

Physical Medicine and Rehabilitation at the Mount Sinai Medical Center During the 20th Century

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Abstract

The Department of Rehabilitation Medicine at the Mount Sinai Medical Center has a long history, beginning in 1910 with the establishment of the Department of Physical Therapy, headed by Heinrich Wolf, M.D. In 1935, William Bierman, M.D., was appointed director. He was, at that time, one of the leading physicians of physical therapy in the United States, and a prolific researcher, writer and clinician. In 1948, the name of the department was changed to the Department of Physical Medicine, reflecting the newly established specialty of the Board of Physical Medicine. In 1959, Lawrence Wisham, M.D., was appointed chairman, and shortly thereafter the name of the department was changed to Physical Medicine and Rehabilitation. Under Dr. Wisham's leadership, services were provided to inpatients on the acute wards of the hospital, and to outpatients. In 1968, the name of the department was changed to Rehabilitation Medicine. In 1986, Kristjan T. Ragnarsson, M.D., became chairman of the department, and shortly thereafter an inpatient rehabilitation medicine service was established and outpatient services expanded. Since that time, rapid growth has occurred within the department, particularly in delivery of clinical services and research. The role of rehabilitation medicine in the delivery of clinical services to people with temporary or permanent disability is now well established, but efficient and effective delivery must be ensured in the current and future healthcare environment. **Key Words:** Physical therapy, physical medicine, rehabilitation medicine, history.

THE GREAT MEDICAL AUTHORS OF ANCIENT TIMES, including Hippocrates and Galen, mention in their writings the use of physical agents to treat disease and to improve health and human function. Physical agents such as, heat, cold, water, sun rays, exercise and massage have been widely used on an empirical basis throughout the ages, with electricity being added more recently. In the early twentieth century, Marie Curie received the Nobel Prize for Physics for her work on radioactivity (1903) and the Nobel Prize for Chemistry for her discovery of radium and polonium (1911). Niels Finsen, M.D., an Icelandic physician practicing in Denmark, received the Nobel Prize for Medicine in 1903 for his work on the effects of ultraviolet rays on animal organisms. Unfortunately, few scientific studies were done on

other physical agents, so that the use of many agents gradually fell out of favor by the medical profession, and often was regarded as a form of quackery.

1910–1935

It was in this atmosphere that the Department of Physical Therapy of the Mount Sinai Hospital Dispensary was established on December 5, 1910, as an independent unit with representation on the Medical Board by its chief, Heinrich Wolf, M.D. Prior to this time the physical therapy services had been "under the supervision of the orthopaedic division" (1). According to a report written by Dr. Wolf in 1912 (2), the treatment provided by the medical staff of the department consisted mostly of applying hot air and performing massage for such medical conditions as bone fractures, joint diseases and constipation (!), reportedly with good results. Dr. Wolf believed that The Mount Sinai Hospital was the first hospital to acquire a modern diathermy apparatus and one of the first to use artificial fever in the treatment of disease.

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1935–1959

There is little information available about activities within the department until 1935, when William Bierman, M.D. (Fig. 1), one of the pioneers of physical medicine as a specialty (3) was appointed attending physical therapist (and apparently director of the department). (In those days all physical therapists were physicians.) Dr. Bierman, together with two other founders of the specialty, Frank Krusen, M.D., and John Coulter, M.D., established the American Board of Registry for Physical Therapy Technicians in 1934, in order to evaluate and register therapists who were considered qualified (4). From 1932 to 1938, he served on the editorial board of the *Archives of Physical Therapy, X-ray and Radium*, the publication that became the *Archives of Physical Medicine* in 1945 and the *Archives of Physical Medicine and Rehabilitation* in 1953. In 1936, Dr. Bierman was elected President of the American Congress of Physical Therapy, now the American Congress of Rehabilitation Medicine. That same year, Dr. Bierman was one of the first to advocate establishing physical medicine as a specialty, to the AMA Advisory Council for Medical Specialties (now the American Board of Medical Specialties) (5). In 1937, Dr. Bierman organized the first international conference on fever therapy in New York City. For his contributions in this field, the French government awarded him the rank of Chevalier (Knight) of the Legion of Honor.



Fig. 1. William Bierman, M.D.

