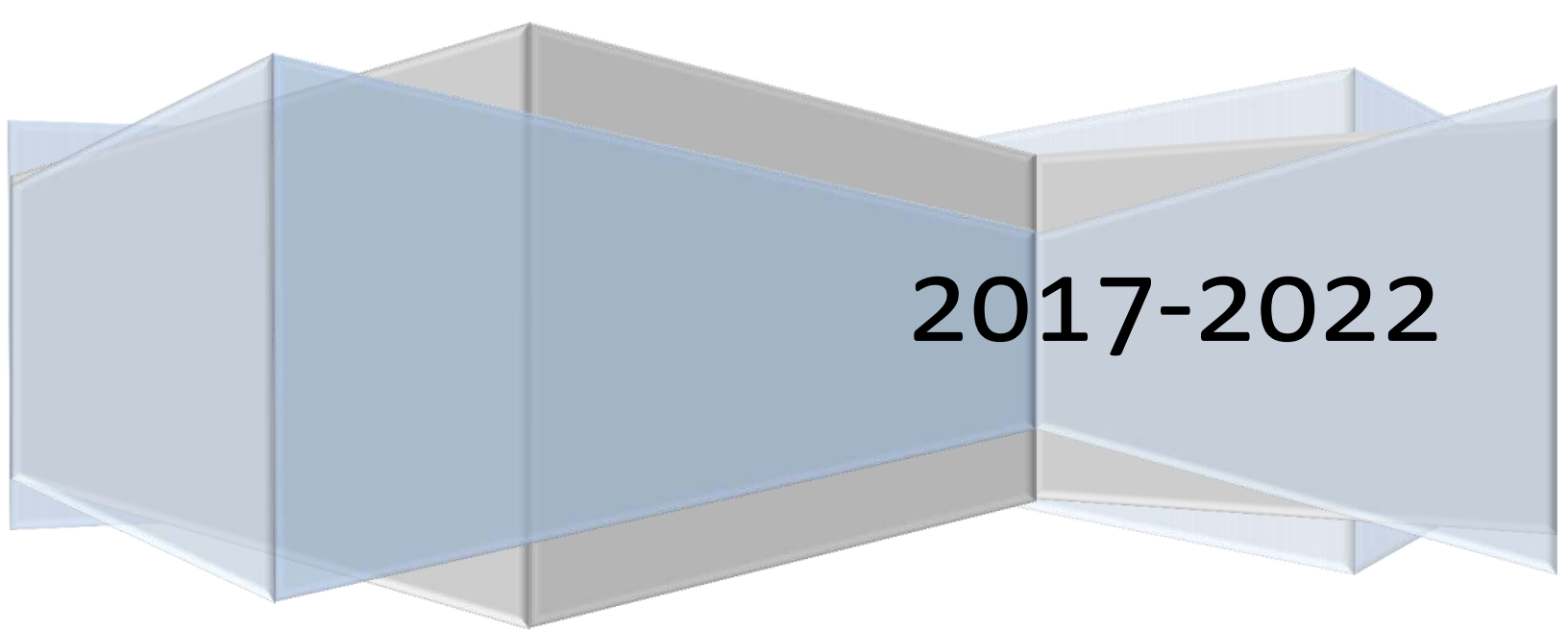


Strategic Research Plan

Critical Care Strategic Clinical Network

Alberta Health Services



2017-2022

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Message from the Scientific Director

In 2009, as part of Alberta's 5-Year Health Action Plan, Alberta Health Services announced the formation of Clinical Networks, bringing together 9 different networks. A second stage was rolled out in 2011, transitioning the Clinical Networks to Strategic Clinical Networks with the main deliverables of improving the health of Albertans and improving the quality of care. The Critical Care SCN was part of this second phase of development, and functions with and within the larger SCNs.

