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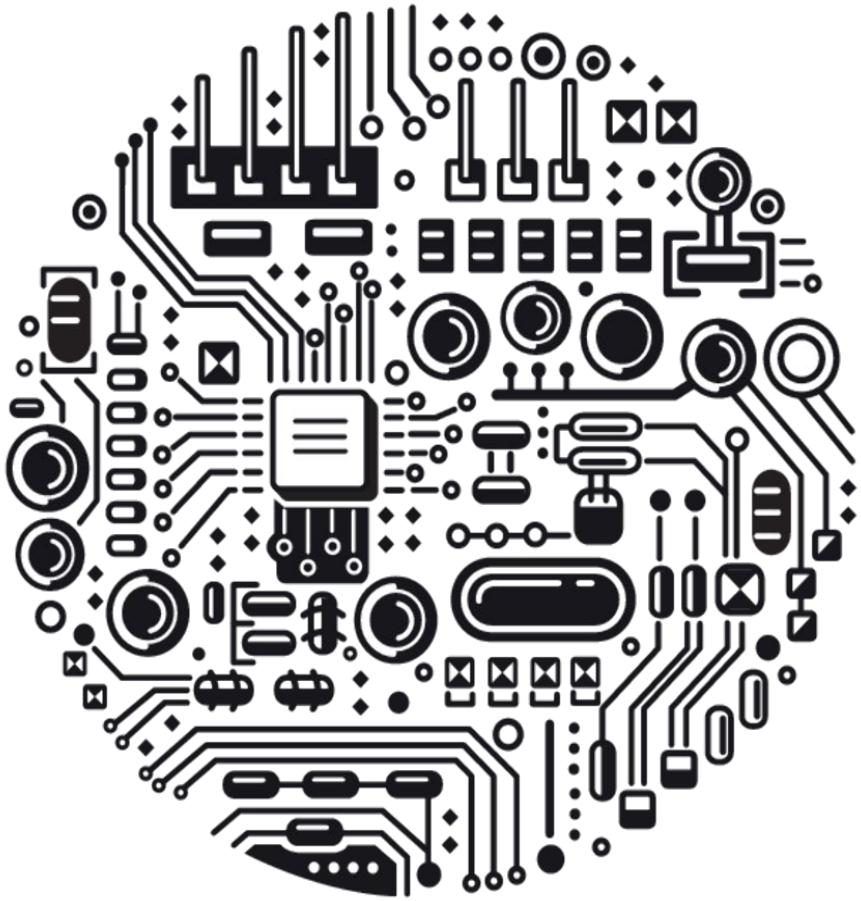


Environmental scan on virtual care – summary presentation

April 2019

Project background and scope

- Deloitte was retained by the Atlantic provincial medical associations to undertake an environmental scan focused on current practices and future trends in virtual care.

Definition of "virtual care"	"Virtual care refers to any interaction between patients and/or members of their circle of care, occurring remotely, using any form of communication or information technology, with the aim of facilitating or maximizing the quality and effectiveness of patient care." (CMA, 2018) "Virtual care is the integration of telehealth into mainstream care delivery to complement or even substitute traditional care delivery. It involves the convergence of digital media, health technology, and mobile devices, and leverages additional modalities—such as text messaging, digital voice assistants, and decision support tools powered by artificial intelligence and augmented/virtual reality—to create a continuous connection between patients, physicians, and other caregivers." (Deloitte research: What can health systems do to encourage physicians to embrace virtual care?, 2018)

- The focus of the environmental scan was on **telemedicine** (virtual visits with providers for prevention, diagnosis, and treatment) and **remote patient monitoring** (remote monitoring for prevention, diagnosis, and treatment), including services that integrate **artificial intelligence** (AI) with virtual care.
- The scan considered Canadian and international jurisdictions, as well as both insured and non-insured health services.
- Deloitte was asked to focus on the work of physicians – either alone, or in conjunction with other providers.

Research questions

The environmental scan was built around five research questions:

1. **What virtual care services are in-use, and likely to be in-use, in the next ten years?**
2. **What benefits has the adoption of virtual care achieved, and what are some potential downsides?**
3. **What are the barriers to physician adoption of virtual care?**
4. **What are the enablers of success in encouraging physician adoption of virtual care?**
5. **What role(s) can physician associations play in adopting virtual care solutions?**

1 What virtual care services are in-use, and likely to be in-use, in the next ten years?

Virtual care terminology and categories

Telemedicine:

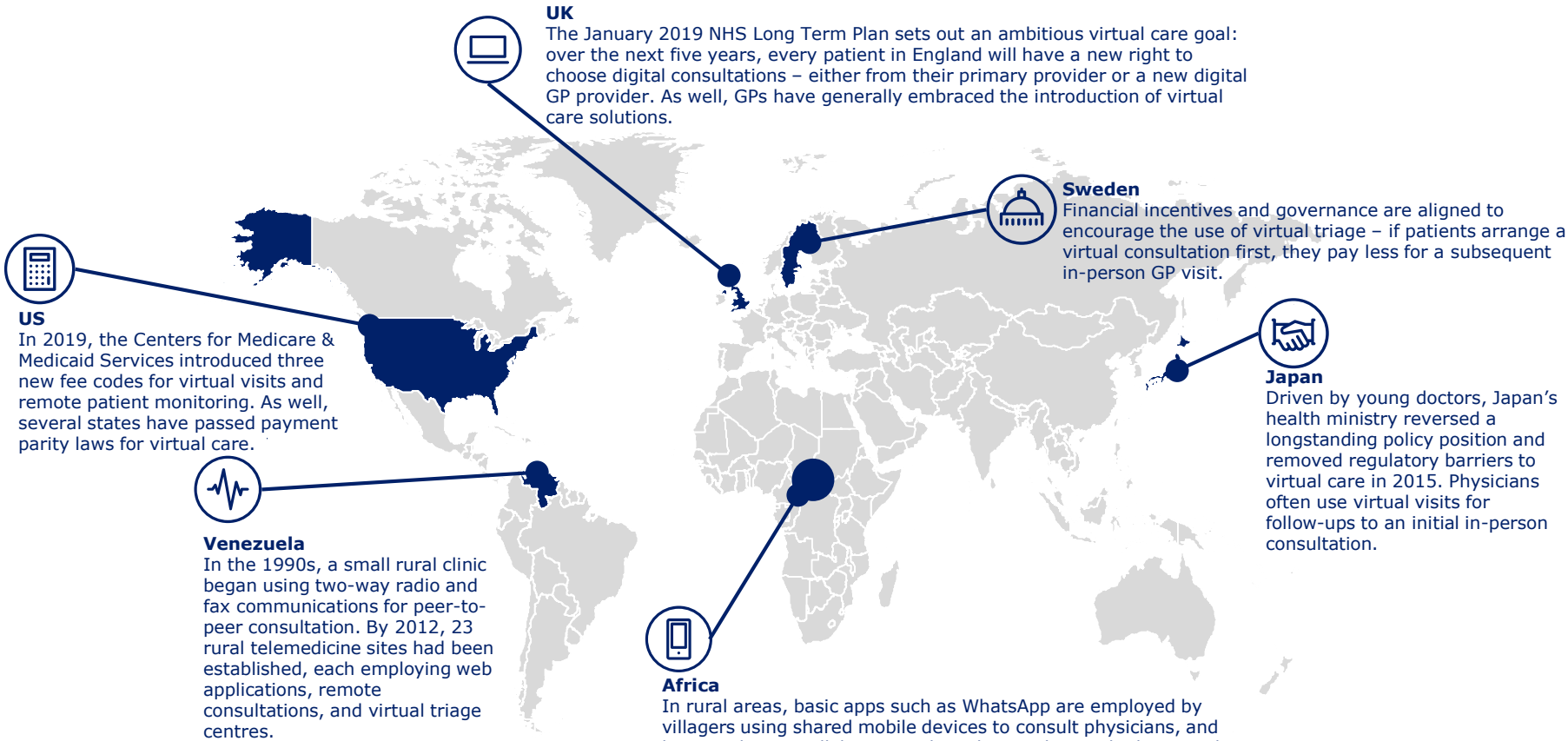
- **Synchronous:** Physicians and other health care providers use telephones, videoconferencing, instant messaging, and/or apps to diagnose, treat, and prevent. This also includes primary physicians and specialists providing synchronous telemedicine in concert.
- **Asynchronous (sometimes referred to as "store and forward"):** Patients record audio and/or video of their symptoms, and submit them to clinical teams for review at a later. This also includes collaboration between primary physicians and specialists.

Remote patient monitoring:

- **Collection** (e.g., through a device such as a weigh scale and heart rate monitor for premature babies)
- **Transmission** (data is sent to care providers via the internet, text, apps, etc., either to teams working in hospitals or other facilities, or directly to physicians' smartphones regardless of where they are located)
- **Evaluation** (both software and providers themselves evaluate data and indicate any areas of concern to other providers and patients themselves)
- **Notification** (data indicating that immediate attention is required alerts emergency responders or other care teams)
- **Action** (emergency response or other in-person interventions are initiated)

AI integration is increasing within remote patient monitoring, as machine learning and advanced algorithms analyze real-time data from patients to identify those at risk of worsening or requiring in-person follow-up.

