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HEALTHCARE POLICY

Modernizing Canada's Healthcare System through the Virtualization of Services

by

Dr. R. Sacha Bhatia and William Falk

- ■ Using certain technologies allows healthcare providers to be separated in time and space from those they serve. This advance presents important opportunities not only to modernize care delivery through digital and virtual services but also to improve access for those in rural and remote areas where providers are not always available.

- ■ In this E-Brief we suggest using the "Quadruple Aim" framework devised by the Institute for Healthcare Improvement (IHI), a premier health improvement agency. The framework, which can be applied in several different contexts, can be used to examine virtual care and digital opportunities as well as the implications for setting policy. We suggest an increased focus on the patient experience as a driving force.

- ■ We make 10 concrete proposals to prompt a full-scale review of our health system and a robust approach to modernizing it.
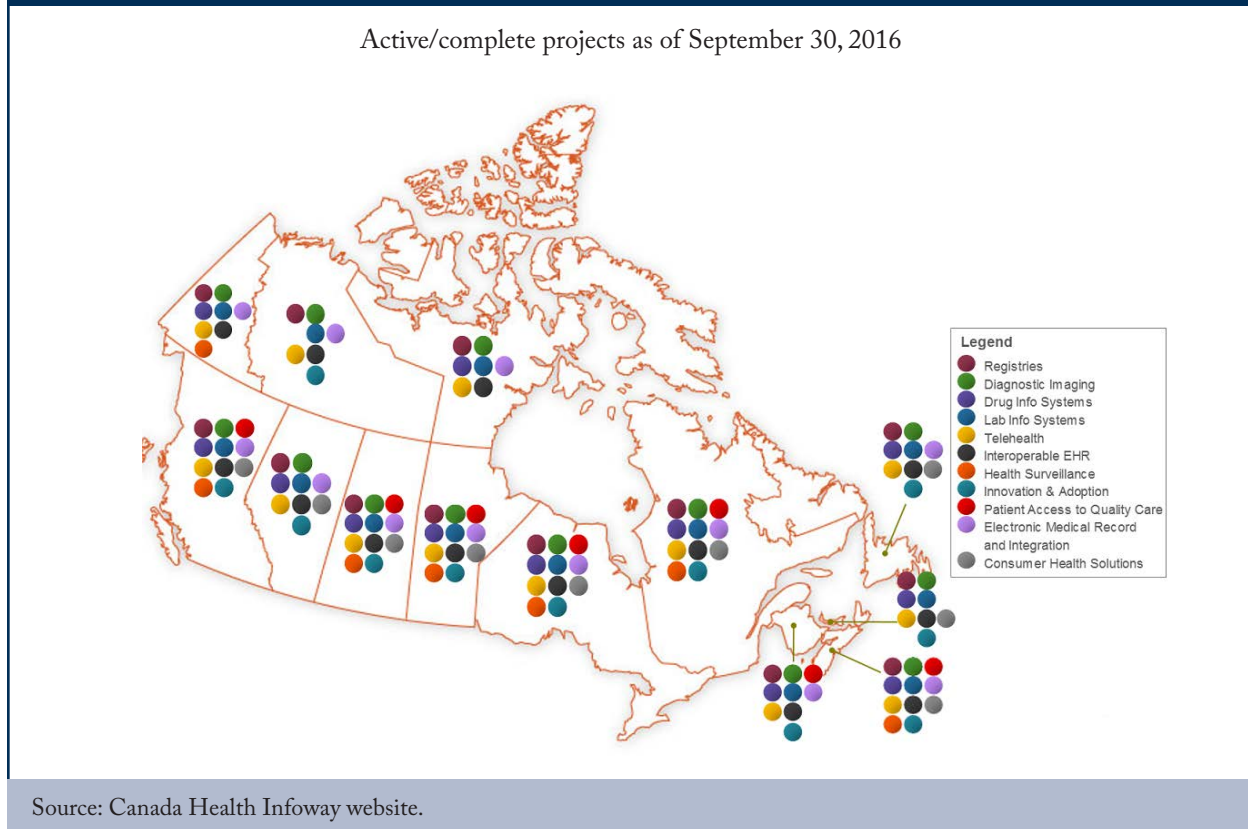
Investments in Digital Health

Digital health has been a key focus of investments for governments around the globe for two decades. The United Kingdom, United States, Australia, and Canada have each spent a lot of money investing in the development and implementation of these systems.[1] In Canada, federal and provincial investments total several billion dollars. There is nothing unusual about these investments – they are common in most other industries that deal with consumers. The investments in the health sector have been more "top down" than in others, but again that is to be expected in the broader public sector.

1   See, for example, Transparency Market Research, Digital Health Market (Product – Health Care Information Systems and Wearable Devices; Component - Hardware, Software, and Services; End User – B2C and B2B) – Global Industry Analysis, Size, Share, Growth, Trends and Forecast, 2017–2025, 2017. https://www.transparencymarketresearch.com/digital-health-market.html.

