



## **A Brief History of the MD**

### **HISTORICAL PERSPECTIVE**



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*This is the first of what the Editorial Committee hopes will be regular "Historical Perspective" pieces in Sierra Sacramento Valley Medicine.*

BY THE AMERICAN REVOLUTION, there were two medical colleges in the colonies. There were presumed to be 3,500 medical practitioners, but not more than 400 physicians had MD degrees. There was no regulatory process, no oversight, and no standards for granting the degree, which was often given after one or more lecture courses and/or participating in a preceptorship of a few years.

There was so little regulation that many persons undergoing training were illiterate. Many adventurous individuals eschewed any formal training and simply adopted the MD degree.

A hundred years later, there were many more organized medical schools in the United States but standards, regulation, and oversight were essentially unchanged. It was in this setting that the vision, perseverance, and ingenuity of Dr. Elias Samuel Cooper resulted in the opening in 1859 in San Francisco of the first class of 10 medical students in the Medical Department of the University of the Pacific.

Another equally visionary San Francisco surgeon, Dr. Hugh Huger Toland, built what was described as "an ornament to the city and an honor to the state" — Toland Medical College, opposite San Francisco City and County Hospital. By 1871, after reorganization of Cooper's school as the Medical College of the Pacific, both schools secured hospital teaching privileges at San Francisco City and County Hospital. Thus began a rivalry that continues today, between Stanford University and the University of California.

In the 1850s, education in the average American medical school covered the following subjects, given over four months: theory and practice of medicine, anatomy and physiology, materia medica and therapeutics, medical chemistry and toxicology, surgery, obstetrics and diseases of women and children, medical jurisprudence.

The requirements for the MD degree were: be a man of good moral character and at least 21 years of age; complete two identical annual lecture courses, one from the school awarding the degree; have studied medicine for three years (including time in lecture courses) with a respectable practitioner; compose and submit an acceptable medical thesis; pass an examination; pay \$145 in assorted fees.

By the 1870s, the Medical College of the Pacific, and presumably Toland Medical College, had added the following to the annual course of lectures: clinical medicine and diagnosis, pathology, hygiene and insanity, physical diagnosis, histology and diseases of the nervous system, descriptive and microscopic anatomy, theoretical and practical physiology, ophthalmology and otology; inorganic and organic chemistry, analytical chemistry and toxicology. The requirements for graduation were unchanged, except lectures were given over a five month period.

In the following years, clinical instruction increased with addition of hospital privileges at the U.S. Marine Hospital and Saint Mary's Hospital in 1877, and establishment of Public Dispensaries. In 1882 it was announced "a limited number of students" were eligible for appointment as interns for one year at the City and County Hospital.

Although the curricula of the two medical colleges had considerably improved since 1859, education of graduating students was still quite deficient. Antiquated requirements for admission and for graduation were major factors. From 1859 through 1883, the Medical Department of University of the Pacific had no educational requirements and required no information about any education or training.

Dr. Daniel C. Gilman, the first President of the University of California (1872-1874), decried in 1876 "that in some of our very best colleges the degree of Doctor of Medicine can be obtained in half the time required to win the degree of Bachelor of Arts." The efforts of the AMA, from its inception committed to improving medical education, had little effect - largely because almost all medical colleges in the country were owned and operated by the faculty.

In 1871, President Charles Eliot of Harvard made basic reforms in admission and graduation. Admission required evidence of previous educational achievement. The annual session was increased from four to nine months; and a three-year curriculum of progressively advanced courses was instituted.

This action ultimately influenced similar changes nationwide, including the two schools in northern California. Beginning in 1884, high school education was sufficient for admission to Cooper Medical College (previously the Medical College of the Pacific); before then, there were no formal admission requirements and standards were undoubtedly lower. In 1879 the requirement for an apprenticeship was abolished, and in 1881 a "Three Year Graded Curriculum" was instituted.

The three year course of studies was as follows:

First Year — descriptive anatomy with dissections, physiology, chemistry, microscopy and histology, and surgery, with an examination covering all subjects at the close of the course. In addition, the student "will be required to attend lectures upon the other subjects whenever a thorough attention to the above branches will permit."

Second Year — *materia medica* and therapeutics, theory and practice of medicine, obstetrics, gynecology, ophthalmology, otology, and pathology, with clinics on the various practical branches. "At the close of this year, examinations will be given in descriptive anatomy, physiology and chemistry."

Third Year — surgical anatomy, surgery, *materia medica* and therapeutics, theory and practice of medicine, obstetrics, gynecology, ophthalmology, otology, microscopy and histology, and pathology, with clinics on the various branches. "The graduating examination will be oral and written, upon all the subjects considered in the third course. This plan will receive such modification as experience may render advisable."

