White Paper on the value of eHealth Assets in Ontario – submitted by University Health Network

Executive Summary

UHN is pleased to submit this position paper on the value of ehealth assets in Ontario. UHN is uniquely positioned to provide a perspective to Mr. Clark's evaluation given its experience delivering many large scale and strategic IT initiatives both internally as well as for the needs of the Province. Specifically, UHN has a firsthand understanding of the clinical value derived from ehealth initiatives to date in Ontario, detailed knowledge of the technology involved in ehealth initiatives, an understanding of how these initiatives relate to the strategic health care objectives of the Province, and direct experience in navigating the related regulatory and policy challenges. It is in our collective best interests to provide an accurate assessment of the value of the investment in ehealth assets to-date and to share our perspective on the future value of these assets as we move towards a digitally-enabled health system. An executive summary of our considerations are provided below.

- The ehealth assets that are now in place have resulted in significant connectivity improvements between providers and have enhanced the access to information that providers need for safe and effective delivery of care.
- The eHealth Ontario Agency has stayed focused on clinical transformation and demonstrated the power of 'can-do' collaboration across the province.
- The Agency has contributed to the creation of a legal framework that benefits all participating providers.
- Ontario should embrace a vision for 'One Patient-One Record-One Portal' with a platform for population health analytics. This will enable us to achieve all the aims in the *Excellent Care for All Act (ECFAA)* and Bill 41: *The Patients First Act*.
- Moving forward, future investment in the Province's digital health technology should be specifically positioned to deliver on the goals and objectives of ECFAA and Bill 41 and agencies such as Health Quality Ontario (HQO) and Cancer Care Ontario (CCO). This is optimally done through strategic partnerships.
- There is an opportunity to more tightly *align* the Ministry of Health and Long Term Care (MOHLTC) eHealth Secretariat reporting relationship with the Ontario Public Service (OPS) Chief Digital Officer role *rather than create new positions* within the MOHLTC.   This enables a coordinated approach to address common themes and digital standards within the OPS.
- Provincial ehealth assets should not be evaluated in isolation. These assets should be examined together with physician office electronic medical records (EMRs), hospital information systems (HIS) and population health management services in the community working together to reap the full value of the investments to date.
- ehealth assets can provide an 'open for innovation and secure for privacy' ecosystem. The timing is right to leverage the data and infrastructure to support entrepreneurs who are committed to developing new technologies in the digital health innovation space.

- The regulatory barrier that currently exists around secondary use of data for population health analytics (both descriptive and predictive), measurement of quality, research and innovation is undermining the long-term value of the assets.
- New technologies and new business models can integrate with and deepen the value of investments currently in place. Ontario needs to guard against a 'sunk cost bias' that may constrain the transformative thinking that could stem from more progressive approaches. Alignment of digital health deployments with incentives to improve patient care, quality and outcomes are the way to overcome this challenge.

We appreciate the opportunity to contribute to this important conversation and will continue to make every effort to engage in advancing Ontario's digital health strategy.

About UHN

UHN is one of Canada's largest research academic health sciences centres and our more than 15,000 employees and physicians share a common purpose of transforming lives and communities through excellence in care, discovery and learning. Above all else, our primary value is that the needs of patients come first. As a teaching and research hospital we pride ourselves in leading medicine through discovery, innovation and education. UHN is highly engaged in the local, regional, provincial, national, and international community. These activities include supporting the health care teams around us (e.g. Community Care Access Centres, family health teams), engagement in provincial agencies (e.g. Cancer Care Ontario, Cardiac Care Network), partnering with remote communities (e.g. Thunder Bay, Sault Ste. Marie), and engaging in international health care projects (e.g. Toronto Addis Ababa Academic Collaboration).

The UHN Telehealth Program has been recognized internationally for innovation in process and technology to improve access and quality care for patients requiring our interprofessional expertise locally and at a distance. Programs such as the provincial Home Total Parenteral Nutrition Program and the national Lung Transplant Program have imbedded virtual care pathways for a significant proportion of their patients with improved patient satisfaction and outcomes. Current initiatives include virtual visits with patients in their homes and remote monitoring. UHN also has a long and strong track record of innovation in clinical practice (e.g. ISAEC program), technology creation (e.g. eFilm viewer), developing new paradigms in education (e.g. Surgical Telesimulation) and advancement of basic science (e.g. discovery of the cancer stem cell).

