

Hallway Healthcare: Solving Acute Care Overflow from the Community

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Abstract

Access to emergency and acute care health services are at risk as our aging population brings with them a new wave of complexity and chronicity. This stems from patients receiving fragmented primary care that neglects the necessary monitoring and continuity to provide adequate management for chronic diseases. The increase in prevalence of Alternate Level of Care designations is a symptom of this inefficiency. These patients consume specialized hospital resources despite being capable of receiving effective treatment in the community. The Canadian government has acknowledged the issue of hospital gridlock and has responded by investing in post-acute care resources. While this is a positive step forward, upstream approaches that include preventative medicine may be the key to sustainability. Innovative system-level changes that optimize community and interprofessional care such as integrated home monitoring and interoperable medical records may curb the projected increase in access and financial burden.

Introduction and Background

Hospital gridlock, defined as the stasis of patient services in hospital due to overcapacity, is predicted to worsen in tandem with Canada's aging population, as risk factors for multimorbidity increase progressively with age.¹⁻⁴ Approximately 75-80% of Canadian seniors live with one or more chronic conditions.² One in three Canadian seniors struggle with at least 3 concurrent chronic conditions, and 14% of this population suffers from a mental health problem, such as depression or anxiety.⁵ Management of multiple chronic health conditions significantly decreases a person's quality of life and

ability to maintain employment, as well as increases the rate of hospital admissions.^{2,4} For these reasons, seniors are significantly more likely than the general population to access acute care services.² In this paper we will outline the intersection between the fragmentation of healthcare services and hospital gridlock, exhibited by Alternate Level of Care (ALC) patients, and present sustainable solutions.

Fragmentation in the continuity of healthcare services all too often results in patients with chronic diseases not receiving the right care at the right time.² This access problem is exemplified by the fact that only 44% of Canadian seniors have timely access to primary care, with 59% of seniors unable to get same- or next-day appointments.⁵ Outside of typical working hours, 62% of Canadian seniors had difficulty getting medical care without turning to a hospital emergency department.⁵ Consequently, 31% of seniors reported that their most recent visit to the emergency department was for a health condition that could have been adequately treated by their family doctor.⁵ Beyond primary care, this issue extends to specialist services with 56% of senior patients waiting longer than four weeks to be assessed.⁵

The sequence of late diagnosis and treatment, and a subsequent exacerbation of symptoms results in a more ill and vulnerable patient population being unloaded onto acute care institutions. In particular, patients suffering from chronic diseases with insufficient community resources and lacking long-term monitoring experience poor outcomes.^{2,4,6} This could be seen in failure to adequately detect and address upstream manifestations of life threatening conditions. For example, elderly patients exhibiting cardiac risk factors that are not consistently monitored can progress to pathologically high cholesterol and blood pressure eventually decompensating into a heart attack. This scenario would set in motion an established chain of events, starting with an ambulance ride to the emergency department, admission to a hospital ward, and a prolonged rehabilitation process. Once in hospital, seniors are at increased risk of developing delirium, nosocomial infections and experiencing complications of deconditioning consequently leading to and increase in hospital stay.⁷

Timely access to acute care in Canada is among the poorest among many developed countries. A 2016 Commonwealth Fund report revealed that 29% of Canadians had to wait four or more hours the last time they visited the hospital emergency department.⁸ This constitutes almost three times the international average for patients having to wait four or more hours for emergency care services.⁸ This trend of lengthy

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emergency department wait times appears to only be getting worse. Once admitted to hospital, patients remained in the emergency department for an average of 32.6 hours, 11% longer compared to the year before.⁷

Hospital Bed Allocation: Alternate Level of Care

The Ontario Hospital Association and other governmental agencies have identified various ongoing systemic inefficiencies, including the excessive number of ALC beds in hospitals.⁹ The ALC is designated to patients who occupy hospital beds, but no longer require the intensity of resources and services provided in hospital. Patients designated as ALC do not require the highly specialized services available in a tertiary centre, yet they occupy the physical space and resources that should be available to patients who require them. Approximately 14.5% of inpatient beds in Ontario are being occupied by ALC patients who remain in a state of limbo, waiting for more appropriate care in the community.⁹ At a fixed number, beds represent a vital choke point in the healthcare system.¹⁰ The proliferation of such ALC patients who are stuck in this proverbial traffic jam due to a lack of suitable community-based care options threatens to undermine acute care by regulating access to hospital-based services.⁹ This bottleneck is exacerbated by the fact that Canada has 2.6 acute care beds per 1,000 residents, among the lowest ratio of hospital beds in the developed world.^{10,11}