We have made several important achievements since the inception of the Critical Care SCN. The research portfolio was established in June 2013 with initial stakeholder engagement and priority setting at the Jasper Alberta Innovates Health Solutions meeting. This has resulted in a community of 40 active members coming together to support:

- 2 Partnership for Research and Innovation in the Health System grants;
- Critical Care SCN –Canadian Critical Care Trials Group Fellowship Competition (1 awarded in 2014; \$50,000);
- New Investigator Seed Grants (12 were awarded between 2014-2017; \$233,000);
- Critical Care SCN - Alberta Society of Intensive Care Medicine Trainee Competition (33 trainees; 5 awards between 2014-2017; \$2,500);
- 17 partnered research projects led by 11 different PIs (new and established investigators) and representing over \$5.2 million in peer reviewed funding, since 2014;
- 55 peer reviewed publications.

The purpose of this document is both to track and share the progress of our team and the excellent research conducted with in the Critical Care Strategic Clinical Network (Critical Care SCN) and to guide the work and research to meet agreed upon missions, goals and values. With continued advice from our research team and network members we strive to implement the goals we set out in this document. The following document maps the goals and mission of the Critical Care SCN from 2017-2022. Our aim is to grow and evolve as a community into a leading national network in critical care research.



H.T. Stelfox Md. PhD.



1. Introduction

The Strategic Research Plan outlines the goals and priorities of the Critical Care Strategic Clinical Network (Critical Care SCN) for the current term, 2017-2022. The overarching aim of the Strategic Research Plan is to present the role research will play in the Critical Care SCN and how research will help the Critical Care SCN achieve its' strategic objectives. The main purpose of the Strategic Research Plan is to outline the research plans and goals for the 2017-2022 period and to provide a framework to evaluate the effectiveness of the objectives each year. We plan to revisit the Strategic Research Plan annually in order to provide an opportunity to measure success in our short term goals while also measuring the progress of programs in an ongoing way. It also ensures that our goals and objectives are monitored on an ongoing basis so that the Strategic Research Plan is updated in response to evolving and emerging priorities.

2. Background

About the Strategic Clinical Networks:

Created in 2011, the Strategic Clinical Networks (SCNs) expanded the role of the provincial Clinical Networks in Alberta by prioritizing research innovation and outcomes evaluation. As multidisciplinary groups, the SCNs are mandated “to develop a focused provincial health research program in collaboration with academic partners and...to create new knowledge and translate it into measurably improved health care for Albertans.”ⁱ In order to achieve this directive, the SCNs are expected to access provincial, national, and international research support to execute the mandate. Multi-organizational collaboration ensures that SCN goals (developing health research capacity and executing prioritized population-specific basic research; applied clinical research; health services, systems, and policy research; and/or population and public health research)ⁱⁱ can be achieved. Alberta Health Services established a set of six measures for the evaluation of research. The impact of research within the SCNs is measured by the outputs from six categories: (1) creating new knowledge; (2) creating research capacity; (3) informing decision-making; (4) providing health benefits; (5) improving health system effectiveness and efficiency; and (6) providing broader economic and social benefits.ⁱⁱⁱ

About the Critical Care Strategic Clinical Network:

The Critical Care SCN research priorities are based on the needs of its populations of interest. We define “population of interest” as critically ill patients requiring assessment and/or treatment from critical care medicine services and the people, this includes both those patients admitted to an ICU as well as those who receive outreach services in the form of evaluations and therapies. As such, the Critical Care SCN will focus on the first three research categories as outlined by Alberta Health Services: creating knowledge, creating capacity and informing decision-making to improve the care of critically ill patients. In addition to these goals, the Critical Care SCN seeks to expand on them. Partnership and collaboration are important to both research and innovation. Equally as important are the strategies to share outcomes and findings from the work we do with all stakeholders. For example, the Critical Care SCN will develop new research knowledge and will also facilitate Knowledge Translation (KT), which the Canadian Institute of Health and Research defines as “a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the health care system.”^{iv}