UHN is a leader in information technology (IT) and implemented one of the country's first electronic patient record systems nearly 30 years ago. UHN was Canada's first academic health sciences centre to implement computerized physician order entry (CPOE), reducing patient adverse events by more than 50% and driving clinical productivity and efficiency for its health care providers. During the mid-2000's, UHN led the "SIMS Partnership" IT shared services organization, where multiple hospitals and the Toronto Central CCAC jointly implemented a shared electronic patient record and related clinical systems to support clinical integration across the continuum of care. Building on its large-scale project delivery capabilities, system interoperability expertise and long-standing collaboration with health care

leaders to bring about system-wide change, UHN was asked by the Province to lead the ConnectingGTA program. This major ehealth program, which begun in 2011, is the largest health information exchange in Canada built and deployed to serve the 6.75 million citizens and tens of thousands of health care providers in the six Local Health Integration Networks (LHINs) in the Greater Toronto Area. ConnectingGTA served as the cornerstone architectural and clinical engagement model for the Province's longitudinal electronic health record (EHR) strategy, now renamed ConnectingOntario.

The combination of this experience in information technology and our focus on the patient provides a powerful perspective from which to evaluate the assets established by the Province through eHealth Ontario.

UHN's Experience with eHealth Ontario

UHN has worked extensively with eHealth Ontario (eHO) since its inception in 2008. While eHO has changed leadership numerous times since then, the Agency has provided continuity of service and ehealth leadership over the years. Of note, the current senior leadership team is the most strategic and focused on value for money to-date – more than any other leadership team since its inception. Today, there is a strong "can-do attitude" and focus on driving clinical transformation, not just implementing IT solutions for IT's own sake. This is both refreshing and welcomed by the health care community. In the future, this linkage needs to be even tighter if the full cost of digital health assets is going to deliver value to the patient.

The leaders at the Agency recognize the importance of partnering with key health care provider organizations, vendors and other entities to achieve shared goals and complement their own skills. In particular, the eHO leaders recognize their distinctive competencies in large system infrastructure operations management and system performance. But they also recognize that they need to partner with clinicians from outside the Agency to ensure that system design and implementation and adoption plans meet the needs of the sector. The Agency has rigorous project controls in place that pay on achievement of deliverables.

Despite the many setbacks faced by the Agency, eHO has led the achievement of important ehealth milestones for the Province, and should be recognized for its resilience and perseverance.

The Value of Ontario's ehealth Assets

Presuming that others will enumerate the inventory of ehealth assets and project achievements over the past decade, this report will not restate those facts. What UHN believes should be emphasized is the current clinical impact and future potential of the rich base of connectivity assets and real-time record level patient datastores that have been established through the work of eHO. Most notably, the connected datastores that are now part of the ConnectingOntario longitudinal EHR (acute and home-care, labs, diagnostic imaging, immunizations and drug data) enumerate point-of-care interventions that depict relationships and workflow between providers.

The Impact on Care Providers: In our experience, these investments have significantly improved the ability of care providers across the Province to access data they need to deliver safe and effective health care. The ConnectingGTA platform connected providers to the health records of 6.75M Ontarians across more than 750 Health Care Organizations, 6,200 Family Physicians, 6,900 Physician Specialists, and 49,900 Nurses. The ability to link and locate information from a patient's distributed interaction with the Ontario health system is impacting the care and health outcomes of patients each and every day across the GTA.

More than Technical Work: Establishing the technical infrastructure is necessary to allow improved health data exchange, but it is *not sufficient on its own* to enable the aims in ECFAA and Bill 41. The MOHLTC in partnership with eHO led the development of the legal framework to allow individual provider organizations to share their data in a rigorous, privacy-protected manner. It is important to note that this type of valuable asset is distinct from provider-driven investments in Ontario and needed a provincial agency to bring it into operation.

Position Ontario for the Future: UHN believes that the true value of the ehealth assets in Ontario is greater than the sum of its parts. The valuation underway by Mr. Clark should take a composite view of the current ehealth asset foundation and new technologies that can work together to address the multiple bottom lines of transforming the patient care experience, managing the health of vulnerable populations, engaging patients and families, and contributing to the future through relevant innovations in technology and processes. Beyond doubt, the digital health strategy of 2016 is our greatest hope for bending the cost curve for the Province's greatest economic challenge – assuring the future health of Ontarians.