Figure 1: Infoway Investments over the Past Fifteen Years

Active/complete projects as of September 30, 2016

Legend
- Registries
- Diagnostic Imaging
- Drug Info Systems
- Lab Info Systems
- Telehealth
- Interoperable EHR
- Health Surveillance
- Innovation & Adoption
- Patient Access to Quality Care
- Electronic Medical Record and Integration
- Consumer Health Solutions

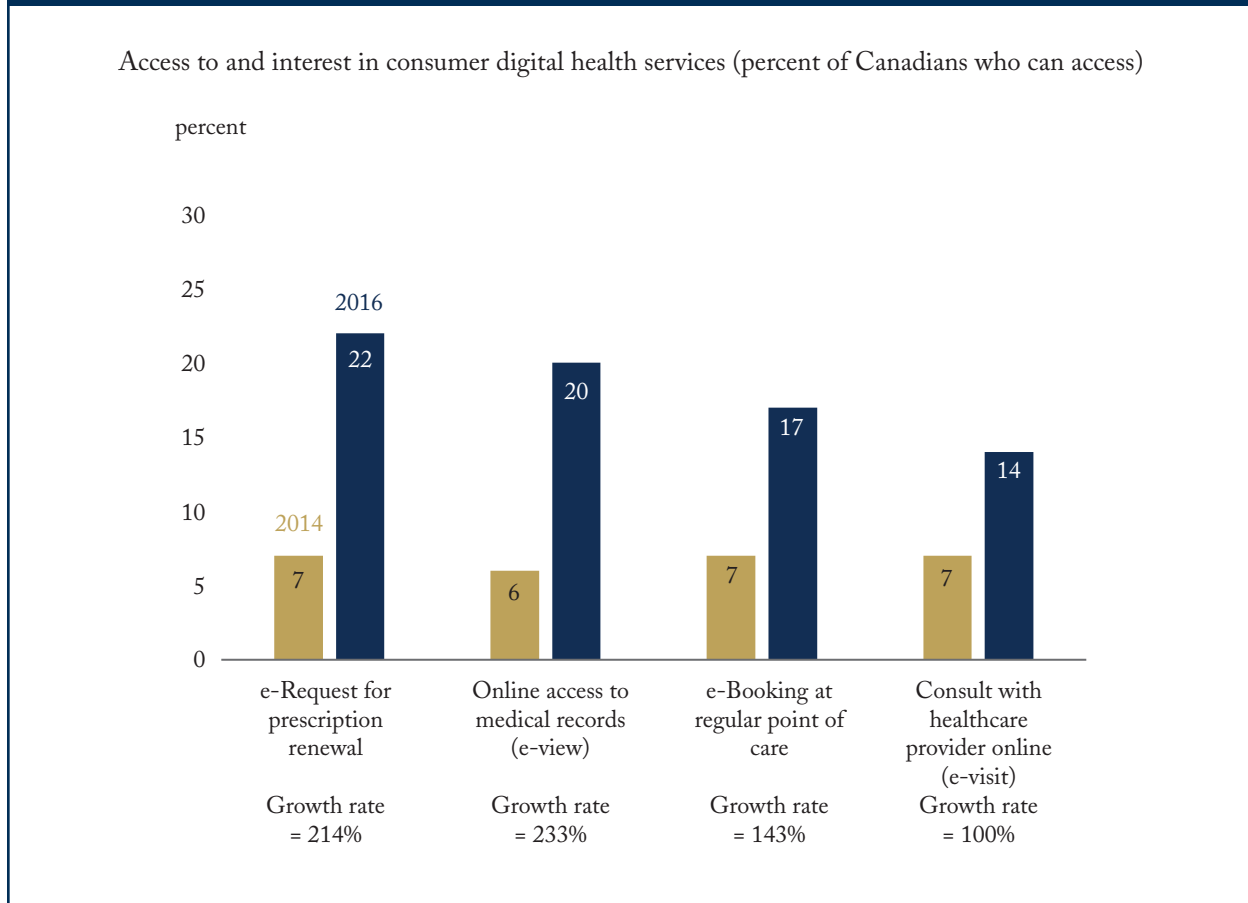Source: Canada Health Infoway website.

In other industries, digitization has been accompanied by the rise of virtual services (services in which the provider and the recipient are separated in space). Banking, travel, and retail have now all shifted (or are shifting) toward delivering the majority of their services virtually. In some cases, mixed delivery is significant: consumers search information online but interact physically. Virtual service and mixed channels have been the norm for most professionals for many decades. Lawyers, accountants, and real estate agents "virtualized" their service delivery in the mid-20th century by using telephones and fax machines. The internet, complex search algorithms, virtual tours, Quicken, and online contracting tools are now leading these service professions into a second generation of virtual service delivery and mixed channels. Ubiquitous virtual care is a natural next step in technological innovation for healthcare. It has the potential to improve both access to care in hard-to-reach areas and quality of life for patients while also increasing the healthcare system's efficiency. At the same time, it presents substantial challenges for clinicians and policymakers.

