Preventing Acute Care Hospital Readmissions Through the Use of a Virtual Ward

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Abstract: The Canadian healthcare system is facing growing challenges due to increasingly complex patient cases and the lack of a truly integrated healthcare system. As a result, a rising problem has been the high rate of readmission to hospital within 30 days of discharge. Readmissions are costly, frustrating for care providers, and most importantly, are an indication of poor patient health outcomes. This paper will discuss the Virtual Ward and highlight how it intends to be a clinically and financially effective solution in reducing readmissions. The Virtual Ward functions by transporting key components of hospital care into the community, providing patients with the necessary level of ongoing support without occupying hospital resources. Patients are 'admitted' to the Virtual Ward, and are then cared for by a team who assess the patient on a regular basis. The care team is readily accessible around the clock, while the patient remains at home. Currently, the Virtual Ward is being piloted in Toronto and undergoing a randomized control trial (RCT) for evaluation purposes. If results of the RCT support the Virtual Ward as a viable solution in reducing readmissions, it poses to be a powerful tool with the potential to be implemented across the country. Not only does the Virtual Ward play a key role in improving patient health outcomes while reducing costs, but it represents a new philosophy of health management and addresses the need for the Canadian healthcare system to radically change how it functions systematically.
Need:

It has become increasingly apparent over recent years that the Canadian healthcare system is facing new challenges brought on by the rapidly changing face of illness and disease. While modern innovations and advancements in both medicine and technology mean that Canadians are able to live longer than ever before, a simultaneous shift in lifestyle has caused an ever increasing proportion of the population to be burdened with chronic disease and illness (Mirolla 2004). Living longer has not equated to living healthier (Pittman 2012). Given an aging baby boomer population in Canada, coupled with the fact that seniors over the age of 65 have a higher predisposition to chronic diseases, the Canadian healthcare system is facing a growing burden that the traditional system of providing care is no longer able to effectively manage (MacAdam 2011:1; Terner, Reason, McKeag, Tipper & Webster 2011:1).

There has been a growing recognition across the nation that Canada needs to urgently address how healthcare is delivered (Schipper, Pai & Swain 2008). The current provision of fragmented care is unable to effectively deal with patients suffering from long term chronic illnesses, who come into contact with the healthcare system on a frequent basis to multiple different caregivers (Dhalla, O'Brien, Ko & Laupacis 2012). Disjointed information systems across hospitals and provinces mean that transitions between caregivers often result in errors, duplications, and delays ("Integrated Health Care Needed as Canada Ages" 2011). The current lack of an integrated system has numerous negative effects on patient health, quality of care, and satisfaction.

These issues relating to gaps in care are particularly evident when looking at the transition of patients from hospital to home, and the subsequent readmission rate. A recent report by the Canadian Institute for Health Information (CIHI) found that approximately 8.5% (or 1 in 12) of acute care patients returned to hospital for an unplanned readmission within 30 days of being discharged over an 11 month period included in the study (2012:5). Total costs of these unplanned readmissions came to $1.8 billion.

Avoidable readmission rates vary widely across studies, ranging from 9% to 59% (CIHI 2012:1). While many different factors have been identified across studies to correlate with high risk for readmission, the transition from hospital to home has been recognized as a crucial point in the patient care path where interventions can make a notable difference in preventing readmission (Shipton 1996:85; van Walraven, Seth, Austin & Laupacis 2002:190; Dhalla et al. 2012:65). This paper will therefore discuss the Virtual Ward, an innovative concept that seeks to address these gaps in care that take place upon patient discharge by creating a forum where transitory care can be provided in an integrated fashion. While three such programs are currently being trialed in Canada, this paper will focus on the Virtual Ward begun by Dr. Irfan Dhalla as a collaboration between the Toronto Central Community Care Access Centre (TCCAC), the
Toronto Central Local Health Integrated Network (TC LHIN), St. Michael's Hospital (SMH), Women's College Hospital, the University Health Network (UHN), and Sunnybrook Health Sciences Centre (SHSC) (Ndewa 2011).

**Audience:**

The primary audience to benefit from this innovation is the patient. An Ontario Hospital Association (OHA) report states that "1% of the population accounts for 49% of combined hospital and home care costs; 5% of the population accounts for 84% of combined hospital and home care costs" (OHA 2012:6). The Virtual Ward aims to target this 1%, the most frequent users of the healthcare system. These patients have a tendency to suffer from multiple co-morbidities and are considered to be most at risk for readmission, putting them in need of transitory support and education (Dhalla et al. 2012). Studies indicate that the provision of varying types of post-discharge care between the hospital and home can lead to lower readmission rates; lower readmission rates are in turn associated with improved patient health outcomes, fewer adverse events (including death), and more satisfied patients overall (Lindquist & Baker 2011; van Walraven et al. 2010; Dhalla et al. 2012).