Key Data and Information Technology Challenges Facing Ontario's Health Care System

Pressing Need for Investment: According to a 2016 report by PwC, "At least 10% of Ontario hospital beds need new solutions immediately (McKesson hospitals) and up to 47% of hospitals may need solutions in the near future." Replacement EMRs are capital intensive with capital requirements that exceed the capacity of hospital resources.   For example, in 2014, UHN projected the Total Cost of Ownership for the deployment of a new institution-wide EMR was $600M CDN. The MOHLTC convened an HIS Renewal Panel to examine this challenge and recommend approaches to achieve economies of scale but the panel mainly focused on expanding existing installations through "cluster" type delivery models, rather than examining alternative technologies with new business models that could further enable key elements of health policy. Moreover, the panel only considered HIS implementations by themselves, without consideration of important integration with other types of clinical data – most notably in ConnectingOntario – that could substantially increase the return on such investments. Ontario should create a foundation from which to move to population health supported with robust analytics capabilities that enable individual care plans for high needs, high costs patients, facilitate integration of primary and specialists providers who are jointly managing these patients, and integrate key elements of public health. This is consistent with and could greatly enable the aims present in Bill 41. The Province needs to take a system-level view for future investment in ehealth-related infrastructure. Examining

EMR investment in isolation of an overarching digital strategy will result in significant redundancy and devalue the investments to-date.

No Innovation Ecosystem: Ontario is behind other jurisdictions in developing an ecosystem to support digital health innovation and the creation of start-up companies focused on digital health solutions. This is truly unfortunate considering that we are immersed in what many would consider a period of 'digital renaissance' in health care. Despite growing availability of venture capital and other funding sources, entrepreneurs have repeatedly argued that there are numerous regulatory and system access barriers (privacy, procurement, device regulation, etc.) that make it difficult to implement their solutions in Ontario and Canada, and thus leave Ontario to pursue other markets abroad. Access to the wealth of record-level health care data that now exists in Ontario, is minimal and is not sufficient to create the rich entrepreneurial eco-system that we need to drive economic growth or engage our young innovators. Inventors need help to securely navigate the regulatory environment, to test their solutions in a sandbox that also tests interoperability with other ehealth systems, and to engage in clinical implementation and change management within our health care system that will drive the benefits of thoughtful adoption. Ontario needs to create an ecosystem that is open for innovation and secure for privacy.

Connected Systems and Cybersecurity: Ontario faces a significant cyber-security risk in the health care sector. This is underscored by limited resources available to hospitals to provide state-of-the-art data security for their local IT environments which in-turn materially amplifies the risk for connected systems. Experiences in other jurisdictions clearly demonstrate this risk in health care and its adverse economic and patient care impact. Technological advances are available to greatly mitigate these risks, and some hospitals like UHN are trying to lead harmonization efforts with local partners, but there is no provincial strategy to address health care cyber risk and to protect Provincial digital assets in a coordinated manner.

Sunk-cost Bias: With the annual expenditure on health care in Ontario exceeding $50B and mounting pressure to improve performance and identify efficiencies, the Province needs to take a long-term view on its investment in ehealth technologies and the adoption of new processes. Progressive digital health technologies are rapidly emerging and offer many advantages that will work to bend the cost curve for health care in the Province. We believe there is a significant risk that the existing investments in traditional technologies will bias the strategy moving forward and undermine the adoption of progressive methods and technologies that are transforming more progressive and faster evolving health care systems. Given the scale of investment to-date, it may seem counterintuitive to increase investment from some perspectives, but from the perspective of UHN, this is not the time to slow down or complicate adoption of digital health technologies in the Province.

Evolving Models of Care through the Cloud – Building a Digital Health Platform: Advances in network connectivity and cloud-based software as a service are changing the health care IT landscape and have significant implications for the Province. Industry leaders such as athenahealth™ and SalesForce™ are demonstrating the future of health care through their cloud-based technologies that can connect tens of thousands of providers and support tens of millions of patients in a single web-based instance. A single,

integrated platform and a consolidated view of providers, patients, and quality allows health care organizations to analyze performance across multiple complex clinical programs to identify gaps in care, understand utilization, manage costs, and monitor total population risk. These companies are fundamentally different from traditional software vendors, helping health care organizations connect the needs of the patient with the skills of their provider and having creative compensation methods linked to performance. It provides a remarkable parallel to digital transformations underway in other sectors of the economy, such as the effect of Facebook on commerce and the disruption caused by Uber[TM] in the taxi business. The re-focusing of health care on the customer including extending customer engagement (population health) and assuring customer satisfaction (measurement and reporting of which is now mandated by MOHLTC) are what these technologies were built to enable and support. This is the *digital health platform* of the future.

