The Evolution of Women as Physicians and Surgeons

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Women have played an active role as physicians and surgeons from earliest history. In the United States, medical education for women began in 1847 and flourished as medical schools proliferated to meet the growing population demand. The Flexner Report in 1910 resulted in about half the medical schools in the U.S. closing; many of them had admitted women. The number of women medical students increased beginning in the 1970s, until now, 43% of medical school graduates are women. The number of women residents has increased concomitantly from 22% in 1980 to 36% in 1997. Women residents in surgical training programs lag behind. Thoracic surgery has the lowest percent of women residents, at 5%. Unless an attempt is made to actively recruit women, thoracic surgery training programs are in danger of drawing from an increasingly smaller portion of medical school graduates.

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The evolution of women in surgery began 5,500 years ago, when surgical instruments of flint and bronze were placed in the grave of Queen Shubad of Ur, that she might practice surgery in the afterlife [1]. The earliest Western medical school was founded in Salerno, where a confluence of Arabic, Greek, and Jewish medical thought from around the Mediterranean basin came together. One of the most distinguished professors was a woman named Trotula, famous for her skill in gynecologic surgery. Over the years, women continued to play an important role in surgery until excluded by the growing power of the Guild of Surgeons. In 1540, Henry VIII of England granted the surgeons permission to form a Guild. One of the rules promulgated was "No carpenters, smiths, weavers or women shall practice medicine" [1]. Women practiced medicine in Colonial times, particularly mid-wifery. However, the male-dominated theocracy with Cotton Mather's "Angelical Conjunction," the need to heal the body as well as the soul, tended to exclude women from medical practice.

Currently, women represent almost half the entering class of American medical schools. Similar representation of women medical students has existed for years in Europe. However, in the U.S., significant numbers of women medical students are a relatively recent phenomenon, and the presence of more than a token number of women in surgical training programs is even more recent.

The education of women in the U.S. can be seen in historical perspective using Yale as an example. In 1783, President Ezra Stiles quizzed 12-year-old Lucinda Foote, "I found her translating and expanding with (perfect) ease both words and sentences in the whole of Vergil's Aeneid and in the Greek Testament. I testify that if it were not for her sex, she would be considered fit to be admitted as a student" [2]. Women were presumably not considered "fit" until 1969, when women were first admitted to Yale College!

Medical education for women in the U.S. began in 1847, when Elizabeth Blackwell was successful in gaining admission to Geneva Medical College [3]. In 1872, the Prudential Committee, which was the Executive Committee of the Medical Faculty at Yale, voted unanimously, after discussion, to admit women to the medical school if other schools in the University did also. Apparently, the other schools at Yale were not so inclined, because no further discussion about admitting women occurred.

The first major, traditional medical school to admit women was Johns Hopkins in 1893. This landmark event was less due to an enlightened view of women's role in medicine than to financial exigencies. With the legacy left by Johns Hopkins, Johns Hopkins University and Johns Hopkins Hospital had been founded, but decreases in the endowment and the cost of recruiting faculty like William Halsted and William Osler left insufficient funds to open the medical school. Elizabeth Garrett and several friends had offered financial support if women were admitted. However, the funding was still insufficient. The Johns Hopkins Trustees had decided that nothing less than a first-class medical school was acceptable and they would wait until sufficient funds were available. Finally, Elizabeth Garrett offered to donate $500,000, the entire amount needed to open the medical school, if women were admitted and for which 4 years of undergraduate preparation were required for admission [4]. Despite concern that students would not attend because of the strenuous admission requirements and the presence of women, the Trustees had no other choice and accepted.

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In the first medical school class, three women were admitted out of a total of 12 students. William Osler commented at a later date that the experiment of admitting women to medical school was a failure but the "die was cast."

