



BLUEPRINT FOR RESEARCH

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Nova Scotia Health Authority

Prepared for:

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Executive Summary

Health research is a priority for NSHA for the obvious reason that research leads to cures (sometimes) but almost always better ways of achieving our main goal – better health and health care for all Nova Scotians.

This is a critical time for NSHA, now in the third year since its formation. There has been considerable change and there is a need for critical appraisal of what has been done and what needs to be done. With that in mind the President and CEO, NSHA asked the Interim Vice President Research, Innovation & Knowledge Translation to develop a blueprint for research for NSHA.

This blueprint has been developed over six months with a lot of consultation and input from individuals both internal and external to NSHA. There is now an opportunity to have health research flourish within Nova Scotia and return to the community benefits in terms of better health care; decision making based on data and boosting the local economy. There are several reasons for this optimistic forecast; Nova Scotia has the benefit of its manageable size and collaborative culture resulting in significant and enviable alignment regarding health research amongst key entities – Nova Scotia Government, Vice President Research Dalhousie, Faculties of: Medicine, Health and Dentistry at Dalhousie and NSHA and IWK. Critically important as well is the fact that the infrastructure is in place to support this research, along with and most importantly, the highly skilled personnel to do it.

Optimism notwithstanding there are obstacles to be overcome, decisions to be made and a plan to be operationalized in order to achieve our potential. Key to all of this is that the Executive Leadership Team at NSHA own the Research Portfolio.

This report (*Blueprint for Research*) consists of 12 modules, each dealing with various aspects of research at NSHA. The role of the Vice President Research, Innovation & Knowledge Translation needs attention and ways that this can be done are outlined.

Great infrastructure exists in the Central Zone in terms of Research Services. Then too there is the close association with many Faculties at Dalhousie which affords research expertise across a wide variety of disciplines. The same is not true for Zones outside Central. There could be better uptake of the many services offered by Research Services. Within NSHA there is widespread (across all zones and occupational groups) support for research. However the research culture is not what it should be and often is subsumed by clinical demands. In addition there are many barriers to the smooth functioning of a research operation with NSHA. With a modicum of commitment most of these can be removed.

If there is only one module that you read in this report it should be [Module #5-The Missing Link-A Combined Outcomes Research/Implementation Science Unit](#). Such a Unit will help NSHA eliminate unacceptable variations in processes of care. This is also the main reason why NSHA has to have its own research agenda and never assume that others can do this for them.

A realistic budget is necessary to run the research enterprise and a realistic proposal for this has been submitted. There is an opportunity to reap a many fold return on investment which a new implementation science unit could provide. Endowed chairs are key to building any research enterprise. The QEII Foundation has an excellent track record in raising funds for these chairs. Testimonials from some chair holders explain their importance and unique abilities.

The challenge now is to get endowed chairs for the other zones. Foundations in these zones have not been involved in such activities in the past but now is time to open this discussion. In addition, there are chairs which could be considered NSHA wide chairs and all Foundations should collaborate to raise money for such chairs.

NSHA not only supports researchers with services (contract/grant facilitation, education, project promotion etc...), they also provide some internal funding opportunities. The Translating Research Into Care (TRIC) grant program is a relatively new initiative that promotes implementation science. Recently having a team composed of a member from Central and Western Zone has spontaneously occurred and this should be encouraged in the future. The NSHA Research Fund (NSHA RF) stimulates original research taking place at the NSHA. A brand new initiative, the Vice President Research Matching Funds Program (VPR MFP) increases researcher's ability to be competitive in funding competitions that require matching funds.

In addition to expanding research capacity across the province by appointing a research facilitator in management zones other than Central, NSHA is looking to other disciplines than Medicine to do research. Pharmacists and Nurses are leading some research projects but it is highly desirable to expand these programs. NSHA is a provincial organization and as such needs a strong research relationship with all academic institutions within NS. There are some such relationships at present but they need strengthening.

NSHA needs to constantly assess its future and be flexible. Remaining at the forefront is critical in research. Multiple strategies over a 10 year horizon are necessary to achieve this objective. This blueprint identifies some barriers to overcome, some areas to expand and some new ideas but all efforts point to an institution with an engaged, collaborative and quality research enterprise.