In the ensuing 15 to 20 years, considerable agitation by the AMA did little to improve educational standards. In 1891, the Association of American Medical Colleges was formed and by 1904 the American Medical Association had created a permanent Council of Medical Education to survey and rate the nation's schools.

The Abraham Flexner report, commissioned by the Carnegie Foundation and released in 1910, was a scathing indictment of medical education. By then, Toland Medical College was affiliated with the University of California and Cooper Medical College had just become the School of Medicine of Stanford University. Of five medical schools in northern California, a high school education was the only entrance requirement for three, but two years of college was required by the University of California and three years by Stanford. Nevertheless, Flexner censured both UC and Stanford.

The Flexner Report caused many changes in medical education. Without access to the archives of the UCSF Library and the Lane Medical Library at Stanford, it is not possible to describe specific curricular changes and the dates they occurred. Many medical schools throughout the nation, including three in Northern California, closed - which was one of Flexner's major objectives. Presumably some curricular changes, such as a four-year curriculum, were fairly prompt, while others were gradual and progressive. By 1947, Stanford and UCSF, were adding or removing the following courses in the curriculum:

First year — neurology was added and surgery removed;

Second year — bacteriology, pediatrics, public health, radiology, and surgery were added;

Third year — neurology/psychiatry, pediatrics, physiology, and public health were added;

A fourth year was added with the following courses — communicable disease, dental medicine, epidemiology, industrial medicine, medicine, ob/gyn, oncology, otorhinolaryngology, pathology, pediatrics, psychiatry, public health, radiology, special medical procedures, statistics, surgery, urology; set clinics and out-patient clinics in medicine, ob/gyn, pediatrics, and surgery.

In 1966, the University of California at Davis School of Medicine was founded, with the first class graduating in 1972. In the following decade the technology revolution began to affect the practice and teaching of medicine. Medical schools realized it was not productive to spend so much time on the didactic teaching of the "basic sciences."

In 1950, as many as 460 hours were spent in the first year on human anatomy, almost all in meticulous dissection by two students on one cadaver. Now, from 132 to 220 hours may be spent, much of the instruction supplemented with clinical imaging plus attention to developmental and topological anatomy. Dissection is much less time consuming, with four to six students per cadaver.

The number and subject of courses required for graduation has increased tremendously. For the first two years, one school added these courses: computers in medicine, development and disease mechanisms, physicians and patients, basic cardiac life support, fundamentals of clinical investigation, introduction to health care systems and health policy, nutrition principles, molecular biology, human genetics, cardiovascular physiology, introduction to clinical psychiatry, infectious basis of disease, immunology for medical students, endocrine physiology, and introduction to clinical problem solving/skills training. Another school added many of the same subjects but included oncology, dermatology, virology, pulmonary, and gastrointestinal as separate subjects.

More importantly, all the schools drastically changed teaching methods and introduced innovative education techniques. They intertwined the fundamentals of clinical medicine throughout the basic science curriculum from the start of the first year. Students may practice the medical interview in one course and learn basic physical examination skills correlated with surface anatomy as part of the anatomy course. A course in endocrinology and homeostasis may introduce basic physiology concepts, and medical biochemistry may include consideration of specific disease states. Introduction to the neurologic examination may occur in a neurobiology course.

As students regularly practice interviewing patients, they also are exposed to interdisciplinary topics of cross-cultural medicine, biomedical ethics, human sexuality, and disease prevention. Trained actors simulate patients during a medical interview and examination by an instructor and a small group of peers. The process is then critiqued by the instructor, fellow students, and the "patient." Of course, computer knowledge is essential for students, but additional training is provided through hands-on use of information resources such as medical databases, diagnostic software, and Internet resources.

During the third and fourth years, the teaching changes are not as marked; these two years

have always concentrated heavily on clinical work. During these years clinical clerkships in medicine, surgery, ob/gyn, pediatrics, primary care, and psychiatry are generally required. Some schools have additional requirements but all provide six months to a year of elective clerkships, or other electives such as research.

What does the future of medical education hold? Some of the suggested challenges are: the erosion of the clinical environment and the loss of clinical revenues with all its attendant consequences; how to incorporate all the different subjects, new domains of knowledge, and emergent disciplines into the curriculum to produce a more complete physician; information technology that constantly changes, improves, gets faster, gets more wireless, gets more pervasive, and becomes all encompassing; and training of students to practice under managed care, which many faculty members do not believe is the right environment for the practice of medicine.

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