

# The Potential Benefits of Utilizing Technology in LTC

By Susanne Flett  
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*Susanne Flett, Chair, TECHNATION Health Board*

I have always been a proud Canadian – until this year.

The COVID -19 pandemic has brought to light long-standing fundamental issues in our Long Term Care (LTC) system. Our elderly have suffered from the impact of these issues experiencing horrific neglect and high rates of mortality. At the time that I am writing this, LTC residents have accounted for 69% of all reported COVID-19 deaths in Canada (Information, Canadian Institute for Health, 2021). Tragically, this is unique to Canada. The 16 other OECD member countries have an average of 41% of COVID related deaths occurring in LTC, significantly better than Canada. Canada’s treatment of our elderly is shameful and inexcusable! Throughout the pandemic I have been very grateful that my 95 year old father is mentally and physically able to live on his

own and care for himself.

So, what are the problems? Can technology help us find a solution?

Tim Guest, President of the Canadian Nursing Association and Director at Healthtech Consultants, has identified systemic, regional, and local barriers that impact the quality of care that LTC residents receive. These factors are summarized below: (Guest, 2021)

People	Policy	Data	Resident/Family	Resources/Funding
Salaries and benefits are not equitable with other health system sectors	Inconsistent standards across jurisdictions	Sector lacks standardized data collection that is comparable across the country	Increasingly complex resident care needs, and diverse resident populations	Staffing models have not evolved with the complexity of the resident (the model is only focused on CCAs and nurses it need to be broader including recreation, OT/PT and OT/PT Assistant)
Large percentage of the staff tend to come from marginalized and radicalized demographic groups and are predominantly female	There is a strict regulatory environment that can have punitive non-compliance systems	Sector lacks standardized quality indicator measurement across the country	Environment/technology/programming does not support the diverse populations which can lead to social isolation	Staff mix has become increasingly unregulated with lack of standardized education preparation
Workloads are high, and workplace injury rates are higher than many other industries	Inconsistent approach to service levels, funding, and self-pay requirements	There is a lack of technology capability to capture data for measurement (EHR, HRIS)	Inadequate family involvement in care, decision making, and communication	Sector has not been supported to develop educational supports required to care for the increased complexity of resident
The complexity of the residents has changed increasing the acuity	Legislation needs to be updated to reflect the expanded scope of practice of the LPN and Nurse Practitioners	Information is siloed between providers, and between health sectors due to lack of integration	Family conflicts related to care expectations	Sector lacks ability to meet growing level of diversity in the population (ethnic, religious, LGBTQIA+)
The length of stay has decreased significantly adding to higher resident turnover				Facilities have not been updated to meet current standards (infection control)
				There is a lack of funding for the sector to innovate and invest in technology

leading to  
increased  
workload

Staffing  
shortages are  
often leaving staff  
working short  
discouraging  
people to want to  
work in this  
sector

In Ontario's Long-Term Care COVID-19 Commission Final Report the drastic loss of life and impacts related to the pandemic were made worse by the lack of technology in many long-term care homes, "test results often took seven to ten days to be received. Some results were lost. The Commission heard stories of homes receiving tests by fax and by regular mail." (Marrocco, 2021). The report went on to say that there is no real-time data gathered and widely distributed in the sector, and there is a need for "better data and better reporting by the province" (Marrocco, 2021). "The Commission heard that many homes lacked the technology to access Public Health Ontario's Online Laboratory Information System (OLIS) meaning they were not able to receive test results electronically. Instead, they were left to rely on outdated technology" (Marrocco, 2021). The Commission recommends Ontario's labs and long-term care homes be interconnected as approximately one third did not have access to online results. They also recommended, "long-term care homes have the technological capacity to receive electronic medical results" (Marrocco, 2021). The recommendations while a positive step, are grossly inadequate. Residents have the right to fully integrated health records that do not require reams of paper to be faxed to hospitals when they require additional care, and the faxing and mailing of laboratory results are beyond believe with the current evolution of electronic health records.

Several reports, and provincial government plans from other jurisdictions across the country identify the need for long-term care to have access to technology that is fully integrated with the rest of the health system. However, all of these plans and reports fail to recognize the significant role that technology can play in enhancing the quality of care for LTC residents, improving communication with families, establishing a positive work environment for staff and improving efficiencies and safety in the delivery of care. This is a missed opportunity by government to address some of the major problems in LTC!

