BY THE NUMBERS: NEUROLOGY AT THE UNIVERSITY OF MICHIGAN
1890-2000

A GRAPHICAL HISTORY

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PREFACE

In contemplating and preparing this attempt at a history of the Department of Neurology, I speculated on why Horace Davenport’s scholarly and delightful narrative history of the University of Michigan Medical School ends in 1941\(^1\). One possible reason is that, in his first version of the Medical School’s history\(^2\), Professor Davenport chose to begin his narrative with the administration of Victor Vaughn (1891) and decided that 50 years was a good even number with which to end. But another reason, perhaps not consciously chosen by Professor Davenport, may be that narrative histories of institutions, enriched by details of the personalities that influence them, become exponentially more difficult as the size and complexity of the institution increases. As an inspection of the Figures in this presentation will show, the University of Michigan and its Medical School show an accelerated growth and complexity beginning in the 1940s and 50s so that it becomes practically impossible to weave the history of individuals neatly into the history of the institution.

Admittedly, the history of a department, especially one as small as the Department of Neurology, represents a level of effort that is smaller, by orders of magnitude, than Professor Davenport’s. However, I have three good excuses for avoiding the substantial effort that a full narrative history would require. First, the history of a department is embedded in the history of the larger institution of which it is a part. Departments, even very good and big ones, do not alone drive the histories of medical schools or medical centers. Second, narrative histories necessarily document the contributions of individuals. In a small department, the contributions of each individual are more likely to contribute to the overall departmental history than in a larger one, so it becomes difficult, and possibly irrelevant, to select individuals for special mention. In this history, I have, with few exceptions, limited personal identifications to Departmental chairs. Third, I wished to create a document that could be read easily at a single sitting; details of particular interest to individual readers are available in the sources given below.

Given these personal limitations, I have elected to collect data, create graphs that I thought would be interesting, and let the numbers speak for themselves as much as possible. All the graphs are plotted with the beginning of each relevant decade on the abscissa and numbers or percentages on the ordinates. I have tried to organize the graphs into categories and to facilitate their interpretation with a sparse narrative. The narrative is intended to provide some additional explanation, detail, and (I hope) color to the data presented in the graphs. I have tried to spare the reader the irritation of repeatedly paging back and forth between the narrative and the graphs by replicating the graphs at appropriate places throughout the text. This may be annoying to some, but I did not know another way to avoid this problem.

ACKNOWLEDGEMENTS AND SOURCES

I am indebted to Janet Tarolli of the Historical Center for the Health Sciences for materials she provided from The University of Michigan, an Encyclopedic Survey, edited by W.B. Shaw, University of Michigan Press, 1951. Ms. Tarolli’s epilogue to Professor Davenport’s book is a pleasure to read and helped immeasurably in filling important gaps in information. The staff of the Bentley Historical Library, especially Brian Williams and Karen Jania, were very helpful in guiding me to the President’s Reports, the Statistical Reference Book,
and Medical School materials available in loose filings. Kathleen Schuch of the Sesquicentennial office (Medical School) was very helpful in guiding me to several sources. The following individuals and offices provided important information:

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In addition, I used Internal Reviews of the Department of Neurology (copies available in the Department of Neurology office) as a source for information from 1977 through 1997. The reader is encouraged to consult these documents for further details, especially regarding the number and identities of faculty and trainees. The sources of direct quotations are given in the text.

Finally, I am most grateful for the opportunity to have known Horace Davenport and to have had the pleasure of reading, and being inspired by, his history of Medicine at the University of Michigan.


2. Davenport, H.W. *Fifty Years of Medicine at the University of Michigan, 1891-1941*. University of Michigan Medical School, Ann Arbor, 1986
BEFORE 1890

At the time of William Herdman’s appointment as Professor of Practical Anatomy and Diseases of the Nervous System (1888), Michigan had been a state for 51 years, Ann Arbor had a population of about 8000, and the University of Michigan had 1600 students. Ann Arbor had had electric lights for 4 years and a city water system for 3 years.

