efforts of the American Congress of Physical Therapy to educate physicians about the value of physical therapy in rehabilitating World War I veterans and to warn general practitioners of the dangers of "machine therapy." At this time there appeared:

"Mysterious, high priced electrical appliances in mahogany cabinets so that the term physical therapy was apt to call to mind, not heat, water, massage and exercises, the fundamentals of physical therapy, but rather the paraphernalia of the charlatan."¹⁸

Despite the conflicts for control, the work of the physical reconstruction aides during and after World War I led to the realization that physical therapy was an essential part of good patient care. The reconstruction aides, all female, functioned as physical therapy technicians and were charged with applying physiotherapy, hydrotherapy, electrotherapy, mechanotherapy and massage to disabled soldiers and veterans. In 1920, a small group of these aides formed the American Women's Therapeutic Association. The American Physiotherapy Association was incorporated in 1930 when it pledged to work with the American Medical Association to establish standards of education for physical therapists; to encourage the regulation of physical therapy practice by law; and to cooperate with, or under the direction of, the medical profession to provide a central registry for physical therapists.¹⁹ At this time the group agreed that all cases should be referred to physicians and that the referring physician would oversee the care of the patient.

Physical Therapist Physicians Become "Physiatrists"

In 1925, a group of physical therapy physicians founded the American College of Physical Therapy which became responsible for the publication of the Archives of Physical Therapy, X-ray and Radiology. In 1925, this group changed its name to the American Congress of Physical Therapy as it joined an AMA-sponsored group of the same name. By the mid-1930s, a group of prominent physical therapy physicians had established the American Registry of Physical Therapy Technicians. Registered physical therapists remained technicians under the supervision of physicians. By 1937, physical therapy physicians achieved recognition as a medical specialty. In an effort to distinguish themselves from the technicians who were called physical therapists and in order to gain respect within the medical profession, physical

therapy physicians began to call themselves "physiatrists." Departments in medical schools were renamed "Departments of Physical Medicine." However, it would take a Second World War to make rehabilitation a full-fledged specialty.

Physical Therapy Department and Laboratory at the Hospital of the University of Pennsylvania (HUP)

In 1920, a physical therapy department was first listed in the curriculum at the University of Pennsylvania Medical School. Departmental faculty included McKenzie as Professor of Physical Therapy with William T. Johnson, M.D., as Instructor and Nylin as Associate. Bi-weekly lectures were given to second year students and were complemented by practical demonstrations in electrotherapy by Johnson and hydro- and thermotherapy by Nylin. The demonstrations were given in the Department of Physical Therapy at the University Hospital. This format was followed until McKenzie's retirement in 1931. That year, no Professor of Physical Therapy is listed, and Johnson and Nylin appear to have shared the teaching duties.

Occupational Therapy first appears in a 1919 report to the University Hospital Board of Managers from the Auxiliary Committee on Occupational Therapy stating that a trained occupational therapist had been hired. By 1920-1921, there were three trained occupational therapists on staff.



In 1923, McKenzie was listed as "physiotherapist" on the hospital staff. The physician-in-charge of the Physical Therapy Laboratory, Nylin, had two assistants, Miss Bilgrain and Mr. Frazer. In the mid-1920s, the Department of the University Hospital was reported as the "Physio-Therapy Department" and Nylin was designated as Chief of the Clinic, with two assistants. During this time, the department's equipment was constantly being upgraded. The new equipment included massage machines and electrotherapy apparatus. Thirteen to fourteen thousand patients were served by the clinic per year.

When the Maloney Clinic Building opened in 1929, the Physical Therapy Department of the Hospital was assigned offices on the fifth floor. The new facilities provided for such treatments as diathermy, suction pressure and hydrotherapy; the treatments were available to both private and ward inpatients as well as to outpatients. The adjoining fifth floor of the Gibson Building contained a large, well-equipped gymnasium.²⁰

While the medical specialty of physical therapy, i.e., "physiatry," continued to flourish at the University Hospital, its place in the Undergraduate Medical School curriculum gradually declined. During the 1937-1940 academic years, while Nylin was listed as Director, the course in physical therapy was given to third year medical students for only one hour per week for five weeks.

REHABILITATION MEDICINE (1940-1987)

During the 1940s, several events and the personalities connected with them led to a world-wide interest in, and acceptance of, physical medicine and rehabilitation as a vital component of medical treatment.

The Military Prepares

As the United States prepared to enter World War II, the United States Army Medical Department laid plans for the "reconditioning" of wounded soldiers. These plans were summarized by the Division of Orthopedic Surgery as follows: A concept of rehabilitation is required that is entirely new. It treats the whole man and includes physical reconditioning and retraining, psychological adjustment and vocational guidance.²¹

The program offered at various convalescent hospitals was to include medical supervision, coordination of reconditioning efforts, teaching of crafts and military discipline. Despite the proclamation that "this is entirely new," many of the features of the proposed programs resembled closely those of the World War I efforts.

