Learning Health Systems in British Columbia
FOCUS & FINISH - AN ACTION PLAN

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Note to the Reader
This Action Plan seeks to clarify the nature and purpose of the British Columbia Academic Health Science Network (BC AHSN). At the same time, the Plan advances the intent and the goals of the Network. More can, and will, be done to better understand assets and gaps, with BC AHSN working to support the former and filling the latter. This document is not able to recognize substantial work already underway by many individuals and organizations. We seek to work collectively with such individuals and organizations.

This is not a Strategic Plan. As the name suggests, this is a Plan with the intent of causing action. It is meant to create a path that leads to measured improvements in population-level health outcomes. This Plan is meant to be a dynamic document which can and should change with time, and with progressive input on the path towards implementation. Most importantly, this Plan is a call to action. The components are in place. British Columbia could choose to be the highest-performing learning health system in the country. BC AHSN can help to achieve that.
1.0 The BC AHSN Action Plan – Our Remit

The British Columbia Academic Health Science Network (BC AHSN) was initiated by the BC Ministry of Health (MoH) as a strategic opportunity and a path to enable and embed research, teaching, and ongoing professional support across the continuum of health services in BC. Connecting and integrating these sectors as part of a Learning Health System (Appendix 1) promises to improve our Province’s ability to implement system-wide innovations, and to improve health outcomes and value. Our fundamental assumption is:

By connecting and enabling collaborators and partners, and providing infrastructure that is not otherwise available, the British Columbia Academic Health Science Network has the potential of achieving more than any one organization can do on its own and can drive innovation and ‘at-scale’ improvement at the provincial level. Accordingly, BC AHSN sees its role as being a champion and facilitator of innovation, and an engine enabling such innovation, in a high-performing Learning Health System.

In other jurisdictions, population-level change has been studied from the perspective of collective impact and organizational capacity to influence social change. Two factors stand out above all others in terms of being foundational to large-scale impact: a backbone of supports, with a shared measurement system; and, a common agenda, with a shared vision. This does not happen without respectful relationships, at and between all levels. These factors are central to our Plan.

Based on our Network’s progress to date and the strength of our developing integrated organization, BC’s Deputy Minister of Health has directed BC AHSN to develop this Action Plan. This Plan is intended to identify and implement system-wide initiatives that will result in positive transformational change in the BC health system. This Action Plan, as presented, is not meant to replace our developing Strategic Plan, which will be finalized after broad-based input and consultations, and tabled in June 2019. Rather, it is meant to catalyze and quicken action in clinical innovation. As such, it contributes to building the collective vision and to shaping the Strategy of the Academic Health Science Network, as an engine of clinical innovation enabling a Learning Health System.

1.1 About BC AHSN

With linkage to patients, government, health authorities (HAs), universities, professional groups and a host of organizations, BC AHSN’s unique role is to connect and catalyze BC’s collective expertise and resources to deliver high-priority, high-impact innovations into our health system, for the benefit of our Province and its people.

Our Network’s development recognizes the potential for BC AHSN to build this required backbone of supports, capitalizing on the existence of a shared vision and on several strategic opportunities within the provincial, national and global context. These include, but are not limited to:

- A clear set of provincial health priorities upon which to focus and rally system change efforts
- A rich asset base in British Columbia, with many of the building blocks for health system change already in place (e.g. environment, resources, expertise), albeit not always well-connected
- Provincial initiatives currently underway that will directly increase BC’s capacity for system change (e.g. provincial health data platform, provincial clinical trials management system, ethics harmonization linking universities and health authorities)
• Major national funding initiatives that directly and indirectly increase BC’s capacity for system change (e.g. Canadian Institutes of Health Research’s Strategy for Patient-Oriented Research [SPOR])
• Opportunities to support selected existing and emerging key provincial assets (e.g. the BC Emergency Medicine Network [EM Network], Clinical Trials BC, Research Ethics BC, Population Data BC, evidence-based prescribing etc.)
• Connections to a pan-Canadian and global movement of academic health science networks linking and integrating research, health care delivery and health professional education

Stakeholders have been consulted and have confirmed that BC AHSN is uniquely positioned to connect and build upon this base, offering provincial resources and services for implementing health system change (Figure 1). BC AHSN can be a focal point, drawing existing expertise together, amplifying cross-boundary collaboration, and building new services and ways of working that are foundational for learning health systems.

Figure 1: The British Columbia Academic Health Science Network
2.0 Progress to Date

The Board of Directors of BC AHSN was created in 2016. The management has been structured and the organization has the support of the Ministry and continues to develop and add value to its partners. Operating Units, including Clinical Trials BC and Research Ethics BC, are being nurtured and integrated as additional network components. Each of BC AHSN’s Operating Units has, and will have, a distinct role, client base and core activities; however, aligned and together as one expanding family, they form an ecosystem of innovation and activities that are essential components of Learning Health Systems.