The need for direct physical contact and for building relationships between physicians and patients may make healthcare different from other industries. For that reason, in this E-Brief we will consider how, through thoughtful policy decisions, virtual services can best be used to deliver comprehensive, patient-centric care.

Existing Virtual-care Services

Many examples of virtual-care services already exist in our health system, and their penetration will increase with or without government intervention. As part of a broader societal change, cell phones, text messaging, and

Figure 2: Canada's Consumers are Ready for Modernization

Access to and interest in consumer digital health services (percent of Canadians who can access)

percent

	e-Request for prescription renewal	Online access to medical records (e-view)	e-Booking at regular point of care	Consult with healthcare provider online (e-visit)
2014	7	6	7	7
2016	22	20	17	14
	Growth rate = 214%	Growth rate = 233%	Growth rate = 143%	Growth rate = 100%

Source: Canada Health Infoway.

email have replaced traditional paging as modes of communication among medical teams.[2] In Canada, federal and provincial governments have made specific concrete investments to respond to our geographic challenges. Through eConsultations, virtual visits, and remote patient monitoring, Ontario Telemedicine Network (OTN) and its partners facilitated 600,000 clinical events in 2017. For example, a partnership between OTN and the Champlain Building Access to Specialists through eConsultation (BASE) program provided a province-wide e-consult service between primary-care providers and specialists.

The Canadian medical start-up called "Figure 1" securely shares medical images among more than a million physicians and has more than 50 percent of all North American medical students enrolled on its platform,[3]

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2   P. McCluskey, "Turning the Pager on a Bygone Era." *Boston Globe*, 2016. http://ezproxy.lib.ryerson.ca/login?url=https://search-pr.

3   Users of Figure 1 have viewed cases 2 billion times. Canadian Healthcare Technology 2017. http://www.canhealth.com/blog/users-of-figure1-have-viewed-cases-2-billion-times/.

suggesting that by the time these students are practising, they will find it natural to interact virtually with patients and other providers. In British Columbia, virtual visits have been publicly funded since 2012, and research has demonstrated high patient satisfaction and the potential for cost savings (McGrail, Ahuja, and Leaver 2017). Many Family Health Teams in Ontario use email and the telephone to communicate regularly and promptly with their patients and family members. This system has been in place for several years, sometimes to the distress of privacy officers and regulatory colleges.

Recent statistics from Canada Health Infoway show a tripling of access between 2014 and 2016 to online services such as e-booking, e-prescribing, and the electronic results of laboratory tests(Canada Health Infoway 2017).

This rapid increase is not surprising: Canadians overwhelmingly report their interest in receiving services virtually. Leading systems such as Kaiser Permanente report that more than 50 percent of primary-care interactions are already virtual.[4] Moreover, in countries where there are provider shortages, structured interactions with "bots" have been of great assistance to physicians and nurses in making diagnoses (Huda, Yu, and Cang 2016).

Current Regulatory and Payment Policies

While our patients expect virtual and digital care, our current regulatory and payment policies do not support this modernization. We risk losing the potential transformational benefits of virtual care simply by maintaining rigid, dogmatic rules that penalize providers and organizations that want to innovate. In our 2014 essay on this topic (Falk and Bhatia 2014), we specifically identified nine challenges:

1) lowering prices for higher throughput virtual care;

2) queue reduction and total system costs: how to balance;

3) queue reduction and appropriateness: how to handle intentionally inappropriate care ("milling");

4) short-term impact of queue shortening: one-time cost impact;

5) quality and virtual care: how to ensure high-quality service delivery;

6) virtual care continuity and coordination: the "virtual walk-in";

7) drug-seeking behaviour;

8) fraud and abuse; and

9) barriers to adoption of the new standard of care.

This essay treated the individual tradeoffs that need to be considered when a particular service virtualizes. It examined how we manage the dramatic shifts that happen when there is less friction in scheduling and completing a healthcare service. Although this change is often positive for both provider and patient, we also discussed negative ramifications such as excessive treatment, inappropriate care, and the potential for increasing fraud and drug-seeking behaviours.

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4   More than half of Kaiser Permanente's patient visits are done virtually. http://fortune.com/2016/10/06/kaiser-permanente-virtual-doctor-visits/.

A Comprehensive Approach to Virtual Care

Canada will need a comprehensive approach to virtual care, and, in the current essay, we will set out a plan for it. We divide our approach into three areas: payment reform; access to electronic information; and applying the IHI's Quadruple Aim to virtualization.