Currently, patients eligible for enrollment to the Virtual Ward are those being discharged from SMH, SHSC, Toronto General Hospital (TGH), and Toronto Western Hospital (TWH). Patients being discharged are classified using the 'LACE' index, a tool developed by Canadian researchers to assess readmission risk (Laupacis 2009:4; Dhalla 2010). Classification using the 'LACE' index takes into consideration each patients length of stay (LOS), acuity on admission, co-morbidities, and the number of emergency department (ED) visits in the 6 months prior to admission (van Walraven et al. 2010). Patients with a LACE index greater than 10 (considered high risk for readmission) are eligible for admission to the Virtual Ward.

Other stakeholders who may benefit from this innovation include hospitals, the provincial and federal government, as well as patient families. Readmissions are recognized as a contributing factor to both ED volumes and prolonged wait times, as well as occupying valuable bed space and resources within hospitals (CIHI 2012; Laupacis 2009:3). By reducing readmissions, it would be likely that hospitals would see a drop in resource utilization, since healthier patients would presumably require fewer visits and lower intensity care. The provincial and federal governments would potentially see a reduction in healthcare expenditure, considering that readmission episodes range in cost from $3109 to $10,404 per patient (CIHI 2012:17). Taking even the lowest estimate of preventable readmissions at 9%, CIHI estimates that $162 million could be saved over an 11 month period (2012:1-18). Finally, patient families often struggle to provide the necessary care to family members suffering from chronic illnesses; support and education post-discharge would ease the burden that is often placed on these families and provide peace of mind.
Goals & Objectives:

The primary goal of the Virtual Ward is to improve patient health outcomes (Dr. Dhalla: personal communication, December 11th 2012, see Appendix 1). It does so by attempting to bridge the gap between hospital and home care, integrating multiple health services into one application to allow for patient needs to be addressed in a timely and systematic fashion (Dhalla 2010).

The measurable objective of the study testing the Virtual Ward is an evaluation of the readmission rates between patients receiving standard care (control group) versus patients who are admitted into the Virtual Ward (intervention group). The primary metric is readmission or death within 30 days of discharge (Laupacis 2009:7). An additional measurable objective is the economic impact of the Virtual Ward, and whether the costs of the Virtual Ward are offset by the costs saved in preventing readmissions (Dr. Dhalla: personal communication, December 11th 2012). While it is too early to determine whether the Virtual Ward is a concept that should be implemented across the country, the next steps would include expansion and to establish the Virtual Ward as the standard for post-discharge care (Laupacis 2009:9).

Beyond these visible, patient-centered goals, there is also the hope that the Virtual Ward will play a role in changing the framework of healthcare and how healthcare is delivered. The Virtual Ward speaks to an overarching problem in the Canadian healthcare system, which is the lack of integration across services and information (Dr. Dhalla: personal communication, December 11th 2012). In the absence of an integrated system, the Virtual Ward is not only a promising solution, but a necessary one.

Solution Overview:

The Ontario Ministry of Health and Long Term Care (MOHLTC) defines the term 'Virtual Ward' as "an innovative service model that delivers high quality coordinated care to patients in the community, after they have been discharged from hospital. It combines the best aspects of hospital care and management, outside the walls of the hospital" (MOHLTC quoted in Ndegwa 2011:2).

The Virtual Ward addresses a number of current priorities that have been identified by the MOHLTC and the TC LHIN, which include reducing ED wait times, avoidable hospitalizations, the use of affordable solutions that maintain quality of care, and a reduction in acute long term care (Ko 2011:2). Beyond these, the Virtual Ward fills the gap that currently exists between the hospital and home, a problem that has long been recognized to be an issue but has remained unresolved. It integrates services and institutions to provide timely access to resources while providing an inter-disciplinary team that acts as a ‘one stop shop’, accessible
This intermediary 'step down' style of care means that patients continue to be supported without occupying expensive and limited resources in hospital.

By transitioning care from the hospital to the home, the Virtual Ward provides a number of additional yet indirect benefits to the patient. The current management of health, disease and illness in Canada continues to revolve around an acute care framework, where there is a distinct doctor-patient relationship in an institutional setting. However, increases in chronic disease means that the traditional acute care paradigm must shift towards one that is better suited to the long term management of health and disease outside of the hospital. While saving resources and money is one benefit of bringing patients home, it also gives patients increased autonomy with their own wellbeing and health. In the Virtual Ward setting, doctors and other healthcare professionals continue to take an active role while patients have the opportunity to become educated and make independent decisions regarding their health.