1890

As the decade of the 1890s began, Dr. Herdman was Professor of Nervous Diseases and Electrotherapeutics, later changed to Professor of Diseases of the Mind and Nervous System and Electrotherapeutics (1898). Faculty appointments were given in the Medical Department of the University; the Medical School was not created officially until 1915. The small size of the University faculty distorts the proportional representation of disciplines. Nonetheless, it is notable that the Medical faculty comprised over half of the University faculty (40% of these in “neurology”; Figures 1 and 2) and that over 20% of the 2,159 University students were enrolled primarily in the medical curriculum (Figure 3).
Dr. Herdman had a private practice in Ann Arbor. He and his assistant, Jeanne Cady Solis, M.D. offered electrotherapeutics to patients with a variety of neurologic disorders, especially “neurasthenia”. Treatment consisted of placing the patient in an electrostatic field or applying faradic (alternating current) or galvanic (electric pulse or “shock”) stimulation to the body.

1900

The demographics of the University and its Departments changed little from the previous decade, but Ann Arbor now had a population of over 14,000, over 25% of whom were University students.

Dr. Herdman, who then held the title of Professor of Nervous and Mental Diseases, convinced the State Legislature to establish a State Psychopathic Hospital in Ann Arbor. The building was ready for occupancy 1906, but Dr. Herdman died in December of that year at the age of 58. He was traveling on sabbatical leave and died in Baltimore following surgery for intestinal obstruction. Albert Barrett, M.D. (U. Iowa) was then appointed Professor of Psychiatry and Diseases of the Nervous System and Director of the Psychopathic Hospital, which opened formally in 1907. Carl D. Camp, M.D. (U. Penn) was appointed Clinical Professor of Diseases of the Nervous System. The teaching and patient care functions of Neurology and Psychiatry were separated but the two emerging disciplines were administratively combined as the Department of Diseases of the Mind and Nervous System.

According to a subsequent report by Dr. Carl Camp (The Michigan Alumnus 32: 524, 1926): “In 1907, the number of patients examined in this department averaged about two hundred a year”.

1910

The proportion of University students pursuing a medical career dropped (Figure 3), probably because the new entrance requirements called for 90 semester hours in various science courses as well as some facility with Latin and Greek. The proportion of University faculty appointed in the Medical School also declined, and continued to do so through the next decade before beginning a steady increase in the 1960s (Figure 2). The Department of Medicine became the School of Medicine in 1915. The 34 Medical School faculty were assisted by 22 demonstrators and assistants. The University Hospital had 280 beds.

Dr. Camp did formal teaching of medical students in class and on the wards 8 hrs/week and continued to have a private practice in Ann Arbor. He was assisted by Dr. Barrett (1.5 hrs/wk) and, part of the time, by a junior faculty appointee.

Ann Arbor’s population was 17,000. The city established the first ordinances to control automobile traffic in 1910.
1920

At the start of the decade, the proportion of the University faculty with Medical School appointments declined further (Figure 2). The demand for medical doctors during WW I accounted for much of this decline. There were 23 Instructors to assist the 27 members of the full time faculty. Although Neurology was not a specialty as defined today, there was formal instruction in Neurology and the Department had 3 additional junior faculty members to assist Drs. Camp and Barrett. I counted these appointees as Neurology faculty (Figures 2 and 4) although most probably did not all have ranks of Assistant Professor or above; they usually went into private practice after a year or so.

In March of 1920, the University Board of Regents dissolved the Department of Diseases of the Mind and Nervous System. The Regents appointed Dr. Barrett Professor of Psychiatry and Dr. Camp Professor of Neurology. This date marks the administrative creation of these two Departments.

University hospitals admitted approximately 8000 patients that year (Figure 5). The hospitals had an average daily census of 370 and were described in the President’s Report as “…full all the time.” Many patients were veterans of WW I. In The Michigan Alumnus (32: 524, 1926), Dr. Camp claimed that: “…the number of patients now examined (by the Department) has reached about three thousand annually.”
The new University Hospital, which opened in 1925, recorded 1226 available beds with an average daily census of 1080 inpatients and an average length of stay of 18 days. The University Hospital report of 1930 stated that 21,750 patients had been admitted as inpatients and that 819 of these were Neurology patients (Figures 5 and 6). I could not find a list of diagnoses.

The Department of Neurology consisted of 5 faculty, including 1 Professor, 1 Assistant Professor, and 3 Instructors with 2 year appointments. Russell N. DeJong joined the faculty as an Assistant Professor in 1936 following his graduation from the UM Medical School (1932) and 4 years of graduate clinical training. In recalling his internship, Dr. DeJong wrote: “I lived in the intern’s quarters…. My remuneration was room, board, and laundry. For night call, we were awakened by an orderly with a flashlight. We had good meals….with tablecloths and table service. One of our waiters was Gerald Ford, then a student working for his board.” (Arch. Neurol. 44: 1193-4, 1987).
In the President’s Report for 1938-39, Dr. Camp wrote: “Research work has been carried on by all members of the Department, and six papers have been published.”

