

Virtual Care: A Framework for a Patient-Centric System

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<i>Table of Contents</i>	<i>Page</i>
Foreword	3
1. What is “Virtual Care”	4
2. Why Does Virtual Care Matter?	5
3. Why is Innovation Imperative to Improve Virtual Care?	11
4. What are the Main Barriers to this Innovation?	12
5. Who are the Key Players in Virtual Care?	15
6. How can WIHV Help Accelerate Virtual Care?	17
Conclusion	20
Appendix A	21

Foreword

The World Has Changed

The revolution of consumer electronics has brought powerful mobile devices and wireless high-speed connectivity to the general public. Fixed and mobile broadband are available to over 99% of Canadian households, while Smartphone penetration has risen to 56% of the Canadian population ([citation](#)). There are now over 97,000 mobile health applications. Consumers are increasingly using online health technologies to self-manage their personal health and wellness goals, access health information, and connect with peer-to-peer health groups ([citation](#)). 96% of Canadians think it's important that the health care system make use of digital health tools and capabilities, and 89% feel it is important that they personally have full advantage of digital health tools and capabilities. Additionally, 90% of Canadians who access their own health information online describe the experience as positive ([citation](#)).

This milieu of consumer uptake and private and public investment will result in an increasing demand for virtual health care interactions, a demand that centrally driven solutions will be unlikely to be able to meet. Currently, more than 308,000 patients receive care through the Ontario Telemedicine Network (OTN) – a 51% increase over 2013 ([citation](#)).

Increased consumer uptake has led to more and more companies investing in Information and Communications Technologies (ICT). **There are over 33,000 companies in the ICT sector in Canada that generate \$155 billion in revenue.** The fast growth means that since 2007 the ICT industries account for 7.5% of the Canadian GDP growth and 3.0% of total employment ([citation](#)). The global mobile health technologies market is projected to reach nearly \$21.5 billion in 2018. Here in Canada, Telus – now the country's major provider of EHR systems – has invested \$200 million building two “state of the art” data centres, which it opened in Rimouski, Quebec and Kamloops, British Columbia over the past three years ([citation](#)).

Enter a Unique Care Facility with a Unique Focus

As an academic center exclusively focused on the ambulatory environment, Women's College Hospital is unique in the health care space.. Central to this unique identity is a mandate to identify, incubate and leverage technologies and policy innovations that will improve the process of clinical care across Ontario.

As the Hospital's laboratory for creating and testing evidence-based solutions, the **Women's College Hospital Institute for Health System Solutions and Virtual Care (WIHV)** is a key catalyst for this work.

Virtual Health Symposium

On June 17, 2014, WIHV hosted its first Virtual Health Symposium. This event brought together multiple health system stakeholders, including governmental agencies, clinicians, innovators and industry experts (see Appendix A) to discuss key questions surrounding the increasingly important topic of “Virtual Care”:

1. What is “Virtual Care”?
2. Why does Virtual Care matter?
3. Why is innovation imperative to improve Virtual Care?
4. What are the main barriers to this innovation?
5. Who are the key players in Virtual Care?
6. How can WIHV help accelerate Virtual Care?

This paper summarizes the discussions initiated and accelerated by the seminal session that took place last spring, and proposes a framework for the realization of the potential of Virtual Care in Ontario.

1. What is “Virtual Care”?

While often used interchangeably with “telehealth” or “eHealth” or “telemedicine”, “Virtual Care” is more of a broad concept than a precise term. “Virtual Care” involves the application of technology to improve the flow of information between patients and their health care teams (and within those teams themselves) in order to improve analysis, coordination, decision-making and – ultimately – health outcomes. WIHV’s formal definition is as follows:

Virtual Care (noun):

“any interaction between patients and/or members of their circle of care, occurring remotely, using any forms of communication or information technologies, with the aim of facilitating or maximizing the quality and effectiveness of patient care.”

It is important to note what “Virtual Care” is NOT: it is not about a particular technology, particular actors, or particular pieces of data. Instead, Virtual Care can involve the exchange of all types of information from laboratory information to advice and ideas, and can involve actors that include the patients themselves, their caregivers and providers, and even the broader systemic players involved in their care, including their health care institutions and the government. Box 1 summarizes some of the more commonly cited examples of Virtual Care.

