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## Unintended Consequences of the Flexner Report: Women in Pediatrics

The 1910 Flexner report is recognized as a critical component of the transition to the current model of medical education. Within a decade of the report's publication, the curriculum of nearly every American medical school included 2 years of basic science education and 2 years of clinical apprenticeship. By midcentury, the practice of medicine focused on acute care visits and technologically sophisticated procedures performed in hospitals. As we mark the 100th anniversary of the Flexner report, it is also important to draw attention to one of the unintended consequences of Flexner-era reforms, namely, the near elimination of women in the physician workforce between 1910 and 1970. In this essay we briefly trace the history of women in medicine in the decades surrounding the Flexner report and suggest some implications for the future of pediatrics at a time when women outnumber men.

**THE FLEXNER REPORT: AN OVERVIEW** In the late 19th century, there were hundreds of medical schools in the United States, and the quality of medical education varied substantially. Generally, medical schools offered minimal training in basic science, and few schools provided their students with the opportunity to acquire clinical skills. Concerned about this situation, the American Medical Association worked with the Carnegie Foundation to hire a professional educator, Abraham Flexner, to review the state of medical education in the United States. Flexner chose the Johns Hopkins Medical School as the model educational system, and he

toured medical schools throughout the country to gather information about current standards of education. His report, which was considered provocative when it was issued in 1910, indicted the quality of medical education in most American medical schools. The recommendations focused on rigorous entrance requirements, longer periods of study, and more attention to the basic and clinical sciences. The principles in the report enshrined an educational model that favored the laboratory over the bedside, the hospital over the home, and the physician-as-researcher over the physician-as-practitioner.<sup>1,2</sup> The Flexner report by itself did not transform medical education in the United States, although it has come to symbolize Progressive-Era reforms that led to our current system. The ideas reflected in the report, which had been promoted by leaders in medical education since the late 19th century, fit neatly into broader trends in American medicine, such as the increasing appreciation of science, the growing complexity of medical practice, and the newfound power of organized medicine.<sup>3</sup>

**FEMALE PHYSICIANS IN THE 19TH CENTURY: PREVENTION AND PUBLIC HEALTH** In the period just before the Flexner report, female physicians had a significant presence in many parts of the United States. When all-male medical institutions refused to admit them, women created their own schools and hospitals, some of which rivaled all-male physician institutions in prestige and health outcomes.<sup>4</sup> Eventu-

ally, the struggle to integrate all-male institutions paid off. By the 1870s, women could choose from a number of co-educational institutions in the United States, such as the University of Michigan and the University of Iowa, as well as a few institutions in Paris and Zurich. In 1892, when Johns Hopkins Medical School agreed to accept women in its inaugural class, women believed that the hardest battles had been won.<sup>4,5</sup> From 1880 to 1900, the number of female physicians doubled (to 5.6%), and in some cities such as Boston, Massachusetts, and Minneapolis, Minnesota, nearly 1 in 5 physicians was female. Although England had 258 female physicians and France just 95, the United States could boast more than 7000 female physicians.<sup>3,6</sup>

Female physicians had opened the doors to medical school in part by arguing that they possessed unique skills that would transform the practice of medicine. Elizabeth Blackwell defined medicine as the caring profession par excellence and insisted that women's maternal instinct, either potential or realized, endowed them with a unique and natural capacity to heal. Other physicians, such as Marie Zakrzewska, rejected the biological arguments about women's unique qualifications to be physicians,<sup>7</sup> yet most women gravitated toward such specialties as pediatrics, obstetrics, gynecology, and preventive medicine. Blackwell, Zakrzewska, and others recognized the need for profound changes in health systems, in part because women and children experienced high rates of morbidity and mortality, and they dedicated themselves to careers that incorporated advocacy and public education into clinical practice. This pioneering generation of female physicians joined a relatively small, but effective, group of male physicians such as Abraham Jacobi, who advocated for health system change to address the health needs of children, the poor, and other disadvantaged populations.<sup>6,8-10</sup>

For example, at the turn of the 20th century, female physicians played a critical role in public health campaigns to reduce infant mortality. The infant mortality rate was considered an important measure of societal health and well-being, and many US cities reported rates that exceeded 100 deaths per 1000 live births in the early 1900s.<sup>11</sup> To address the problem of infant mortality and other public health issues, female physicians assumed leadership positions in departments of public health and preventative medicine, as exemplified by Dr Josephine Baker, who led New York City's first Division of Child Hygiene. Dr Baker helped shape health policy for public health practice throughout the United States and emphasized the social determinants of health.<sup>9</sup>

Physicians and other child advocates incorporated new scientific understandings of germ theory into public health campaigns to reduce infant mortality rates by promoting breastfeeding, educating parents, and mandating pasteurization of milk. The dramatic decrease in infant mortality in the 20th century was probably more strongly related to these public health interventions than the efforts of individual physicians at the bedside.<sup>12</sup> Although male physicians contributed to these changes, female physicians were disproportionately drawn to translational policy efforts to address the compelling public health issues of the day at a time when they represented only a small proportion of physicians.