The Critical Care Strategic Clinical Network has embedded research and innovation within the SCN to ensure evidence contributes to achieving its goals. This strategy rests on the understanding that networks are a tool for integrated knowledge translation and ongoing collaborative identification of issues, developing solutions, implementing plans and evaluating our work. As researchers and innovators, we

lead research and partner with patients and their families, students, researchers and organizations in order to improve the health of Albertans through the development, execution, and implementation of research. The Scientific Office of the Critical Care Strategic Clinical Network was created to lead Alberta Health Services (AHS) in the promotion, adoption and diffusion of evidence-based innovation to drive decision-making in critical care medicine.

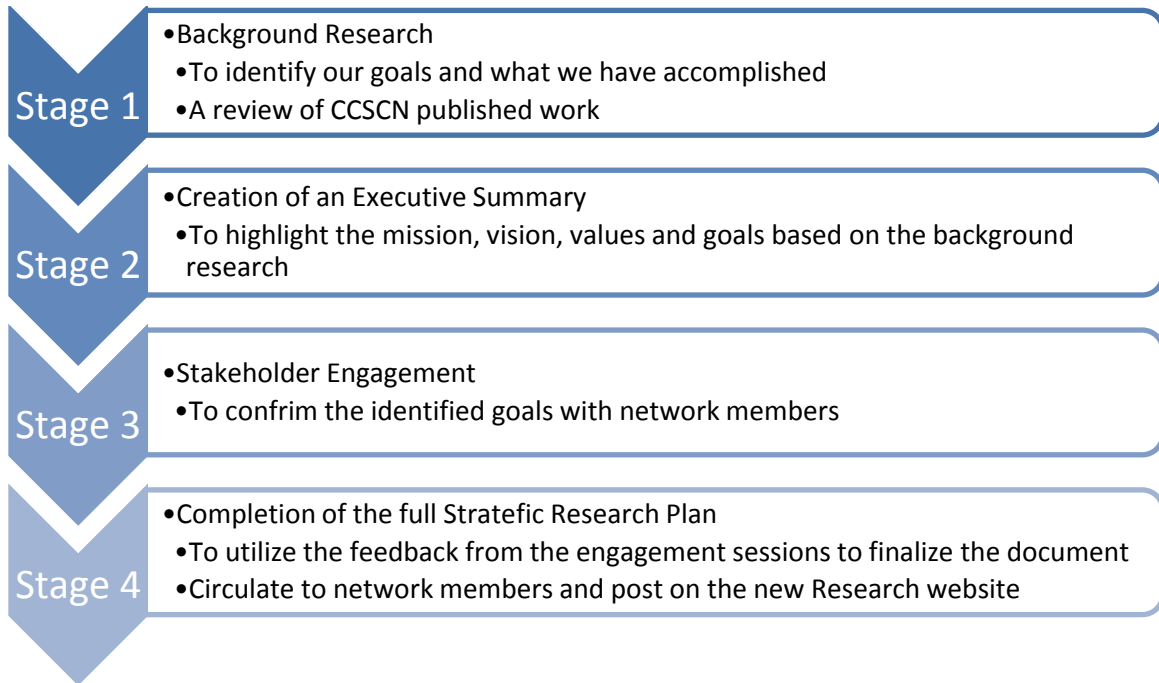
Scope of our Network

The SCNs have a specific mandate to develop a focused provincial research program in collaboration with academic partners. The early integration of research and innovation is important. Key academic stakeholders contributing to the research and innovation work within the Critical Care SCN include researchers at educational institutions throughout the province, collectively known as Campus Alberta. This collective includes such academic institutions as, the University of Alberta; the University of Calgary; the University of Lethbridge; and national and international collaborators. Academic Researchers will be engaged with the Critical Care SCN through invited meetings, presentations, workshops and funding opportunities.