The initial and primary focus of BC AHSN has been to oversee the start-up and maturation of the BC SUPPORT Unit, with the support of CIHR, the Michael Smith Foundation for Health Research (MSFHR), the BC Ministry of Health and many other partners. Through the Unit, we have supported data utilization and services and contributed to the health data platform, including efforts to provide easier access to data, methodologic advice, knowledge management and other research supports. The BC SUPPORT Unit has a distributed and provincial model that now includes active regional centres in all regions: Fraser, Interior, Northern, Island and Vancouver Coastal. These regional centres are flourishing and capitalize and build on natural affinities between BC universities (UNBC, UBC, SFU, UVic) and health authorities (e.g. collaboration between Northern Health and UNBC). The pending CIHR SPOR 2.0 application will build on commendable and measurable successes to date. Moreover, it will allow for growth in breadth and depth in regional centres, thereby creating greater linkage and exchange with the BC SUPPORT Unit and expanding the array of supports and services offered by BC AHSN.

Advancement of BC AHSN is boosted by several provincial assets and conditions: a stable and mature health authority structure; a provincial medical school, with distributed education and service models; a vibrant university and health research community, with international impact; provincial “infrastructure” funding and capacity building (BC SUPPORT Unit, Clinical Trials BC, Research Ethics BC, Population Data BC); robust provincial data repositories (Ministry, HAs, EMRs); extensive learning to date in clinical communities (BC and other jurisdictions); vibrant physician and clinical organizations (Rural Coordination Centre of BC (RCCbc), BC Emergency Medicine Network (EM Network)); supportive partner organizations (MSFHR, BC Patient Safety & Quality Council [BCPSQC]); and, an enabling Ministry and Government, which has consistently offered advice and support to BC AHSN and has permitted the Network to get to this stage. What is not, as yet, in this Plan is development of a future Strategy to include the benefits of strong private sector engagement, in such areas as addressing the gap between research and commercialization; new investments; and, push-pull interactions and innovation between industry and the health care system, taking into account the forces at work that will advance virtual care and self-measurement and self-management of illness by the public and patients themselves.
The integrated research and knowledge management services and supports that are in place and will be further advanced, represent the developing backbone of BC AHSN (Figure 2). This backbone, together with the initiatives in our Action Plan, will contribute to a living laboratory, within and among the existing resources and talents, to develop a province-wide Learning Health System (Figure 3 and Appendix 1). The intent is collective impact at the population level and achieving the **Quadruple Aim**: Increase population health; Improve patient experience and outcomes; Achieve value for money; and, Enhance the work life of health care providers.
2.1 Principles

The BC AHSN Action Plan reflects the following guiding and operational principles:

- Based on the culture of a Learning Health System in which evidence informs practice and practice informs evidence
- Enables “top down” - “bottom up” decision-making
- Involves five core stakeholder groups (WHO – Health for All Pentagram) throughout, and as central parts of the change:
  - Patients, family, caregivers and public (community)
  - Clinicians in active practice (health professionals)
  - Researchers and universities (academics)
  - Policy makers
  - Health managers
- Builds on, and makes the most of, current assets and structures; works collectively and avoids unnecessary duplication
- Contributes to the Provincial Health Data Platform; supports timely and value-added analytics and evaluation
- Focuses on the need for strong leadership and engagement for moving research evidence into improved care and outcomes
- Identifies and supports champions of change and clinician leaders
- Mobilizes teams of experts and patients
- Aligns education and training with system needs

3.0 Focus & Finish

In our forthcoming BC AHSN Strategic Plan in June 2019, we will provide greater detail in terms of what we envision in terms of accomplishment and how that vision will be achieved. Moreover, a better understanding of existing assets and gaps will inform our vision and strategy. This Action Plan takes a further step towards that Strategic Plan, and the foundations of our work, focusing on early developments and the building blocks for a Learning Health System, and on identification of initiatives to accomplish policy priorities. We will work with government and health authorities to elucidate and inform provincial priorities, by listening for direction from the five key stakeholder groups indicated in our Principles. We envision a process for selecting specific initiatives, such as the one depicted in Appendix 2.

In this Action Plan, we draw on clear and compelling direction found in the Policy Papers of the BC Ministry of Health, and from the Ministry & Health Authority Bilateral Planning and Action Expectations documents. Moreover, we have paid attention to the Ministry’s Research & Knowledge Management Strategy – Putting Our Minds Together. In doing so, we have made choices which triangulate into an accomplishable agenda for immediate action. We also realize that the potential for successful outcomes will depend on a focused and common agenda. This, of course, compels the requirement for making choices as to “focus,” with a clear eye to achieving a “finish.”

Focus and Finish means choosing and implementing successfully one or more worthwhile provincial initiatives that achieve the Quadruple Aim and support the Learning Health System model. The eventual and specific signature initiatives which will flow from these priority choices will be championed by BC
AHSN. These will be informed by, and develop around, engagement with the clinical and patient communities, and with broad linkage and exchange within the MoH, and including but not limited to, public, private and the social sectors. In all cases, BC AHSN will seek to understand and build on current provincial strengths and assets, and work with those seeking comparable and common goals.