Technology needs to be positioned to support and enable vision and strategy. John Yip, the President and CEO of the Kensington Health Centre, has stated that "a new model of care is key in transforming LTC. Institutionalized segregated care should be moved to community care in a multi-generational setting, engaging all of us in supporting our seniors" (Yip, 2021). Although this a relatively novel idea in Canada, it has been successfully implemented in other countries.

A good example of this approach is Denmark. Denmark has a long-term care system that is public, and home-based services are provided at a no cost. They initiated a policy of deinstitutionalization in the 1970s that emphasizes preventative and proactive care focused on maintaining or regaining skills needed to live independently. This has resulted in more than two thirds of seniors that need care continuing to live in their own homes. (World Health Organization, 2019)

Denmark has also implemented a fully interoperable information technology platform with electronic medical records and electronic prescribing with complete uptake among providers. Interoperability standards have facilitated the exchange of information across health care settings. (World Health Organization, 2019).

In contrast, the current use of technology in LTC in Canada is low. The focus has largely been on other healthcare sectors such as primary care and acute care. Clinical Information Systems (CIS) /Electronic Health Record (EHR) systems that have been implemented in LTC are underutilized, with staff not fully trained to optimize the systems. A high percentage of data is collected and recorded manually. Innovative projects utilizing technology have been initiated. However, these are small in number and appear to have been implemented with a "scatter gun" approach to addressing the issues.

So, what is the potential value of investing in technology in LTC? Where will we realize the best "bang for the buck"?

Paula Hucko, CEO of GoldCare, stated “we need to start with “tech basics” and capture clinical and administrative data electronically” (Hucko, 2021). Baycrest, a large provider of LTC in Ontario has demonstrated that there is significant value in this approach.

Baycrest is one of the few LTC organizations that have taken the time to assess the benefits related to the implementation of a new EHR system. Baycrest implemented a clinical information system (CIS), including Computer Physician Order Entry (CPOE) in their LTC facility, Apotex Centre Jewish Home for the Aged. Adding a bidirectional interface ensured interoperability between CPOE and the pharmacy information system, further enhancing overall CPOE workflow. The combined solution was the first of it’s kind in Canada at the time, for a LTC facility. As an integral component of the implementation, Baycrest developed an evaluation framework, identified Key Performance Indicators, established a baseline and monitored the results. Maria Muia the Executive Director of Information and Technology at Baycrest has stated, “our outcomes were focused on improved quality of care, improved safety and improving efficiencies thus allowing more time for care.” (Muia, 2021) Outlined below is a summary of the positive results that have been achieved by focusing on the “tech basics”.

Baycrest			
PCC Evaluation Framework	Baseline Q (Apr'18-Sep'18)	Rolling 6 months (Oct'18-Mar'19)	
Accessible	ADLER Report Census PLST Allergy report Transcription Code	10 hrs saved Eliminated paper New report 7% improvement 4 saved	
Effectiveness	% Pharm. Order within 4hrs # SERS med incidents % complete notes in 30day % UDA that are open CMI	71% (Reduced review lag time) Improved by 14 No baseline No baseline Improved by 2%	
Care & Safety	E-MAR %care plans within 24hrs Average days b/w review & completion % active care starts	Paperless & more efficient Improved (100%) No baseline No baseline	
Efficiency	Lab, MAR, TR, DI Phy / NP communication Vitals & Weights EPC	Automated through PCC No integration yet Moved from paper based to report Automated (portal) Automated (portal) UDA created & functional	
Integration	MDS Assessments compliance Integrations within PCC with Kardex and MDS assessments	Compliance fully integrated Fully integrated	
Satisfaction	%cost reimbursement %improved ADL <del>%worsened ADL</del> <del>%worsened Behavior</del> <del>%worsened mood</del>	7% improvement 5.5% improvement 0.3% decline 0% decline 0.2% decline	

We are planning to track the progress by calculating metrics for latest and Rolling 6 months.

(Baycrest, 2021)

After “the tech basics” are established through the implementation of an EHR and administrative systems such as Human Resource Management, accounting and procurement, what should be next?

