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by

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Abstract

There have been various movements in medical education in North America over the last two hundred years that have drastically changed the face of the educational experience. From a grass-roots profession with no standardization, North American medical schools now have common curricula and educational techniques, stemming primarily from the 1910 report *Medical Education in the United States and Canada* by Abraham Flexner. Developments since the release of the Flexner report have included organ-based block teaching and, more recently, the addition of problem-based learning to the educational process. The latest trend in medical education is the movement towards social, cultural and geographic proximity: the inclusion of social and cultural minorities (those considered underserviced by the medical community) in the student body and in the curriculum, and the placement of schools (or of the classes themselves) near to or within these underserviced communities. This movement towards social accountability, though new in application, was suggested by Flexner who suggested that it is in "[the] interest of the public […] to have well trained practitioners in sufficient number for the needs of society." It is within this movement that the roots of the *Northern Ontario School of Medicine* (NOSM) lie. Within this paper, we will examine aspects of the history of medical education in North America, including this latest trend and the contribution of NOSM to it.

Who was Abraham Flexner?

Surprisingly enough, the individual who arguably has had the most impact on American and, by association, Canadian medical education, was not a physician, but an educator. The sixth of nine children, Abraham Flexner (1866-1959) was born in Louisville, Kentucky in 1866. Born into an impoverished immigrant family, Flexner's father had big dreams of a professional life for his children (Parker, 1962).

Flexner attended Johns Hopkins University in 1884 to1886 to study Classics. In 1890, he then opened up the Flexner School, a preparatory school for young boys, many of whom caught the attention of Harvard University officials. After marrying his wife, Anne Laziere Crawford (1874-1955), in 1898, Flexner spent considerable time studying higher education at the *Friedrich Wilhelms University of Berlin* from 1905 to 1908. It was in Berlin, that Flexner published *The American College* in 1908. This was a scathing report on the state of American colleges, particularly the elective system of classes. This report caught the eye of Henry Smith Pritchett (1857-1939), then President of *The Carnegie Foundation for the Advancement of Teaching* in Washington, D. C.. The Carnegie Foundation was scouting for an individual to survey and analyze the American

medical education system (Parker, 1962). According to Hiatt and Stockton, the actual number of medical schools being evaluated was 168, 13 of which were Canadian (2003). Pritchett hired Flexner for the task. The ensuing Report entitled *Medical Education in the United States and Canada*, compiled in 1909 and eventually published in 1910, was and is highly heralded for bringing about a massive reform in American medical education and guiding the direction of *Canadian Medical Education* (Parker, 1962).

Pre-Flexner Era

Prior to the publication of the so-called "Flexner Report" in 1910, American and Canadian medical schools had no common ground. There were no standardized admission criteria, no standardized curricula, and certainly no standardized licensing exams within North America (Beck, 2004).

The delivery methods of medical education before the release of the Flexner Report spanned the spectrum. Predominantly, three widely varied methods existed, including: the apprenticeship, proprietary college and university systems. In the apprenticeship style of learning, medical students worked in a clinic with a physician from the onset of their education, similar to the present day clerkship. The education ended when the physician felt the student had learned enough and no degree or certificate was conferred. In the proprietary medical education system, students learned in a group setting through a series of lectures. These lectures were presented by doctors who owned the medical college (Beck, 2004). These were for-profit enterprises, where the resources available to students depended on how much the proprietary doctor invested (Flexner, 1910). The university style of learning medicine itself was a compromise between the apprenticeship and proprietary styles. Lectures and hands-on training, both occurring in facilities associated with the university, were combined. The present-day system of delivering medical education can be seen as closest to the university educational system of the pre-Flexner Report era (Beck, 2004).

Not only were the methods in delivering medical education varied, but so too were the types of medicine taught at North American medical schools. Everything from the scientific stream of medicine to osteopathic, homeopathic and chiropractic medicine was taught (Beck, 2004; Flexner, 1910).

The build-up to the Flexner Report began with the *American Medical Association* (AMA) and the creation of the *Council on Medical Education* (CME) in 1904. According to Beck, 2004, "the AMA sought to eliminate schools that failed to adopt this rigorous brand of systematized, experiential medical education" (p. 2139). The AMA's belief was that with standardization across North America, the number of doctors graduating would be reduced and that only the best doctors would be able to practice medicine.

Furthermore, the AMA's belief was that the ideal medical education system would entail students partaking in two years of "laboratory sciences" preceding two years of apprentice-type training in teaching hospitals. At the request of the AMA, the *Carnegie Foundation for the Advancement of Teaching* and Flexner as its counselling and reporting officer were chosen to examine the state of medical education in North America (Beck, 2004).

The Flexner Report (1910) and the Aftermath

The Flexner Report was a two year assignment for Abraham Flexner, as he travelled across the continent. While visiting the schools, Flexner assigned a grade to each school based on five distinct areas: "Entrance requirements," "Size and Training of the Faculty," "Size of Endowment and Tuition," "Quality of Laboratories," and "Availability of a Teaching Hospital," whose physicians and surgeons would serve as clinical supervisors (Beck, 2004).

The remaining schools largely adopted the educational format Flexner recommended: students were required to have an undergraduate degree as a prerequisite to entry, with science being the recommended choice. They would begin their education with two years of class work, studying all of the sciences relevant to health, like anatomy, histology, physiology and pathology, to name but a few. This would be followed by two years of clinical medicine in a teaching hospital or similar practice. Following graduation, students would complete residency, also in a hospital. This format was in accordance with that desired by the AMA to improve standards and remains common to the North American medical education system today (Beck, 2004).