The Virtual Ward is based out of Women's College Hospital located in downtown Toronto. Their first patient was admitted on March 16th, 2010 (Ko 2011:3). It is currently conducting an ongoing randomized control trial (RCT) comparing the Virtual Ward with the standard post-discharge care to formally evaluate the effectiveness of the intervention. The patient care team consists of a physician, two care coordinators, a team assistant, a part-time pharmacist, and part-time nursing support. Key service provisions include 24/7 telephone support, education and counselling, medication reconciliation, home visits by a physician, nurse, or care coordinator, and assistance in coordinating with other healthcare providers such as the patient's family physician (Ndewga 2011:3). Patients follow an individualized care path that begins on day 0, which corresponds to their day of discharge from the hospital. Once admitted, from Day 1 and onwards, they are treated by the patient care team on a regular basis (Laupacis 2009:6). Patient cases are discussed on 'rounds' that take place at Women's College Hospital (see Appendix B). While individual patients are not discussed every day, the care team creates a patient specific plan that is implemented and followed. Like any patient treated in hospital, plans are modified according to the patient's changing status and need. Discharge from the Virtual Ward occurs when the team determines that the patient is stable and no longer in need of that level of care, upon which a comprehensive discharge plan is created for the patient (Jeannette Hilliges: personal communication, December 19th 2012; Laupacis 2009:6).

While results from the RCT will not be available until 2013, initial anecdotal evidence has been positive, with success stories coming from patients and calls for expansion from policy makers (Boyle 2012).

"I knew who to call and it was such a peace of mind. The doctors responded within half an hour and were able to let me know if things were ok. Otherwise I would have had no
choice but to call ER [Emergency Room]...Due to the Virtual Ward, I know we saved 3-4 ER visits” (Daughter of patient quoted in Ko 2011:11).

Implementation and Challenges:

Implementation of the Virtual Ward required a significant level of collaboration between key stakeholders in order to gain buy-in, support, and the necessary resources to set up and maintain the project (Dr. Dhalla: personal communication, December 11th 2012). Additional partnerships have since been built to better support patients, such as the one between the Virtual Ward and the Toronto Community Addiction Team. Patients can be referred upon discharge from the Virtual Ward to ensure they have ongoing support (Ko 2011:5).

One of the main challenges that the Virtual Ward has encountered is the lack of a sufficient information technology (IT) system. The team currently uses a paper based system, and communicates via telephone or e-mail. Without an appropriate IT solution, it is difficult to provide truly integrated care because of the disjointed information transfers between care providers (Ko 2011:5).

An additional challenge has been the amount of time required to obtain the results of the RCT. While initial anecdotal evidence has been positive, further implementation and expansion must wait until the formal evaluation is complete to ensure that the Virtual Ward is both a clinically and financially effective tool in reducing readmission rates. Although there have been calls to expand the Virtual Ward, waiting for evidence will allow decision makers to ensure that resources are deployed in an evidence informed manner (Dr. Dhalla: personal communication, December 11th 2012).

Future Applications & Limitations:

Initial feedback indicate that the Virtual Ward has significant potential to be an effective solution in successfully preventing readmissions, as well as improving patient health outcome and satisfaction. If the data from the RCT supports this, it would be likely for additional LHINs and hospitals across Canada to adopt the Virtual Ward.

Potential limitations to widespread use include geographic limitations and resources. Use of the Virtual Ward in rural and remote areas may not be possible due to the fact that population densities are much lower. Patients for a single care team would likely be widespread, which would affect how quickly caregivers are able to respond to patient needs. The current trial in the GTA excludes patients who live beyond the TC LHIN boundaries, however a look at the geographic boundaries of each Ontario LHIN reveals that the TC LHIN is by far the smallest of the 14, making it much easier for caregivers to reach patients (see Figure 1, Appendix 3).
Additionally, financial and human resources would be required to implement the Virtual Ward on a wide scale. While one of the objectives of the Virtual Ward is to reduce the burden of high risk patients on the healthcare system, implementation would still require buy-in and significant investments from the government, hospitals, and local communities. As well, policymakers must adopt a shift in philosophy from highly individualized care providers towards a model that integrates services and centers around the patient.

Conclusion:

Readmissions to hospital are the result of a combination of complex risk factors. Not only is it a burden on resources, but readmissions more importantly represent a decline in patient health status. Although a proportion of readmissions are not preventable, the current structure of the Canadian healthcare system is fragmented, allowing patients at risk to fall through the cracks post-discharge and ultimately land back in the hospital. To address this longstanding problem, the concept of the Virtual Ward has been implemented, integrating key aspects of hospital care into the community setting. In doing so, the Virtual Ward seeks to bridge these gaps in care by providing an appropriate level of ongoing support for patients identified as high risk of readmission. While the primary goal is to improve patient health outcomes, it is also an opportunity to provide care to patients in a far more cost effective manner.

Looking beyond the primary goals and objectives, the Virtual Ward further represents an entirely new philosophy of providing healthcare in Canada. Changing demographics and a growing population of Canadians suffering from chronic diseases means that new frameworks of health management must be considered in the development of solutions and policies. There must be a shift away from the distinct doctor-patient and hospital-home dichotomy towards one that empowers patients and provides them with the resources in managing their own health and wellbeing. Without systematic changes, it will become increasingly difficult in the coming years to provide high quality care. The Virtual Ward is therefore not only an innovative solution to address a major gap in care that currently exists, but overarching themes can be used to drive key institutional changes in every aspect of the Canadian healthcare system.
References


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