Care providers have repeatedly identified transitions of care between acute care and LTC as significant points of risk. Medical records do not always make the move smoothly or accurately between acute care and LTC. Integrating EHRs between the two would minimize risk and improve efficiency.

The Kensington Health Centre has mastered the “tech basics” by capturing 95% of their patient’s clinical data electronically with daily orders and care plans that are easy to follow, medication carts and medication reconciliation have also resulted in reduced errors and improved resident safety. John Yip, the President and CEO of Kensington Health Centre, has indicated, “integration is now his top priority” (Yip, 2021).

The issue of integrating systems has been approached with a variety of solutions that vary in effectiveness. Outlined below are five approaches that have been utilized in addressing the challenge of integration.

1. Single system
2. Clinical viewer across several systems
3. Two-way interface between an acute care HIS (Hospital Information System) and a LTC EHR
4. Integration between the LTC EHR and other vendors systems focused on specific functionality

The single system solution uses one HIS (Hospital Information System) for both acute and LTC settings. Three of the four HIS platforms that dominate the market in Canada – MEDITECH, Cerner and Allscripts have extended the use of their systems into LTC facilities.

Fraser Health and Interior Health in British Columbia. have utilized the MEDITECH system, with limited functionality in the LTC facilities that they own and operate. A shared territory wide MEDITECH system is currently being implemented in the Yukon that will encompass the acute, community and LTC sectors.

Jim Shave the President of Cerner Canada, stated "Island Health has extended the use of the Cerner system into LTC. Other Cerner clients are in the early stages of implementation in LTC" (Shave, 2021).

Some Allscripts clients have provided access to their Sunrise product with limited functionality to provincially owned LTC facilities. This single system approach supports sharing of clinical data but does not provide the deep functionality of a system that meets the specific needs of LTC. "Experience gained over the past few years has repeatedly highlighted the value of providing clinicians with fast, easy access to an integrated view of a patient's clinical data." (Yeaman, 2015) Allscripts dbMotion clinical viewer product is used in Manitoba and at Fraser Health in BC. In Ontario, the Clinical Connect and ConnectingOntario Clinical Viewer provide access to clinical data from hospitals, lab/drug/diagnostic imaging repositories and home and community health care systems. Unfortunately, this does not include LTC clinical data.

These viewers are a significant step forward in providing clinicians with access to clinical data, but they are limited in functionality (view only, no order entry, no ability to abstract data, users reported slow to use) and do not provide access to data across the province or the full continuum of care.

For the last two decades, Alberta has been making consistent strides to expand digital health solutions across the continuum of care provincially. Alberta is a leader in Canada in providing acute care and LTC clinicians with an integrated view of clinical data. Since January 2008, the Netcare electronic health record has captured patient health information on every Albertan, from birth to end of life, including drug, lab, diagnostic imaging, immunization, summary of hospital discharges, and most recently, patient summaries from primary care physician EMRs. Significant benefits have been realized through the deployment of this system.

Today, over 50,000 clinical providers in Alberta including doctors, pharmacists, nurses and allied health workers routinely access Netcare on a daily basis. Deployment and access to Netcare in LTC facilities began in 2014 in an effort to expand the use of Netcare beyond visiting physicians to also include access by resident nurses and allied health to the LTC patients' health data.

For seniors and their family care supports in Alberta, regardless of if they are in a home care program, assisted living or LTC, two provincial consumer/patient digital health solutions are having a significant impact: My Personal Record and MyAHS.

- **My Personal Records (MPR)** is an online application that allows Albertans to access their key personal health information derived from Alberta's provincial electronic health record, Alberta Netcare. Information currently available includes immunizations, dispensed medications from pharmacies and most lab results, including COVID-19 test results. It also allows users to track and manage their health and wellness data and to share their information electronically or to print reports. The Province continues to expand the information available to Albertans in MPR.
- **MyAHS Connect.** Albertans who are patients of Alberta Health Services (AHS) and have visited an AHS facility that is using Connect Care can use MyAHS Connect to securely access their AHS Connect Care record. Connect Care is AHS' Clinical Information System that maintains the AHS record of care. Using MyAHS Connect, Albertans are able to view their lab and diagnostic imaging results and to interact with their Connect Care healthcare team.