The projects and initiatives will be aligned to provincial priorities. The research and knowledge management support structures for these initiatives are partly in place, through the BC SUPPORT Unit’s regional centres and supports for patient-oriented research. BC AHSN will further support initiatives with measurement and analytics, sharing of results for learning and guidance around program refinements and scaling to provincial levels.

3.1 Priorities

Our Action Plan is targeted at three of BC’s stated priorities:

- Primary & Community Care
- Rural & Remote Services
- Emergency and Surgical Services

3.1.1 Primary & Community Care (PCC):

PCC is a vital component of health service delivery, particularly for chronic disease management. Family physicians, primary health care and allied health professionals are core components of PCC. Working with models of integrated team-based care, such as the Medical Home, patients achieve better outcomes. PCC would benefit from transformative changes – much like transformative changes that have taken place since 1970 have positively impacted hospital and specialty care. International comparisons place us at the bottom of the Organisation for Economic Cooperation and Development (OECD) countries in terms of care transitions and use of electronic records. There are widely-held views that change is needed and wanted in terms of philosophy of care, attachment, practice management, population health in general practice, to name but a few. The window of opportunity is open to change primary and community care in BC and the MoH is providing leadership and direction. In our enthusiasm for change, we should be guided by the characteristics of high performance and we could utilize BC AHSN as a catalyst towards the culture of a Learning Health System, for this and for all priorities.

PCC is a vast component of any health delivery system, and it makes sense to place emphasis on specific areas of focus. For this Action Plan, these will include:

- Healthy Aging in Place;
- Seniors’ Health & Frailty; and,
- Reducing Pharmaceutical Harms

These areas of focus emerged from discussions with key informants familiar with opportunities for improvement, gaps in care and disparities in outcomes. In all cases, we recognize that many individuals and organizations have interest and expertise in these areas. Achieving better outcomes and greater value for money will require the health system, researchers and the quality improvement infrastructure to work collaboratively with measurement and evaluation and sharing of results, all as part of a Learning Health System.
3.1.1.1 Healthy Aging in Place:

A broad range of philosophies and practices are present in the many interesting initiatives now underway in the Province, nationally and internationally, led by respected community leaders, clinicians and clinician scientists. Aging and a focus on enablement will mobilize communities of interest and technologies to support individuals and families. A compelling potential exists, with both existing and asset-to-be invented technologies, for self-measurement, self-management and virtual care, all with a patient-centred goal of aging in the place of choice. The scope of initiatives for this population may relate to home care, respite or new innovations and ways of working; they may be population oriented, such as prevention and home care; or, they may be chronic disease oriented, such as around diabetes, or dementia-friendly services, programs and communities. A special opportunity exists with the current initiative underway in diabetes to provide population-level assessments of outcomes in relation to services and programs. BC AHSN will use the Diabetes Initiative to pursue the organization and use of data that will help inform the choice of specific actions. Diabetes is a useful example in this context, as it is a condition that affects a large number of people, is managed within primary care but inevitably requires coordination with other parts of the health care system. Diabetes is also associated with other conditions as well as clinical and medication complexities – particularly as people age. We anticipate this initiative will identify patterns of care and outcomes that point both to promising practices and to areas where there is clear need for improvement.

3.1.1.2 Seniors’ Health & Frailty:

Canada’s and British Columbia’s population is aging. We can and should be better prepared for it. We can learn from those countries and societies that are demographically ahead of us. Elder-friendly care in the community can and should be valued and advanced in all aspects of engaging older adults. The future is promising in terms of technological support for healthy aging and assisted and supportive care to those with frailty. Frailty is a syndrome characterized by loss of functions and deterioration, which increases vulnerability. Coping with frailty requires and deserves special attention. In repeated observations, frail elderly patients are frequent users of the health care system and drive a disproportionate share of costs. Accordingly, special attention to frailty is an accomplishable and, arguably, a moral imperative requiring special attention and intelligent use of resources. With the will to do so, and with a philosophy of enablement, careful use of technology, and policy and practice driven by measurement and analytics, seniors’ health in BC could be an internationally acclaimed exemplar of a Learning Health System.