Virtual care is being advanced worldwide



UK
The January 2019 NHS Long Term Plan sets out an ambitious virtual care goal: over the next five years, every patient in England will have a new right to choose digital consultations – either from their primary provider or a new digital GP provider. As well, GPs have generally embraced the introduction of virtual care solutions.

Sweden
Financial incentives and governance are aligned to encourage the use of virtual triage – if patients arrange a virtual consultation first, they pay less for a subsequent in-person GP visit.

US
In 2019, the Centers for Medicare & Medicaid Services introduced three new fee codes for virtual visits and remote patient monitoring. As well, several states have passed payment parity laws for virtual care.

Japan
Driven by young doctors, Japan's health ministry reversed a longstanding policy position and removed regulatory barriers to virtual care in 2015. Physicians often use virtual visits for follow-ups to an initial in-person consultation.

Venezuela
In the 1990s, a small rural clinic began using two-way radio and fax communications for peer-to-peer consultation. By 2012, 23 rural telemedicine sites had been established, each employing web applications, remote consultations, and virtual triage centres.

Africa
In rural areas, basic apps such as WhatsApp are employed by villagers using shared mobile devices to consult physicians, and by providers to collaborate and send reminders and educational materials to patients.

Virtual care – a widening variety of uses

	Category of virtual care	
	Telemedicine	**Remote patient monitoring**
Prevention	• St. Michael's Hospital uses telemedicine appointments in kidney stone prevention. • Ontario has explored patient-initiated primary care virtual visits through an integrated platform incorporating audio, video, and email messaging.	• For dementia patients at risk for falls, remote monitoring can alert caregivers to intervention when a vulnerable patient is at-risk or in danger.
Diagnosis	• In NB, telemedicine was combined with remote patient monitoring: virtual visits through videoconferencing were supplemented with use of an electronic stethoscope (by a physician remotely, and a nurse or other provider in-person with the patient). • Online portals allow patients to submit images and/or video of their symptoms for diagnosis by a provider. • Virtual consultations also apply to primary care and specialist collaboration. This technology is frequently used to provide specialist access in remote areas lacking these physicians.	• Software that provides intervention alerts and/or treatment recommendations based on analysis of data collected through remote monitoring. • AI-integrated solutions (see below) can diagnose signs of at-risk patients and recommend courses of action including in-person interventions.
Treatment	• PEI's telerounding project is one of many examples of telemedicine used for treatment. Nurses and lab technicians located at Western Hospital use secure videoconferencing to connect with physicians located elsewhere and treat patients through virtual rounds. Reaction from both patients and providers has been very positive. • Virtual consultations, particularly through videoconferencing, allow physicians to treat patients as an alternative to in-person visits. • Ontario has piloted "telepalliative" and "telewound" virtual consultations for assessment and treatment.	• The DuoFertility wearable monitor and app works to identify ovulatory cycles. Data is collected and analyzed by a supporting team of fertility experts. A 2014 study found the solution performed comparably to a traditional alternative. • Type 1 diabetes management through remote patient monitoring was found to be equal in effectiveness to a quarterly in-person visit. • The Ontario Telemedicine Network's Telehomecare program helps patients and providers monitor and treat cardiopulmonary disease through the use of technology-integrated equipment.
AI integration	• Machine learning and AI can be paired with virtual consultations to analyze EMR data and provide patient care recommendations for providers. • AI algorithms are incorporated into chatbots that can recommend diagnoses based on symptoms and patient health data.	• The Stasis Smart Monitoring Solution tracks six key vital signs, and AI is deployed to add a layer of monitoring to identify patient deterioration. • Alignment Healthcare's AI-powered command center analyzes remote monitoring data and works to identify at-risk patients and escalate to in-person follow up visits where required.

There are examples of both telemedicine and remote patient monitoring in use across the continuum of care. These virtual care technologies are employed by physicians working alone, family physicians and specialists working together, physicians working with other health care providers, and non-physician providers such as emergency response teams.

Virtual care in the medium-term future

Gartner's Strategic Planning Assumptions for Healthcare Providers[1]:

- By 2022, the first U.S. medical **malpractice** case involving a medical decision made by an advanced AI algorithm will have been heard.
- By 2023, U.S. **emergency department visits** will be reduced by 20 million (14.6% of visits) due to enrollment of chronically ill patients in AI-enhanced virtual care.
- By 2023, **virtual encounters** will exceed face-to-face care delivery encounters, resulting in a dramatic realignment of clinical care and health IT.
- By 2023, 60% of healthcare consumers will have **access** to and control of their health data using a technology of their own choosing.
- By 2023, one-third of Health Delivery Organizations (HDOs) globally will deploy cutting-edge clinical and operational **command centers** that will yield vital insights for real-time delivery excellence.
- By 2025, 50% of all healthcare delivery organizations will include material contributions from **digital giants** in their clinical diagnostic or treatment processes.