Box 1: Select examples of Virtual Care Initiatives

- Personal Health Records (PHRs), either standalone or tethered to an Electronic Health Record (EHR)
- Secure electronic messaging
- Teleconsultations/eVisits
- Remote telemonitoring of patients

It is imperative that policymakers, clinicians and technologists reject a narrower definition of Virtual Care – since only an expansive vision for Virtual Care will create the creative innovation space required to maximize its disruptive impact and patient-centric potential.

2. Why Does Virtual Care Matter?

Participants in WIHV's Virtual Care Health Symposium agreed that the majority of patient interactions will occur virtually by 2025. These same participants, however, enumerated a host of barriers limiting the effectiveness and impact of Virtual Care (Box 2). These comments are the foundation for much of the discussion from this point forward.

Box 2. Key Systemic Issues Limiting the Impact of Virtual Care

Integration Issues: A system of disconnected silos

- Lack of system-level interoperability and infrastructural alignment
- System-centric as opposed to patient-centric approach to privacy/security and data sharing
- Competing and misaligned incentives
- Mutual misunderstanding of the challenges/priorities of various system stakeholders

Innovation Issues: A system where innovations die on the table

- Time-to-market for novel innovations is too long
- System is not structured for scalability

Equity Issues: A system where the most needy have the least access

- Balancing financial viability of novel innovations with equitable access to care

Quality Assurance/Improvement Issues: A system where QI is an afterthought

- Lack of system-wide measurement that allow iterative local refinement of innovations and implementations
- Challenges in assessing the relative quality of innovations as they relate to hard clinical outcomes
- Difficulty in confidently determining how and where care should take place (virtual vs. in-person) to reduce inappropriately episodic and impersonal care

In essence, there are at least three foundational reasons why “Virtual Care” is worthy of deep investigation (Box 3):

Box 3. The value proposition of Virtual Care

- A. Virtual Care Creates the Preconditions for Truly Empowered Patients and Patient-Centric Care
- B. Virtual Care Spans the “Silos” of Care, Virtually Eliminating the “Transition”
- C. Virtual Care Reduces Redundancy and Waste by Sharing Greater Knowledge Across the System

A. Virtual Care Creates the Preconditions for Truly Empowered Patients and Patient-Centric Care

Virtual Care is about bringing together people and information; it is the healthcare equivalent of what people have been doing in other facets of their lives for years, including banking, shopping, or fundraising.

*At WIHV, we envision a day where **a patient, empowered** by Virtual Care, **has access to their entire circle of care** through an abstraction of his/her consolidated health record (labs, medications, documentation, appointment schedules, etc) accessed **via a robust and dynamic marketplace of secure applications** with the goal of **successfully executing a unique patient-centric plan.***

All integral parties must have access to the patient, the shared record, and each other within a framework of an integrated plan of care facilitated by communications technologies. On that framework, a diverse set of applications are built that perform a wide range of essential functions:

- System, practice and patient-level performance and quality analytics
- Patient and provider education,
- Clinical decision support,
- Patient monitoring and tracking,
- Communication and collaboration between patients and their care team
- Organization and management of the patient's unique care plan

By definition, empowered and engaged patients are more likely to understand their overall plan of care and to be in a stronger position of self-advocacy when there is care discontinuity or inconsistency. **This Virtual Care framework provides a tremendous opportunity to increase patient engagement.**

The areas of greatest potential impact for Virtual Care, as per the symposium participants, are included in Box 4.

Box 4: Areas of greatest potential impact for Virtual Care

- Multimorbid patients with multiple chronic diseases
- Mental health
- New Immigrants
- Marginalized populations
- Care transitions across silos in general

Early Virtual Care interventions have already been shown to specifically improve both patient access to care – and the effectiveness of that care itself.

Access

Although a core principle in Canadian healthcare is equal access for all, the quality of healthcare available has always been highly dependent on where a patient lives. OTN has tackled this disparity by leveraging the Virtual Care principles and programs to help mitigate the asymmetry of resources dividing more remote and more urbanized regions across the province.

By virtually eliminating geographical barriers, repurposing underutilized specialists, and reducing the barriers to follow-up, the OTN enables ongoing access to care for more than 100,000 mental health and addictions patients annually, providing assessments, case conferencing and therapy ([citation](#)). The convenience and quality of care provided by telemedicine generated a 94% satisfaction rate in this patient population.

Given the access challenges faced by mental health and addictions patients (see Box 5), the impact of these initiatives is especially significant.