3.1.1.3 Reducing Pharmaceutical Harms:

Reducing pharmaceutical harms is about safety and quality. It deserves priority attention as part of a larger vision to optimize pharmaceutical management and prescribing. More can and should be done to build on the already excellent work of investigators, practitioners, the British Columbia Patient Safety & Quality Council (BCPSQC), the Therapeutics Initiative, the Ministry, to name but a few. Collective efforts are necessary to reduce adverse drug reactions, drug to drug interactions, polypharmacy, and inappropriate use of certain drugs in seniors and those with frailty. The primary intent is not cost savings. The intent is to achieve best possible patient outcomes from pharmacotherapeutics and, at the same time, maximal value for money spent on pharmaceuticals.
3.1.2 Rural & Remote Care:

Canada is either populated in clusters near the US border, or sparsely in most other places. Half of BC’s land mass is home to approximately 5% of the population. Accordingly, and for many reasons, health care delivery is a challenge in rural and remote communities – service provision, cost, providers, to name but a few. At the same time, substantial inequities in outcome from our system are encountered in rural and remote locations and in all locations with low socioeconomic status. Central to rural and remote care is special attention and support for First Nations and their communities. There is much to be learned from reconciliation and to be done about achieving better outcomes, team-based care, cultural humility and safety, and new understandings with those committed to improving health and wellbeing of Indigenous peoples and our First Nations communities. BC has a distinct advantage in the work and potential of the First Nations Health Authority and existing organizations, such as the Rural Coordination Centre for BC (RCCbc).

3.1.3 Emergency Care & Surgical Services:

With new configurations for service delivery, such as Primary Care Networks, Urgent Primary Care Centres (UPCCs) and Community Health Centres, there is apparent and renewed emphasis on pre-admission care. BC AHSN is supporting the BC Emergency Medicine Network (EM Network), which is flourishing in terms of engagement and support for policy and practice across BC (Appendix 3). But, the EM Network needs further enhancement to achieve its fullest potential. Thus far, the EM Network has focused on emergency care but is highly motivated to expand its reach and value. The Province is currently planning new primary health care investments, and there is emphasis on the service delivery trajectory before admission to hospital. The EM Network is in an ideal position to contribute to innovation and improvement in pre-admission care. Consider that as one moves from metropolitan to suburban BC, and from there to rural and remote locations, the nature of urgent and emergent services, and their relationship to primary and community care, become one and the same for some locations and practitioners. Hence, there is a need for planned design to be informed by place and context, measurement and, in turn, staged implementation to guide best performance and desired outcomes.

Surgical Services, including obstetrical care, are a provincial priority for BC. While much has been done, there is renewed emphasis in improving quality and access in surgical services. Founded on evidence, measurement and a learning community of surgeons and clinicians, more can be done to support innovation and enable change in such areas as performance measurement, audit and feedback; waiting time management strategies, including single-entry models; process redesign and surgical care pathways, to name only a few options. Surgical services are another vast component of service delivery and focus is warranted. Our emphasis will be on surgical services for seniors and in rural and remote locations.
3.2 Learning Health Systems

A Learning Health System is an integrated health system in which progress in science, informatics, and care culture align to generate new knowledge as an ongoing, natural by-product of the care experience, and seamlessly refine and deliver best practices for continuous improvement in health and health care (Charles Friedman, 2015). The Friedman Model for Learning Health Systems is depicted in Figure 4 and explained in Appendix 1.

![Friedman Model for Learning Health Systems](image)

**Figure 4: Friedman, 2015**

Learning Health Systems are those that are organized to learn at every level of scale, from a hospital unit or a single physician’s practice to an entire provincial system. They require structure, including a number of building blocks such as: robust, comprehensive and accessible data; standardized approaches to measurement, including tools for sharing results and key outcomes; supports for behaviour and culture change, including encouragement of collaborative networks to address priority topics; and stakeholder involvement to establish and maintain trust and appropriate ethical underpinnings.

Clinical networks involving patients, physicians and other care providers, with clinical and non-clinical professionals, have become a successful means of driving innovation and improving clinical outcomes in Canada, and elsewhere. Carefully-designed structures, with strong leadership, using sound processes for quality improvement and scaling to the provincial level, can achieve outcomes in a continuous learning cycle. BC AHSN will support **Learning Cooperatives** of patients, clinicians, researchers and experts within clinical network configurations, as essential components of learning health systems.
The intention behind these Learning Cooperatives is to enable clinical innovation and patient engagement to drive change at the point of care. BC AHSN will be a cohesive force for change in policy and practice, and will champion top-down, bottom-up decision-making by supporting these Cooperatives. Building on the success already achieved by the BC Emergency Medicine Network, a Learning Cooperative will be advanced for Emergency Services. Additional Cooperatives will be considered for Seniors’ Health, and Rural & Remote Care. The intent is to strengthen integration of primary health care, and its interface with emergency services, within a community of interest focused on pre-admission, and community-based care (Figure 5). The expanded EM Network, as a Learning Cooperative, might take on programs to assist UPCCs to improve attachment. Or, it may advance work to identify patients with frailty, and work with the Seniors’ Health Learning Co-operative to advance the philosophy and practices of elderly-friendly care.