Netcare demonstrates the effectiveness and efficiency of providing a tool for clinicians, patients and families to access a consolidated view of clinical data that crosses the continuum of care.

A third approach to integration is a two-way interface supporting patient transfers between acute care and LTC. In Hamilton, Ontario, the Harmony Project has been successful in providing the exchange of data between the PointClickCare (PCC) system at St. Joseph's Villa and the Epic system at St. Joseph's Healthcare Hamilton. Tara Coxon, the CIO of St. Joseph's Healthcare Hamilton indicated, "this proof-of-concept project funded by the CAN Health Network has demonstrated significant benefits related to timely/easy access to clinical data, clinician time savings, reductions in re-admissions/emergency visits, enhanced continuity of care and reduction in risk" (Coxon, 2021).

PCC has approached the integration issue, not only through an interface to the local HIS (Harmony Project outlined above) but also by partnering with innovative vendors that can address specific needs (wound care, etc.) within LTC. PCC dominates the LTC EHR market in Canada. They have developed a strategy of partnering with over 100+ innovative organizations

A fourth approach to integration across the acute and LTC sectors, focuses on a particular function. For example, PetalMD provides a system that integrates scheduling of staff, procedures, and virtual visits across both levels of and regions/ jurisdictions. PetalMD has indicated that this approach enhances patient safety and care and provides visibility of prioritization of care, vaccinations, traceability, and management of care rooms (cleaning).

Integration between health care sectors and levels of care is important, but so is integration within an organization. We have seen in the hospital sector that organizations need to have a base of electronic information in order to effectively add innovative technology that is of value. So, if we invest in EHRs to provide a base of electronic data and we support integration within LTC organizations and between LTC and other healthcare sectors (particularly acute care) where else can technology provide value to LTC patients, families and staff?

There are many interesting and innovative technology solutions that are focused on specific issues in LTC. In my discussions with care providers in LTC the day-to-day issue/challenges appear to be wound care, urinary tract infections (UTIs), patients falling/wandering, medication management and staff capacity. It is common for patients to have multiple comorbidities and be on more than twenty medications.

Staff shortages and challenges in staff capabilities have been historical and highlighted with the pandemic. The following list summarizes some of the types of electronic solutions that can potentially meet the need for efficiency (optimizing staff time), enhancing quality of care and reducing risk. These however, are quite often siloed solutions.

## **CLINICAL INFORMATION AND DELIVERY OF CARE**

1. Patient movement sensors/wearables that track walking, turns in bed, falls, wandering, and lifting patients. Collecting data using sensors could potentially save staff time, reduce risk for providers, and minimize harmful preventable complications for residents.
2. Remote collection and monitoring of resident vital signs and test results with sensors/ wearables can monitor and record – temperature, Oxygen saturation level, and blood pressure multiple times per day, as well as the use of point of care devices for lab tests. Use of such technologies can improve efficiency leaving staff with more time to interact with residents, while reducing risk to both residents and staff. As John Yip stated, “technology offers the opportunity for staff to have the time to be able to extend more “kindness” to residents” (Yip, 2021).

Michael Chrostowski, Business Development and Industry Relations Manager at AGE-WELL, indicated, “one of the startups/SMEs (TeneraCare) in AGE-WELL’s network has deployed a wearable technology at several LTC sites in Nova Scotia and New Brunswick with a few use cases. (Chrostowski, 2021)” These include contact tracing during the COVID-19 outbreak, a replacement for nurse call systems to address resident distress or falls, part of staff, resident and visitor safety system to avoid challenging interactions.

3. Consolidation and integration of clinical data to facilitate monitoring of units/facilities, alerts, alarms and delivery of care. More efficient while improving quality of care.
4. Remote delivery of care – virtual care and specialized apps including wound care. Through the pandemic there has been a significant upswing in the use of virtual care in LTC. Dan Perri, CMIO at St. Joseph’s Healthcare Hamilton, stated “the increase in virtual visits has minimized transfers between LTC and the hospital”.(Perri, 2021)

Virtual care also helps LTC residents receive more timely care, while minimizing risk to clinicians. Unfortunately, most of the virtual health solutions are not integrated with EHRs, creating workflow issues for clinicians.