Box 5: Virtual Care, Mental Health, and Access

- 1 in 5 Ontarians are affected by a disorder of mental health or addiction ([citation](#))
- Patients with mental health concerns are both marginalized and high users of the system
- The distribution of psychiatry support is significantly imbalanced across the province with huge variation between locations such as Toronto and North Simcoe – this is not simply an urban-rural divide with Mississauga being relatively disadvantaged
- Workloads mirror this imbalance with psychiatrists in “high-supply” regions seeing far fewer patients than those in “low-supply” regions ([citation](#))
- Even when a provider is present, 20% of appointments are missed resulting in large (50%) patient dropout rates ([citation](#))

An effective Virtual Care network may not only help reduce some of the inequalities in access due to geography, but would also reduce some of the indirect costs patients face due to the way health care is organized, including:

- Lost wages, transportation and parking costs for in-person visits ([citation](#))
- Inconvenient scheduling of care around work, childcare, and other basic needs ([citation](#))
- Unavailable linguistic and cultural support for patients and family MDs (in particular for immigrants/refugees) ([citation](#))

However, access issues are not solely due to the lack of appropriate connecting technologies; significant incentive barriers also exist. While requesting a medication refill by phone or email is certainly technologically possible, privacy and security concerns over the use of email with patients in particular ([citation](#)), and the lack of incentive payments for clinics and MDs to provide this service ([citation](#)), often leads to patients unnecessarily attending an in-person appointment or paying an extra fee for a remote service ([citation](#)).

Effectiveness

As in most developed countries, chronic disease is the leading cause of death and disability in Ontario. **Almost 80% of Ontarians over the age of 45 have a chronic disease** ([citation](#)). An even greater challenge is the escalating number of patients with multimorbidity, or the presence of two or more chronic diseases; this situation is associated with elevated risks of death, disability, poor functional status, poor quality of life, adverse drug events and high system utilization.

Virtual Care has the potential to strengthen the management of chronic conditions by improving continuity of care, by allowing for early intervention, and by promoting better patient self-management through education. A recent study of heart failure patients, found that after 6 months, those randomized to telemonitoring as opposed to usual care experienced significant improvements in brain natriuretic peptide levels and metrics of self-management ([citation](#)).

B. Virtual Care Spans the “Silos” of Care, Virtually Eliminating the “Transition”

The healthcare system is heavily fragmented and defined by institutional, geographic and therapeutic “silos” that are all too often disconnected. One of the most dangerous characteristics of the siloed system, the “transition”, is an attribute entirely defined by such a system. In a race defined by the passing of a baton, the most risky and potentially costly activity in the system is this very activity: passing the baton.

Virtual Care allows for a game with different rules, a team-based game where risk is minimized through task delegation, communication, shared accountability and contingency planning.

Multimorbidity, or patients with multiple coincident chronic conditions, creates a particular challenge for care continuity and coordination. The traditional guideline and disease-centric model of patient management is frequently impossible to apply to these patients and can result in further discontinuity of the care plan, complex and dangerous medication regimens, and an overwhelming burden of treatment ([citation](#), [citation](#)). In this expanding group of patients, Virtual Care is not only a facilitator; additionally, it may be a necessary precondition to optimal outcomes wherever cross-institutional, cross-setting (in-patient vs. ambulatory), and cross-professional care teams are the norm.

Again, technology is not sufficient. While there are subtle shifts in the landscape towards a greater team-based approach – notably the integration of home care and primary care services through the Health Links and the introduction of the Coordinated Care Plan (CCP) – the truth is that achieving true collaboration in a team consisting of multiple, diverse HCPs is a major logistical challenge.

The current fractured system results in unnecessary “hard” transition points and unneeded fragmentation of communication, often segmented in an implicit professional hierarchical manner with vastly inequitable (or non-existent) incentives.

C. Virtual Care Reduces Redundancy and Waste by Sharing Greater Knowledge Across the System

Virtual Care can improve overall system efficiencies through the sharing of data. Increased access to results throughout the system and clear care plans will help eliminate duplicated or unnecessary tests. *ConnectingGTA* is a specific example of an eHealthOntario-sponsored initiative to integrate patient information from across the care continuum and make it available at point-of-care ([citation](#)).

An Eastern Ontario based eConsult program allows family physicians to contact specialists directly through secure email with questions about patients. This has been shown to prevent unnecessary trips to a specialists’ office and to improve timely access to specialty services ([citation](#)). 43% of patients whose family physicians used the service, which is designed for non-urgent issues, avoided an unnecessary referral.