The Critical Care SCN's network also includes key external partners. Key external stakeholders contributing to the research and innovation work within the Critical Care SCN include, but are not limited to: Canadian Institute of Health Research (INMD, IHSPR, IPPH); Alberta Innovates (AI); Alberta Society of Intensive Care Physicians, Canadian Frailty Network (CFM); Canadian Critical Care Trials Group (CCCTG); various charitable foundations; and several professional associations (e.g., The Canadian Association for Critical Care Nurses). In addition to these partners, Alberta health services decision-makers, clinicians and front-line staff as well as patients and their families are also key stakeholders contributing to the research and innovation work of the Critical Care SCN.

3. Process: Developing the SRP

Developing the Strategic Research Plan was an iterative, multi-stepped process. The following sections detail pieces of this process. This section provides more detail on the work as a whole.



The process to develop this SRP involved background work, including a review of other Strategic Research Plans from the other SCNs. We also sought to include information from our stakeholders with regards to direction and design of the SRP. This research was pulled directly from major Critical Care SCN led studies that engaged diverse stakeholders representing the SCN (patients, patients family members, providers, decision-makers, researchers) to identify priorities for research and quality improvement. This research included SCN identified research priorities from the evidence-care gap PRIHS project. We reviewed this list as part of the process to establish the Strategic Research Plan.

An executive summary, outlining the goals and priorities of the Critical Care SCN, was developed and presented to stakeholders in January of 2017 at the Alberta Society of Intensive Care Physicians (ASICP) -CCSCN Annual Winter Meeting in Lake Louise, in order to confirm with our members that these are reflective of the direction we want to pursue. Following that meeting, another stakeholder engagement session was held in February in Calgary. In addition to these meetings, electronic copies of the Executive Summary were circulated to the entire Research Advisory Committee for feedback. We used these opportunities to: confirm our goals, define how the goals should be implemented, how they should guide our work and identify ways to improve and measure the goals themselves. All feedback has been reviewed and applied to this document.

4. Background Research: Identifying Priority Areas

In order to understand the role of research in the Critical Care SCN, how research can support the Critical Care SCN's strategic objectives and decide how to prioritize research, the Critical Care SCN worked to identify key themes/goals/directions from the network itself. Over the course of the last few years, the Critical Care SCN has embarked on several large-scale studies related to the experience of Critical Care in intensive care units (ICUs).^v Each study required researchers to gather information from stakeholders, including but not limited to patients, former patients, providers, decision-makers and the larger care community. Through engaging with various stakeholders for these various projects, key care gaps were identified. These gaps represent areas for further work and study, but also provide valuable direction for the Strategic Research Plan itself. For example, current studies^{vi} identified several priorities related to improving the experience of care in critical care:



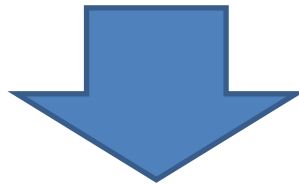
After a scan of provincial and national research publications, we also identified opportunities to advance research in critical care medicine. Globally, clinically relevant and reproducible innovation (novel solutions developed from applied research or knowledge translation) in critical care is uncommon (13 diagnostic/therapeutic practices since 1950). Nationally, despite expertise in critical care research, Canada's contribution to high impact ICU publications has declined relative to other nations (rank #2 1980-89, rank #5 2010-). Locally, few ICU patients (194/10,567) and providers (26/123 physicians) participate in research (2015 Alberta data). The result is suboptimal care because there is too little

innovation to meet evolving patient and health system needs. These data highlight the opportunity for the Critical Care SCN to contribute important research towards improving the care of critically ill patients.

Finally, after engaging with the network both at the ASICP-CCSCN meeting and at a Calgary Research Advisory Committee meeting, we heard from our members that both data liberation (easier access to data) and additional forms of funding (outside of grants etc.) were also essential to the network's continued success.