Under his leadership, the department expanded and opened an inpatient division which, in 1938, obtained new quarters with a well-equipped gymnasium for therapeutic exercises, hydrotherapy facilities, a wide range of devices for electromagnetic therapies, and three rooms with equipment for fever therapy. At the opening of this new facility, an all-day presentation of scientific papers by the Department of Physical Therapy and other “cooperating” departments was held on April 13, 1938, and many of these papers were subsequently published in the September/October issue of the *Journal of the Mount Sinai Hospital* (3). The articles describe the use of different physical agents in the management of diseases, such as ultraviolet light for skin infections, convulsive heat and iontophoresis for osteoarthritis, and artificial pyrexia (fever therapy) for achalasia and gonococcal infections.

In 1938, Dr. Bierman helped found the Society of Physical Therapy Physicians, now known as the American Academy of Physical Medicine and Rehabilitation (4). He served as the third president of this organization from 1940–1941. In 1941, Dr. Bierman received the Gold Key Award, the highest honor given by the American Congress of Physical Therapy (the other recipients that year were President Franklin Delano Roosevelt and Bernard Baruch, the financier and philanthropist).

During his career, Dr. Bierman was the author of three books, many book chapters and more than 100 scientific articles. He reached the age of retirement in 1958, but spent the next 10 years at the University of California, San Francisco, where he did research in biomechanics. He died in 1973.

There is little material available to describe activities within the department during the 1940s. During this period, antibiotics became widely available, eliminating the need for fever therapy in the treatment of infectious disease. During World War II, the focus of physical medicine broadened to include rehabilitation of persons with physical disabilities. This development was partly due to the large number of wounded soldiers in military hospitals, but also due in part to the passing of new legislation aiding persons with physical disability. During the war, Howard A. Rusk, M.D., introduced into Army Air Corps hospitals the concept of active rehabilitation of injured soldiers, emphasizing physical training as well as psychosocial counseling. In 1943, the Barden-LaFollette Amendment, commonly known as Public Law 113, was passed by Congress to permit availability of funds for physical restoration, in addition to vocational training,

for persons with physical disabilities. After the war, Dr. Rusk and his colleagues initiated rehabilitation programs for civilians with physical disabilities and began efforts to establish rehabilitation medicine as a new medical specialty with approved residencies.

In June 1947, the American Board of Physical Medicine was established and approved by the Advisory Board of Medical Specialties (ABMS). That same year, 93 physicians were certified by the board, after passing oral and written examinations, and approximately 30 were certified without examination (6). Perhaps related to this development, the department changed its name from Physical Therapy to Physical Medicine on May 11, 1948. In 1950, the name of the board changed to Physical Medicine and Rehabilitation, as these two medical specialties merged into one. This merger was not approved by all; one of the most vocal opponents was a physician, Sidney Licht, who had trained and worked with Dr. Bierman at Mount Sinai (7). There is no indication that any comprehensive rehabilitation programs were established at Mount Sinai, either for inpatients or outpatients, during this period. Most of the treatments involved the use of physical agents, although there are numerous indications in the Mount Sinai Annual Reports that physical exercise and skills training for patients with physical disabilities were gradually becoming more important.

1959–1986

In January 1959, Lawrence A. Wisham, M.D. (Fig. 2), was appointed chairman of the Department of Physical Medicine. Shortly after his appointment, on March 10, 1959, the name of the department was changed to Physical Medicine and Rehabilitation (PM&R). Dr. Wisham is best known for his investigations on the clearance of sodium from human muscle, some of which he did in collaboration with Dr. Rosalyn Yalow, the Nobel Prize recipient for medicine and physiology in 1977. During Dr. Wisham's tenure, the department primarily provided consultation services to inpatients on the acute wards of the hospital and in various outpatient clinics, but did not have an active inpatient service. In the spring of 1964, the Rehabilitation Workshop, a project of the Women's Auxiliary Board, began providing paid employment in a sheltered environment for outpatients with disabilities—individuals who were unable to work in a competitive commercial environment but who hoped to gain employment in the future. On July 1, 1966, the department began a three-year training program in PM&R,



Fig. 2. Lawrence A. Wisham, M.D.

with eight residents and fellows who had received a federal traineeship grant from the Vocational Rehabilitation Administration.