By the beginning of the 20th century, a number of medical schools were admitting women, although most of these were homeopathic or proprietary schools that needed money. Nevertheless, women physicians were being produced. In 1890, 18% of the physicians in Boston were women. After Abraham Flexner issued his scathing report in 1910 on the quality of the 150 medical schools in the U.S. in 1910, a large number of those schools disappeared [5]. Flexner actually had a chapter in his Report on "The Medical Education of Women" and commented, "Now that women are freely admitted to the medical profession, it is clear that they show a decreasing inclination to enter it." He was referring to the fact that the number of women medical students nationwide had decreased from 1,129 in 1904 to 921 in 1909. Many of the schools that Flexner had found unacceptable and that had disappeared were the schools that admitted women. The number of women medical students plummeted in the U.S. after 1910. From 1910 to 1916, the number of women students at coeducational medical schools dropped from 752 to 464 and did not rise until 1916.

At Yale, the question of the admission of women medical students had lay dormant since 1872. But in 1915, the Board of Permanent Officers, the governing body of the medical school, discussed the admission of women. After the first discussion, a committee of three professors was appointed to confer with the Yale Corporation on the admission of women to medicine. When the subject was brought up for discussion, the Board of Permanent Officers voted to admit women to the medical school provided the $1,000 could be found for necessary alterations to the physical plant. No bathroom facilities for women were available in the medical school and would have to be provided before women could be admitted. Henry Farnam, Professor of Economics and a member the Executive Committee of the Hospital Board, wrote to President Hadley offering to provide funds for the women's bathroom. His daughter, Louise Farnam, a graduate of Vassar and the recipient of a PhD in Physiological Chemistry from Yale in 1916, wanted to apply to the medical school.

The Bulletin of the Yale University School of Medicine for 1916 to 1917 stated: "A limited number of graduates of recognized colleges for women who can meet the special requirements in sciences and languages will be admitted to the school of medicine." Men did not have to be a college graduate to apply to the medical school until 1924, and their number was unlimited. Nevertheless, the *Journal of the American Medical Association* reported that "Yale was throwing its doors open to women." Other eastern medical schools began to admit women about the same time as Yale: the medical school of the University of Pennsylvania admitted women in 1914, and Columbia University began admitting women in 1917. Harvard Medical School, however, did not admit women until 1945.

Table 1. Women Residents[a]

	1989	1997
Pediatrics	50%	64%
Obstetrics	44%	63%
Orthopedics	5%	7%
Urology	5%	10%
Thoracic surgery	2%	5%

[a] Percent of women residents in specialty.

Louise Farnam and her two classmates were under great pressure and responded magnificently [6]. One of the women transferred to Johns Hopkins. Louise and her classmate, Helen May Scoville, a Wellesley 1915, graduated cum laude, two of seven students so chosen. Louise Farnam was valedictorian, winning the prize for the highest rank in the examinations [7]. After graduation, she went to Johns Hopkins for further training and then to China as a faculty member at a Yale-sponsored medical school in Changsha. She remained there for 9 years until driven out by Mao's army in 1930.

By 1970, Yale was admitting six to eight women a year and an occasional under-represented minority student. In the course of increasing the numbers of under-represented minority students in medical school, attention was no longer paid to gender or distribution. In the first year of the new policy 29 women were admitted to the first-year class. In an effort to achieve "balance," subliminal quotas had been in place, which had restricted the number of women admitted.

With those barriers removed, as increasingly larger numbers of women graduated from medical school, increasing numbers of residency positions were being filled by women. The proportion of women in residency programs has grown from 22% in 1980 to 36% in 1997 and will continue to increase. The proportion of women in the different specialties varies widely [8]. Two-thirds of pediatric and obstetrical residents are women. In orthopedics and urology, 7.1% of the residents are women, while in thoracic surgery, 5.0% are women, which has increased from 2.0% in 1989 [9] (Table 1). The length of the training program in thoracic surgery clearly plays a role in the discrepancy. This is particularly true because more women over 24 years of age are admitted to medical school than are men. However, neurosurgery also has a long training program but has a higher proportion of women than does thoracic surgery [10].

The Committee on Women of the American Association of Medical Colleges studied the issues of women in surgery and concluded, "Many women are apparently not finding mentors in or are discouraged from entering surgical fields, raising questions about whether women enjoy the same access as men do to the full range of specialty choice opportunities [10]."

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