An association between increased hospital length of stay for ALC designated patients with the number of comorbidities has been established.¹² Risk factors for ALC include history of hospitalization, decreased functional or cognitive ability, aggressive behaviour, pain, and neurological disease conditions.⁹ Protective factors for long-staying ALC include availability of a caregiver and community skills training.⁹ Among seniors who received their initial assessment in hospital, 82% experienced a designation of ALC during their stay.¹³ It follows that an estimated 85% of all ALC patients are aged 65 years or older and 35% of ALC patients are 85 years or older, with 25 - 60% of this cohort having been diagnosed with dementia.^{2,14} Of seniors that received an in-hospital evaluation, those assigned to be transferred to residential care were at an increased likelihood to experience ALC compared to seniors assigned to be transported to home care (90% versus 57%, respectively).¹³ Of this same cohort, however, seniors assigned to be transported to home care spent more time in ALC compared their counterparts waiting for residential care (median 34 days versus 28 days, respectively).¹³ According to Community Care Access Centre (CCAC), it costs an average \$1100 per day for a patient to stay in an acute care bed, while long-term care is \$144.82 per resident, per day (\$52,861 per year).¹⁵

This all too common pattern of care is unsustainable. Treatment of chronic diseases accounts for 67% of all direct health care costs, and provincial expenditure on health care, including Ontario, has been recorded to amount to more than 43% of total spending on public programs.^{16,17} Costs are anticipated to accelerate, as Canadians over 65 years of age are set to double in the next 20 years and the number over 80 years of age are set to quadruple over the next 30 years.¹⁸

The financial burden stemming from seniors occupying ALC beds is not the fault of individuals, but rather a symptom of a broader system-wide dysfunction. As of October 2017, in Ontario, there were 77,477 permanent placement beds allocated to provide long-term care to seniors, 617 convalescent care beds to serve as a bridge between hospital and home care, and 355 beds used to offer respite to overburdened families.¹⁹ Despite this support network, the wait-list for long-term care beds in Ontario is 32,775 individuals long.¹⁹ The CCAC are the gatekeepers of long-stay beds, and, since 2010, only people with high or very high care needs are eligible for placement.¹⁹ This criteria is seen in practice in long-term care facilities, as approximately 97% of residents have two or more chronic conditions, while 90% have some degree of cognitive impairment.¹⁹

The Current Approach: Brick and Mortar

Increasing the number of residential options, such as home, nursing, recovery, and palliative care, to redirect traffic and free-up hospital beds is one of a number of solutions endorsed by the government to bypass a stenotic health care system. The Ontario Liberals have pledged an additional 5,000 long-term care beds over four years, and 30,000 beds over the next 10 years, should the party remain in power come June.²⁰ This plan, called Aging with Confidence, has \$155 million in funding, which includes \$15 million to boost “naturally occurring” retirement communities.²⁰ Nationwide, in 2016, there were about 721,000 Canadians aged 85-94 and approximately 16% resided in a long-term care home or ALC bed.²¹ In 15 years, this demographic is estimated to more than double to close to 1.5 million, requiring 239,000 beds.²¹ A Conference Board of Canada report revealed that Canada requires 42,000 new long-term care beds by 2022 and upwards of 199,000 beds by 2035, nearly double the 255,000 beds available country-wide in 2016. These new beds would have an approximate \$64 billion price tag, while operation costs between 2018 - 2035 are roughly \$130 billion.²¹ The brick and mortar centric approach to expand post-acute care is necessary to provide temporary relief to tertiary care hospitals, but this one-sided solution does not resolve the ongoing fragmentation of health services that gives rise to ALC.^{10,22}

These efforts focused on transitions between hospital and post-hospital care do not address long-term management of people with multimorbidity.⁴ Multimorbid patients that transition between different fiefdoms of care, including emergency rooms, inpatient hospital wards, outpatient settings, and rehabilitation facilities, are susceptible to suboptimal quality care, such as adverse events associated with polypharmacy.⁴ Policy-makers have recognized that as our population ages and new health challenges evolve, our system must be more responsive and connected.^{4,6,9,23,24} The goal of Canada's health care evolution should be threefold: increased screening to expedite diagnosis and treatment, seamless outpatient management of chronic diseases to prevent symptom exacerbations, and timely access to primary and secondary care services.⁶

Building Community-Based Capacity by Leveraging Technology

Medicine of the future will be based on a patient-centered format that uses a digitally-connected in-home monitoring system linked to an interprofessional outpatient network.^{22,24,25,26} Such a system will facilitate the diagnosis and management of chronic disease and improve universal healthcare in a cost-effective manner by keeping patients in the community and out of hospital. Higher continuity of care has consistently been associated with reduced hospitalizations and emergency department visits.²³