![Figure 5: Integrated Primary Healthcare, Urgent & Emergent Services](image)

These Learning Cooperatives will be supported by specific qualitative data collection specific to their function, and by extensive quantitative content, starting with data included in the Ministry of Health-led Health Data Platform. Working with the Ministry of Health and Integrated Data Office of Government, BC AHSN offers an opportunity to contribute to a Knowledge Commons. A Knowledge Commons builds on existing and planned initiatives. It offers the potential for secure, flexible, computational infrastructure, with expert data services and tools for analyzing multi-dimensional data; sharing the results of those analyses; and, archiving the approaches taken. This may include providing connections to other large initiatives, such as the digital supercluster. Perhaps more importantly, through the Methods Clusters already established as part of the BC SUPPORT Unit, BC AHSN is a natural focus for the development of tool sets, methodologies, and capacity to support analytics, research and knowledge management.

Data are central to any Learning Health System, and BC AHSN is positioned to build analytics and information-sharing mechanisms that utilize the health data platform, and that support Learning Cooperatives and a broad-based orientation to using real-time information to guide policy and practice. A number of initiatives have been launched as part of SPOR that are building a foundation for improved
data access and utility in BC, as well as forging relationships that can be leveraged for further work. Formal partnerships have been established with key sector leaders and projects (Clinical Systems Transformation at PHSA/VCH, Health Data Platform and associated streamlining initiatives at the Ministry of Health). It is timely to increase the role and presence of BC AHSN as a cross-organizational and cross-sectoral organization that can facilitate integration of a Knowledge Commons and build an effective network of health data and knowledge management organizations.

BC has unique data assets, including patient-reported experience and outcome measures, that through a BC SUPPORT Unit project (in partnership with the provincial patient-centred measurement initiative) will soon be linkable and available for research. BC is also home to national and internationally recognized clinical, health services, policy, population health, and implementation science researchers. There has been less attention to cross-institutional sharing and supports that make secondary use of data more efficient, and to ensuring that Research and Development (R&D) results in standardized and commonly available definitions and analytic tools. BC AHSN provides the opportunity to create this necessary and missing layer of a Knowledge Commons. Several lines of work are currently in progress. For instance, within the context of our previously-approved Diabetes Initiative, we will advance the culture of a Learning Health System by:

1. Defining the process and mechanisms by which BC AHSN will have ongoing permissions to access and use health data. This will enable BC AHSN to play a role in finding and describing health care system issues, through approaches such as hot-spotting and analysis of variations in health care services use and health outcomes.
2. Assessing the potential utility of establishing ongoing population or disease-based cohorts. Given changing technology, these cohorts may be virtual, depending on the difficulty of acquiring and managing relevant high-value data sets.
3. Developing routine and reusable analytics for quality improvement, evaluation and research. Actionable analytics are a cornerstone of Learning Health Systems. The Ministry of Health, health authorities and researchers all have developed standard definitions, e.g. for chronic disease, or measuring continuity of care, but these are rarely in the form of shared or commonly-accessible analytic code. Establishing routine codes and/or a bank of derived variables or indicators will greatly increase the efficiency and quality of project design and execution.
4. Working with new, high-value data sets central to advancing the Quadruple Aim. While BC’s current data are impressive, there are areas that require further development, for example: routinely available laboratory data, imaging information, and development of secondary use data from electronic medical records in primary, secondary and tertiary care.
5. Developing approaches for communication of information to stakeholders. The patient-centred measurement initiative has highly-developed ways of working with stakeholders, including provision of run charts, communications and education mechanisms to support their use in quality improvement. We will learn from this and identify ways of scaling and routinizing these processes for other clinical, population and service areas, with attention to all stakeholder groups.

While germinated through the Diabetes Initiative, all these areas will be further developed and strengthened through the broader set of activities that will be articulated in the BC AHSN Strategic Plan in 2019.

The Health Data Platform currently in evolution within the Province, government and MoH is designed with the option of having advanced data services and analytics “hosted” by a third party that is neither an academic institution nor health system partner. Under special and thoughtful arrangements, the conditions are favourable for BC AHSN to be a “home” for this and similar platforms, as a value-added coordination and network management function, and not as an information technology service.
Discussion will ensue as to how best BC AHSN can be an asset within the Health Data Platform and support value-added use of data to inform and enable health system change.

4.0 Considering Potential Projects for Discussion

In considering the Priorities, several potential and promising projects and initiatives arise as possible options aimed at leveraging the Learning Health System model and achieving the Quadruple Aim: Increase population health; Improve patient experience and outcomes; Achieve value for money; and, Enhance the work life of health care providers.

Over the next three to six months, a granular approach will be finalized to determine which initiatives are to be implemented in the first phase. This will take into account criteria developed by BC AHSN and what is do-able, worth doing and has the support of clinicians, patients and clinical operations leadership and management (Appendix 6). In the more immediate term, and developing from previous considerations by the BC AHSN Board, we will pursue the aforementioned as well as smaller-scale initiatives around diabetes that will serve as an exemplar for future initiatives. The overall purpose envisaged for the Diabetes Initiative is to demonstrate how clinical, administrative, laboratory and other relevant datasets in BC can be brought together and used to enable the development of data-informed evidence, insights and feedback to researchers, policy makers, health authorities, clinicians, and patients. The BC AHSN Board has confirmed that this initiative presents an early opportunity to advance work in primary care and in data-driven health system transformation. The Initiative has also had enthusiastic support from clinicians and researchers who were interviewed as content experts during its preparation.