Three groups vied for the power and money involved in rehabilitating hundreds of thousands of returning soldiers: the Armed Forces, which was primarily concerned with returning soldiers to active duty; the Veteran's Administration, which had been created after World War I and was committed to the rehabilitation of disabled, discharged soldiers; and the Office of Vocational Rehabilitation, which had enjoyed a congressional mandate since the 1920s. Improvements in medical treatment brought about by sulfa drugs and penicillin, as well as advances in surgical techniques and transportation, decreased mortality but increased the number of disabled veterans far beyond all expectations.

Howard A. Rusk

In 1942, Howard A. Rusk, M.D., an alumnus of the Perelman School of Medicine, began working with wounded soldiers at Jefferson Barracks in St. Louis, Missouri. He soon became Chief of the Army Air Forces Convalescent Training program. His work there led him to be called "The Father of Modern Rehabilitation Medicine." He showed that active rehabilitation promoted the return of soldiers to full duty and also prepared those unfit for further service to return to their communities as useful, functional individuals. During the post-war period, rehabilitation medicine

reached its height in power and prestige. After World War II, Rusk created the Department of Physical Medicine and Rehabilitation of New York University and the Institute of Rehabilitation Medicine at Bellevue Medical Center. This Institute had its own personnel and beds and afforded comprehensive rehabilitation services in a private hospital setting. Through his writings in *The New York Times*, his contacts with many influential individuals, and his position as Director of the Institute of Rehabilitation Medicine at NYU Medical Center, Rusk increased public awareness of the need for rehabilitation as part of good medical practice.²²

The Poliomyelitis Epidemic

Epidemics of infantile paralysis afflicted children throughout the world during the 1930s and 1940s. Children who survived were often left severely paralyzed. Some spent the rest of their days in "iron lungs," the only apparatus then available to assist in breathing. During World War II, soldiers from all over the world developed the disease, which was then renamed "poliomyelitis." In 1940, an Australian nurse, Sister Kenny, articulated a revolutionary new treatment for polio victims. Prior to her efforts, treatment had consisted of absolute immobilization of affected limbs either through splinting or placement of the limb in a plaster cast. Sister Kenney argued that: "Immobilization prevents treatment of the disease; prolongs muscle spasms; prevents restoration of muscle action; and promotes stiffness which prevents the development of muscle power by re-education or re-awakening of nerve impulses."

She advocated warm, moist packs for muscle spasms and muscular manipulation to re-educate the muscles. Although orthopedists insisted that she did not know the mechanisms of the disease or muscle physiology, she did know paralyzed children. Her work represented a turning point in the after-care of paralyzed patients and pioneered the discipline of modern physical therapy.²³

Franklin Delano Roosevelt

The charismatic President Franklin Delano Roosevelt, played an important role in the development of rehabilitation medicine. As an adult victim of poliomyelitis, Roosevelt continually sought new treatment and worked at living a useful, active life. The Georgia Warm Springs Foundation, created by Roosevelt in 1927, led the country in rehabilitation and physical therapy for polio victims and became a symbol for the best in after-care. The Foundation was subsequently reorganized as the National Foundation for Infantile Paralysis and remains well-known for vigorous fund-raising efforts such as the annual March of Dimes.

Rehabilitation Medicine Becomes a Specialty

After World War II the practice of medicine became increasingly specialty-based. Not to be left behind, the American Board of Physical Medicine and Rehabilitation was formed and recognized as a specialty Board by the American Medical

Association. The Board was composed of four members from the American Academy of Physical Medicine and Rehabilitation, four members from the American Medical Association, and three members from the Association of Academic Physiatrists. The Board certified the first specialist in Physical Medicine and Rehabilitation in 1947. Despite this "stamp of approval" by the American Medical Association, rehabilitation was never really accepted by mainstream medicine.

A basic course in Physical Medicine and Rehabilitation was offered in the Graduate School of Medicine of the University of Pennsylvania beginning in the 1943-1944 academic year. George M. Piersol, Director of the Center for Instruction and Research in Physical Medicine at the University Hospital, ran the course from 1944-1954.

George M. Piersol

George M. Piersol, M.D., a 1905 graduate of the Perelman School of Medicine, had been chief resident in Orthopedic Surgery under Williard at the University Hospital where his early interest in physical medicine and rehabilitation began. He believed that if physical medicine was to achieve status in the medical profession, a "sound program of basic research in the field must be undertaken and opportunities for education in this field should be expanded and improved."²⁴



In 1947, when the first Department of Physical Medicine and Rehabilitation of the University of Pennsylvania School of Medicine was created, Piersol became the Department's first Professor and Chairman. Under Piersol, the place of Physical Medicine and Rehabilitation in the medical curriculum increased considerably. Piersol taught rehabilitation as a concept, not as a specialty. Nonetheless, he was a staunch advocate for the recognition of Physical Medicine and Rehabilitation as a specialty Board by the American Medical Association. In 1963, the Board recognized his contributions to Physical Medicine and Rehabilitation by designating him a diplomate.