Forbes explored the top trends in telemedicine and remote patient monitoring:

- **Data analytics:** Big Data and analytics will play an increasing role, particularly in remote patient monitoring.
- **Mobility and cloud access:** mobile devices will continue to be come more ubiquitous, and storing medical records in the cloud will allow patients to access results online at any time.
- **IT security:** paired with the two trends outlined above, an increasing emphasis will be placed on safeguarding patient data and health records.
- **Decentralized care:** telemedicine will continue to shift from large hospital settings to community-based medicine, which can in turn be used as a physician attraction and retention tool as practitioners can keep flexible hours and are not always required to be in the same place as their patients.
- **Proprietary networks and hardware will become obsolete:** with the availability and affordability of secure software that is easy to implement, proprietary technology used by individual hospitals or telemedicine providers is becoming less common.

[1]Gartner, Inc., Predicts 2019: Healthcare Providers Must Embrace Digital Transformation, Laura Craft e. al. December 10, 2018.

The state of AI integration in virtual care

- Disruption is expected to continue as development of AI accelerates. To date, the results of using AI in virtual care, and health care overall, have been mixed.
- A prominent example is IBM's Watson supercomputer – during a recent partnership at Memorial Sloan Kettering Cancer Center in New York, Watson frequently gave inaccurate diagnoses and medical guidance, and was heavily criticized by physicians.
- Philips' eICU program (which combines audio-visual solutions with AI, data visualization, and advanced reporting) is seen as a leading AI-enabled technology.
- Radiology has seen particularly advanced applications of AI. Deep learning neural networks can identify warning signs in radiological images more accurately than an average radiologist.
- AI is seen to hold potential in terms of serving as a filtering device, for example, to avoid unnecessary visits and infection risks while directing patients to the most appropriate level of care.
- AI and virtual care should be seen as an enhancement, rather than replacement, of physicians and their work. The roles of physicians will shift towards more human aspects of medicine, such as ethics and empathy.

2 What benefits has the adoption of virtual care achieved, and what are some potential downsides?

Benefits and drawbacks of virtual care

Benefits	Drawbacks
i. Improved health outcomes	i. Data breaches and patient privacy violations
ii. Increased patient access	ii. The inappropriate use of virtual care
iii. Improved physician retention and attraction	iii. Unintended health system cost increases
iv. Health system cost and utilization reductions	

The story of British Columbia contains elements of drawbacks ii and iii:

- Despite a wide variety of use cases having emerged over the last several years, BC has lacked a strategic framework for virtual care. This is now being developed by a small unit within the Ministry of Health.
- In 2012-2014, concerns arose regarding large increases in demand and physician billings for virtual visits, which coincided with the market entry of Livecare and Medeo.
- While physician fee codes were modified in response, the use of virtual care continues to grow. However, part of this demand can be attributed to overarching factors such as aging populations, and the number of virtual care services still pales in comparison to the total number of health services provided within BC's fee-for-service model.
- While it remains to be seen whether cost and demand increases for virtual care are sustainable, several lessons have emerged: the importance of equitable and appropriate physician reimbursement models; the prominence of concerns regarding the continuity of virtual care; and the potential role for medical associations to encourage physician conversations on how to most appropriately enable virtual care.