Taken together, the feedback from the various sources has shaped the Critical Care SCN priority areas. The Critical Care SCN has identified the following Strategic Research Directions:

- Supporting evidence-informed decision making within and across the SCNs;
- Leveraging partnership opportunities for SCN priority areas;
- Promoting Patient and Family Centered Care (PFCC) across the network;
- Enhancing research presence and culture in Alberta;
- Engaging academics in SCN research priorities by encouraging and facilitating integrated knowledge translation;
- Championing the role of research and innovation in providing a high-quality sustainable critical care healthcare system.



While the needs, interests and priorities of the Critical Care SCN are diverse. They represent three areas:



5. Strategic Research Directions: Moving from Priorities to Goals

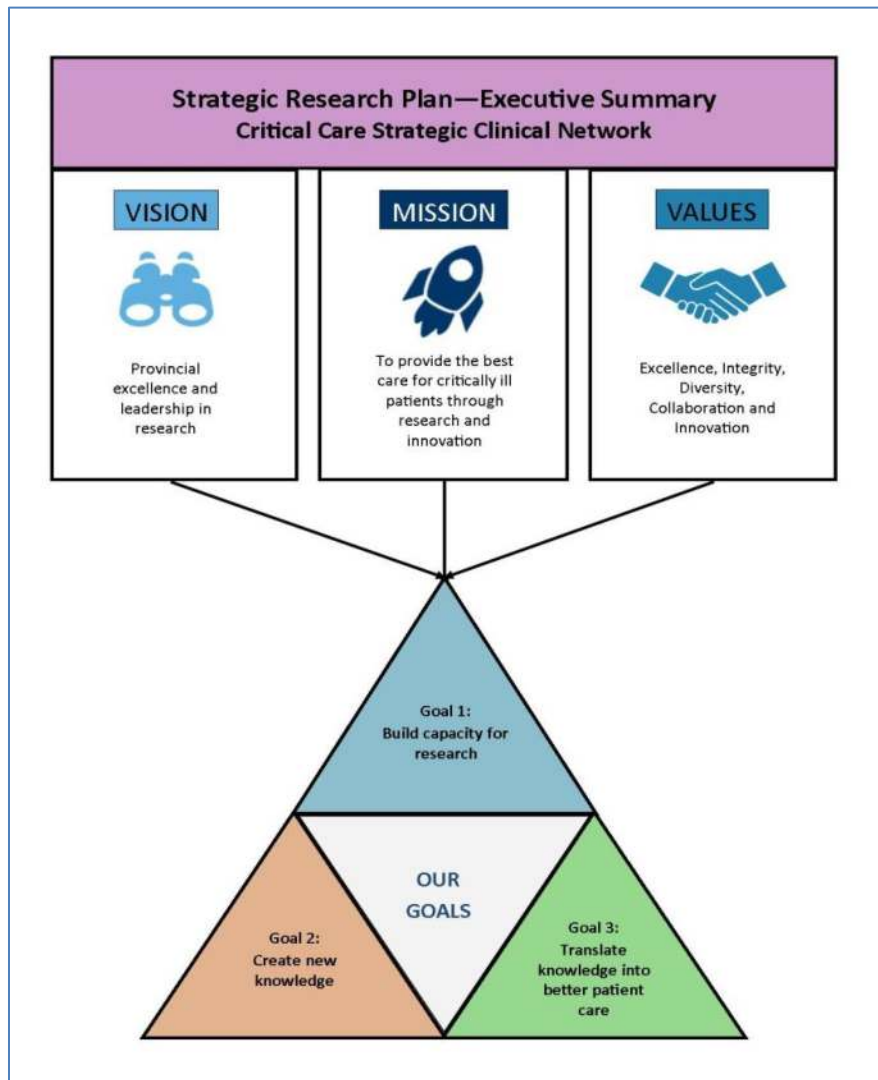
Members of the Critical Care SCN seek to “be a recognized as leaders in the provision of optimal, sustainable, patient and family centred critical care across the health continuum.”^{vii} To achieve this goal, the Critical Care SCN has identified values, a mission and a vision which serve to steer our work:

Values: **Excellence, Integrity, Diversity, Collaboration and Innovation**

Mission: **To provide the best care for critically ill patients through research and innovation**

Vision: **Provincial excellence and leadership in research**

The priorities, values, mission and vision jointly informed the creation of 3 overarching goals. This information was translated into an executive summary (below) and vetted by our community of stakeholders.