The Significant Opportunity Facing Ontario's Health Care Leaders

Aligning Action and Investment with Policy: Ontario's health care system and its principles are at the core of what makes Ontario one of the best places in the world to live.   Over the past 10 years the Provincial government has made a series of strategic and tactical changes to assure quality, performance, and sustainability.   The *Excellent Care for All Act* (ECFAA), which came into law in June of 2010, puts Ontario patients first by strengthening the health care sector's organizational focus and accountability to deliver high quality patient care. It helps define quality for the health care sector, reinforces shared responsibility for quality of care, builds and supports Boards' capabilities to oversee the delivery of high quality of care, and ensures health care organizations make information on their commitment to quality publicly available. As part of the Health Quality Ontario's mandate for ECFAA, their Quality Matters initiative outlines a common language of quality and is designed to unite the efforts and goals of everyone in the health system.

Bill 41: the *Patients First Act* is the provincial government's blueprint for the next phase of health care system transformation. The Bill is designed to deliver on one clear health promise – to put people and patients first by improving their health care experience and their health outcomes. The plan focuses on four key objectives:

- Access: Improve access – providing faster access to the right care.
- Connect: Connect services – delivering better coordinated and integrated care in the community, closer to home.
- Inform: Support people and patients – providing the education, information and transparency they need to make the right decisions about their health.
- Protect: Protect our universal public health care system – making decisions based on value and quality, to sustain the system for generations to come.

Taken together, the Provincial government has outlined an exciting and powerful vision for the future of health care in Ontario and, with the *Patients First* agenda, identified the critically necessary drivers for success: the patient-centred perspective, a focus on quality, and controlling costs for long-term sustainability.   With these drivers defined and agencies, such as Health Quality Ontario, positioned to advance the agenda, the significant challenge that remains is in the development of an *operational*

system to inform and support this agenda.   While the Province of Ontario has made significant investments in information technology for health care (the ehealth assets), there has been little to no investment in the technology to support the processes necessary to advance the *Patients First* agenda. Investments in connectivity alone will not guarantee advances in quality. Furthermore, a failure to tightly align the system to advance quality and support health care delivery will undermine all four key objectives of the *Patients First* agenda.

The Province of Ontario is poised to move beyond 'medical record thinking' and 'electronic note taking' in its technology investment efforts and needs to capitalize on next generation technologies and approaches that integrate patient and provider perspectives and align incentives to ensure the *Patients First* agenda is realized. Providers, such as UHN, need to work to align their strategies for digitally-enabled health care with that of the Province. Arguably, these strategies should be one and the same, with potentially different scales of operation managed by different groups. The emergence of cloud-based solutions and population health service offerings has significant implications for the Province.

Importantly, the Ontario Public Service (OPS) has already recognized the need to digitize services for all citizens by creating a new role – the Ontario Chief Digital Officer. This is critical to ensure consistency and coordination within the OPS, along with alignment of strategies across the different Ministry clusters. UHN believes that the digital health strategy must be aligned with the digital strategy for the OPS overall. There is an opportunity to more tightly *align* MOHLTC eHealth Secretariat reporting relationships, *rather than create new positions* within the MOHLTC, with the OPS Chief Digital Officer. This will enable recruitment of top talent in the sector, maximize economies of scale and also support tighter integration of data, standards, and services across the public service.   Areas where standardization is required and would create value include:

- Universal identity management for all citizens
- Consistent privacy policies and cyber security standards
- Coordinated and standardized network architecture
- Migration to cloud-based solutions
- Coordinated approach to integration of blockchain technology in the OPS
- Strategic vendor relationships that offer value across multiple Ministries

We need to move today to establish the linkages between data sources for health, community services, housing, welfare, education, corrections and public health to seamlessly support all Ontarians (not just current patients), and foster population health, preventive care and wellness while enabling a true, citizen-centred approach to digital services.