It is not only in the realm of direct patient care that Virtual Care has the potential to reduce waste. Redundant copies of the same information exist across silos, some of which is reduplicated through error-prone manual processes. If this redundant data exists electronically, this often means redundant costs for hosting and storage as well as the added risks for data breaches. The result is multiple “copies” of the same individuals across the system, for patients through redundant copies of their data and for providers through multiple redundant institutionally-based electronic identities – introducing numerous opportunities for information gaps and creating an inadvertent barrier to entry to anyone hoping to innovate in this space.

3. Why is innovation imperative to Virtual Care?

It is not just the demands of the marketplace that will make centrally driven solutions ineffective; innovation in Virtual Care is a critical necessity for two very important reasons:

1. Healthcare is an unpredictable, evolving “complex adaptive” system necessitating near perpetual adaptation; and
2. Local environments have different pressures and workflows and often require different tools.

Healthcare is a Complex Adaptive System

It is not enough to simply define top-down solutions in healthcare; the domain is too complex. Indeed, you can argue that healthcare is a prime example of a “complex adaptive system” (see Box 6).

Box 6: Key features of complex adaptive systems (Meso & Jain, 2006):

- Open systems that interact with an external environment
- Dynamic interactions where the behavior of the system is determined by the nature of the interaction as much as the information exchanged.
- Transformative feedback loops.
- Emergent, i.e. non-determinant, behavior.
- Distributed control.
- Minimal organizational (shallow) structure
- Continuous growth and evolution

By definition, complex adaptive systems are evolutionary, distributed and relatively unpredictable. **The only conceivable way to meet the demands of the system is through a market for tools that is propelled by innovation.**

While innovation is an ideal way to further adaptive solutions, there is another critical necessity for the system: continuous quality improvement with iterative processes of evaluation and modification in order to optimize outcomes. Here too Virtual Care can help by breaking down not only the silos of care, but also the silos of measurement, allowing for comprehensive, as opposed to fragmented, data on system performance.

Local Environments have Different Workflows and Usability Requirements

Understanding local workflows is of paramount importance when constructing tools for a local system. Each and every cardiology clinic, for example, will have different sets of personnel and patients who exist in different contexts and “neighborhoods” (*demographic, sociocultural, linguistic, technological etc.*). Moreover, while tasks in general may be similar, how one approaches a task is defined by the constellation of other competing tasks, the likelihood and frequency of interruption, and the interplay of the system you are using with other systems defining the broader external environment. For all of these reasons, maximizing flexibility is imperative: while the data and messaging in the system should be platform-independent, **the best way forward is for the user-facing elements of the system to be tailored to the specific user.**

Empowering the patients of the future will require technologies that are first-and-foremost tailored to the clinical needs of the primary users of those systems: patients, caregivers, and healthcare providers. All other needs are secondary.

4. What are the main barriers to this innovation?

Fundamentally, healthcare amounts to shared decisions between trusted care providers and patients. On the surface, these decisions are facilitated by a complex web of infrastructure, clinical environments, incentive schemes and regulations. All too often, however, benefits to patients are highly indirect and challenging to ascertain, whereas the most direct and obvious benefits of many systemic decisions are to the systemic players themselves.

The disruptive power of Virtual Care comes with the realization that it is the patient, and necessarily the patient-clinician relationship, that should be the most direct beneficiary of all things health, whether clinical, regulatory, reporting or incentive.

Virtual Care can make this state a reality, but in order to realize this state, innovation is a must. Unfortunately, there are a host of systemic challenges that make healthcare a challenging marketplace for most innovators to enter:

- **Privacy/Security regulatory frameworks**, often read by systemic stakeholders in the most conservative of light, making the development of patient-centric tools that bring the system together highly bureaucratic, time-consuming, and frequently requiring one-off agreements with several players to move anything forward.
- **Duplicative data hosting and storage** which can incur significant costs primarily due to the inability to effectively share the gold-standard resource for that data
- **Complex and often redundant authentication and identity-management procedures** creating a system where patients and providers alike have multiple identities
- **Unnecessarily restrictive terminology** which may exclude tools from governmental or grant-level funding support based on precisely how a tool works rather than what it accomplishes
- **Complex and expensive procurement processes** which can effectively exclude smaller players
- **Regulatory definitions of what is and what is not a “device”** with the additional regulation that that entails

Payment in healthcare is also extremely complex, since billing and reimbursement is invariably mixed: part single-payer – through a distributed network of institutions – and part truly private payment. **Determining who will pay – and how – can be a much trickier question to answer for innovators working in the healthcare sector than in other, simpler markets.** Nine of the thirteen provinces and territories bill Virtual Care services using existing fee for service codes. Only two (the Northwest Territory and Yukon) have created new codes. Current Virtual Care billing codes are not comprehensive. In Ontario today, a patient must pay out of pocket for a clinician to phone in a prescription renewal because there are no virtual prescription renewal billing codes.