During the early 1980s, there were five physiatrists on the faculty at Mount Sinai. Besides Dr. Wisham, these were Drs. Frances Dworecka, Danuta Janiszewski, Somchat Chiamprasert and Beatrice Kaplan. A residency training program, for 24 residents, was directed by Jerry Weissman, M.D., at Elmhurst Hospital. These residents rotated through four hospitals: Elmhurst City Hospital, Beth Israel Medical Center, The Bronx Veterans Affairs Medical Center (VAMC) and The Mount Sinai Hospital. There were no federally funded research programs within the department, nor have I been able to find any history of such.

On the national scene, during the 1950s and 1960s, a small number of academic medical centers established their own departments of PM&R, which incorporated inpatient hospital beds for the rehabilitation of persons with severe physical disabilities. Teams of rehabilitation professionals were created, consisting of specialists in PM&R (physiatrists), physical, occupational and speech therapists, as well as rehabilitation nurses, psychologists, social workers, vocational counselors, recreational therapists, etc. These people worked together under the direction of the physician to reach the goals of rehabilitation medicine. The goals were defined as maximizing the function of the disabled person physically, psychologically, socially and vocationally. In 1965, the U.S. Congress passed legislation creating Medicare and Medicaid, and through diligent advocacy of

leaders in the field of PM&R, rehabilitation services for both inpatients and outpatients were included in the Medicare/Medicaid health care package. Since that time, rehabilitation services have become a standard component of health care services in the United States for all persons with a new onset of physical disability. On May 20, 1968, the name of Mount Sinai's Department of Physical Medicine and Rehabilitation was changed to its current name: the Department of Rehabilitation Medicine.

Until the mid-1970s, inpatient length of stay (LOS) at rehabilitation institutions remained relatively long. At this time, many insurance companies became cost conscious and wanted to have an influence on the management of their patients. They demanded that rehabilitation centers establish criteria for patients to be admitted and criteria for continued stay; most rehabilitation services complied. During the early 1980s, as the flow of patients admitted for rehabilitation increased, there was also an increased demand for accountability. While the need for rehabilitation services for patients with physical disability was not an issue, the question was raised as to how the value of rehabilitation services could be measured, to justify its cost. It was generally agreed that the primary product of rehabilitation therapies was improved function. A variety of functional assessment scales were proposed, but many of these were found to be too complex to be practical, and others were found not to be scientifically valid or reliable. Finally, one functional assessment scale emerged, the Functional Independence Measure (FIM), which has been adopted by virtually all of the major rehabilitation centers in the U.S., These centers now collect functional data on admission, on discharge, and on follow-up for each patient.

During the 1980s, the U.S. Government established a new payment system for hospitals. Called the diagnosis-related groups (DRG) system, it prospectively assigns a specific number of inpatient days for each specific diagnosis. This payment system was created to give hospitals an incentive to reduce their LOS and consequently to reduce cost of care. Acute-care hospitals were paid a fixed price, depending on the specific diagnosis, regardless of whether the patient stayed less than the assigned number of days, or more. If hospitals were able to shorten the LOS for patients with acute illnesses, they were able to make more money than under the per diem payment system, but if the LOS was long, they would lose money. Two types of medical services were exempt from the DRG payment system: rehabilitation medicine and psychiatry. The DRG exemp-

tion proved to be very good for the field of PM&R. Since hospitals continued to be paid per diem for rehabilitation admissions, but not for admissions to the acute-care medical and surgical services, there was a financial incentive to open up more rehabilitation beds. Needing to shorten acute-care LOS, hospitals discharged patients earlier from the acute-care services and often transferred them to the inpatient rehabilitation medicine service. This resulted in a great increase in referrals of patients for inpatient rehabilitation, and increased the demands for rehabilitation beds. Since 1980, the total number of inpatient rehabilitation beds in the United States has more than doubled and is now well in excess of 22,000. Most of the new rehabilitation beds have been opened within hospitals; relatively few new free-standing rehabilitation centers have been built. This too has been advantageous for the field, since patients who arrive earlier for rehabilitation after illness or injury tend to be sicker and need continued access to hospital resources for proper management while they receive rehabilitation therapy. At the same time, more young physicians have been attracted to the field of PM&R, which now counts more than 5,000 specialists.