Payment Reform

Virtual care needs to start with how providers will be paid. Given the current politicization of payment agreements, that is an unfortunate starting point, but it is an essential part of the program. Our traditional fee-for-service models use physical contact as an implicit control mechanism. By requiring hands-on care, we set up queues that prioritize need and limit the scope for inappropriate care but also inconvenience patients and providers and cause them anxiety. Payment policy must be modernized if we are to integrate effective virtual care into clinical practice while also managing appropriateness. Capitation, block fees, or bundled payments that encourage improved outcomes that include appropriate virtual-care services would be superior to fee for service. However, we cannot put virtual care on hold while we figure out what to do with our dated fee-for-service model.

Where the fee-for-service system is still necessary, separate clinical and pricing reviews will need to be made. We believe that the clinical review and the pricing review should be separate processes:

- The **clinical review** asks questions about whether physical contact is necessary or desirable for a given service to be delivered, based on clinical practice guidelines. It also examines appropriateness guidelines and other required protections (e.g., no drugs of street value in virtual visits with first-time patients). Where possible, the clinical review should not be done by a group with financial interest in the outcome. In those instances where the expertise to do the clinical review exists only within the specialty group receiving the fee-for-service payment, steps must be taken to mitigate the risk of regulatory capture. This clinical review should incorporate patient and family caregiver perspectives as well as provider perspectives. It should consider that the fast pace of technological changes will require regular updating, both to incorporate new technology and to remove technology that has become obsolete.

- The **pricing review** looks at the relative effort and payment for the virtualized service (and the remaining physical service). This review may have considerable complexity because of the changes that virtualization has on the underlying population being paid for by a particular fee code. For example, many prescriptions can be renewed virtually fairly quickly. As a result, those that require a physical visit may need a richer fee code than currently exists once virtual e-renewals are implemented. The new virtual code and the new physical code both need evaluation as a result.

Clearly, it would be preferable not to rely on fee for service as the payment methodology, but in the real world that may be a necessary compromise. Where possible, payment alternatives to fee for service, such as bundling and capitation payments without volume incentives, should be considered. For bundling or capitation payment structures to work, greater integration between primary, community, and hospital-based care will likely be required in order to realize the potential system's savings from virtual care. Wherever fee for service is used with virtual codes, we will need to manage inappropriate care with provider self-policing and system monitoring. Virtual services do not in themselves create inappropriate care, but the scalability of digital systems and the lack of friction in diagnostics mean that caution, monitoring, and professional judgment are needed. Recent examples

Figure 3: Applying the Quadruple Aim to Virtual Care

Quadruple Aim

Improved Population Health

Satisfied Patients

Satisfied Providers

Reduced Care Cost
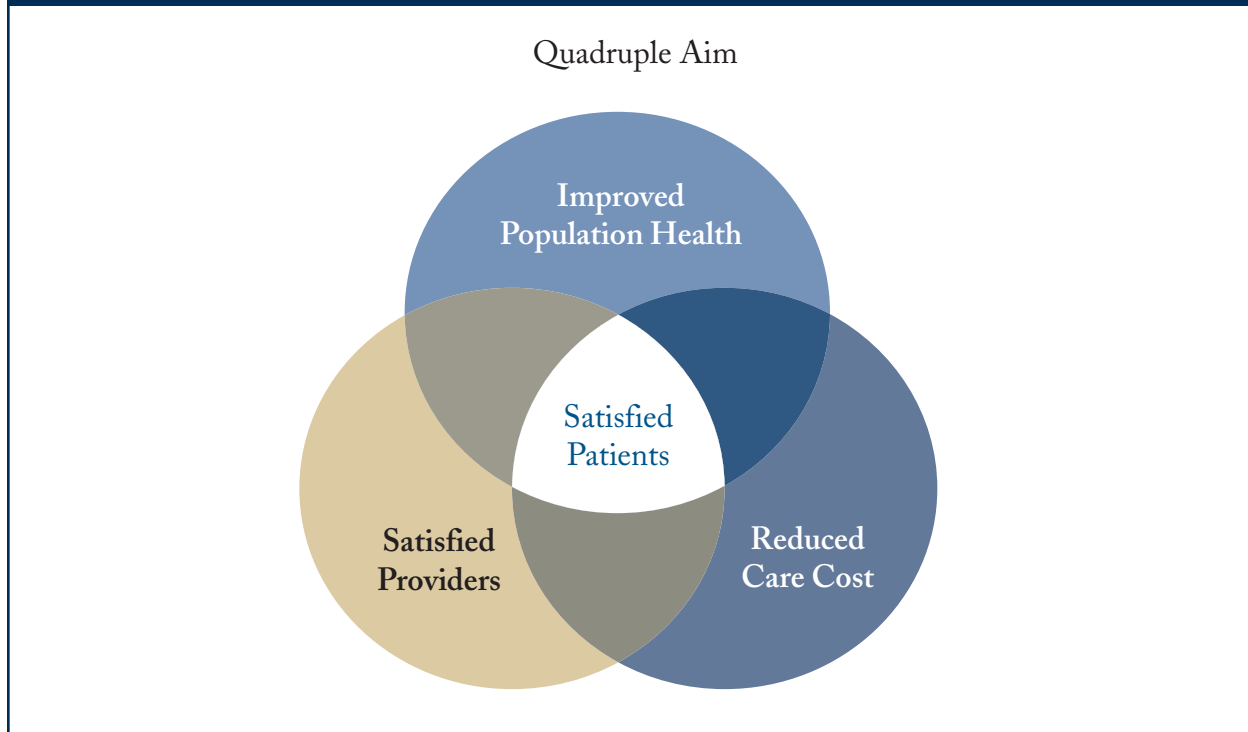
Source: Institute for Healthcare Improvement.