5.0 Next Steps

5.1 Resources for Innovation

BC AHSN receives financial resources for operations of $2,000,000 per year from the BC Ministry of Health. These resources will be used prudently in the 2018 and 2019 fiscal years to support the continuing core functions of BC AHSN and this Action Plan. Resources are in place for continuance of the BC SUPPORT Unit, other support structures and current Operating Units.

The initiatives and projects flowing from this Action Plan will require additional resources for implementation and provincial scaling. Two strategies for allocating resources to underwrite innovation are offered for consideration within the 2019 budget: Benefits Realization & Pay-back Model; and, Health Innovation Fund aligned to the Board of BC AHSN. Both are described in Appendix 5.

5.2 Disposition of this Action Plan

This Plan is being submitted, as requested by the Deputy Minister, by September 2018. This is a dynamic document which can, and should, change with progressive input and discussion. It requires further efforts and undertakings to achieve collective understanding and agreement on projects and initiatives, and their nature, and extent of implementation. That said, this is a call to action, which can, and should, commence once tabled. The proposed path forward and next steps are to:

- Receive advice and input from the Deputy Minister of Health before October 2, 2018 - completed
- Make necessary adjustments in the Plan to maximize alignment with the Ministry of Health - in-progress
• Discuss further with the BC AHSN Board of Directors meeting on October 2, 2018 and monthly thereafter by the Planning Committee - pending
• Continue engagement of clinical and patient communities - ongoing
• Present to Leadership Council in November 2018
• Discuss with each health authority and key informants in October to December
• Plan for construction/refinement of clinical networks as Learning Cooperatives in October to December
• Plan review and refine with Ministry and Leadership Council in March 2019
• Launch of Learning Cooperatives on April 1, 2019
Appendix 1: Learning Health Systems

A Learning Health System is an integrated health system in which progress in science, informatics, and care culture align to generate new knowledge as an ongoing, natural by-product of the care experience, and seamlessly refine and deliver best practices for continuous improvement in health and health care (Charles Friedman, 2015). Learning health systems are those that use every patient encounter as an opportunity to learn and improve. Learning health systems embrace research, evaluation, quality improvement and change at every level of aggregation, from wards to institutions, regions, provinces and beyond. Learning Health Systems require people, processes, technology and governance to achieve their objectives. These structures support ongoing learning at scale in three broad areas:

- **Data to Knowledge**: Qualitative and quantitative data are used to understand where the system is working well and where there are gaps. This can range from fundamental research (e.g., development of a new device or intervention) to hot-spot identification of geographic areas with high costs, to engagement with patients and family members on where the system is and is not meeting needs. Learning systems cannot function without routine, organized and available data.

- **Knowledge to Practice**: The use of data in its many forms produces knowledge that then needs to be put into practice to make change. These changes, again, can range from new remuneration policies to support primary care, to changes in list management to decrease waiting times for services, to new care delivery models or human resource deployment. These changes might take place in smaller or larger areas depending on the strength of evidence and extent of the gap or care issue being addressed. Learning systems acknowledge that there is little use of knowledge if it is not translated to action.

- **Practice to Data**: Changes in policy and practice need to be monitored to understand whether what was implemented had its desired effect. The ability to evaluate, or to peruse quality improvement in the process of change, depends on systems that organize and support ongoing data capture, and the feedback of those most involved. Transparency is important, as are collective and agreed measures of success. Learning Health Systems understand that not all changes will be successful, and that continual monitoring and adaptation are critical.
The approach to priority setting and project selection remains to be finalized. Preliminary considerations suggest a need to think broadly in terms of multiple sources of input, with a clear understanding that success in population-level impact requires the support and engagement of patients, physicians, clinicians, and care providers, whose collective voice is heard and supported by system-level decision-makers and policy leaders. BC AHSN has developed and approved 11 criteria to be taken into consideration in selection of projects and initiatives. Moreover, programs and initiatives underway in such organizations as MSFHR and BCPSQC require further iteration of the plan and focused selection of initiatives.
Appendix 3: Emergency Medicine Network

BC EMERGENCY MEDICINE NETWORK

Exceptional emergency care. Everywhere.

A LEARNING HEALTH SYSTEM

108 emergency rooms
2.3M patient visits
1400+ emergency practitioners

A province-wide network that supports emergency practitioners. Successfully connecting ALL 108 emergency departments, it provides BC-relevant emergency best practices to improve patient care.