In 1943, the wealthy and influential adviser to presidents of the United States, Bernard Baruch, created the "Baruch Committee on Physical Medicine." Piersol served on the Subcommittee on Clinical Research of this Committee. The Baruch Committee set out to improve the scientific basis of physical medicine and to gain recognition and respect for physical medicine

in the medical profession. The Committee supported the establishment of major rehabilitation teaching and research centers in the United States. It also funded 57 fellowships during the 1940s. The efforts of the Baruch Committee bolstered academic physical medicine and rehabilitation. By 1945, the Archives of Physical Therapy had become the Archives of Physical Medicine and, in 1947, as noted above, the first physiatrist was Board certified.²⁵

Piersol's goals for the Department of Physical Medicine at the University of Pennsylvania predated the reports of the Baruch Committee. First, he set about reorganizing Departments of Physical Therapy at the University Hospital and the Graduate Hospital of the University of Pennsylvania in order to improve their visibility. Second, he sought to enlarge the educational activities of the Department by increasing instruction in physical medicine to undergraduate medical students. This added to the basic course in physical medicine which was already in existence at the Graduate School of Medicine with the aim of preparing physicians for teaching and research careers in the specialty. Finally, the Department was to institute and coordinate fundamental research in physical medicine.²⁶

Before 1952, only seven hours of instruction in physical medicine and rehabilitation were given to undergraduate medical students throughout the four years of medical school. The Hospital of the University of Pennsylvania had no facilities for long-term rehabilitation. Nor was there any organized teaching program that dealt with the concepts and techniques of rehabilitation.

The University of Pennsylvania Rehabilitation Commission

In 1952, the Vice President for Medical Affairs, Norman H. Topping, M.D., formed a Rehabilitation Commission at the University level. Members of the Commission represented all Departments in the University with an interest in rehabilitation. The Commission was responsible for formulating policies and for supervising teaching, service and research aspects in rehabilitation medicine at the University; the charge included both the undergraduate and graduate medical schools as well as the School of Auxiliary Medical Services. The Coordinator of the program and Secretary to the Rehabilitation Commission was William Dunbar, M.D., Assistant Professor of Physical Medicine and Rehabilitation. The original Commission was made up of members of the Departments of Neurosurgery, Psychiatry, Orthopedic Surgery, Neurology, Public Health and Preventive Medicine, Physical Medicine and Rehabilitation, Surgery and Internal Medicine. Subsequently, representatives from the Schools of Auxiliary Medical Services (later to become the School of Allied Medical Professions), Nursing and Dentistry, as well as the Departments of Sociology and Psychology, and the Social Service Department of the University Hospital, were added.²⁷

The National Foundation for Infantile Paralysis

In 1952, the National Foundation for Infantile Paralysis funded a number of pilot programs to improve the teaching of rehabilitation in medical schools in the United States. Recognizing that many post-poliomyelitis patients were not receiving adequate therapy, the Foundation believed that: "it is essential that the concept of rehabilitation and the basic techniques become part of the education of the medical student and the auxiliary personnel."²⁸ The newly formed Rehabilitation Commission at the University of Pennsylvania submitted a proposed plan for teaching rehabilitation in the University's medical school and was awarded a five-year grant.

The Piersol Rehabilitation Center

In 1954, using funds from the National Foundation for Infantile Paralysis, Piersol opened a rehabilitation center in the University Hospital and is listed as its Director. Since the University Rehabilitation



Commission's grant proposal had included the establishment of a rehabilitation center, funds were readily available in support of Piersol's proposed center.

The Center opened in 1954, in a building which had been the maternity wing of the University of Pennsylvania Hospital. This Center was unique in that it was designed for inpatient care as well as a training and research unit. In 1959, the building was completely renovated with a gymnasium for physical therapy, occupational therapy and recreational therapy, a constant climate room for research in arthritis, and rooms for inpatients. When the renovated building opened in 1959, it was named the George Morris Piersol Building. Piersol had become Emeritus Professor of Physical Medicine and Rehabilitation in 1954. The team concept of rehabilitation medicine was put into practice in the new building. The team included physical therapists, occupational therapists, speech therapists, vocational counselors, social workers, and psychologists, under the leadership of a rehabilitation physician or "physiatrist." The services were offered to both outpatients and inpatients.

Education in Rehabilitation Medicine at Penn

In 1957, a concerted effort was made to integrate the principles of rehabilitation into the teaching programs of the various specialty departments in the School of Medicine. Second year students received a total of five hours of classroom instruction in the "survey of clinical medicine" and "preventive medicine and public health" courses. Third year students were offered a two and one-half hour course on the role of rehabilitation in chronic disease. In the fourth year, clinical conferences on topics in rehabilitation, such as paraplegia, hemiplegia and arthritis, were given weekly for a total of nine hours.

The teaching program in rehabilitation techniques was offered to undergraduate and graduate medical students, hospital interns and residents, graduate and student nurses, therapists and hospital personnel. The program was supported by grants from the National Foundation for Infantile Paralysis, the Office of Vocational Rehabilitation and the United States Public Health Service. The teaching was given by the Rehabilitation Center's staff from the School of Medicine, the Graduate School of Medicine, the School of Auxiliary Medical Services (later the School of Allied Health Professions) and the School of Nursing. A series of six five-day courses was also open to rehabilitation personnel from outside the University.²⁹

During the eight years of the teaching program, 14 courses in "Principles of Rehabilitation" were given to rehabilitation professional personnel, seven courses in "The Medical Aspects of Rehabilitation" were for the Pennsylvania Bureau of Rehabilitation counselors and three courses were given for graduate physicians. More than 800 persons were enrolled in these courses.