6. Critical Care SCN Research Goals

Establishing research priorities is a requirement of all SCNs. Indeed, as the *SCN Primer* articulates, the SCN “research priorities will be established and revisited regularly based mainly on demonstrated need(s) of its populations of interest.”^{viii} As such, the Critical Care SCN will work to ensure that research priorities will “provide strategic value that promotes health, economic and/or social benefits for Alberta.” Resting on the research, engagement and feedback received, we identified three main goals. These goals, summarized in the following executive summary, illustrate not only 3 individual objectives but 3 interrelated and interconnected ideas. The following section details each goal in more specificity.

Goal #1: Build capacity for research

Definition: is the ability (human and financial resources, organizational structure, standardized processes) to define problems, set objectives and priorities, conduct sound scientific research, build sustainable projects, and identify solutions to key research problems.

The oversight for building research capacity will come from the Critical Care SNC Leadership, including the Scientific Director and the Assistant Scientific Director. The leadership will ensure the operationalization of the plan. The Critical Care SCN will assemble a [Scientific Advisory Board](#) to inform the Scientific Director and Assistant Scientific Director in all matters related to research and innovation. The Critical Care SCN will ensure that research and innovation conducted within the Critical Care SCN aligns strategically with the needs of the SCN.

Strategy: To build strategic partnerships and pursue opportunities to collaborate. Develop and mentor young investigators in critical care research. Provide current and future trainees with advanced skill development to ensure Albertan researchers are competitive. Increase awareness of partnering opportunities with the Critical Care SCN. To establish a networked community of collaborating researchers, decision-makers, knowledge users and other stakeholders with the shared vision of ‘provincial excellence and leadership in research’. The Critical Care Strategic Clinical Network will be a leader in critical care research and to also promote an environment of sharing knowledge and learning with all stakeholders.

This strategy will also include mentorship and research support:

Mentorship

Members of the Critical Care SCN are committed to supporting the development of research skills. Research skills relevant to a career in Critical Care Medicine may involve, but are not limited to, various methods or topics. Undergraduate students, graduate students, medical students, interns, residents, fellows, and faculty members will be supported and mentored by members of the Critical Care SCN.

Research and innovation project-based support

The Research Priorities and Implementation Portfolio (Alberta Health Services) will provide support with research proposal development, data and data analyses, knowledge translation, and other logistical aspects of research.

Examples of what we do:

1. Quarterly province-wide interdisciplinary critical care medicine research meetings
2. New Investigator Seed Grants (12 were awarded between 2014-2017; \$233,000)
3. CCSCN-CCCTG Fellowship Competition (1 awarded in 2014; \$50,000)
4. CCSCN-ASICP Trainee Competition (33 trainees; 5 awards between 2014-2017; \$2,500)

Measuring Success: The success in meeting this goal will be measured according to a set number of outputs. Metrics evaluated will include, but not be limited to the number of:

- public lectures/event held, as well as people attending our research meetings/presentations;
- patient/family advisors engaged with the Critical Care SCN;
- grants applications we support;
- frontline staff engaged in a research project/activity;
- critical care stakeholders participating in a critical care research project (as a participant, researcher or knowledge user) each year.

Goal #2: Create new knowledge

Definition: The formation of new ideas, new concept, and innovative processes through exceptional research.

Strategy: Support the creation of knowledge that will improve the care of critically ill patients and the experience of their family members' experience. Support research aimed at implementing best practice, including clinical care pathways. Broker research funding partnerships in Critical Care SCN priority areas. Provide expert scientific advice to mentor and support collaborating health researchers. Support funding applications that directly address the Critical Care SCNs priorities.