### **THE CONSEQUENCES OF THE FLEXNER-ERA REFORMS FOR FEMALE PHYSICIANS**

Although a number of medical schools had already implemented the tenets of the Flexner report by 1910, Flexner's role in transforming medical education quickly expanded when some foundations decided to distribute funds only to those medical schools that followed the Hopkins model. Many medical schools closed after the Flexner report was issued, particularly schools that educated female, black, and working-class students.<sup>1</sup> For example, 5 of 7 historically black medical colleges closed in the wake of Flexner-era reforms.<sup>3</sup> In 1900 there were 7 women's medical colleges in the United States; by 1930, only the Women's Medical College of Pennsylvania remained. The proportion of women who graduated from medical school decreased to an all-time low shortly after the Flexner report was issued (2.9% in 1915), and the proportion remained below 5% until the 1970s,<sup>10</sup> when radical social forces challenged the barriers that prevented women from studying medicine.<sup>13</sup> Overt discrimination at co-educational institutions, such as gender-based quotas, had succeeded in limiting women's acceptance to medical schools, but the loss of female role models also contributed to the institutionalization of an unwelcoming atmosphere for female students. Moreover, the Flexner report recommended longer periods of study, which may have limited women's ability to finance medical studies. Although the decrease in female medical students may have been multifactorial, the transformative dream shared by the pioneering female physicians at the beginning of the 20th century faded within a decade of the Flexner report.

### **MARKING THE CENTENNIAL: A HISTORIC JUNCTURE**

Individual physicians make many decisions that shape their path in medicine: choosing a specialty; deciding whether to pursue research; selecting a practice setting; and determin-

ing how to balance home and work. Before the Flexner-era reforms, female physicians generally made different choices than their male counterparts; women were more likely to choose specialties that emphasized prevention and the translation of science into improvements in public health. When traditional career paths were closed to women, they took advantage of the opportunities available, and some female physicians became leaders in fields such as occupational health, child health, and maternal health. Despite these gender differences in practice patterns, however, women did not have a major impact on American medicine in the late 19th century, partially because they represented such a small proportion of physicians, even at their peak. Today, a century after the Flexner report, we have witnessed a gender revolution in medicine, and women constitute more than half of American medical students<sup>14</sup> and more than 70% of residents in pediatrics.<sup>15</sup>

As today's pediatricians revisit the history of foremothers such as Drs Blackwell and Zakrzewska, they may draw inspiration from the strength and creativity that these women showed in the face of daunting institutional barriers. Physicians in the 21st century could tap into the pioneers' commitment to translational science and public health and search for ways to create new career choices that allow physicians to effectively address the social determinants of health.

## REFERENCES

1. Ludmerer KM. Commentary: understanding the Flexner report. *Acad Med*. 2010;85(2):193–196
2. Hudson RP. Abraham Flexner in perspective: American medical education 1865–1910. *Bull Hist Med*. 1972;46(6):545–561
3. Starr P. *The Social Transformation of American Medicine*. New York, NY: Basic Books; 1982
4. Morantz RM, Zschoche S. Professionalism, feminism, and gender roles: a comparative study of nineteenth-century medical therapeutics. *J Am Hist*. 1980;67(3):568–588
5. Bonner TN. *To the Ends of the Earth: Women's Search for Education in Medicine*. Cambridge, MA: Harvard University Press; 1992
6. Walsh MR. *Doctors Needed: No Women Need Apply—Sexual Barriers in the Medical Profession, 1835–1975*. New Haven, CT: Yale University Press; 1977
7. Tuchman AM. *Science Has No Sex: The Life of Marie Zakrzewska, M.D.* Chapel Hill, NC: University of North Carolina Press; 2006
8. Bittel C. *Mary Putnam Jacobi and the Politics of Medicine in Nineteenth-Century America*. Chapel Hill, NC: University of North Carolina Press; 2009
9. Morantz-Sanchez R. *Sympathy and Science: Women Physicians in American Medicine*. Chapel Hill, NC: University of North Carolina Press; 2000
10. More ES. *Restoring the Balance: Women Physicians and the Profession of Medicine, 1850–1995*. Cambridge, MA: Harvard University; 1999
11. Brosco JP. The early history of the infant mortality rate in America: "a reflection upon the past and a prophecy of the future." *Pediatrics*. 1999;103(2):478–485
12. Meckel R. *Save the Babies: American Public Health Reform and the Prevention of Infant Mortality*. Baltimore, MD: Johns Hopkins University Press; 1990
13. Ludmerer KM. *Learning to Heal: The Development of American Medical Education*. Baltimore, MD: Johns Hopkins University Press; 1996
14. Riska E. Towards gender balance: but will women physicians have an impact on medicine? *Soc Sci Med*. 2001;52(2):179–187
15. Althouse LA, Stockman JA 3rd. Pediatric workforce: a look at general pediatrics data from the American Board of Pediatrics. *J Pediatr*. 2006;148(2):166–169

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