A program was also developed for hospital resident physicians in General Surgery, Internal Medicine, Urology, Neurology, Neurosurgery, and Orthopedic Surgery. As part of their residency training in the specialties, residents were required to attend rehabilitation evaluation conferences, attend seminars on special aspects of rehabilitation and provide consults for patients in the rehabilitation center.³⁰

The School of Auxiliary Medical Services

The School of Auxiliary Medical Services at the University of Pennsylvania was established in 1950 with the merger of the University Hospital's Division of Physical Therapy and the Philadelphia School of Occupational Therapy. Piersol, the Director of the Department of Physical Medicine at the Hospital became the Medical Director of Physical Therapy at the School.

The School offered a Bachelor of Science degree in Physical Therapy or Occupational Therapy. The Bachelor of Science degree required four years of study. An Associate degree, which took one year of study, was offered to those students who already had a Bachelor of Science degree with the appropriate science courses. The physical therapy courses and facilities were located at the Graduate Hospital of the

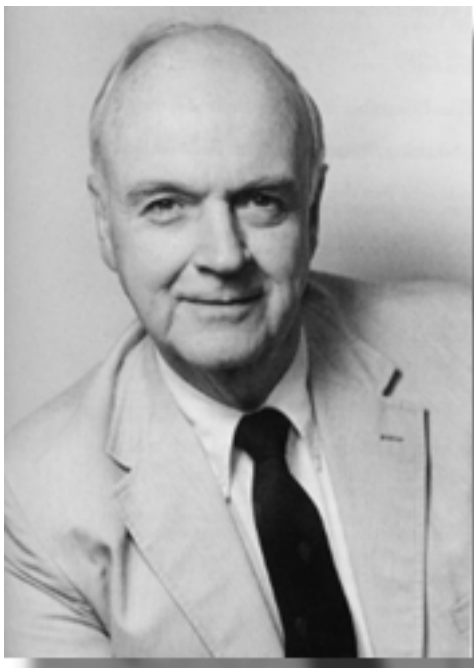
University of Pennsylvania from 1950-1956. The program at Graduate Hospital had been accredited in physical therapy since 1931. Beginning in 1952, Bachelor of Science degrees were also available in medical technology and radiological technology.

In 1960, the School was renamed the School of Allied Medical Professions. By 1966-1967, only the postgraduate Associate degree was being granted. Physical Therapy, Occupational Therapy and the Orthotics/Prosthetics Sections were under the control of the Department of Physical Medicine, both administratively and financially. These divisions were always profitable and enabled the Department to operate in a fiscally responsible manner.

Interest in and support for physical medicine and rehabilitation had grown rapidly under Piersol's leadership. Throughout the 1950s, physiatrists increased their power and influence in the world of medicine. In an editorial written by Piersol in the 1952 issue of the Archives of Physical Medicine, he stated that "never in the field of physical medicine have educational possibilities been so excellent, professional opportunities so many and demand for qualified physiatrists so great." However, he was concerned that the medical profession in general showed little interest in this field and that young physicians did not choose to enter this specialty.³¹

William J. Erdman, II

In 1954, William J. Erdman II, M.D., succeeded Piersol as Chairman of Physical Medicine and Rehabilitation. He established a department supported by adequate funds with a thriving hospital facility. The department staff in 1955-1956 is listed as William J. Erdman, M.D., Associate Professor and Chairman; George M. Piersol, M.D., Emeritus Professor; Martin Schultz, M.D., and Herman O. Schwann, M.D., Associate Professors; Emery K. Stoner, M.D., Associate; Elinor Bindler and Emilie Maxwell, Assistant Instructors; and Thomas V. McKee, M.D., Assistant Instructor and Fellow. In 1956, Erdman became the 284th diplomate of the American Board of Physical Medicine and Rehabilitation.³²



Erdman also presented a course on Physical Medicine and Rehabilitation in the Graduate School of Medicine of the University of Pennsylvania. Erdman's course was the first systematic course offered to physicians in the United States. It was designed to offer clinical training that led to the practice of physical medicine and rehabilitation as a specialty. It was approved by the American Board of Physical Medicine and Rehabilitation for eight months of residency training. Besides facilities at the Graduate Hospital and the University of Pennsylvania Hospital, other hospitals in the

area such as Bryn Mawr Hospital and Children's Hospital of Philadelphia were also used.

In 1964, at a ceremony celebrating the tenth anniversary of the opening of the Piersol Rehabilitation Center, Erdman, as Professor and Chairman of the Department of Physical Medicine and Rehabilitation and Director of the Piersol Center, reported that over 1,000 inpatients had been treated at the Piersol Center since its opening in 1954. He reported that the Center had treated paraplegia, hemiplegia, arthritis and neurologic disorders. The staff had increased to sixteen. Rehabilitation Medicine had become more visible in the medical curriculum with the addition of a 15-hour course in the fourth year devoted to practical rehabilitation.