Examples of what we do:

Facilitate and conduct research in all 4 pillars of health research:

- 17 partnered research projects, which represents 11 different PIs (new and established investigators) and over \$5.2 million in funds, since 2014.
- 55 peer reviewed publications and another 20 manuscripts are under review of have been accepted for publication in the 2015-2017 period.

Measuring Success: In order to demonstrate a track record of publications and meeting presentations among Critical Care SCN collaborating researchers. The success in meeting this goal will be measured according to a set number of measurable outputs. Metrics evaluated will include, but not be limited to the number of:

- patient and family-oriented research projects;
- research trainees engaged with the Critical Care SCN;
- new investigators engaged through the various opportunities; grants awarded in each pillar;
- manuscripts submitted/published out of the grant funded work;
- Critical Care SCN members who participate in dissemination presentations;
- webinars delivered and number of attendees at webinars;
- grant applications applied for because of the work funded by the new investigator competition.
- results of a media citation analysis conducted each year to determine the level of visibility of Critical Care SCN work.

Goal #3: Translating knowledge towards better patient care

Definition: dynamic and iterative process that includes synthesis, dissemination, exchange and ethically-sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the health care system (CIHR; www.cihr-irsc.gc.ca/e/29418.html)

Data-driven and evidence-based delivery of health care services is pivotal to AHS operations. The Scientific Office of the Critical Care SCN will champion the role of research within the Critical Care SCN and AHS. The value of research will be shared with AHS administrators, decision-makers and frontline clinicians through speaking engagements, conference presentations, newsletters, advisory committee membership etc. The Critical Care SCN Scientific Office advocates for methodologically sound and rigorous evaluation of projects supported by the Critical Care SCN.

Strategy: The collaboration, co-creation, implementation, dissemination, sharing and exchanging with stakeholders undertaking research projects in Critical Care SCN priority areas. To identify, promote, and advocate for evidence-based solutions to address key challenges in critical care. Develop and implement knowledge translation strategies to facilitate uptake of new knowledge. Foster collaborations between basic, clinical, health services, and population health researchers. Facilitate research focused on identifying and overcoming barriers to implementation. Promote the dissemination of knowledge provincially and nationally. Facilitate the implementation of knowledge into practice across the province. Foster collaborations and partnerships between researchers and other stakeholders, especially patients.

Examples of what we do:

1. Engage frontline providers and stakeholders across SCNs in the translation of science into patient care.
2. Facilitate implementation and evaluation of best practices in Critical Care medicine in Alberta.
3. Disseminate research findings provincially, nationally and internationally.

Measuring Success: In order to demonstrate a track record of publications and meeting presentations among Critical Care SCN collaborating researchers. The success in meeting this goal will be measured according to a set number of measurable outputs. Metrics evaluated will include:

- number of submitted funding proposals aimed at knowledge creation/dissemination;
- new implementation tools generated from research;

- new evidence-informed clinical care pathways generated from research;
- peer-reviewed publications; highly cited publications; publications in high-quality outlets (or desired outlets);
- conference abstracts; conference presentations; and presentations at other meetings/conferences core; committee meeting we present at per year.

7. Communications Plan/Knowledge Translation

The Critical Care SCN will participate in Knowledge Translation (KT) in order to increase the visibility of the network's research studies. KT will happen through publication in peer-reviewed journals, presentation at conferences, and by engaging with the community.

Initially, it was unclear what way was best to accomplish increasing the Critical Care SCN's visibility, through either the creation of a Critical Care SCN website or other social media tools. To find out what would serve our network the best, a survey was developed^{ix} and circulated. The highlights of the survey revealed that a website with social media was felt to be the best way forward:

Survey results represent physicians, researchers, clinical scientists, MDs, Quality Improvement Leads, professors and PIs from either **Calgary or Edmonton**.