Understanding the needed tools and how they should work has traditionally required an in-depth knowledge of the domain that many application developers do not have (giving rise to the novel “go-between” discipline of “clinical informatics”). However, a shift towards more patient-centred applications helps those application developers who – despite lacking deep system or sector experience – have been a patient themselves, or have helped care for one.

A great challenge in Virtual Care will be that it will be all too easy to promote a proliferation of consumer tools that may be well loved, but of little value to the delivery of high-quality care (Box 7 discusses an issue of appropriateness, that of the “virtual walk-in”). This will lead many to conclude that we, hence, need strong rules that ensure that risk is eliminated and success guaranteed. **However, while some checks-and-balances in a system as critical as health are required, the twin death knells to innovation, namely centralization and formalization, should be avoided as much as possible.**

There is NO innovation without risk.

Given the growing complexity of the system and of patients with multiple coincident chronic conditions, **convenience and access should not supersede the paramount importance of a cohesive and integrated longitudinal care team.** Episodic care cannot replace longitudinal care - episodic care is discontinuous care, and for complex patients with multiple chronic conditions, discontinuous care is low-quality care.

Box 7: Case Study - Virtual visits in British Columbia

- BC's health plan spending on virtual visits grew 735% from 2012 to 2013, from 897 to 8,253 (!) visits – most were online MD consultations
- BC paid over \$330K, or about \$41/visit
- Health Minister Terry Lake ordered a review and publicly wondered about unintended consequences of a proliferation of “virtual walk-in clinics” ([citation](#)).

This example suggests a number of key questions: *How can we assure appropriate use of these services? In what circumstances is an in-person visit more beneficial or even mandatory? What is the appropriate cost per service? Is this augmenting care or simply resulting in extra billing for services that are ultimately completed in-person on a different occasion?*

Unfortunately those who might benefit the most from Virtual Care, namely the marginalized and complex, are also those who are the least likely to have the resources to pay for Virtual Care, raising an interesting dilemma of how to make the domain profitable for innovation while preserving access to services for the most vulnerable.

Furthering the challenge, many clinicians and patients will require guidance in evaluating Virtual Care solutions. Cherry-picking a handful of solutions will inevitably slow a marketplace to a halt, and so other ways to inform consumer choice will be required. Options could include a certification scheme akin to that for EMR solutions championed by Infoway ([citation](#)) or a system of “trustmarking” akin to the Health On the Net Foundation’s scheme for the quality of healthcare websites ([citation](#)). Unfortunately, many of these systems are voluntary, and **it is appropriate to wonder where on the spectrum of “completely voluntary” to “completely mandatory” the certification of clinician and consumer virtual health solutions should lie.**

The key truth, however, is that there is no innovation without some risk, but a free-for-all system of unchecked and unfettered innovation, not unlike the historical explosion of patent medicines that ultimately led to the rise of the FDA, is also not in the best interests of patients (see Box 8). The question should not be whether to take risks, but to define the appropriate balance of risks and benefits for any particular problem in the domain – and **achieving this balance is essentially impossible without some means for appropriate evaluation and definition of what metrics define success.**

Box 8: Virtual Care and Melanoma

In a recent study by Wolf et al., the diagnostic accuracy of four smartphone applications claiming to detect melanoma were compared.

- Sensitivity across 4 applications ranged from 6.8 to 98.1%
- ¾ applications classified 30% or more skin lesions that were ultimately determined to be melanoma to be not a concern ([citation](#))

Many Virtual Care platforms entering the marketplace without proof of effectiveness – *can you guarantee effectiveness while preserving innovation?*

The Infrastructure is Not Yet There

Perhaps the most challenging aspect to innovating in this space is the lack of a basic technological infrastructural playground in which to play. To encourage innovation without infrastructure excludes many players from the marketplace who lack the means to both devise a solution to a problem AND build the core infrastructure to deliver it.

This infrastructure “deficit” rewards those who have the capital to build the infrastructure by effectively granting them a market-driven monopoly – whether their solutions are the best or not. It also promotes the creation of end-to-end solutions (i.e. user-interface to database) that exacerbate and reinforce the silos that already separate data and people – while spurring amazing amount of redundant effort and expenditures as late-movers race to catch up to market leaders.