In 1964, Erdman became President of the American Congress of Physical Medicine and Rehabilitation. This group, an outgrowth of the American Congress of Physical Therapy, was made up of more than 1,000 physicians who were interested in all types of rehabilitation, emotional and physical. The group was also responsible for publication of the Archives of Physical Medicine and Rehabilitation as well as administering the specialty board, the American Board of Physical Medicine and Rehabilitation. Erdman had established a reputation in the field as an expert in sports medicine while serving as team physician for the Philadelphia Ramblers ice hockey team and consultant to other Philadelphia professional teams. He also headed a team of American physicians who assisted in the rehabilitation of nearly 10,000 Moroccans paralyzed as a result of consuming adulterated olive oil.³²

Within the University of Pennsylvania Hospital the Physical Medicine and Rehabilitation group continued to grow. In 1971, Ms. Jennifer A. Bream, LPT, became Chief of Physical Therapy. Working closely with Erdman, she continued a program for chest therapy that she had begun in England. Together they developed an innovative program in horseback riding for the disabled. By the time she returned to England in 1980, Bream's Section of Physical Therapy was registering 5,000 patients per month.

However, Physical Medicine and Rehabilitation was still not an important part of the undergraduate medical school curriculum at the University of Pennsylvania School of Medicine or at other schools of medicine across the country. Medical schools continued to emphasize acute interventions over long-term rehabilitation. According to the Association of American Medical Colleges Directory for 1963-1964, 57 of the 88 American Medical Colleges had no listing for a rehabilitation department. The remaining 31 colleges listed organized departments of rehabilitation medicine, physical medicine and rehabilitation, or physical medicine.

A 1966 study sponsored by the Commission on Education for Physical Medicine and Rehabilitation, found little time allocated to the subject. The report indicated that the median number of clock hours in physical medicine and rehabilitation offered to undergraduate medical students was zero in the first year, one in the second year,

eight in the third year, and seven in the fourth year. Even these numbers were a distortion since three or four large successful programs inflated the average number of hours.³³ At this time, the University of Pennsylvania Medical School had increased the number of hours of rehabilitation medicine in the four year curriculum to 25. Second year students took a four-hour course, "A Survey of Physical Medicine and Rehabilitation"; third year students were offered six hours of Rehabilitation as part of a clinical conferences course; fourth year students were given 15 hours of practical work in rehabilitation and demonstrations of rehabilitation techniques. The University Hospital Divisions of Physical Therapy, Occupational Therapy and Orthotics/Prosthetics continued to be partners with Physical Medicine in delivering rehabilitation services to hospital inpatients and outpatients.

By 1974-75, 52 percent of the 113 medical colleges reported organized departments of Rehabilitation Medicine that were not merely divisions of Departments of Surgery or Medicine. At this time the University of Pennsylvania Medical School had decreased the hours allotted to physical medicine and rehabilitation offering only one course to third year medical students for one hour per week for seven weeks, i.e., a total of seven hours.

The lack of time devoted in medical schools to physical medicine and rehabilitation, as well as the paucity of organized departments of physical medicine and rehabilitation, inevitably led to a shortage of academic physiatrists throughout the United States. Even institutions with dynamic leaders such as Erdman at the University of Pennsylvania or Rusk at New York University had to struggle to attract residents and fellows for their programs.

During the 1970s under Erdman, the Department of Physical Medicine and Rehabilitation increased to 31 members and increased its rehabilitation services at the University Hospital and in the community. Between 1968 and 1978, Erdman served as Medical Director of the Hospital of the University of Pennsylvania. In this role, he furthered the development of rehabilitation medicine at the institution and nationally.

In 1976, a grant from the Insurance Company of North American (now CIGNA) helped establish a Laboratory of Prosthetics and Orthotics as an integral part of the University Hospital. The first director of the new facility was Amin Hajj, M.D., formerly the director of an orthotics/prosthetics center in Lebanon. After the initial grant, this section became and remains self-supporting under the capable direction of its second director, Mr. David Showers, CPO.³⁴

In 1976, the Department of Physical Medicine and Rehabilitation became responsible for the Center for Information Resources. This Center had been a joint project of the IBM Corporation, the Office of Vocational Rehabilitation in Pennsylvania, and the University of Pennsylvania's Wharton School of Business and Commerce. The Center's mission was to enhance the lives of disabled persons

through computer technology. The Center provided occupational training and subsequent employment in the data and information processing fields to persons with disabilities. The chief impact of the Center was in helping the disabled to become self-supporting. Besides financial support, the Department of Physical Medicine and Rehabilitation provided any medically-oriented services that the Center might request. Persons with quadriplegia, muscular dystrophy, poliomyelitis, juvenile arthritis, respiratory illness, brain injury, paraplegia, spina bifida and visual impairment were served by the Center. As of 1989, nearly 750 disabled persons had been employed by industry after training at the Center. In 1982, Dr. Erdman received an award from the United States Department of Education in recognition of his support in training the disabled in computer technology.³⁵

In the decade between 1974 and 1984, Rehabilitation Medicine suffered a period of decline. Despite an ever increasing awareness of the importance of rehabilitation in many medical specialties, particularly Neurology, Cardiology and Orthopedics, by 1984, only 64 percent of the 126 medical colleges had organized, separate departments of rehabilitation medicine. Nearly 14 percent of these colleges listed rehabilitation as a section/division in either Medicine, Surgery, Neurology or Orthopedics.