Financial investments will be needed to ensure that all physicians and long-term care homes, especially in northern and rural areas, have reliable internet service and devices on which to receive care virtually, and that residences have sufficient staff who are comfortable with and fluent in technology to assist residents receive care by phone, tablet or video device.

The Ontario Medical Association has recommended to the current Ford government in Ontario, “Continue the use of virtual care in long-term care homes to prevent the spread of the virus and improve access to specialists, in conjunction with in-person care where appropriate, especially in homes with outbreaks and where patients are in declining health.” (**Ontario Medical Association**)

5. Socialization, support for enhancing quality of life and communication between residents, families, and care providers is vital and could be improved with the use of technology. One of the limiting factors for residents and families interacting with the use of technology has been the need for a care provider to set up the technology for the resident. Care2Talk has designed their system to address this challenge. Care2Talk is an iOS/Android App which uses a specially designed interface on a mobile or tablet device to create an easy-to-use video chat tool for those with cognitive decline, or other impairments, which may make alternatives difficult to navigate.

Robots could facilitate interaction with residents and clinicians (rounding) as well as resident interaction with robotic dogs, cats, etc.

Varsha Chaugai and Graham Fraser have started Evoke Health to focus on facilitating communication between LTC staff and families – enhancing efficiency. Engage+ by Evoke Health is a web application that enables long term care homes to share resident data in real-time with families. This self-service technology provides families with easy-to-understand, accurate health and care information thereby reducing nursing administration burdens like routine follow-up calls and phone-tag.

Quality of life. Baycrest is one of nine Canadian organizations that are members of the Senior's Quality Leap Initiative (SQLI). SQLI was established in 2010 by leading Long-term Care organizations to improve quality, safety, and quality of life for seniors through the sharing of performance data and results of specific quality improvement initiatives. (Seniors Quality Leap Initiative, 2021) Through the use of Inter RAI indicators each member's performance is compared, with a focus on supporting quality improvements.

Also aimed at improving quality of life for seniors, Baycrest launched a Smart Suite project using consumer technology and sensors customized to support individual residents (robotic dogs, smart TV, lighting, etc.).

## RECOMMENDATIONS:

There have been many reports written about the problems in LTC. We should use the COVID-19 crisis as a platform for change – more virtual care, integrating HIS and LTC EHRs, family/patient portals and tools, data collection using sensors, remote monitoring, AI, etc..

Bill Chornetski, VP at Point Click Care stated. "there has been discussion about the need for staffing and beds in LTC but that the potential use of technology and innovation have not been recognized" (Chornetski, 2021). Laura Tambllyn Watts, CEO of CanAge stated, "we need to invest in technology to alleviate drudgery and enhance patient engagement and that a number of egregious COVID-19 circumstances could have been avoided with technology use" (Watts, 2021).

And Mike Klassen the VP of Public Affairs for the B.C. Care Providers Association stated, "there is a need to align funding with the use of data to improve outcomes. There have been significant challenges in convincing government to understand the benefit of investing in data in LTC" (Klassen, 2021). The potential use of technology needs to be an integral component of any plan to address the issues in LTC. First and foremost – we need a plan, invest heavily, and move forward with the plan!

Outlined below are some of my top recommendations:

1. **Establish an electronic base of resident data and infrastructure**, investing in EHRs, administrative systems and Wi-Fi.
2. **Enhance integration** within LTC facilities (EHR, virtual care and innovative technologies) and between LTC and acute care.
3. Develop national principals and **standards of care** including a central problem list. This will be of value to LTC facilities as well as the vendor community in developing systems. The federal budget has allocated \$3B towards standards in LTC.
4. **Buy Canadian! Invest heavily in the use of technology, "tech basics"** as well as **innovative solutions**, to support the model of care. Design funding programs that promote innovation and scaling as well as adoption. As Angela Mondou CEO of TECHNATION has repeatedly stated "Canada does not have an innovation problem, it has an adoption problem". (Mondou, 2021)
5. **Facilitate/enable collaboration between LTC organizations and vendors** to avoid, what Laura Tambllyn Watts has referred to as the "clash between engineering and clinical"(Watts, 2021). It appears that there is a lack of understanding of the LTC environment, on the part of vendors and it is challenging for entrepreneurs to get an opportunity to develop and test their products. Some LTC facilities do not understand the potential value of technology so we need to bridge the divide between vendors and LTC facilities through education and opportunities to collaborate.