1940

World War II stopped increases in the number of faculty of either the University, the Medical School, or the Department of Neurology during the first years of this decade (Figures 1 and 4). There was a slight dip in the number of Medical students also, despite the fact that students were accepted for accelerated training in medicine as part of the war effort (Figure 3).

The report of the University Hospital in 1940 claimed 307,826 inpatient days and 1,330 beds. The Department of Neurology, which still had only 5 faculty (counting 3 Instructors), accounted for 682 admissions during the 1940-41 year (Figure 6). Later in the decade, patients with war-related injuries and diseases received care at University Hospital and in the Outpatient facilities.

In his one-paragraph report of the Department of Neurology in The President’s Report (1942-43; the last I found in the Bentley Historical Library), Dr. Camp reported: “The department realizes its responsibility to give the students as much instruction as possible on diseases of the nervous system that might be the result of war injuries, anxiety states, injuries to nerves and other maladies of this sort.”

Electroencephalography (EEG) and electromyography (EMG) were increasingly recognized as important routine laboratory procedures during this and the previous two decades. In many medical centers, these studies were conducted within departments of Neurology. At Michigan, however, EEG was developed as a clinical procedure in the Department of Psychiatry and remained within that Department until the late 1970s. EMG was variously performed by the Department of Physical Medicine and Rehabilitation or, occasionally, by the Section of Orthopedic Surgery.
Ann Arbor’s population was 40,000 at the beginning of the decade and grew during the War in part because the manufacturing capacity in Detroit and nearby Willow Run was transformed into what Winston Churchill called “….the arsenal of democracy.”

1950

Dr. Camp retired at age 70 and Dr. DeJong was appointed to succeed him. I did not find records of the number of Medical School or Neurology faculty at the start of this decade. This may be related to the fact that, by this time, The President’s Report (to the Regents) assumed a different form and distribution and no longer included departmental reports. In addition, Fred Hodges, M.D. noted, in his 1972 forward to the Medical Faculty Roster (Dean’s Copy) that: “No faculty lists were published for the ….school years (1944-46).” And that: “The form of the faculty rosters has varied considerably.” Nonetheless, the size of the University faculty increased (to 1,269) as did the number of students (to 21,074) (Figures 1 and 3). The UM
Statistical Reference Book (1958) records an entering Medical School class of 200 that year, bringing the total enrollment to nearly 800.

The University Hospital had 1,078 active beds and 18,074 admissions of which 780 were listed for Neurology (Figures 5 and 6) and 680 for Neurosurgery. There was a dramatic increase in the proportion of patients examined and treated as outpatients, from less than 60% in 1940 (29,303 clinic visits) to about 95% in 1950 (245,216 clinic visits) (Figure 5).

During this decade, the Veteran’s Administration (now the Department of Veteran’s Affairs) built an approximately 500 bed hospital within a mile of the University Hospital. This facility, dedicated in 1953, was one of more than 120 V.A. Hospitals that would serve veterans and become affiliated with major university medical schools and hospitals nationwide. The establishment of these V.A. facilities contributed to the growth of academic medical centers during this time. Like other affiliated V.A. Hospitals, the Ann Arbor facility was staffed by University of Michigan Medical faculty (including Neurology faculty), who administered patient care, trained UM Medical students and house staff, and conducted research supported by the V.A. and other agencies, including the N.I.H.

In his reminiscences (Arch. Neurol. 44: 1193-4, 1987), Dr. DeJong notes that: “…in the late 1950s, the University of Michigan was awarded one of the first neurology training grants by the newly formed National Institute of Neurological Diseases and Blindness.”

![Figure 5](image)

**1960**

The population of Ann Arbor was 67,000.

The University faculty continued to grow (1,781; Figure 1) and with it the total number of students (24,538, including 720 Medical students; Figure 3), Medical School faculty, and Neurology faculty (Figures 4 and 7). However the proportion of Medical to UM students declined slightly to nearly 1940 levels (Figure 3).

The University Hospital recorded 1,038 active beds and 21,299 admissions of which 922 were listed as Neurology admissions (Figures 5 and 6). The average daily census was 665 and
the average length of stay 11 days. The proportion of patients served as outpatients (213,805) remained above 90%, as in previous years since 1950.