1986–Present

By the mid-1980s, it was clear that both The Mount Sinai Medical Center and its Department of Rehabilitation Medicine were about to undergo major changes. A new hospital building was being planned and a search committee was established to find a new chairman for the department. When Mount Sinai applied for a certificate of need (CON) for the new hospital building, to the New York State Commissioner of Health, David Axelrod, M.D., the CON was ultimately granted with the provision that there would be a reduction in the total number of beds in the hospital, but that 50 beds would be set aside for inpatient rehabilitation. After the search committee (led by Julius Wolf, M.D., Chief of Staff at the Bronx VAMC), had identified me as their leading candidate, a long process of negotiation regarding space and staff began. By July 1, 1986, when I assumed the chairmanship, Mount Sinai had made known its new commitment to provide comprehensive rehabilitation services for people with physical disabilities and to facilitate rehabilitation research and education. Since that time, remarkable growth has occurred in the various activities of the department, including expansion of inpatient and outpatient care services, educational programs and externally funded

research. This has involved a large increase in the number of faculty and staff in the department. Some of the major highlights in the growth of the department will be described in the following paragraphs.

In December of 1986, eight inpatient rehabilitation beds were opened on the seventh floor of the old Housman Pavilion and the service grew to 17 beds in 1987. Joining me as an attending physician for this service was Joseph Carfi, M.D., a graduate of Mount Sinai School of Medicine, who completed his training in PM&R at the Rusk Institute. The inpatient service grew to 36 beds early in the year 1990, when it moved to the new Guggenheim Pavilion, and in 1992 it grew to 50 beds. In 1996, the inpatient rehabilitation service moved to renovated, state-of-the-art facilities on the second and third floors of the Klingenstein Care Center (KCC). Each inpatient unit of 25 beds was self-contained, with all rehabilitation services provided on the same floor as the nursing unit. One unit, directed by Adam Stein, M.D., is primarily for patients with spinal cord disorders, while the other unit, directed by Steven Flanagan, M.D., provides services for patients with disabilities caused by stroke and traumatic brain injury. In December of 1997, a third self-contained inpatient rehabilitation unit was added; it is located on the fifth floor of KCC. This unit, directed by David Thomas, M.D., is intended to provide services primarily for patients with physical disabilities of non-neurological causes.

Outpatient rehabilitation services have expanded both on and off the Mount Sinai campus. In 1986, outpatient rehabilitation services were provided only in the sub-basement level of 5 East 98th Street, the old Guggenheim Hall, but in 1996 the outpatient services moved completely to the current facilities in the new Guggenheim Pavilion, main corridor level. In 1992, the Mount Sinai Sports Therapy Center opened at 625 Madison Avenue; it is an elegantly designed outpatient physical and occupational therapy facility, fully equipped with state-of-the-art therapeutic devices and staffed by therapists experienced in the treatment of musculoskeletal disorders. In 1993, the department opened a new outpatient physical therapy facility at "Asphalt Green Swim and Sports Center," at East 92nd Street and York Avenue. Unfortunately, this facility was closed in 1996, when the landlord terminated the lease.

Electrodiagnostic services are provided by Nahid Nainzadeh, M.D., for both inpatients and outpatients. Richard Frieden, M.D., has developed rehabilitation services for persons with amputations and the geriatric population. Parag Sheth, M.D.,

working closely with Mount Sinai's Center for Corporate Health, has provided consultation services for persons with musculoskeletal disorders, as well as for sports- and work-related injuries.

There has been considerable interaction with hospitals within the Mount Sinai Health System, other than the traditional academic affiliates. One very significant development has been the close collaboration with Jersey City Medical Center and Meadowlands Hospital in New Jersey, in opening, staffing and operating the Liberty Rehabilitation Institute at Meadowlands Hospital. A 30-bed inpatient rehabilitation unit opened there in December of 1996. Jorge Mayoral, M.D., has been the unit's medical director since its inception. The department has also provided guidance and assistance to many other hospitals within the Mount Sinai Health System regarding establishment of new rehabilitation medicine services and recruitment of professional staff, including medical directors. In July of 1998, 26 representatives from 12 system hospitals with rehabilitation medicine services met for the first time at Mount Sinai to discuss future collaboration and networking.

