Healthcare in the World of Tomorrow: What the Future Holds for Medical Education

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In 1895, Wilhelm Conrad Röntgen accidentally discovered X-Rays and communicated his findings of a then-mysterious radiation to the scientific community. By 1913, William Coolidge had developed an apparatus that could continually produce X-Rays such that the technology could be feasibly introduced into practice. Today, X-Rays are the most accessible form of medical imaging, and their interpretation is a foundational skill in medical education. Such evidence-based transformations have revolutionized healthcare, raising the question, "how will healthcare evolve over the next 50 years"? Current trends suggest that medicine will need to accommodate the growing diversity of demands that patients have.[1] A national assessment of primary care in the UK showed that patients had significant unmet needs. Specific requests included: improved emotional and social support; better strategies to overcome environmental, geographic, and community barriers in healthcare delivery; and a more accessible discussion of medical research to include patients in treatment decisions. The authors note that in order to make these improvements for patients, medical professionals in the future must have broader expertise and a greater aptitude for technology.[1] The onus for this is being placed on medical education and training programs, which are now being challenged to develop effective strategies to prepare physicians who are capable of meeting these future demands.

Medical school admissions tests are attempting to meet the increasing demands on physicians by selecting students with more diverse backgrounds. The Association of American Medical Colleges is updating their universally accepted Medical College Admissions Test (MCAT) for 2015 to integrate psychology, sociology, and behavioural science into the content of the test for the first time, thereby recognizing these specialties as relevant prerequisites for medical training.[2] This is a positive update, requiring students to have greater knowledge of a more diverse selection of medical sciences. However, success in medical careers has been attributed not only to sufficient knowledge, but also to non-cognitive abilities that are not yet well taught in medical schools.[3] Such non-cognitive skills include the ability to systematically interpret and respond to information. Given that physicians have greater access to medical resources than before, the ability to recall information is becoming less important, while the ability to demonstrate these non-cognitive skills is increasingly important.[1,4] In previous iterations of the MCAT, an essay section was included to challenge students to develop independent ideas and express them concisely in response to a prompt, but this section was removed to accommodate the additional psychology, sociology, and behavioural sciences section. As a result, a greater responsibility rests with admissions teams to screen applicants for these communication and analytical skills, so that successful candidates enter into medical school with a foundation of non-cognitive skills already intact. Future efforts will need to address the lack of objective measures of non-cognitive skills in medical school applicants.

As resource material is so readily available, it will be increasingly important for physicians to use technology to access and critically appraise medical literature during the clinical decision-making process.[4] The electronic health record (EHR) is an electronically accessible system that contains the complete health and personal history of, and health care provided to, a person from birth to death; as such, the EHR integrates information from all providers, test results, and appointments. A key challenge with EHR, however, has been the slow rate of uptake by physicians. In an international assessment of primary care physicians done in 2009, it was found that only 37% of Canadian family physicians had adopted electronic records—significantly lower than the US, Germany, France, Australia, and the United Kingdom, among others.[5] However, in the same study it was noted that the total functionality of EHR was not taken advantage of. Even where EHR has been adopted in Canada, no universal system exists so charts cannot be accessed across different hospital networks. While most literature cites security concerns and cost as leading barriers for implementing EHR, there has not been improvement even after those concerns have been largely addressed. Furthermore, most EHR use is limited to that of a record of activities and a pharmacological database, and the integration of internet resources into EHR has not yet been successfully done[5]. In addition, medical sciences and technologies have begun to advance so rapidly that clinicians have difficulty accessing the relevant resources to their discipline, and this concerning trend is expected to continue. One study in the New England Journal of Medicine found that only 54.9% of patients were receiving care in line with the most current guidelines, suggesting that a significant proportion of physicians have difficulty providing the best prescribed care to their patients.[6] Dr. Lori Heim, president of the American Academy of Family Physicians, suggests that access to the most current databases could be integrated into EHR,

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but the future clinician must be able to efficiently find, analyze, and incorporate this information into a patient-specific plan.[7] In a systematic review of the effectiveness of critical appraisal skills training done in 2000, it was found that clinician skills improved significantly with training, but concrete methodologies have not yet been reported in the literature, suggesting that skills training is not effectively implemented in medical education.[8] Medical education must adapt to encourage effective use of EMR, and provide the skills necessary for physicians to take advantage of the tools available to them.

Complex decision-making skills are becoming increasingly important for the ethical dilemmas that future clinicians will encounter. As medical treatments improve, there is a growing discordance between quality-of-life and length-of-life. This complicates palliative decision making, as patients may be living longer but not necessarily better lives. Medical education has a difficult time broaching complex palliative discussions, with the bulk of the lessons centered on standardized approaches to ethical dilemmas. Further, health policies have not yet offered solutions for managing an older and more medically-complex population, though some progress has been made. In 2011, the Royal Society of Canada published "End-of-Life Decision Making", and this stimulated advancements in Quebec, leading to the production of "Dying with Dignity" legislation, the implementation of which the Quebec government committed to in 2013.[9] However, Federal legislative action has been slower to change. The most recently proposed amendment to the Criminal Code, Bill C-562 (right to die with dignity), was dismissed in 2010.[9] No further parliamentary action has been made to update policy regarding physician-assisted suicide, and the Library of Parliament notes that if new legislation were to be passed on this topic, a number of issues would need to be resolved. These issues largely involve how to define life and mental capacity, how to identify the ability to communicate in competent patients accurately, and what members of an interprofessional healthcare team should be consulted.[9] Healthcare in the world of tomorrow must have solutions to these existing issues, and the role of euthanasia in medical care will be changed. Without sufficient exploration of these topics during medical education, or a thorough study of the currently unevaluated concerns with euthanasia, clear strategies can not be developed. As such, current clinicians are left without direction or the skills to make appropriate life-or-death decisions with their patients.

While these and many other gaps in medical education are now being realized, some progress has been made to improve clinician training in Canada. The Royal College of Physicians and Surgeons of Canada (RCPSC) directs Canadian medical training using their CanMEDS framework.[10] CanMEDS outlines the responsibilities expected of physicians at each stage of their training. The RCPSC is updating their CanMEDS model for 2015 to a competency-based training, reflecting an acknowledgement that a changing climate for healthcare professionals requires not only the knowledge of updated medical science in order to be successful, but also practical training in the necessary competencies of their discipline and profession.[10] Further, to assist with the RCPSC evaluation of the core competencies, two additional working groups have been created to better integrate new content related to Patient Safety & Quality Improvement, and eHealth into the existing seven CanMEDS Roles.[10] By mandating that physicians have a core level of competency regarding quality of care assessments and medical technology, the RCPSC is demonstrating an understanding of the direction that medical education needs to go to stay relevant.

Over the next 50 years, clinical medicine will change significantly, and current trends in healthcare have identified some weaknesses in practitioner training thus far. More unforeseen problems have yet to come to light as we rely on research to identify and assess the complicated problems facing modern healthcare delivery. The next 50 years in medical education must be a time of rigorous evaluation and problem solving so that approaches to physician training can be developed to best equip clinicians to handle the challenges of a rapidly evolving healthcare system. This issue of the UBCMJ highlights the work of clinicians and scientists who are answering tomorrow's medical questions. Our feature articles explore the future of end-of-life issues (Hébert), and the changing face of primary care (Parhar). The issue also contains articles discussing updated roles for first responders (Guy) as well as those for anaesthetic assistants in the anaesthesia care team model (Martin). It is through research like this that medical education will progress.

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