In 1979, after having served for 25 years as Chairman and Professor, Erdman requested that the Department of Physical Medicine and Rehabilitation undergo review and that the process of selecting a new chair for the Department be initiated. He promised to continue as Chairman until this effort was completed, anticipating that it could be completed within a year. This began a very unsettling period for the Department. As one of the first teaching departments in physical medicine and rehabilitation in the United States, approximately 10 percent of the physiatrists in the United States were graduates of the residency program given cooperatively by the University of Pennsylvania and the Hospital of the University of Pennsylvania. Among these were many academic department chairs and hospital chiefs of service.

The process of finding a new chairman proceeded very slowly. In 1987, after eight years of searching, none had been found and Erdman chose to resign, feeling that he could wait no longer to retire.

REHABILITATION MEDICINE (1987-Present)

The Department Deteriorates

In the summer of 1987, Laurence E. Earley, M.D., Chairman of the Department of Medicine, was assigned the title of Interim Chairman of Physical Medicine and Rehabilitation. With this move, the Department of Medicine assumed both administrative and fiscal responsibility for Physical Medicine and Rehabilitation which essentially became a division of the Department of Medicine.

The search for a new chair continued. During the search that began in July 1979 and was to last until July 1990, the Department of Physical Medicine and Rehabilitation lost many faculty members. By 1989, Jennifer Chu, M.D., an Associate Professor, was the sole faculty member and new faculty were impossible to recruit. Two other physiatrists, Keith Robinson, M.D., and Margaret Stineman, M.D., held primary appointments as Assistant Professors in the Section of General Medicine of the Department of Medicine.

The physical facilities of the Department in the hospital in the Piersol Building continued to deteriorate because of lack of repair and inadequate upkeep. Equipment became obsolete and was not replaced. In 1987, the Commission for Accreditation of Rehabilitation Facilities did not accredit the Piersol Rehabilitation Center because of insufficient clinical leadership and inadequate facilities. In 1988, accreditation was granted on the promise by the Hospital that new space and facilities would be found. In 1990, space was finally found for inpatients at the Veterans Administration's newly-constructed nursing home located on the University campus, a short drive from the University Hospital.³⁶

The "Penn Center for Rehabilitation"

In 1988, the Hospital of the University of Pennsylvania organized a "Penn Center for Rehabilitation" to provide the needed services of Physical Therapy, Occupational Therapy and Orthotics/Prosthetics. These departments became Hospital departments with no connection to Physical Medicine and Rehabilitation in the Medical School or to physiatrists. A rheumatologist, Bruce Freundlich, M.D., was designated Medical Director, responsible to an Associate administrator. The allied health professionals operated independently reporting only to Hospital administration. Before the Center was established, the Department of Physical Medicine and Rehabilitation had directed Physical Therapy, Occupational Therapy, and Orthotics/Prosthetics with a subsidy by the Hospital to provide that direction. Sadly, Rehabilitation Medicine at the University Hospital declined even further as the "team" approach dissolved and allied health professionals assumed the role of consultant physiatrists instead of consulting with physiatrists for direction.³⁷

The research and education activities needed for accreditation at a medical school teaching hospital setting fell by the wayside. The Department of Medicine which oversaw Physical Medicine and Rehabilitation ("PM&R") was not prepared to resuscitate it. The Division of PM&R had virtually no faculty of its own and no research space. The little research that was being done in rehabilitation medicine was carried on by physicians in the Aging Center or the Section of General Medicine of the Department of Medicine where two of the three remaining physiatrists were located. In 1989, the PM&R residency training program was placed on probation and rehabilitation practically disappeared from the undergraduate medical curriculum.

A New Chair is Appointed

In 1989, William N. Kelley, M.D., took the reins at the University of Pennsylvania Medical Center as CEO and Dean of the School of Medicine. Aware of the growing importance of rehabilitation and the decline of academic Physical Medicine and Rehabilitation Department at the University of Pennsylvania, Kelley determined to act quickly to resuscitate the Department. He turned to Alfred P. Fishman, M.D., William Maul Measey Professor of Medicine, pledging support in the creation of an academic department if Fishman would accept the Chair. Fishman, former head of the Cardiovascular-Pulmonary Division of the Department of Medicine at the University of Pennsylvania Medical Center, had established an international reputation as a scientist and clinical investigator of the heart and lungs. In over 50 years, Fishman's name had appeared as an author of 337 original papers and 332 editorials, chapters or reviews. He also authored or edited 15 books. For the first six years after his arrival at the University in 1969, Fishman had served as Associate Dean for Research and had continued without interruption as Consultant to the Dean until Kelley's arrival and for one year thereafter. Fishman brought expertise as an administrator and academician to the Department, which was reestablished as an independent entity separate from the Department of Medicine. The hospital-based Penn Center for Rehabilitation Medicine was dissolved and Fishman assumed the Directorship of the allied health professional departments in the hospital.