BRIDGING CARE

- Community Care
- Emergency Medicine
- Acute Care

HOW WE ARE LEARNING

- Implementing functional, real-time, virtual support
- Sharing point-of-care, clinical tools for urban and rural practitioners
- Sharing wisdom from all

STRENGTH THROUGH PARTNERSHIPS

In working with a broad range of diverse partners in government, university, health authorities, and communities, BC EMN supports emergency care delivery and innovation in every part of the province.

BC EMN: A CONTINUALLY LEARNING SYSTEM

- Reducing feelings of isolation for rural health care providers
- Increasing rural recruitment and retention
- Decreasing costs on the health care system
- Reducing morbidity/mortality rates
- Reducing unnecessary transports
- Increasing clinical integration in innovation initiatives
- Increasing safety and confidence for patients and practitioners
- Increasing engagement with Indigenous peoples
- Increasing patient participation

“The BC Emergency Network is the current best practice for the systematic support of emergency care at the bedside in a province.”
Howard Oves, Chairman of the Ontario Ministry of Health, Emergency Services Advisory Council

“It’s a strategy that should be replicated across Canada.”
Ellen van de Sande, Chairman, Canadian Association of Emergency Physicians Rural & Remote Communities

BC EMERGENCY MEDICINE NETWORK

BC SUPPORT Unit

Special thanks to Academic Health Sciences Network, BC SUPPORT Unit, Institute for Health System Transformation & Sustainability, Ministry of Health, Rural Coordination Centre of BC, UBC Faculty of Medicine

www.bcemergencynetwork.ca
connect@bcemergencynetwork.ca
PROVIDING VIRTUAL EMERGENCY SUPPORT IN EVERY BC COMMUNITY

26 cases of real-time support in a single pilot

“The BC EMN can and will help everyone, be it the physician finding information they need at a key moment, or a patient who doesn’t have to take a long drive some place else.”

Ed Martin, BC EMN Patient Partner

VIRTUAL EMERGENCY SUPPORT FOR RURAL COMMUNITIES

In a small town in Northern BC, a 75-year-old man is suddenly stricken with an abnormal heart rhythm.

He can hardly breathe. The local GP practicing emergency medicine has not dealt with such a condition for many years. Fortunately, this happened in a town that was trying out a video support system piloted by the BC EMN.

The physician logged in, and with real-time, step-by-step guidance from an experienced, full-time emergency physician in Prince George, was able to restore the man’s heart rhythm, spare him transport to a faraway hospital, and make it possible for him to go fishing the very next day.

IMPROVING HEALTH OUTCOMES FOR ALL

EVIDENCE-INFORMED CLINICAL SUPPORT

66 members and growing

- Opioid overdose management
- Concussion in children
- Choosing wisely recommendations
- Stroke and TIA recommendations
- Brain injury guidelines
- CT guidelines for a acute headache

REDUCING UNNECESSARY AND COSTLY CT SCANS

A pulmonary embolism – a clot in the lungs – is life-threatening, but easily missed because patients often exhibit vague symptoms, such as chest pain and shortness of breath. The condition can only be diagnosed with a computed tomography (CT) scan, leading many emergency practitioners to order one even if it requires transport to a distant hospital.

The BC EMN was asked by the Ministry of Health to create a concise, evidence-informed clinical guideline that more precisely identifies patients who need a CT scan, and those who don’t — so all patients can get the care they need, and those who don’t need a scan can avoid the inconvenience, cost, and harmful side-effects.

These educational resources are really useful... Several rural physicians have worked with @BCEmergMedNurk on the PECs guidelines to provide a rural lens on clinical ER care...”

Rural Coordination Centre of BC, Twitter June 7

27,563 web page views

1,000 users per month

27 ECs

70 Point-of-care videos

Patient information sheets (multiple languages)
Appendix 4: Project & Initiative Descriptions

4.0: Diabetes Initiative

In fall 2016, in response to a government-wide call for “catalyst projects” that would demonstrate the benefits of linking government data to address important public policy issues, the BC Ministry of Health (MoH) proposed, and was approved, to develop a clinically-validated diabetes data registry that could be used to provide ongoing feedback to physicians and health authorities providing care to diabetic patients, and to design and evaluate new models and approaches to care delivery. Within the six-month timeline of the catalyst project, the MoH was able to link administrative data held by the MoH with health authority data (specifically VCH), develop an information sharing agreement/privacy impact assessment that would allow multiple uses of the registry and develop a mock-up of the kind of clinical feedback that could be provided to clinicians and health authorities for quality improvement purposes.

In September 2017, BC AHSN agreed to act to sponsor the next phase of the project and approved the development of a framework for a diabetes data linkage initiative to demonstrate how clinical, administrative, laboratory and other relevant datasets in BC can be linked to accelerate care, research and innovation.