The Future, However, is Looking Brighter

Ontario has seen the writing on the wall: the Ontario Health Innovation Council has recently had its core 6 recommendations ([citation](#)), including the creation of an Office of the Chief Health Innovation Strategist, validated with their inclusion in the 2015 Ontario budget ([citation](#)). This represents an important step forward for Ontario and, specifically, for Virtual Care - a key innovation to support the Ontario health care system of the future.

5. Who are the Key Players in Virtual Care?

There are three key participants who will ultimately determine the success of any Virtual Care initiative:

- The PATIENT
- The CARE TEAM
- The INNOVATOR

At its core, “care” is an interaction between a healthcare team and a patient. In this instance, a healthcare team is defined as broadly as possible; from the patient’s of view, the team is the sum total of all actors, regardless of institution or profession, who hold key information, knowledge or other expertise that is critical to the successful implementation of the patients unique longitudinal care plan. As we move into the era of Virtual Care, the chief enterprise of the system at large should be to facilitate this interaction.



In order to respond to diverse local needs and maximize the flexibility offered to system participants, the system should not define the “care”, but should, rather, facilitate the interaction of parties who are critical to the “care” and define the high-level rules through which they interact.

As Stanford's Victor Fuchs has noted, coordinated care requires three “I”s: information, infrastructure, and incentives. In this instance, there are a huge number of intersecting systemic actors who are critical to ensuring the availability of the 3 I’s, including:

- Payers: government, insurers, granting agencies and subsidiaries thereof
- Regulators and associated officers
- Public technology providers (e.g. eHealthOntario)
- Publicly funded associated agencies (e.g. Canada Health Infoway)
- Publicly funded agencies involved in quality assessment and evaluation (e.g. Health Quality Ontario or ICES)
- Institutions: both inpatient (e.g. hospitals) and ambulatory (e.g. CCAC), both public (e.g. HealthLinks) and private (e.g. pharmacies)
- Agencies contracting for the provision of services: for example, agencies providing allied health services such as physiotherapy, nursing and/or speech therapy
- Private companies providing backbone technologies for the system, for example telecommunications providers, smartphone manufacturers, or electronic health systems vendors
- Venture capitalists or other groups providing incubator style support to innovators, (e.g. MaRS)
- Associations representing major roles in the system, for example the OMA, OPA or ONA
- Academic institutions defining both the activities and educational priorities of our future care providers and defining what constitutes appropriate academic “output” for researchers

With such a huge group of players, it is no wonder that fragmentation is the norm in the system. And since healthcare is a complex adaptive system, expecting stakeholders to dramatically shift their behavior without an eye to all other players in the system would be a huge risk.

Solutions to these problems cannot be accomplished in isolation; **as patients get more and more complex, care teams must behave like teams and coordinate around collaborative solutions, and as the system gets more and more complex, it is critical that the systemic actors listed above do the same, as naïve and wildly complex as that notion may seem.**

6. How can WIHV help accelerate Virtual Care?

Virtual Care has the potential to truly shift the patient to the center of their care, to eliminate hard transitions in the system, and to reduce unnecessary redundancy in the system. **Success will be maximized by a guiding philosophy that is fundamentally patient-centric, and that focuses on two core values: collaboration and evaluation.**

WIHVs Guiding Philosophy for all Virtual Care Health System's Solutions

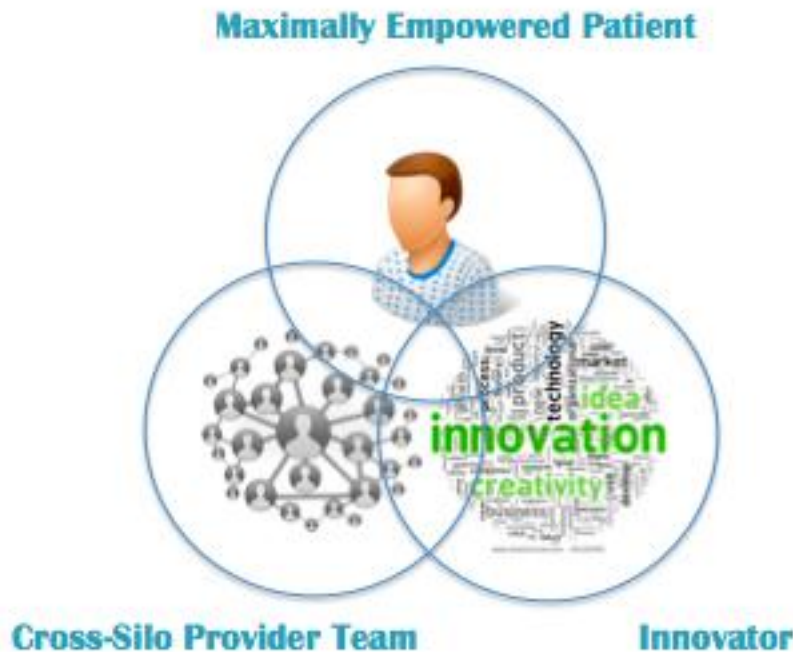
At its core, all work at WIHV is driven by an adherence to the principles of the **IHI Triple Aim:**

