

# Is Canadian healthcare lagging behind when it comes to technological literacy?

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Technology is transforming our world of medicine faster than medical professionals can keep up with it. When tasked with running a busy clinical practice, technological literacy often falls low on a physician's list of priorities. This lack of literacy among current physicians is causing a lag in the uptake of useful technologies that can revolutionize medicine in Canada. A bright spot is that Electronic Medical Record (EMR) adoption has increased from approximately 25% in 2007 to 75% in 2014 across Canada.<sup>1</sup> EMR refers to a digitized version of a patient's paper chart. Electronic Health Records (EHR) is a term that describes the entire software that organizes, stores, and shares patient data over a network.<sup>2</sup> The non-compatibility among EHR software between health networks has been one of the Canadian healthcare system's biggest downfalls. As large companies such as Google and Apple become more integrated in our lives, what happens if one of these large companies does EHR better than the public system? With innovative technologies around the corner, steps to make future physicians more current on the world of technology in medicine are warranted.

## Canada's "slow and silo-style" adoption of EMR

In the early years of EMR during the 1990s, its uptake was particularly slow.<sup>3</sup> A dearth in financial incentives for physicians to pay the upfront cost to switch from paper to EMR, along with the losses associated with incorporating EMR into the workflow of a medical practice were often blamed for this slow uptake.<sup>4</sup> The adoption rate in Canada was noticeably lower than its developed nation peers during this early period.<sup>5</sup> With its focus solely on adoption, much of Canada's shift to EMR was developed with a "silo approach" and information technology (IT) systems were incompatible with sharing patient data with each other. In response to this widespread issue, Canada Health Infoway was launched in late 2000 with an initial investment of \$500M to streamline the EMR across Canada towards interoperable EHR (iEHR).<sup>6</sup> iEHR is an integrated EHR that allows the sharing of patient data across the healthcare continuum. Although they have planned out a pan-Canadian iEHR action plan many years ago, it is only in recent years that provinces are moving toward iEHR, and this progress is variable. A review published in 2016 stated that only 58% of physicians are reporting access to iEHR data.<sup>7</sup> If just short of half of physicians are being left behind in iEHR access, one must wonder how well-connected our healthcare is at a provincial level.

Traditionally, each province and territory is allocated a certain budget for their own healthcare system. Within each province or territory, a global budget is the most common funding structure, where health authorities are allocated an operating budget for their year.<sup>8</sup> Due to this segmented approach, it is possible that health networks, even within provinces and territories, have issues with exchanging patient data with one another. This is affirmed by an announcement by the

province of British Columbia (BC) stating that an \$842M investment will be made to integrate and modernize EHR between Vancouver Coastal Health (VCH), Provincial Health Services Authority (PHSA), and Providence Health Care (PHC).<sup>9</sup> Canada Health Infoway also states that each province and territory is responsible for developing their own iEHR solutions.<sup>10</sup> When provinces and territories create iEHR independently without a plan to connect them, further healthcare dollars may be spent to retrospectively connect each provincial health system with one another.

## Streamlined EHR with nationwide share-ability

Many start-up companies have looked into designing iEHR software that allows for simple and easy patient data sharing. Practice Fusion is an example of an EHR start-up in the United States (US) that has achieved this. Their website claims to have processed 56 million patient visits in 2014 which is equivalent to 6% of all ambulatory visits in the US.<sup>11</sup> Their software is free, and has a well-connected user base, which allows for the sharing of EMR to anywhere across the US. A nationwide connected iEHR similar in scope to Practice Fusion could be beneficial for Canada in numerous ways. For example, centralizing waitlists has been shown to cut down on waitlist times due to streamlining waitlist management in countries such as Portugal.<sup>12</sup> Centralized EHR could also facilitate the sharing of patient information between universities across the country for larger scale research trials, paving a way for big data to play a larger role in medicine in the future.

## Implications of organized EHR on big data medical research

Google ventures led a \$130M round of funding for a cancer data start-up named "Flatiron". Flatiron is a cloud-based cancer data start-up that aims to organize the entire cancer treatment process on one single EHR and connect cancer centers all across the US. Their pitch is that data for 24 out of 25 cancer cases is not kept in an organized manner, and that we should be building knowledge on every cancer case on a common platform in a HIPAA-compliant manner to fight cancer. This company looks to analyze this patient data in multiple ways to gain deeper insights into clinical decisions. For one, they claim that their platform will make it easier to identify candidates for large scale research trials. Secondly, they claim that their software will be able to pull up cases that are most relevant to the patient at the point of care.<sup>13</sup> If made HIPAA-compliant, consulting a database of potentially millions of patients for similar cases could help physicians find highly-specific information about drug treatments that worked better or worse for a similar type of patient. A software this powerful has potential to create a more personalized approach to oncology and potentially give us data to make better choices with respect to chemotherapy treatment.

Although Flatiron has potential, their company's structure raises concerns regarding how patient data is used and monetized. For one, they claim that their platform will allow "life sciences" companies to get an unprecedented view of how their drugs are used in the real world.<sup>13</sup> One must wonder if this patient data will be sold to pharmaceutical

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companies and whether this is ethical. Additionally, if a company like Flatiron is owned in majority by Google, who has a reputation for selling large amounts of data to marketing companies, conflicts of interest could arise in the future.<sup>14</sup> Canada should look to companies like Flatiron for ideas about how patient data can be leveraged to the benefit of everyone, but look to do so in a way that is transparent, ethical, and compliant with patient safety standards.

### State of BC's physician leadership in the face of a technological revolution

A McKinsey report states that one of the potential key risk factors for BC's \$842M EHR integration project is that there is not enough physician and health care provider involvement.<sup>9</sup> The EHR integration project faced some setbacks when IBM, the contractor heading the project, and the province of BC parted ways. The project has since been picked up by Cerner. A transition period was required to handover the project, causing a delay in the project's timeline and \$190,000 spent in legal and mediation fees.<sup>15</sup> With a more technologically and project-minded physician population, risks of this nature would be mitigated in future IT renewal projects. Canada appears to be lacking in physician leadership who is well-acquainted with integrating technology in medicine. A lack of leadership could be addressed by educating medical students on technological literacy. The Sauder School of Business at the University of British Columbia (UBC) offers a course called Technology & Entrepreneurship (BAEN 506/APSC 541) that guides practical aspects of identifying a problem and planning, building, marketing, as well as funding a technologically-based solution for it. However, the 2015-2016 academic year was the last year that the course accepted medical students. Courses for medical students such as these should be encouraged by medical curricula, as they will create physician leaders who are technology-savvy and able to imagine and create technological-based solutions to systemic healthcare problems in the future.

### Canada's fate and EHR

Healthcare is changing due to advances in IT. While the developed world innovates with EHR, Canada could possibly lag behind again if it does not keep up with the growing global demand for technological-modernity. To make a complete switch-over to a single iEHR transnationally would likely be too costly and disruptive to workflow, however at the same time Canada should be looking further into how technology and data can be leveraged to improve medicine

when planning IT projects. This foresight requires knowledge of the healthcare system along with IT. Thus, medical curricula should consider technological literacy for physicians as an investment in the future of Canadian healthcare. Although not discussed here, professional development run by technology-industry leaders could also help to improve the technological literacy among Canadian physicians. A technologically-educated population of physicians will facilitate better choices regarding health information systems at the provincial and federal level.

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