By this time, departmental reports to the Dean of the Medical School varied considerably and ranged from brief letters (one paragraph) to more extensive citations of research and teaching by the faculty. There is no summary record of research conducted or published by the faculty of the Department of Neurology at this time.
1970

There were now 27,719 University students, including 846 Medical students, 3.1% of the total. Ann Arbor had a population of 99,797 people.

In his two paragraph letter to Dean John Gronvall (1971), Dr. DeJong noted that two faculty members, one with a joint appointment in Pathology and both with strong research activities, had departed for other positions (Figure 4). A neurologist was recruited subsequently to fill a research oriented position with laboratory space in the Kresge I building.

In 1973, the Board of Regents endorsed the establishment of a new Medical Service Plan, which was designed to enhance the incentive for patient care effort by faculty appointed in clinical departments. The MSP, later to evolve into the Faculty Group Practice (FGP) in the 1990s, replaced a clinical faculty reimbursement system that was a mixture of straight salary (the Department of Neurology, for example) and on-site part time private practice at University Hospital (established by individual arrangement).

Dr. DeJong continued to serve as Chair of the Department through the mid 1970s. Following a national search, Sid Gilman, M.D., a Professor of Neurology and of Anatomy at the Columbia-Presbyterian University College of Physicians and Surgeons, was appointed Chairman of the Department of Neurology in 1977. Dr. Gilman immediately began a vigorous recruitment for additional faculty with clinical skills and strong backgrounds in research. In the year of Dr. Gilman’s appointment, there were 7 full time Neurology faculty, 26 full publications (including 4 chapters or books), and extramural research support that totaled $129,716 (including $42,416 at the VA).

With Dr. Gilman’s appointment, EEG was moved administratively to the Department of Neurology. EMG remained administratively within the Department of Physical Medicine and Rehabilitation; later, a sharing agreement gave Neurology access to the EMG laboratories for patient care and teaching.
At the beginning of this decade, Ann Arbor had a population of 107,960. The University had 35,628 students, an enrollment that would change little over the next 20 years. The Medical School enrollment reached 957, but declined slightly from the previous decade as a percentage of the total student enrollment (3.1 to 2.7%; Figure 3). There were 2,157 University faculty, of whom 494 (23%) were appointed in the Medical School, over twice the proportion that existed at the beginning of the ‘60s (Figures 1 and 2). The Department of Neurology now had 12 full-time faculty, representing 2.4% of the Medical faculty. Because of the growth of the total Medical faculty, this was a decline in proportional representation compared to the beginning of the ‘60s (6%; Figures 2 and 4).

The research activity in the Department increased throughout this decade, with external funding nearly quadrupling from $482,121 in 1980 to $1,831,204 in 1984, the period covered by the Internal Departmental Review of 1977-1984. Publications by Neurology faculty increased from 21 (13 peer-reviewed articles and 8 chapters and books) in 1980 to 50 (38 peer-reviewed articles and 12 chapters and books) in 1984.

Clinical activity also increased during this period. In 1980, the Department of Neurology had 926 inpatient admissions (204 at the VAMC), saw 8,725 outpatients (878 at the VAMC), and 1,232 consultations (379 at the VAMC). Within the next 4 years, patient care activity had increased to 1,194 admissions (367 at the VAMC), 9,960 outpatients (1,486 at the VAMC), and 1,562 consultations (420 at the VAMC). Figures 5 and 6 show the 1980 data for Neurology activity at the UMMC only.

In February of 1986, the current outpatient facility and hospital (872 licensed beds including the Mott, Women’s, and Psychiatric hospitals) was occupied, replacing the “Old Main”
hospital, which had 1226 beds. The reduced number of beds reflected the accelerating trend from inpatient to outpatient care (Figure 5).

![Figure 5](image)

FIGURE 5

![Figure 6](image)

FIGURE 6

1990

From the previous decade, there were slight increases in the population of Ann Arbor (109,608), and the University faculty (2,532), but the student population declined slightly within the University (34,097) and the Medical School (826) (Figures 1 and 3). However, substantial changes were apparent within the Medical Center. To support increased clinical activity (Figures 5 and 6), a non-tenure Clinical Track II appointment was established in the mid 1980s, so that physicians whose responsibilities were limited to clinical practice and teaching could be appointed at the UMMC (Figure 1). By 1990, there were 69 Clinical Track II faculty (1 in Neurology; Figure 4), raising the proportion of Medical faculty (total 765) to 30% of the University faculty (Figures 2 and 7). The tenure-track Neurology faculty now numbered 20, nearly doubling during the past decade (Figure 4). Fourteen house officers were enrolled in the 3-year clinical training program and there were 2 Clinical Fellows.