with payment abuse of dermatology in Florida and elsewhere in the United States have revealed the potential for wide-scale inappropriate care (Hafner and Palmer 2017).[5]

Finally, and critically, we must consider issues of health equity when modifying payment mechanisms to facilitate the use of virtual care. We fundamentally believe that virtual care can be delivered within a single-payer healthcare system. Access to technology, concurrent with health and technology literacy, could exacerbate already existing inequitable access within our health system (Papanicolas, Woskie, and Jha 2018). The issue of equitable access must be considered when considering new payment policies. One way to monitor for both increases in inappropriate care and health disparities is to use tools such as the Electronic Medical Record (EMR) and other virtual tools to collect quality data, which are then fed back to providers and policymakers.

Access to Electronic Information

Data sharing and privacy requirements must be streamlined to strike an appropriate balance between legitimate privacy concerns and the timely flow of information among providers or between patients and providers. Patients

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5   K. Hafner and G. Palmer, "Skin Cancers Rise, Along with Questionable Treatments." *New York Times*, 2017. https://www.nytimes.com/2017/11/20/health/dermatology-skin-cancer.html.

should be guaranteed timely access to their medical data and should have virtual options to connect with their healthcare team for mundane administrative tasks, such as booking appointments or receiving laboratory test results. Payers and government agencies that fund and regulate these technologies must engage providers early to ensure that the provision of virtual services integrates seamlessly into clinical practice so as to not overburden clinicians. Access to electronic data is a patient's right, along with that of their families and care providers. The system needs to organize itself to ensure that patients not only have timely access to their data but that sensitive data (e.g., pathology results) can be delivered in a way that does not unnecessarily distress or overburden patients.

Although it is useful to list the challenges ahead, we believe that virtual care and digital health are not separate silos in the health system. They are a core part of everything we do in caring for our patients. How we will incorporate digital health in every aspect of the healthcare system is our current challenge. The Ontario Ministry of Health has, for example, recently spoken of "Digital Health by Design" as an approach to consider systematically how to modernize all healthcare processes. This approach would also allow the ministry to work with partners (OMA, OTN, and others) to add appropriate virtual options.

Applying the Quadruple Aim to Virtual Care

The IHI Quadruple Aim provides a robust and comprehensive framework for evaluating digital health and the virtualization of services. This framework was initially developed in 2007 as the "Triple Aim" by the Institute for Healthcare Improvement under the leadership of its founder, Dr. Donald Berwick. The Triple Aim has traditionally been composed of three equal dimensions – experience of care, population health, and per capita cost – but was expanded in 2014 to include provider satisfaction as the fourth dimension (Bodenheimer and Sinsky 2014). This framework is widely applied to measure the impact of all forms of interventions for health-system improvement around the world (Cooper University Health Care 2018). The evaluation should aim ultimately to improve the four areas of patient experience, population health, provider satisfaction, and healthcare costs. Although it may not be possible to achieve all the goals with one intervention, the measurement of all the defined dimensions tries to ensure that there are no unintended consequences of a given intervention.

The key point here is that the impact of a virtual-care intervention can and should be measured using a similar framework to other types of health system interventions and should not be considered something distinct from any other model of care. Rapid yet robust evaluation of virtual-care programs should be built into every roll-out of these new programs to ensure they are achieving the hoped-for health system objectives, without leading to unintended consequences or patient harm. Robust data regarding the effectiveness of virtual models of care have been lacking. Meanwhile, data on the implementation of electronic solutions have focused on the technology itself and its costs and benefits to population health, and less on how that technology affects the patient experience, or whether the technology helps to empower patients to participate in their own care (Mohr, Batalden, and Barach 2004).

The Experience of Care

Improving the experience of care has been ignored or downplayed in current evaluations. Costs and quality metrics are relatively easy to measure and have been the focus of both researchers and system managers. Although a few studies have considered gains in terms of costs and public health, we believe that the goal of experience of care for both providers and patients has been systematically underappreciated. Improvements that simply allow a better experience of care, with little change in costs or population health, are undervalued by the

health system. That attitude may help to explain why so many consumers are looking for a different customer experience from the health system. Recent movements toward patient-centred care and the entry of disruptive actors from adjacent industries may result from this lack of emphasis on the experience of care.