4.1: Reducing Adverse Drug Reactions (ADRs)

With pharmaceutical management, there will be harms caused by adverse drug and drug-drug interactions. Adverse drug reactions (ADRs) range from minor and incidental to life threatening and may be a direct cause of mortality. The provincial mortality rate from ADRs exceeds that of motor vehicular trauma. It behooves us to lessen the possibility of ADRs and stop repeat occurrences. This research work, using high-quality data from BC, offers a realistic means of preventing ADR recurrences, with promise to develop into a broader range of targets for improved management of pharmaceutical prescribing and usage. Leveraging and complimenting resources such as PharmaNet, the Therapeutics Initiative, the MoH and the work of many researchers in pharmacology, therapeutics, pharmaco-epidemiology and pharmaco-economics, BC AHSN could advance collective actions towards improved prescribing and better value from pharmaceutical expenditures.

4.2: Coordinated activity to support, evaluate and continuously improve Urgent Primary Care Centres (UPCCs) & Primary Care/Emergency Medicine interface

There is a convincing argument for, and expertise in, a staged approach to clinical innovations, with a design-delay methodology to study and refine the design as it is successively implemented in a staged fashion to permit the benefits of refinement coming from the continuous measurement. There will be many innovations introduced, such as Primary Care Networks, Urgent Primary Care Centres and Community Health Centres. Integration of these components of service delivery is essential and will require methods support, continuous evaluative techniques and a variety of supports for policy and practice. The methods for developing and sharing clinical support tools, including guidelines and protocols, simulation training, and point of care supports for urgent and emergency situations developed by the EM Network could be expanded to address unique needs of urgent care centres to ensure the efficient use of resources and delivery of high-quality care in all parts of the province.
4.3: Point of Care Support for Emergent and Life-threatening Conditions

Low-volume settings present challenges in maintenance of skills for dealing with emergency and life-threatening conditions. While the EM Network has made contributions to this to date, more can and must be done to offer point-of-care support to clinicians and teams. In addition, enhanced simulation practice for emergency teams can be advanced to support practitioners in rural and remote settings. This could be accomplished in two ways: provincial resources for best practices, clinical support tools and clinical discussion; and, virtual support by experts to ensure quality of care regardless of setting or experience.

Appendix 5: Funding Innovation

5.0: Benefits Realization & Payback Model

Oddly enough, and without intention, we may penalize efficiency and discourage innovation, if gains made from innovations are solely directed to budgetary savings, or to elsewhere, or unknown parts of the organization. The head room for clinical innovation must come from system and quality improvements, with the benefits being clearly accounted and, in planned cases, a payback model to those responsible for the benefits. Whether or not there is ever actual resource transfer between cost centres in recognition of benefits, is a strategic choice. What is important is that benefits be realized in terms of capture, and then used in strategy and planning. This requires attention to productivity gains and performance improvements, and whether or how to monetize these gains for measurement or payback. This strategy could be better informed from learnings derived from the emerging field of research impact assessment and the CIHR Rewarding Success Initiative, in which BC AHSN is sponsoring three proposals to implement and evaluate interventions in healthcare organization(s) that produce health care cost savings and/or improved health system efficiency. The research/implementation team will receive payback for achieving improvement in outcomes, efficiencies, or reduction in low-value services based on actual (e.g. lower drug costs) or measured but not readily retrievable savings (e.g. reduction in hospital admissions).

5.1: Health Innovation Fund

The Partnership for Research and Innovation in Health Services (PRIHS) in Alberta combines resources from the health system (Alberta Health Services) and the research funding body (Alberta Innovates) of $5,000,000 per year to fund clinical innovation and support their Strategic Clinical Networks. As a means of fueling clinical innovation, and taking an analogous approach by another province, contextualized to British Columbia, the Health Innovation Fund could be created as a system-level expenditure, not added to the planned budget but, rather, taken as a first allocation from it, and prior to distribution to health authorities. The Health Innovation Fund would be earmarked for clinical innovation, at provincial scale. These resources would be utilized to support their contributions to the planned provincial initiatives. The Board of BC AHSN would have governance and accountability over the expenditure of these funds, with input by, and agreement with, the respective and participating health authorities.
Appendix 6: 11 Criteria for Assessment

**British Columbia Academic Health Science Network Criteria for Project & Initiative Selection**

1. **Addresses an issue that is a priority for British Columbia**
2. **Chooses a problem that requires a networked approach (or requires cross-sectorial access/mobilization)**
3. **Demonstrates effective collaboration across institutions and partners and across the domains of research, education, patient care, innovation and implementation**
4. **Builds upon existing excellence and high-quality evidence in biomedical, clinical, public health and health services research generated in BC and globally**
5. **Shows the opportunity to effect transformative change through large-scale implementation, adoption and maintenance**
6. **Demonstrates strong clinical and academic leadership**
7. **Relies on inter-professional teamwork**
8. **Demonstrates the potential to reflect improvement in defined population-based health outcomes**
9. **Demonstrates innovative engagement with industry and the private sector**
10. **Incorporates meaningful involvement of patients, families and the public**
11. **Uses investments effectively and efficiently**