3 What are the barriers to physician adoption of virtual care?

Barriers to physician adoption of virtual care

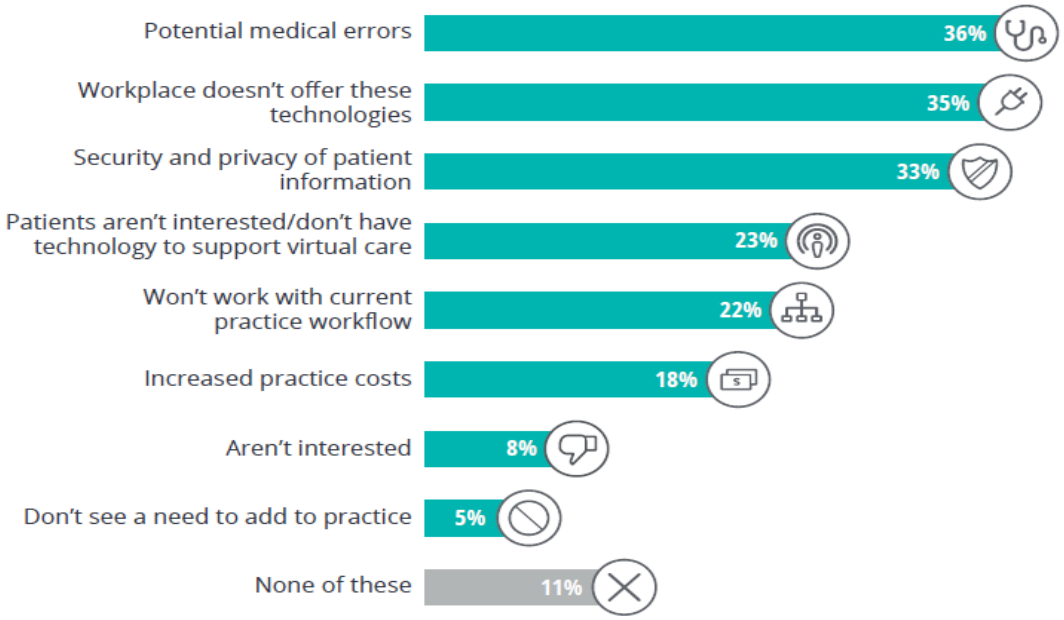
i. Lack of reimbursement, and/or inappropriate funding models
ii. The learning curve associated with technology use
iii. Capital investment requirements and increased practice costs
iv. Physician skepticism and discomfort (see next page for details)
v. Privacy and patient data security
vi. Process and workflow implications

Understanding physician skepticism and discomfort

While the lack of an appropriate physician reimbursement model for virtual care is frequently highlighted as the top barrier to its adoption, the 2018 Deloitte Survey of US Physicians identified several additional barriers:

Concerns about potential medical errors, patient privacy, and access to technology are the main barriers to adopting virtual care technologies

Survey question: Assuming satisfactory reimbursement and no regulatory and licensing barriers for telemedicine and virtual care, what are some of the reasons you would not use these technologies?



Base: 624 (all physicians)
Source: Deloitte 2018 Survey of US Physicians.

4 What are the enablers of success in encouraging physician adoption of virtual care?

Enablers of success

Physician Champions

- Useful to have physicians who can generate excitement, spread the word about the benefits of virtual care, encourage further implementation, and serve as early adopters who aid in overcoming implementation issues.

Training and Support

- Areas of need in terms of training and support for physicians include: use of the technology itself (including technical support), process and workflow changes, and evaluating technology providers and solutions.

Necessity

- Often, the use of virtual care is driven by growing and/or unsustainable demand, patient access issues in remote geographies, and physician retention issues.

Familiarity

- Familiarity through early (or prior) adoption of virtual care technologies can enable success by reducing physician skepticism caused by disruptions to established workflows, novel approaches, and shifting roles and responsibilities.

5 What role(s) can physician associations play in adopting virtual care solutions?

Potential roles of physician associations

To address the barrier of reimbursement schemes and funding models…	• Advocacy and/or lobbying for the establishment or modification of virtual care fee codes
To increase physician familiarity with technology and comfort as an enabler of success…	• Identify physician champions within their membership • Leverage the trust that physicians place in their medical associations to dispel common virtual care myths and proactively prepare them for the future of their work
To enable success through supporting the development of training and support mechanisms…	• Identify the most appropriate and effective virtual care tools, technologies, and solutions • Develop protocols, a review board, and/or step-by-step guidance for the adoption of virtual care • Ensure medical school curricula remain current • Arrange tours of leading virtual care practices
To consider necessity as an enabler of success…	• Identify priority areas that can serve as fertile ground for testing/pilot programs (e.g., remote communities) • Leverage best practices from other jurisdictions that have addressed challenges through the use of virtual care

Closing remarks

Closing remarks

- Virtual care is happening everywhere around the world, either out of ambition or necessity.
- For the most part, virtual care is seen as making a positive contribution to health systems.
- Like Atlantic Canada, many jurisdictions can point to several successful virtual care initiatives that have generally been small-scale pilot programs. The next steps for most jurisdictions involve efforts towards introducing virtual care at scale.
- Virtual care is unlikely to be embraced by physicians until the key barriers are addressed: a lack of fair and appropriate reimbursement schemes, the learning curve associated with technology use, capital investment and practice costs, physician skepticism and discomfort, and process and/or workflow changes.
- There is real potential for medical associations to play a leadership role in advancing virtual care in Atlantic Canada as there is a leadership gap today.
- As a result of consumer demand and satisfaction, virtual care will continue to advance, with or without leadership being provided by physicians.

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