Fishman set out to develop an academic department that would be excellent in clinical care, teaching, and research. As a start, he undertook an academic review of the Department by two outstanding physiatrists (Theodore Cole, M.D., of Michigan, and Barbara DeLateur, M.D., of Seattle, Washington) and a highly respected neuroscientist whose research related to rehabilitation medicine (Wise Young, Ph.D., M.D., of New York University). Based on their advice, he developed a plan to revive the department and to launch new initiatives. A first step in its rebirth was a change in the name of the Department from Physical Medicine and Rehabilitation to Rehabilitation Medicine. Planning was complicated by the decision of the Medical Center to demolish the Piersol Inpatient Center, thereby forcing the Department into a two- year migratory existence, i.e., from the Veterans Administration Nursing Home and temporary administrative facilities in



the Morgan Building, to its current space in the Ravdin and Gates Buildings of the University Hospital.

By 1992, the reorganization of the Department was well under way. Physical Therapy, Occupational Therapy and Orthotics/Prosthetics became divisions of the Department of Rehabilitation Medicine for programmatic development and medical direction; the Directors of these hospital departments continued to be in charge of service activities with joint reporting lines to Hospital administration and to the Chair of the Department of Rehabilitation Medicine. Fiscally these departments remained under the aegis of the University Hospital. The Gift Shop on the Ground Floor of the White Building was relocated to the Silverstein Building in order to make way for a modern outpatient rehabilitation facility designated "The Erdman Clinic." A new, modern acute rehabilitation facility, "The George Morris Piersol Rehabilitation Unit," consisting of 24 acute care beds, gymnasium, and other relevant facilities for occupational and physical therapy, was installed on the sixth floor of the Ravdin Building of the University Hospital. The Piersol Unit revived the team concept, i.e., a team of professionals led by a physiatrist was to manage each patient's rehabilitation program.

Rebuilding the Department

In 1993, the Piersol Inpatient Rehabilitation Unit and the new William J. Erdman II Outpatient Center, both located in the University Hospital, were officially dedicated. Along with these units came a new facility for Orthotics and Prosthetics in the basement of the Gibson Building and a new gymnasium for physical and occupational therapy on the first floor of the Ravdin/White Building.

Along with the new facilities, Rehabilitation Medicine took on a whole new approach. In addition to revitalizing its clinical services, the Department placed renewed emphasis on teaching and research. The Department now offers five divisions as subspecialties within Rehabilitation Medicine: Geriatrics, Musculoskeletal Disorders, Neurorehabilitation, Pediatric Rehabilitation and Electrodiagnosis. Pediatric Rehabilitation is provided at Children's Seashore House, a regional facility adjacent to the University Hospital. In collaboration with the Department of Orthopedic Surgery, and in response to a "musculoskeletal initiative" created by Dr. William N. Kelley, a multi-department ("one-stop shopping") Spine Center was created.

Soon after accepting leadership of the Department, Fishman set out to rebuild the residency program and to reclaim the rehabilitation medical service at the Veterans Administration Hospital (which had been ceded to Temple University). All full reaccreditations for the inpatient activities of the Department were in place by 1991 and the number of institutions used off-site for residency training was reduced from 15 to three (Children's Seashore House, Veterans Administration Hospital, Our Lady of Lourdes Hospital). Recruitment of faculty for the rejuvenated Department was remarkably successful with little turnover. As of January 1996, the faculty of the

Department had increased to 14 full-time faculty members, 11 residents, and four postdoctoral fellows. Several faculty members held individual NIH grants in addition to grants from the Agency for Health Care Policy and Research of the Department of Health and Human Services.

Investigators in the Department of Rehabilitation Medicine sought cooperation with established scientific components of the University for scientific training and collaboration. This strategy brought the experience of established investigators and laboratories from other departments and schools to rehabilitation medicine. In addition, efforts were made to encourage collaborative clinical activities. A five-year research training grant, from the National Institutes of Health, operated conjointly with the Moss Rehabilitation Institute, provided for four research fellows per year. (In 1997, this research training grant was renewed by the National Institutes of Health.) Collaborative research was undertaken with faculty in other departments such as Biophysics and Biochemistry, Bioengineering, and Medicine. Keith Robinson, M.D., Assistant Professor and Board certified in both Internal Medicine and Rehabilitation Medicine, was given a two- year leave of absence by the Department for supplementary training in cognitive research. By 1993, the Department had jumped from last to second place in research funding by the National Institutes of Health. In 1996, this success in research funding was topped by a large grant from the Department of Defense in support of fundamental research on the "fatigue syndrome" in veterans of the Persian Gulf War.

Commitment to outcomes research has been an outstanding strength of the department. Margaret Stineman, M.D., Director of Program Evaluation and Quality Assurance, conducts a nationally prominent program in outcomes research largely supported by grants from the National Institutes of Health. She is at the forefront of national planning for cost-effectiveness and quality improvement in rehabilitation medicine.

Clinically, the Department has taken on a new life. Indeed, it has developed so rapidly that the new facilities were soon outgrown. The multi-departmental, interdisciplinary Spine Center, under the Direction of Curtis W. Slipman, M.D., is expanding to new sites off-campus. Krista Vandeborne, Ph.D., Research Assistant Professor, has embarked on projects involving NMR imaging and spectroscopy of muscle. In this research, she works closely with John Leigh, Ph.D., her former mentor in Radiology, Biophysics and Biochemistry. Leigh has made NMR imaging and spectroscopy available to Vandeborne, thereby paving the way for a collaboration that has led to the studies of Gulf War veterans noted above. Robert J. Goldman, M.D., a Board certified physiatrist, is conducting research on electromagnetic induction of wound healing with colleagues in the Department of Orthopedics and Bioengineering. M. Elizabeth Sandel, M.D., Director of the Neurorehabilitation Program, began collaborative research with neuropsychologists, psychologists, and therapists in the rehabilitation of patients who have suffered mild brain injury.