Many technological advances that are at least neutral on quality and costs but more convenient for patients have not gained acceptance by clinicians and governments. For example, Holter monitors, which are bulky and inconvenient, are still used by cardiologists in spite of several modern, convenient solutions that different companies have offered. More recently, AliveCor's partnership with Apple has paved the way for the mass use of smartphone-enabled home ECG monitoring, with payment mechanisms yet to be determined. New technology that allows sleep studies to be done at home, rather than in sleep laboratories, has not gained widespread clinical adoption, likely because of payment idiosyncrasies.[6]

The difficulty of incorporating email into medical practice is another example where improved patient experience is not enough to push widespread adoption, despite minimal increases in costs and no change in patient outcomes. The recent physician pushback to My Health Nova Scotia, an online patient health record that allows doctors to communicate electronically with patients, likely stems from the lack of compensation for physicians who use the system.

The patient experience is critically important. While delaying a diagnosis for a few weeks may not be clinically significant to policymakers, it makes a huge difference to patients and their families. Access and timely communication to providers builds confidence in the system and may well reduce costs and improve health in the longer term. We are not arguing that this communicating be done at the expense of greatly increased costs or reduced quality of care, but we are making the case that where the other two aims are held constant, we be allowed to modernize our mid-20th-century healthcare system.

The lack of modernization also threatens to undermine support for our publicly funded Canadian system. When virtual care (and its convenience) is available privately for a credit card payment, but not within our public system, we risk creating a second tier of healthcare based on technology. This would be a grave mistake for Canadian healthcare: for that reason alone, policies that support widespread adoption of virtual technologies to increase the overall quality of our public health system while also ensuring equitable access should be considered without delay. Equity considerations become even more pronounced in rural and remote communities where travel costs become a further barrier to our public system.

The importance of modernization is also underscored by the new fourth aim in the Quadruple Aim framework: healthcare provider experience (Bodenheimer and Sinsky 2014). A significant amount of attention has been focused recently on sub-optimal user experience in healthcare technology, leading to wasted time, expense, provider dissatisfaction, and, ultimately, poorer patient outcomes. A comprehensive modernization of the system would place a much greater emphasis on the user experiences of both providers and customers. We firmly believe that most care providers want to be able to engage in better communication and monitoring of their patients.

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6   See "At-Home Sleep Apnea Test Coming to Ontario This Year, with Costs Covered." *Financial Post*, 2017. http://business.financialpost.com/entrepreneur/bresotec.

A Quadruple Aim evaluation, including the impact of technology on the provider experience as well, can provide payers with a comprehensive guide when selecting the types of technology platform that would underpin new virtual models of care. Finally, the Quadruple Aim framework can be used as part of a continuous quality improvement strategy to help refine the technological and non-technological aspects during the implementation process. This last point is critical, as often it is the non- technology portions of any implementation efforts, such as the ways physicians, nurses, other caregivers and patients interact with the technology, that ultimately determines success or failure. The use of the Quadruple Aim framework to evaluate the effectiveness of any virtual-care intervention will ensure that the incorporation of virtual care into clinical practice achieves the objectives of better clinical care and that it will give policymakers confidence that investments in virtual care will be well spent.

Ten Practical Steps towards Virtualization in Canada

We have argued that virtual care is a necessary part of our healthcare future, that regulatory and payment policies must catch up to the technological advancements in our healthcare system, and that we need to use a standard framework for evaluating the effectiveness of new virtual models of care. So, how do we get started? We turn now to 10 practical steps that could significantly increase the virtualization of health services in any Canadian province. We believe these changes, which could be enacted relatively quickly and painlessly, would significantly improve Canadian healthcare on one or more of the dimensions of the Quadruple Aim.

1) **Provincial regulatory colleges should make it compulsory for every provider to have a secure email address**

   Every year, when physicians update their certificate of registration with the relevant provincial college, they provide an up-to-date address (including fax number) to which patient material can be sent. If, as part of this process, physicians were required to have a secured email address, the digitization of patient records would significantly accelerate. (Already, many provinces have invested millions of dollars into creating such a system.) Rather than faxing patient results or letters, this information could be sent electronically, allowing easy upload into an electronic medical records (EMR) system. In addition to the transfer of patient records, a secure email address would make inter-physician communication and registration for patient care much easier. Best of all, this recommendation would require no new dollars to make it happen.

2) **Hospital on-call services should include virtual-care services as part of their call responsibilities**

   In Ontario, the Physicians Services Agreement states that physicians will be compensated for providing hospital on-call coverage (HOCC). Physician groups should also be able to offer virtual-care coverage, in terms of providing e-consults to other physicians, answering emailed patient queries, and other services as part of the requirements to receive on-call funding. Any fee-for-service billings would be in addition to the HOCC payments. This arrangement would facilitate more rapid and urgent after-hours patient-care inquiries from both local and geographically isolated parts of the province. It would also establish a funding basis for an e-Consult system.