Increasing evidence supports the role of information technology as the means to achieve improved community care delivery.²² This investment will eliminate geographical barriers and reduce the indirect costs in accessing care, including lost wages, transportation, and childcare.²⁶ Emerging technologies, including artificial intelligence, machine learning, and service automation, expedite diagnostic and therapeutic efforts with increasing accuracy.²⁷ Information technologies will create a paradigm shift in the point of care from reactive to proactive, and will further augment professionalism by facilitating the delegation of tasks to allied community workers. This integrated healthcare system will increase communication between traditional silos of care.²²

Contrary to popular belief, this technology revolution largely does not require innovative devices, but rather repurposing available resources.²⁶ Broadband is now available in over 99% of Canadian households, with more than 84% having home computers, and over 76% of Canadians owning a smartphone.^{26,28} The Institute for Health Systems Solutions and Virtual Care (WHIV) at Women's College Hospital works with companies, clinicians and patients to develop and evaluate methods to connect patients and family physicians to monitor symptom flare ups and prevent costly visits to emergency departments.²⁵ Proof of concept is demonstrated by 1-800-Imaging, a new service that connects community-based family physicians with radiologists through 120 call centres in the Greater Toronto Area.²⁵ In most urgent or uncertain cases, physicians send patients to the emergency department for assessment, but, after using this service, approximately 50% of calls prevented unnecessary visits to the emergency department.²⁵

In addition, the Ontario Telemedicine Network telehomecare initiative empowers patients with chronic disease to become partners in their care, within the comfort of their home.²² Telehomecare technicians deliver and train patients to use easily operated technology that connects to a phone line or internet to transmit vital signs and symptoms to remote clinicians to be monitored. If obtained data falls outside of acceptable limits, automatic notifications identify symptom flare ups for opportune intervention, often avoiding a hospital or emergency department visit.²² The success of the program is outstanding, with 91.9% of respondents reporting that they have less need to visit the emergency department, and all sites demonstrating a 58-73% reduction in emergency department visits post-enrolment compared to pre-enrolment.²²

To foster this collaboration and create a fluid matrix of care, an electronic medical record (EMR) containing patient

health information will need to be fully implemented.^{24,26} Shared online data will enable health professionals to diagnose and treat patients in a timely manner, decrease the duplication of testing and polypharmacy, as well as enable community workers to provide real-time updates on a patient's health status.

Implementation Considerations

The reality remains that our current system has a low tolerance for risk, and adopting change has been a slow process rife with uncertainty in design and risk in implementation.^{29,30} From a practitioner perspective, doctors cite increased administrative burden from EMRs among their biggest stressors and a leading cause of burnout.³¹ In Ontario, only 53% of family doctors state that they, or other personnel in their practice, frequently coordinate care with social services or other community providers.³² At the same time, 36% of family doctors in Ontario report it is easy or very easy to coordinate their patients' care with community care providers when needed, and only 29% of family doctors, or someone in their practice, regularly communicate with their patient's home care provider regarding patient needs.³²

Ultimately, policy-makers will need to weigh safety versus added value in determining how best to achieve positive health-related outcomes using virtual care.²⁹ This complex system-level framework for the evaluation of properties and effects of health technology must engage local, provincial, and federal stakeholders across jurisdictions to ensure consistency of quality services and standards around data management.²⁷ Health systems tend to take a population health approach, but new technologies will need to factor inpatient preferences and circumstances that contextualize the management of multimorbid conditions to promote compliance.^{4,27,29} The current rigorous review process of evidence-based medicine may conflict with the "fail fast" attitude of the technology sector.^{29,33} The software industry is responsive and incorporates user feedback to develop timely upgrades and corrections to devices. Nevertheless, safety considerations in virtual care is less black and white than simply morbidity and mortality, as technological advancement presents an uncharted course.^{29,34} Given this uncertainty, regulatory roadblocks delay these initiatives from reaching patients.^{29,30}

Concluding Remarks

Well-targeted investment by the Canadian federal government in the continuity of hospital-based and outpatient services, with an expansion of post-acute care resources, has the potential to conserve and repurpose scarce economic and human resources. This can produce long-term cost savings through reduced demand on the tertiary health care system. Government entities will need to be developed to facilitate the timely application of health system innovations research into practice.²⁷ Leveraging technology to engage patients as partners in their care and to increase interdisciplinary collaboration among providers will enable personalized and continuous virtual care. As health professionals begin to rely more heavily on technology for patient management, physicians must understand disease in the context of a person

and not lose sight of individual values and priorities. Moving forward, policy-makers will need to develop a framework for technology assessment that balances patient safety with timely integration in order to establish the Canadian healthcare system in the 21st century.

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