Other clinical activities were initiated or nurtured. The electrodiagnosis laboratory expanded its activities to include pioneering research by Jennifer Chu, M.D., on intramuscular stimulation of muscle (IMS). Chu continued to play a central role in the teaching of electromyography to residents and in teaching them the fundamentals of nerve conduction studies and of somatosensory evoked potentials. Acupuncture, a traditional clinical activity of the Department, became a nodal point for the development of complementary medicine by the Department. The pediatric rehabilitation division, located at the Children's Seashore House, has achieved national recognition for excellence in pediatric rehabilitation under the direction of Linda J. Michaud, M.D. and Stephanie Ried, M.D.

As the Department returned to its former stature, its presence in the medical curriculum increased. Four week clinical clerkships were resumed in Musculoskeletal Rehabilitation, Neurorehabilitation, General Rehabilitation, and Pediatric Rehabilitation. The Scott family sponsored summer student fellowships for two post-first year students to be introduced to the field under close mentoring by David A. Lenrow, M.D. Currently, a new medical school curriculum is about to be implemented. Rehabilitation Medicine is thoroughly integrated into the new curriculum.

The original plans in 1990 for the renaissance of the Department called for the allied health activities, i.e., Physical Therapy, Occupational Therapy, and Orthotics and Prosthetics, to return to the aegis of the Department. However, implementation of this design was delayed by other priorities imposed by the rapidly evolving health scene and the needs of the rapidly emerging University of Pennsylvania Health System. Nonetheless, allied health activities continued to expand. In 1996, the time of this writing, the Hospital of the University of Pennsylvania created and acquired an off-campus facility for physical and occupational therapies and other facilities strategically dispersed throughout the University of Pennsylvania Health System. Concomitantly plans were revived to shift control of the allied health activities from the hospital to the Department.

The renaissance of the Department was welcomed not only by alumni of the Department, but also by physiatrists elsewhere who recalled the days when the Department had been preeminent in the field. They interpreted the institutional recommitment to rehabilitation medicine as a sign of a reversing trend at a time when the need for rehabilitation services was increasing exponentially. In 1994-1995, 54 of the 128 medical colleges in the United States (41%) had no department of rehabilitation medicine; in 18 medical schools, Rehabilitation Medicine was part of other specialties, such as Orthopaedic Surgery or Preventive Medicine. The revival of the Department in a distinguished research-oriented university augurs well for the specialty.

Postscript

This brief report was begun in 1996 in anticipation of the 1997 Centennial of the Department. A great deal has transpired since the writing began. Expansion of the University of Pennsylvania Health System generated increasing demands for rehabilitation services throughout the System. The



The number of satellite facilities for physical and occupational therapy increased, both as free-standing operations and as part of hospital acquisitions (e.g., Phoenixville Hospital). As the missions of the core hospitals (Hospital of the University of Pennsylvania, Presbyterian Hospital, and Pennsylvania Hospital) became defined, plans were made to satisfy their respective needs for rehabilitation services. Divisions of the Department were established at Presbyterian and Pennsylvania Hospitals. The Department set up rehabilitation activities at Radnor and these prospered.

Another landmark event in 1997 was the return of all physical and occupational services throughout the University of Pennsylvania Health System, as well as Orthotics and Prosthetics, to the aegis of the Department. Plans are currently under way to reincorporate these activities into the Department in keeping with its mission and responsibilities in clinical activities, research and teaching.

As the Department embarks upon its expanded roles within the University and the Health System, it is poised to further its scholarly and research ambitions as well as playing an essential role in the evolving University of Pennsylvania Health System: as part of a distinguished research University, it plans to take full advantage of the talents and facilities that surround it; as part of the Health System, it will take full advantage of opportunities for education and research throughout the System while constantly seeking to provide a continuum of effective and efficient care for those who require rehabilitation services.

Acknowledgements

In the course of its evolution, the Department has changed names and moved from site to site on campus. These forced marches, with their attendant dislocations and relocations, have complicated the documentation of persons and places involved in the natural history of the Department.

In order to provide a nucleus for future health professional and scholars interested in Rehabilitation Medicine, Mary Berwick, Ph.D. undertook to search University archives as well as materials held by the libraries of the University of Pennsylvania and the College of Physicians of Philadelphia in order to gather relevant information. This proved to be a more formidable task than either she or I had anticipated. Nadine Landis, M.S.N. then pitched in to provide most of the illustrations for this publication. Deborah Franklin, Ph.D., M.D. helped with the editing. Betsy Ann Bozzarello, Kimberly Secreto and Amy Johnston added critical reviews and revisions to the process. I am greatly indebted to these individuals for providing the substance, illustrations and critique that made this publication possible.

*Alfred P. Fishman, M.D.
Chairman
Department of Rehabilitation Medicine*

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