- 1. Improve Population Health**
- 2. Enhance Patient Experience**
- 3. Reduce Health System Costs**

Within the scope of Virtual Care, WIHVs guiding philosophy can be summed up in one simple statement:

NOT
solutions for Institution X's patients
BUT
solutions for Patient X
who happens to receive care in the following settings...

The above statement does not imply that patients must be the primary users or consumers of all innovations, just that they always be considered as the primary beneficiary. This fundamentally amounts to the maximization of benefit to the **3 key stakeholders** enumerated before: **the maximally empowered patient, the cross-silo provider team, and the innovator designing and building solutions to connect these two players.**



Do not assume that by placing the “maximally empowered” patient at the center of the framework that WIHV believes that empowerment is a pre-requisite to participation. On the contrary, **we view systemic innovation as a gateway to further patient empowerment, which in turn leads to greater innovation.** While the maximally empowered may be the best positioned to push the boundaries of innovation in the system, our guiding philosophy is that all patients, regardless of means, educational attainment, technological prowess or other measures of socio-economic status, should have access to empowering technologies. This is especially important, in so far as it is often those patients who are the most systemically disempowered that drive the majority of costs in the system.

This philosophy can therefore be summed up in 3 guiding questions against which all Virtual Care solutions should be judged:

- 1) **To what extent does this solution directly impact real patient outcomes or patient/provider decisions about a patients’ health?**
The patient should always be at the center.
- 2) **To what extent does this solution represent a patient’s entire journey across the continuum of care?**
Think outside the silo before you think within it.
- 3) **To what extent does this solution benefit the small percentage of patients in our system who generate dramatically out of proportion systemic costs?**
The complex are a rule, not an exception.

WIHV Is a System Broker

WIHV's role is to help accelerate the shift to Virtual Care by acting as less of a system stakeholder and more as a system broker.

WIHV's symposium model is designed to facilitate the interaction of key players system-wide in the presence of patients, providers and innovators, to take the first steps to solving very concrete and specific problems in the system. Going forward, our goal is to replicate and refine the following 5-step approach:

1. **Presentation of a Targeted Topic** – This could be a topic such as “maximizing the power of a medication list” or “enabling greater patient control over patient data”. As symposia become more mature, the goal would be to allow patients, providers and innovators to define the topics of discussion.
2. **Discussions 1-3 (Unbridled Facilitation):** For each of the empowered patient, the cross-silo provider team, and the innovator,
 - a. What does their ideal system future state look like?
 - b. What are the barriers to them achieving maximal benefit within the system?
 - c. What are the disincentives from maximal participation within the system?
 - d. Who “owns” these problems?
3. **Discussion 4 (Measured Constraint):** What regulatory framework, if any, is required to constrain the activities within this domain to ensure that the principles of privacy, security, patient safety, and overall healthcare quality are maintained – and how do we ensure that framework is acceptable to the patient/providers/innovators?
4. **Discussion 5 (Evaluation and Improvement):** What are the metrics that define success and how can we ensure that the metrics are measurable? How do we promote rigorous evaluation against the metrics that matter and ensure a learning system of continuous quality improvement? How can we maximize adaptive efforts across the system from high-level evaluators, to infrastructural players, to local care providers?
5. **Discussion 6 (Next Steps)**

WIHV sees these targeted symposia as an opportunity to allow infrastructure stakeholders a greater understanding of the challenges faced by the other players, and to ensure that the discussion remains focused around patients, providers and innovators.

By focusing specifically on evaluation, and the challenges inherent in quality evaluation system-wide as an independent issue spanning similar stakeholders, we hope to create the preconditions for true continuous quality improvement in the system.