Laura Tambllyn Watts stated "the technology industry needs the human understanding of staff and residents in LTC. For systems to be successful in LTC there is the need for co-creation with involvement of vendors, staff and residents" (Watts, 2021).

Leverage existing tools to help LTC facilities and the vendor community to connect. For example, TECHNATION has launched the Digital Marketplace ([https://technationportal.ca/industry\\_dashboard](https://technationportal.ca/industry_dashboard)) in an effort to connect vendors with potential clients. This registry has a separate section for LTC vendors.

AdvantAge Ontario have put in place a strategy to facilitate collaboration and support a better shared understanding between the vendor community and LTC facilities by offering commercial memberships. AdvantAge Ontario has 400 members along with 187 commercial members. They also have an innovation advisory group.

In addition to the need for significant government funding for technology in LTC, there is an opportunity for vendors to sell directly to consumers. Based on a poll that AGE-WELL conducted they found that “half of Canadians 65+ are willing to pay out-of-pocket for technology that helps manage health and wellness. Almost 7 in 10 (66 percent) are willing to pay out-of-pocket for technology that allows them to stay at home as they age.” (Chrostowski, 2021) Vendors need a cost effective conduit to access these markets.

6. **Align innovation funding grants** with solutions that address key issues and **deliver benefits that are of value**. Articulate what problems we are trying to solve and include funding to track benefits. Ensure that the solutions are funded not just as silos but are integrated with the EHR
7. Dispel the **myth that seniors are not tech savvy**. Dr. Andrew Sexsmith Scientific Co-Director at AGE-WELL stated, based on research conducted in July 2020, “Most are unfazed by technology and they are using a lot of it during these challenging times. We were already seeing older adults using more technology, but COVID-19 is clearly a catalyst that is taking tech use to a new level.”(Sexsmith, 2021)
8. **Support staff in gaining tech literacy** and privacy and ensure that they are engaged in technology planning, streamlining of work and implementation of systems
9. Invest in **new funding models** – move away from activity-based compliance models to value based, utilizing data, AI, etc.

We must seize this moment of crisis to drive significant change in our Canadian LTC system. Technology offers significant benefits and must be an integral part of the solution if we are going to affect real, cost effective and meaningful change.

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# Plan to be Nimble

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“You can’t stop the waves, but you can learn to surf.”  
-John Kabat-Zinn

In recent months we have discovered that, despite our advances in information technology, we can not predict the future. Most health organizations have been consumed with planning to master the COVID curve; only to find that the reality was far different than predicted and the future continues to be elusive.

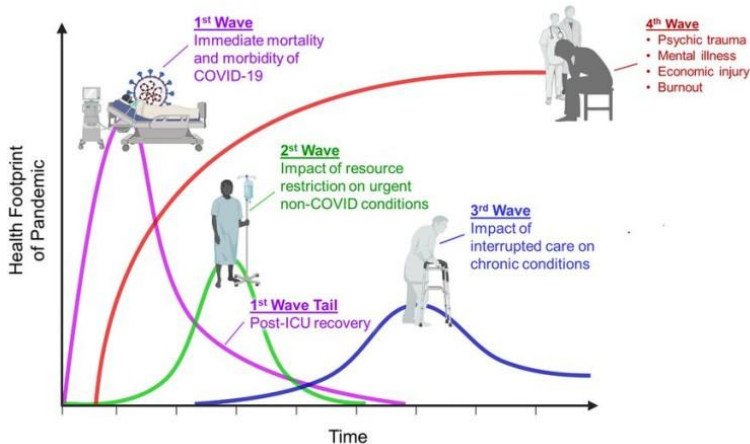
Although we anticipated a volume surge with COVID-19, except for a few well publicized locations, it did not happen. Most hospitals remained at unusually low occupancy, busy with planning and supply chain management as opposed to volume of patient care. With elective surgery cancelations and the fear of contamination from entering medical facilities, people needing healthcare for non-COVID related concerns stayed at home.