3) **The provision of emailed administrative inquiries, electronic renewals of prescriptions, and on-line scheduling should be part of the accountability agreements for primary-care practices**

Often, capitated primary-care practices, such as Family Health Teams in Ontario, sign accountability agreements in return for resources to support the provision of a comprehensive care practice. Governments can amend the accountability agreements with these groups to require them to make available to their patients secure messaging capabilities and online scheduling. These technologies are already available and are being used by some family practices in Canada – in Nova Scotia and British Columbia, for example – and they could be spread nationally with little difficulty.

4) **Integration of virtual care into bundled payments**

The Ontario government has launched a number of bundled-care pilots across the province. These pilots, based on the models that were started at St. Joseph's Healthcare in Hamilton, are meant to provide funding for the entire episode of care, as opposed to piecemeal payments for portions of the care. The integration of virtual care into aspects of the care bundle (e.g., post-operative home monitoring for hip or knee replacement patients as opposed to in-hospital stays) has the potential to reduce costs and to achieve the Quadruple Aim. Bundled payments allow providers to change the mode of interaction and to organize monitoring and follow-up care that best suits their patients. This flexibility is important across Canada but particularly for our rural and remote communities, where following up by long-distance travel is not a practical or affordable option for many people.

5) **Results must be digital by 2020**

The provinces should select a particular date by which all patient results will be communicated electronically. For most large providers, this date should be 2020 or earlier. The message to laboratories, pharmacies, hospitals, and large group practices would be that this switch is a minimum expectation for all providers of services under the publicly funded healthcare system. The provinces should take the position that they are already paying for this electronic system as part of payment contracts. The federal and provincial governments should insist that every citizen and/or their family members should be able to access their health data. Numerous examples of readily accessible patient data already exist, through both public providers (e.g., My Health Nova Scotia and the various Ontario portals) and private providers, including major private laboratory companies and major pharmacy chains. Digital results are an increasingly common feature of physician and hospital EMR systems, and a mandated cut-off date will ensure that electronic transmission of results becomes the new standard.

6) **Email and telephone use**

It is simply not acceptable for any physician's office not to use email in 2018. Privacy concerns about email have been used as a smokescreen for far too long. Once the appropriate permissions are in place, email should be used for administration, minor clinical concerns, and the communication of routine diagnostic results. An equally clear and strong statement should be issued about telephone use. These statements about the use of email and telephone communications should not be seen as blaming providers. After billions of dollars have been spent on electronic health records, the fact that email and the telephone are not used regularly in physicians' offices is a symptom of how broken our policy systems and fee negotiations have become. Providers are simply reacting to the system they find in front of them. We need to change that system.

7) "Digital Health by Design" and "Virtual First" care

Every accountability agreement, alternative payment plan, supervisory agreement, regulation, and fee code needs to be looked at through a modernization lens. This investigation would allow improvements to be made across each of the four Quadruple Aims while at the same time ensuring appropriateness and affordability. Asking questions around how the system can improve the experience for both providers and patients will allow us progressively to redesign our system. We know from other industries that there will be major dislocations. Jobs will be changed and sometimes eliminated. If the human resource planning is not appropriately managed, it could lead to significant disruption in the delivery of healthcare services. On the positive side, the opportunity exists to gain efficiencies for our healthcare system and to avoid capital investments in physical infrastructure. Customers, mainly seniors, will need to do things for themselves (or for their relatives and/or friends) that will be difficult without the appropriate education and training. Roles and control over information will change.

Ontario has called this kind of approach "Digital Health by Design" and sees the opportunity to capture benefits from the investments that have been made over the past two decades. Digital Health by Design is an approach to health policy and program design that embeds digital thinking into the everyday work of health policy makers and planners. The goal is to advance the modernization of a patient-centred health system by making digital health an integral and routine part of patients' experience – in every facet of their interactions with the health system and their healthcare providers. It is a "digital first" philosophy that asks "How can we do it with digital?" when designing or redesigning health policies and programs. Several international providers have labelled this approach "Virtual First." Whatever the label, the intention is a fresh look at the modernization of all existing contracts, agreements, and payment mechanisms.

8) Recognize digital health as a discipline for academic and human resources purposes. Manage virtual care for economic growth

The growth of digital health as a separate discipline over the past 15 years has been remarkable. From its health informatics roots, there has been an employment explosion in the field. Some estimates suggest that more than 50,000 jobs have been added in this area in Canada alone (Faisal et al. 2015). Mohawk College, University of Toronto, and University of Victoria have built solid post-secondary programs around it, and several Master of Business Administration (MBA) and Master of Health Administration (MHA) programs have created significant minors in digital health. Some medical schools are exploring how to partner with computer science departments to build digital health programs. Virtual care gives us the opportunity to imagine Canadian healthcare as an exportable service either through knowledge objects and apps or even through direct care and diagnostics.