Departmental clinical activity increased, and there was a marked shift in the distribution of clinical effort from inpatient (a decrease to 640 Neurology UMMC admissions) to outpatient (a doubling to nearly 15,000 outpatients) and consultation (1,235 patients; Figures 5 and 6).
demand for increasing clinical effort encroached on the time available for research by faculty on the traditional academic tenure track. Recognizing this, Dr. Gilman initiated and led the effort to establish endowed professorships within the Department of Neurology. This led finally to awarding the Russell N. DeJong Professorship to Robert Macdonald, M.D., Ph.D. (August 1, 1995) and the William J. Herdmann Professorship to Sid Gilman, M.D. (August 13, 1997). At the time of this writing, Dr. Gilman continues to lead the effort to establish a third endowed professorship in Neurology.

Research and scholarly activities continued to increase within the Department. A total of 111 publications (peer-reviewed articles, book chapters, and books) are listed in the 1990 Departmental report to the Dean; research funding reached $3,335,771 (annual direct costs at UMMC), an increase of 26.2% over the previous year, and $199,000 at the VAMC. By 1996, research funding exceeded $4 million and the Department ranked 13th among neurology departments nationwide in the total number of research dollars awarded.
In his Introduction to the Annual Report to the Dean (1990), Dr. Gilman noted the death that year of Russell N. DeJong, M.D., at the age of 83. Dr. Gilman wrote: “Dr. DeJong was a skilled clinician, author, educator, and administrator, and his contributions to the burgeoning field of neurology have had lasting significance”. Dr. Gilman concluded: “We are deeply appreciative of his contributions to this department and the field of neurology.”

2000

Ann Arbor now has a population of 114,847. The number of faculty and students at the University has remained stable for the past decade (Figures 1 and 3).

![Figure 3](image-url)

However, the beginning of the millennium reveals an acceleration of the pattern of changes in the distribution of Medical School faculty effort that began in the 1980s, largely driven by the nationwide increasing cost of, and demand for, medical care. Academic medical centers have been forced to compete with for-profit, and not-for-profit, institutions (now well staffed by former trainees of academic centers) that do not incur the costs of education and research. Accordingly, the total number of patients treated and examined at the UMMC soared past the 1 million mark (1.3 million) and the trend toward an increasing emphasis on outpatient care continued (Figure 5). This trend is reflected in the increased clinical activity in the UMMC Department of Neurology, which continued to increase the number of outpatient encounters but also increased the number of patients admitted by nearly 35% (Figure 6). A similar shift in the distribution of patient care was apparent at the VA Medical Center, which reduced the number of active inpatient beds to 100 or less and increased the capacity to provide outpatient care with the construction of a new outpatient, extended care, and critical care facility.
In response to the demand for patient care, the number and percentage of UMMC and Neurology faculty on the academic tenure track decreased (to 641 and 16, respectively) while these figures increased for Clinical Track II faculty (to 430 and 9, respectively; Figures 1, 4, and 7). Because the number of total University faculty has not changed from the previous decade, the proportional representation of the Medical faculty has decreased if only tenure-track faculty is considered (Figures 1 and 7). However, if Clinical Track II faculty is included, the proportional representation of the Medical faculty increases to 45%, nearly the level attained 100 years ago (Figure 2).
The number of Medical students has fallen to the lowest level (667) since the 1940s, the lowest proportional representation among University students (1.9%) in the history of the University (Figure 3).
Despite the changes in effort noted above, the Department of Neurology has continued to maintain a high level of research and scholarly productivity among both the tenure-track and clinical faculty. One of our clinical faculty, for example, received a national award for neurology teaching. Exact figures are not available at the time of this writing, but the total number of publications exceeds 100 and the total amount of research dollars expended by the Department (July, 1999- June, 2000) is $4,168,334 (direct costs) at the University and approximately $250,000 at the VAMC. How and whether the increasing amount of basic biomedical research performed in the industrial sector will affect the amount and character of university-based research remains to be seen.

Like all other academic medical centers and departments, the University of Michigan Medical Center and the Department of Neurology face a serious challenge over the next few decades and beyond---balancing the demand for cost-effective, high quality medical care with the need to maintain excellence in teaching and research. If past is prologue, the future at Michigan seems bright.