In the decades following to the Flexner Report, many of the schools that received the lowest grades in the Report closed or merged with other schools. According to Hiatt and Stockton (2003), the Flexner Report had a direct impact on twelve of the 168 schools in existence, with these schools either closing or merging with other medical schools. Hiatt and Stockton (2003) further quantified that the fact that another potential thirty-eight schools, which closed or merged, could also have been the result of other reasons than due to the Flexner Report's suggestions, but an assessment of direct causation was never made.

Trends in North American Medical Education

Remaining plastic in nature, the format of the medical educational experience has been modified since the publication of the Flexner report. Recent movements have included the shift to organ-based block education within the first two years of the undergraduate medical curriculum, the addition of problem-based learning, and most recently, the shift towards social accountability to the population that the medical schools serve (e.g. cultural competency and geographical proximity) (Baum and Axtell, 2004).

Within the system of organ-based block education, the many scientific areas to be covered are focused on a single organ system, such as the cardiovascular system. During such a block, the anatomy, physiology, histology, pathology, and so on, of the single system are covered, allowing the student to focus their learnings. This educational change represented an attempt to render more efficient the absorption of a growing wealth of scientific information. This process, added in the 1950s, also allowed greater coordination between what were previously separate scientific departments, providing greater control over curriculum and learning (Baum and Axtell, 2004).

Problem-based learning was first used at McMaster University and in the University of Calgary in the 1960s, allowing students divided into groups to discuss science and medicine within the context of a presented problem. This reform was the first major

attempt to change the process of medical education, and to reflect upon its success, it has been widely adopted by all current North American medical schools (Baum and Axtell, 2004).

The latest trend, the move towards social accountability, though initially introduced in 1910 through Flexner's Report, has only recently come to the main stream. As Flexner put it best, "the interest of the public is to have well trained practitioners in sufficient number for the needs of society," reflecting an underlying social mandate critical to the medical education process (Flexner, 1910).

Ever present in the media is the "physician shortage", which can be perceived at the local, regional or national levels, along with various social and political strategies to address it. This shortage was predicted as far back as 1968, when at the October human resources conference of the Association of American Medical Colleges, it was suggested that there had already been a shortage of doctor representation from certain demographic groups, including rural, racial and ethnic groups (Dillon, 1970). It was recommended that in order to meet doctor shortages in the future, that care should be taken when selecting students, with the knowledge originally submitted by Flexner that medical students from underserviced areas are more likely than other groups to return to their home community to practice (Flexner, 1910).

Following from this recommendation and this knowledge, schools began to update their recruitment strategies, taking social needs into account. First, in 1974, Jefferson Medical College in Pennsylvania started the *Physician Shortage Area Program*, seeking students from rural areas who were committed to becoming family physicians in those areas. This was followed later by such examples as Drexel University College of Medicine in Philadelphia, which began requiring community service of its applicants, allowing the students to train at free clinics located in Philadelphia's Chinatown, Salvation Army locations and shelters. This example of required community service within the medical student's education directly supports the social mandate concept (Smith, 2006).

Where does the Northern Ontario School of Medicine Fit?

Indeed, the concept of a social mandate is now supported globally, with the *World Health Organization* (WHO) publishing on the subject. In 1995, the WHO defined the social accountability of medical education stating that it is the obligation of the schools to "direct their education, research and service activities towards addressing the priority health concerns of the community, region, and/or nation they have a mandate to serve". Thus, it becomes the agenda of every medical school to identify the needs of those it serves and establish policies to address those needs. These steps were followed in the creation of Canada's latest medical school, the *Northern Ontario School of Medicine* (NOSM), which opened its doors to the first incoming class in 2005. As part of its development, the social mandate of NOSM was integrated into the entrance requirements, the curriculum, as well as the area in which students learn (Strasser, 2005).

First, the entrance requirements made community service of its students obligatory: Applicants are required to complete a questionnaire and provide a biography to demonstrate community service. Certain demographic groups of the region that were

found to be underrepresented in medical schools, such as Aboriginals and Francophones are asked to self-identify as part of the application process. There is also the opportunity for candidates selected for an interview to complete part of the interview in French (General Information, NOSM Website).

The curriculum of the school was developed after extensive community consultation across the region of Northern Ontario and also took into account the educational requirements of the nation's licensing exams. As such, the social mandate is woven directly into what students learn on a daily basis. As per the discussion above of problem-based learning, students at NOSM are involved in case-based learning, with such regional issues as language barriers, geographic isolation and limited resources being included within the cases (Curriculum, NOSM Website, 2007).

With respect to geography, the school is located in Northern Ontario having two campuses, one located in Thunder Bay and one in Sudbury. Students are required to participate directly in community work in the Northern Ontario Region. This takes three forms: community learning involving weekly placements within Thunder Bay and Sudbury, integrated community experiences involving placements in isolated, remote and rural communities and finally the longitudinal community clerkship completed in the third year, where students are placed in a small urban community (Curriculum, NOSM Website, 2007). All of these placements enable the students to gain knowledge of the various contexts in which they might practice during their career, a method known to improve the likelihood of them remaining in the region (Smith, 2006).

Conclusion

As discussed, the medical education system was altered greatly through the publication of the Flexner Report in 1910. The latest trend in medical education is that a social mandate has been adopted in many medical schools to address physician shortages in ethnic, rural and racial groups. Upon examination, it can be seen that Canada's latest medical school, the Northern Ontario School of Medicine, seeks to meet its social mandate through selection of its students, the curriculum and the geographic proximity of the school to the community it serves. The success of the school in this regard will not be known for some time though it can certainly be seen how the school has taken Flexner's words to heart: "the public interest is […] paramount" (Flexner, 1910). This movement, in all of its various forms, does seek to produce doctors for the people.

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