Beyond Components – Building a Digital Health Platform (DHP): The evolution of health care IT from a data-transmission, storage, and retrieve paradigm to the *digital-enablement of the core business* is beginning after nearly 30 years of experience with health care IT technologies. The traditional definitions of health care IT maturation have been based on adoption of technologies with 'analytics' representing the highest level of performance. These maturation scales drive technology adoption, but

do not necessarily close the loop on incentives and learning as needed to fulfil the Province's *Patients First* agenda. We need to move from defining 'analytical capacity' as success, to having the ability to effectively and efficiently act on the insights in support of the *Patients First* agenda. What we really need is a Digital Health Platform (DHP) that is characterized by 'One Patient-One Record-One Portal' and predictive analytics for population health.

The concept of the DHP provides a framework for health care providers and funders to respond to the evolving primary, acute, and long-term care context in which they are currently emerged. The rapidly changing paradigm for interaction between the hospital and the Toronto Central Local Health Integration Network (TC-LHINs) needs to be considered in any digital health strategy and this model moves the conversation away from 'what software do we buy' to what digital ecosystem do we need to have in place to deliver on the level of quality we are targeting in our health care system.

The valuable assets built through eHO are key enablers for the pursuit of this new paradigm, but further investment in these assets without an overarching strategy as described above will limit the Province's ability to fully capitalize on the quality and efficiency advantages that digital health technologies and processes are bringing to other jurisdictions.

Provincial Strategy on Innovation in Health Care: In addition to addressing the needs of society from a health and health care perspective, the development of a progressive DHP is of critical importance to the stimulation and support of the digital health innovation economy in Ontario. The explosion in digital health tools and applications represents an accelerated period of creativity and innovation that will forever transform health care delivery, medical research, and the education of future health practitioners. Central to the development of this important new sector of the economy is the access to real health care data in real health care settings. Ontario and Canada need to move quickly to advance a state-of-the-art framework for digital health innovation that provides the scaffolding for bright young Canadians to contribute to this renaissance in health and wellness. Failure to do this will result in these young minds and their entrepreneurial spirit migrating to ecosystems that have made progressive decisions and investments in digital health services and policies.

While the global marketplace is incredibly competitive, it is not too late to make decisive investments that retain this talent. Ontario and Canada need to support entrepreneurs and their startup companies at home, which will bring social and financial benefit back to the health care system. Existing innovation assets need to be leveraged and aligned to ensure a competitive innovation marketplace in digital health can blossom in Canada. Communities like MaRS and Communitech need to work collaboratively with the MOHLTC and with the Office of the Chief Health Innovation Strategist (OCHIS) to align health and innovation policy. The MOHLTC's consumer health initiative highlights the type of collaboration we need to foster innovation. While there has been significant investment in the health IT infrastructure in Ontario through eHO and Canada Health Infoway, the economic and innovation benefits associated with these investments have yet to be realized. A major impediment to realizing this value is due to the restriction on these datastores for secondary (administration, learning, and research) uses of the information. A framework for secondary use access needs to be built to ensure the full value of the investment can be realized. Regardless of whether innovation was considered to be part of the return

on these investments, now is the time to make significant efforts to capitalize on these investments by addressing authentication issues, secondary use restrictions, and engaging the Ontario population in conversations on the value of consumer health.

The ehealth assets of the Province of Ontario represent a critical long-term investment for the health care, economic, and innovation agendas of the Province. Moving forward, clear and accountable stewardship of these assets is essential if they are to provide the maximum return.

Summary

The Province has built a necessary and important set of ehealth assets through eHO that are improving the delivery of health care across the Province. Many of these assets would not have been developed without a coordinated provincial vehicle to address the gaps between the various providers that comprise Ontario's health care system. That said, UHN believes that the ehealth assets in this province are greater than the sum of its parts. A true valuation must take a composite view of the current ehealth assets in combination with new technologies and emerging digital health paradigms that can work together to advance Ontario's *Patients First* agenda. This view must evaluate the multiple dividends that will be paid by the investment in ehealth assets including the transformation of the patient care experience, the management of health of vulnerable populations, the engagement of patients and families in care, and the contribution of these investments to the future economic health of the Province through highly relevant innovations in technology and processes.

Our vision for Ontario is 'One Patient-One Record-One Portal' with a predictive analytics platform for population health. The digital health strategy of 2016 is our greatest hope for bending the cost curve for the Province's most valuable asset – the future health of Ontarians. Failure to pivot from the technology-oriented investment strategy to the creation of a *digital health platform* is our greatest risk. We are optimistic that with strategy, governance and commitment, Ontarians are well positioned to benefit from existing ehealth investments. This review is timely and our window of opportunity is narrow.