At the same time as the clinical programs have grown, federally funded rehabilitation research projects have increased significantly. In 1986, the department was funded by the National Institutes of Health (NIH) for a research project on diagnosis and treatment of post-stroke depression. In 1987, the department was designated and funded by the National Institute of Disability and Rehabilitation Research (NIDRR) for five years as a traumatic brain injury (TBI) model system of care. In 1989, the Spinal Cord Damage Research Center at the Bronx VAMC opened under the direction of William A. Bauman, M.D., who holds joint appointments in the departments of Rehabilitation Medicine and Medicine. In 1990, the department received a designation and federal funding as a spinal cord injury model system of care, the only such system currently operating in New York State. In 1990, it received additional funding as a comprehensive regional TBI rehabilitation and prevention center. In 1993, the department was designated and funded as a research and training center to assimilate individuals with TBI into the community.

Working closely with Dr. Bauman on many of his projects is Ann Spungen, Ed.D. The center, which was established with funding from Mount Sinai and the Eastern Paralyzed Veterans Association, has been highly productive in terms of publications and presentations, and successful in obtaining grants from the Department of Veterans Affairs, NIH and non-federal agencies. Numerous other research grants have been obtained, both

from federal and non-federal sources, with the annual funding for research (exclusive of Dr. Bauman's funded projects) varying between \$1 million and \$2.4 million annually. Instrumental in this success has been Wayne A. Gordon, Ph.D., a neuropsychologist, who began his career at New York University Medical Center, but joined me at Mount Sinai as director of research and associate director of the department in 1986. A close associate of Dr. Gordon's on most of his research projects is Mary Hibbard, Ph.D., who joined the department in 1986. As products of the research projects, numerous papers have appeared in journals and presentations have been made at countless professional meetings by the faculty.

The department has had an approved Accreditation Committee for Graduate Medical Education (ACGME) residency training program since 1966. The number of residents in the program during the last 25 years has varied from 24 to 30, depending on the number of affiliated hospitals involved. The program strives to provide exposure to all aspects of the specialty of PM&R. In the past there has been a major emphasis on management of inpatients with physical disability, but given the changing nature of medical practice, the program is currently being restructured, with the major emphasis to be on training in the outpatient setting.

It is regrettable that Mount Sinai medical students have little exposure to the field of PM&R, and the little they receive is through lectures provided by the faculty to third and fourth year medical students in August of each year, and through electives. There is a strong feeling among the department's faculty that PM&R requires designated time in the curriculum of the medical school, preferably by developing a required rotation of medical students through the department, where they would be exposed to patients with physical disabilities and musculoskeletal disorders. From 1978 to 1998, the residency training program was directed by Jerry Weissman, M.D., from Elmhurst Hospital. Adam Stein, M.D., is the current director of this program.

The Future

Like most branches of medicine, the field of PM&R currently is facing numerous uncertainties. However, it is clear that the fundamental needs of persons with disability will not change, and that their rights are now legally protected with the passage of the Americans with Disabilities Act. The elderly population will continue to grow and more lives will be saved after injury and disease. This means that there will be

more people with diminished functional skills, and therefore there will be increased need for rehabilitation services. In delivering these services, accountability will increase, i.e., optimal results will have to be produced at the lowest possible cost. New and different levels of inpatient and outpatient rehabilitation services must be created, each different in scope, focus, intensity and, very important, in cost. The services must operate in a continuum of care, convenient and accessible to all patients in need. Collaboration with partners within the Mount Sinai-New York University Medical Center Health System is likely to increase, building new rehabilitation programs, and coordinating these programs into a network of rehabilitation services where high quality of care goes hand in hand with effective delivery. The recent merger of Mount Sinai with New York University Medical Center, with its world-renowned Rusk Institute of Rehabilitation Medicine, will predictably create new challenges and opportunities in clinical service delivery, education and research. Research must continue in order for us to find new ways to reduce physical disability and, in collaboration with our colleagues in the basic sciences, to find a cure for paralysis. Education of students, residents, various health professionals, and the public must be focused and effective in order to increase their understanding of the needs of people with disabilities and effective treatments. While these are ambitious goals, few if any institutions are more likely to achieve success in this field than the merged Mount Sinai-NYU Medical Center, with its two formidable departments of rehabilitation medicine.

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