WIHVs Is a System Evaluator

While system-wide evaluation should be viewed as a core value of WIHV symposia, WIHV is also well-poised through its mix of clinical, quality, research, informatics, policy and business expertise to be a key player in dedicated Virtual Health evaluations.

By conducting targeted, evidence-based reviews and assessments of emerging Virtual Care innovations through an academically-focused lens, WIHV strives to more clearly define the systemic facilitators and barriers to innovation. Our localization with an ambulatory academic health sciences organization provides a key clinical environment well suited to the evaluation and refinement of Virtual Care solutions at a prototyping stage. And our particular clinical environment allows for

maximal likelihood of innovation success and dissemination when combined with policy-readiness, business-readiness and scoping evaluations occurring concurrently in the system.

At WIHV, we view the evaluation of innovation as a multi-faceted endeavor. While rigorous scientific assessment is certainly a component, complex socio-technological interventions that have the potential to radically modify the system will never be comprehensively evaluated through this method alone. The question cannot be, “does this innovation work?”, but rather, “in what contexts does this innovation work?”, “what are the barriers limiting the success of this intervention?”, and, most importantly, “can, and if so how can, this innovation be improved?”. To fully evaluate a Virtual Care innovation requires assessment, and critique, of the operational, regulatory and policy contexts in which the innovation is placed. Otherwise one risks a system of scientifically supported innovations that are operationally, economically, and systemically unviable.

Conclusion

The symposium held in June 2014 provided a framework for thinking about Virtual Care and helped to define the challenges in maximizing its the value. The other benefit the symposium provided was inspiration for a process of system-wide collaboration that offered patients, providers and innovators at seat at the table – and a voice when subjects are being chosen and stakeholders assembled.

We view the 2014 symposium as the first of many as we help to shape the Virtual Care system of the future. **Our overarching goal is conceptually simple, yet logistically complex: Helping to free the market to build the tools patients need, while simultaneously ensuring it supports and enhances the care patients deserve.**

Appendix A

Nancy Kennedy	Assistant Deputy Minister, Health System Strategy and Policy, MOHLTC
Sam Marafioti	CIO, Sunnybrook
Fraser Edward	Business Development Director, Telus
Zayna Khayat	Senior Advisor, Health System Innovation, MaRS
Matt Anderson	President & CEO, William Osler Health Systems
Jennifer Zelmer	Executive Vice President, Canada Health Infoway
Geoff Anderson	IHPME
Dr. Darren Larsen	Physician Advisor- Quality Innovation and Leadership, Engagement and Program Delivery, OMA
Dr. Lynn Nagle	Assistant Professor, Bloomberg Faculty of Nursing
Lili Shalev Shawn	Chief Communications & Marketing Officer, WCH
Jane Mosley	Chief Nursing Executive, Health Disciplines, Professional Affairs, WCH
Heather McPherson	Vice-President, Patient Care & Ambulatory Innovation, WCH
Ryan Wilson	CEO, Medeo
Anthony Dale	President & CEO, OHA
Marilyn Emery	President & CEO, WCH
Dr. Danielle Martin	Vice-President Medical Affairs & Health System Solutions, WCH
Elizabeth Buller	President & CEO, St. Joseph's
Abigail Carter	eHealth Ontario- Chief Privacy Officer & Vice President
Dr. Wei Qiu	eHealth Ontario- Chief Medical Informatics Officer
Jane Mosley	Chief Nursing Executive and Health Disciplines, Professional Affairs
Heather McPherson	VP, Patient Care & Ambulatory Innovation, WCH
Camille Orridge	CEO, Toronto Central LHIN
Trevor Jamieson	WIHV Innovation Fellow, Virtual Care Lead
Jacob Mksyartinian	Senior Policy Advisory, MOHLTC
Dr. Noah Ivers	WIHV Innovation Fellow, WCH (Clinical)
Dr. Onil Bhattacharyya	WIHV Innovation Fellow, WCH (Clinical)
Dr. Sacha Bhatia	Director of the Institute for Health System Solutions & Virtual Care (WIHV)
Wayne Samuels (facilitator)	Partner, Strategy and Operations, PwC
William Falk (co-host)	Partner, Health Care Services Group, PwC
Dr. Ed Brown (co-host)	CEO, Ontario Telemedicine Network
Dr. John Semple (co-host)	Chief of Surgery, WCH
Jamison Steeve (co-host)	Executive Director, Martin Prosperity Institute