Resources that could have provided this care sat idol.

The next few months are open for speculation. We need facts, not conjecture based on external data. Canada must base COVID analysis on empirical epidemiology data gathered within Canada through adequate testing across the population.

One representation of a possible outcome is illustrated in Image 1. Predictions include:

- New waves of demand as delayed surgical and non-COVID care cases return to the scene,
- Functional impairment from missed care opportunities,
- A mental health crisis exacerbated by economic hardship and social isolation, and
- Subsequent surges of COVID illness.



Considering our recent experiences around the accuracy of predictions, and an understanding that capacity management will be key, how can we best spend our time planning for the unknown? One thing is certain, we will need to be adaptable and prepared to surf whatever waves come our way.

Planning to be nimble begins with awareness of where you are, a vision of the desired future state and development of the tools and skills needed to get there. Prior to focusing on individual pieces of the puzzle, it is important to take the time to craft a strategic approach. Pull in the strategic planners, talk to frontline workers and survey best practices in the field. Identify the problems that need to be resolved and the opportunities for improvements. From this develop a strategic plan. Next move to tactical planning including the outcomes you want to target, innovative solutions required, changes in processes, resources, timing, etc.

The solution is likely to include a constellation of abilities that begins with accurate real-time data about supply and demand of physical, spatial, and human resources. Some organizations have developed tools to facilitate



this. Command centres are popping up in many technology-enabled health organizations. These centres bring real-time data from health information systems into visually descriptive data tiles and apply predictive models to highlight areas of pressure. This information is presented to a team equipped with standardized action plans to manage the pain points. Having access to real-time data enables these organizations to act fluidly based on the reality of a situation from moment to moment. Command centres have been shown to improve efficiency and enhance patient safety and satisfaction.[1]

AI can be a powerful tool in capacity planning. Reducing the time to value will be critical in deploying solutions. Cloud computing has provided organizations with the ability to deploy systems quickly. Some organizations have accelerated the implementation of electronic health records by leveraging evidence based clinical standards along with a streamlined user review process.

Agile resource procurement is another skill necessary to adequately respond to needs. As discussed in Angela Mondou and Colin Deacon's article in the *Globe and Mail*, streamlined procurement processes have allowed our country's entrepreneurs to pivot their businesses into making much needed products. Continued agility in procurement can be facilitated through innovative approaches that focus on problems, not solutions, thereby empowering the problem-solving capacity of the technology sector and liberating the health organizations to focus on patient care.[2]

There is an opportunity for healthcare organizations and provincial/ territorial governments to stimulate the economy, ensure the recovery of Canada's digital health technology sector, rapidly adopt technology solutions that are urgently needed, and create a "new normal" of nimble, agile healthcare procurement that integrates cutting-edge innovations into healthcare delivery while fueling economic growth.

For innovation to thrive in Canada we need "buy Canadian" policies and recognition that many innovative products and services will not meet the need 100% immediately. It needs to be accepted that innovation is "two steps forward and one back". Most innovative solutions will need to be refined over time while others will fail. We need to be nimble in exploring and supporting multiple innovative solutions in parallel and share the results.

Improving patient access to care using innovative approaches is already well underway with the surge of virtual care options. Continuing to innovate in this area by optimizing and integrating virtual solutions with electronic medical records, aligning with homecare services, and focusing on pro-active chronic disease management will be critical to managing hospital capacity. Additionally, methods of resource and referral matching can help match patients needs with providers skills and availability to potentially reduce wait times. The use of wearable monitors, contact tracing, robotics and surveillance systems are in the early stages of adoption but offer significant potential benefits in reducing staff time and patient risk.

These innovations, and many other pieces of the puzzle, are necessary to improve our agility for the tumultuous ride of capacity management that we anticipate in the next few years and beyond. If we expect to master the future, it will not be done by resisting what we do not want, but by adapting to what is.

[1] KLAS <https://klasresearch.com/report/operation-command-centers-2018/1281>

[2] Mondou, A and Deacon, C. (2020) 'Bold government procurement policies help companies recover from crisis', *The Globe and Mail*, April 20, 2020.