9) Explore virtual hospitals as a solution to Canada's remote communities and hard-to-reach populations

Canada's first hospital without beds is Women's College Hospital (Women's College Hospital website). It was rebuilt in 2013 on the premise that there would be no overnight stays and that services would be delivered on an ambulatory and virtual basis. Published results have shown that this model creates a more efficient and patient-friendly way of delivering services (Crawford et al. 2015). We have long known that hospital-acquired illnesses affect one in 14 patients admitted to our hospitals (World Health Organization website). It is time to take the obvious next step and deliberately keep our patients out of hospital. In the United States, several major centres have created specifically designed virtual hospitals.

Recently, the Mercy System in St. Louis and the Montefiore Medical Center in New York have opened major hospitals with no beds. A purpose-built hospital without beds and designed to serve difficult-to-reach patient populations, including Canada's Indigenous communities who live in remote communities, could be a focus for excellence that would create a modern system for these populations.

10) This transformation is no longer just the job of arm's-length agencies

Telemedicine networks, eHealth agencies, digital health secretariats, physician desktop agencies, and even Canada Health Infoway are all important transformational policy and program vehicles. Several of them have been very successful and should be celebrated. Ultimately, more than half of healthcare will be delivered through virtual or digital communications. In the long term, the digital healthcare system needs to become part of the healthcare system, not a separate adjunct service. Virtual care, e-Consults, patient portals, digital results reporting, and even artificial intelligence will become a normal part of everyday healthcare delivery. Provincial and federal agencies that currently fund, regulate, or deliver virtual services need to look to a future where digital care is an integral part of care delivery and re-imagine their roles as system catalysts and stewards.

While even these first steps toward a coordinated digital health policy may seem daunting, the risk of not undertaking such a revision is enormous. Virtual care is happening across the country, and, if we are to take advantages of its benefits and better meet the needs of Canadians, health systems must adapt. If done thoughtfully, virtual care can be a transformational force for improved patient care. Simultaneously, it can ensure that our health system is sustainable into the future even as it also creates economic opportunities for Canadians.

References

Bodenheimer, T., and C. Sinsky. 2014. "From Triple to Quadruple Aim: Care of the Patient Requires Care of the Provider." *Annals of Family Medicine* 12(6): 573–6. November 1.

Canada Health Infoway 2017.Year in Review: 2016–2017. https://www.infoway-inforoute.ca/en/component/edocman/3350-annual-report-2016-2017/view-document?Itemid=0.

Cooper University Health Care. 2018. "Quality and Patient Safety." https://www.cooperhealth.org/about-us/quality-and-patient-safety.

Crawford, D.C., C.S. Li, S. Sprague, and M. Bhandari. 2015. "Clinical and Cost Implications of Inpatient versus Outpatient Orthopedic Surgeries: A Systematic Review of the Published Literature." *Orthopedic Review* 7(4). http://www.pagepress.org/journals/index.php/or/article/view/6177. December 30, cited January 18, 2018.

Faisal, S., D.D. Castillo, F. Inso, and S. Sjodin. 2015. "Digital Health in Canada: Exploratory Analysis of Canada's Domestic Health ICT Sector." Canada Health Infoway. https://www.ictc-ctic.ca/wp-content/uploads/2015/07/Digital-Health-in-Canada-2015-FINAL.pdf.

Falk, W., and S. Bhatia. 2014. "Policy Implications for the Virtualization of Health Services." Healthy Debate. http://healthydebate.ca/opinions/policy-implications-for-the-virtualization-of-health-services.

Huda, M.N., H. Yu, and S. Cang. 2016. "Robots for Minimally Invasive Diagnosis and Intervention." *Robotics and Computer–Integrated Manufacturing* 41:127–44. October.

McGrail, K.M., M.A. Ahuja, and C.A. Leaver. 2017. "Virtual Visits and Patient-Centered Care: Results of a Patient Survey and Observational Study." *Journal of Medical Internet Research* 19(5): e177. May 26.

Mohr, J., P. Batalden, and P. Barach. 2004. "Integrating Patient Safety into the Clinical Microsystem." *Quality and Safety in Health Care* 13(supplement 2): ii34–ii38. December 1.

Papanicolas, I., L.R. Woskie, and A.K. Jha. 2018. "Health Care Spending in the United States and Other High-Income Countries." *Journal of the American Medical Association* 319(10): 1024. March 13.

Women's College Hospital. "Women's College Hospital Milestones." http://www.womenscollegehospital.ca/about-us/our-history/milestone.

World Health Organization. "Health Care-Associated Infections Fact Sheet." http://www.who.int/gpsc/country_work/gpsc_ccisc_fact_sheet_en.pdf.