Most respondents either sporadically or never use the Critical Care SCN webpage for information gathering or for sharing related information in the last year. As a result, **93% of respondents believe that increasing the visibility of the Critical Care SCN is "very important"**. Feedback included: "very important"; "incredibly important – otherwise it is difficult to attract new students, collaborators and generate enthusiasm for new projects"; "very important, I see this as essential in enhancing my research program".

The most researched topic on the website was grants (~80% of respondents), with published research and SCN initiatives and opportunities for participation coming in second place (50% each). In addition, the **information that respondents felt would be most useful to current Critical Care SCN members would be about available grants (>90%)** followed by SCN initiatives and collaboration opportunities (>80%).

Currently, Critical Care SCN members share work through: Conferences (abstract/posters/presentations); Publications in peer reviewed manuscripts; Grand rounds; Journal articles; Universities departmental websites; Profile pages on University websites and Email.

The current Critical Care SCN website was deemed to be **not useful with regards to finding research related information (a median score of 2 out of 7)**.

Available grants and collaboration opportunities were felt to be the most useful information that could be posted on a Critical Care SCN website that would prompt more frequent visits. Research postings came in third and posting information about current job postings was the least favored use of the website.

40% of respondents reported that it is very important to find academic and SCN information in one place.

Lastly, in terms of internal media, most respondents indicated that they would both read and contribute to a monthly e-mail newsletter. One third of respondents were **LinkedIn** users and one third of respondents were also interested in using **Twitter**.

Given this information, the Scientific Office of the Critical Care SCN will develop a new website to enhance communication among members of the research community and facilitate knowledge translation.

8. Moving Forward

This document was formed through collaboration and engagement with the network. It has been developed to guide the next 5 years of Critical Care SCN research work. However, this document should respond to the evolving nature of research conducted across the network. As such, each year members will come together to confirm that these goals, priorities and directions still represent the Critical Care SCN's research plan.

Notes

ⁱ Alberta Health Primer (<http://www.albertahealthservices.ca/assets/about/scn/ahs-scn-primer.pdf>)

ⁱⁱ Ibid

ⁱⁱⁱ Ibid

^{iv} <http://www.cihr-irsc.gc.ca/e/29418.html>

^v Stelfox HT, Niven DJ, Clement FM, Bagshaw SM, Cook DJ, McKenzie E, et al. (2015) Stakeholder Engagement to Identify Priorities for Improving the Quality and Value of Critical Care. PLoS ONE 10(10): e0140141. doi:10.1371/journal.pone.0140141; Potestio ML, Boyd JM, Bagshaw SM, Heyland D, Oxland P, Doig CJ, et al. (2015) Engaging the Public to Identify Opportunities to Improve Critical Care: A Qualitative Analysis of an Open Community Forum. PLoS ONE 10(11): e0143088. doi:10.1371/journal.pone.0143088; Gill M, Bagshaw SM, McKenzie E, Oxland P, Oswell D, Boulton D, et al. (2016) Patient and Family Member-Led Research in the Intensive Care Unit: A Novel Approach to Patient-Centered Research. PLoS ONE 11(8): e0160947. doi:10.1371/journal.pone.0160947; and Holodinsky JK, Hebert MA, Zygun DA, Rigal R, Berthelot S, Cook DJ, et al. (2015) A Survey of Rounding Practices in Canadian Adult Intensive Care Units. PLoS ONE 10(12): e0145408. doi:10.1371/journal.pone.0145408.

^{vi} Ibid

^{vii} <http://www.albertahealthservices.ca/scns/Page9437.aspx>

^{viii} Alberta Health Primer (<http://www.albertahealthservices.ca/assets/about/scn/ahs-scn-primer.pdf>)

^{ix} The survey was developed in conjunction with a group of students at the University of Calgary (BTMA 601: Business Technology Management). For more information please contact danielle.demianschuk@ahs.ca.