Recommendations Summary

Module #1- Vice President Research Innovation & Knowledge Translation (VPR)

1. That the VPR work with ELT to develop the necessary tools to allow VPR to be successful.
2. That the VPR attend two ELT meetings per month.
3. That the VPR be sited within Research Services at the Centre for Clinical Research.
4. That the VPR chair the Research Advisory Committee.
5. That the VPR visit each Zone outside Central at least once per year.
6. That VPR not be eligible to apply for internal NSHA research funding.
7. That VPR have up to 40% of their time for their research.
8. That the VPR have a yearly performance appraisal by the CEO and that researchers have input into this evaluation.
9. That the VPR working with departments ensure that mentoring is available for all new researchers and for any other researchers who need it.

Module #2- Introduction & Infrastructure for Research at NSHA

10. That physicians, health care professionals and those with an interest in research avail themselves of the education offerings and consultation services to help grow research expertise.
11. That all those involved with Quality of Care Projects consult with RMU re research design and methods, data management, data presentation and analysis.
12. That Research Services hold consultation sessions with researchers to determine what new supports are needed.
13. That the redevelopment team work to ensure that the research and education mandates of NSHA are provided for as infrastructure changes occur with the QEII redevelopment.

Module #3- Research Culture at NSHA

14. That NSHA leadership articulate that research and education are priorities for NSHA.
15. That Education and Research be part of everyone's job description at NSHA. This can be done immediately for those who are in management positions and at the time of new contracts for others.
16. That Physicians who are Chiefs of Departments work with their members to ensure that they recognize that research is a priority and that they work with their members to make their patients aware that there are research projects available to them in the Department.
17. That the Hematology Division research model be adopted wherever possible.
18. That a specific public relations strategy be developed promoting research and education within NSHA. This should include but not be limited to – signage; research and education on our letterheads, website and other communication materials.
19. That the VPR have an annual award for the team that has improved the research culture within its unit.
20. That opportunities to work within PHIA framework to increase research opportunities for public and patients in NSHA be explored and implemented.

Module #4- The Business Case for Removing Barriers to Research at NSHA

21. That researchers communicate with Research Services when issues are unresolved after a reasonable time/effort.
22. That financial personnel who deal with research finances be sited in Research Services Unit.
23. That proposals needing reviews by multiple disciplines (legal, IT, etc.) be done concurrently with a two month target to completion.
24. That an overarching **Provincial Health Research** plan be developed in conjunction with VP Research Dalhousie, VP Research IWK, Deans Faculties of Medicine, Health and Dentistry, NS Department of Health and Wellness and NS Health Research Foundation that has as its focus, health outcomes and implementation science research.
25. That all those who are in the circle of care promote the research process by asking their patients for permission to be approached by a research staff member to get permission to review their record to see if they are eligible to participate in a research project.
26. That the VPR report to ELT every six months on progress regarding removal of barriers to research.

Module #5- The Missing Link – A Combined Outcomes Research/Implementation Science Unit

27. That NSHA form a Health Outcomes/Implementation Science Team nested within the portfolio of VPR.
28. That the ELT formulate at least two research questions per year – one will be answered by the Health Outcomes/Implementation Science team.
29. That at least one question per year be advertised to the NS Health Science Community as a call for proposals to answer this question.
30. That up to \$300,000 (cash/in kind) will be available to fund a team(s) to answer the questions posed in recommendation number 28.
31. That a strategy be developed to monitor the outcomes of investigator driven projects, including quality of care projects, and where appropriate, implement province wide those that have the potential to improve care system wide in NSHA.
32. That NSHA consider amalgamating the Quality, Data Analytics and Health Implementation Sciences teams into one unit under the direction of VPs Research and Quality, System Performance and Transformation.
33. That NSHA provide a 3 day workshop in knowledge translation and implementation science as soon as possible.

Module #6- Budget for Research at NSHA

34. That the Health outcomes and implementation science unit – the rationale for this entity is given in detail in the [Module #5 –“The Missing Link”](#) be funded at \$300,000 per year.
35. That contract research to enhance the work of the Health Outcomes and Implementation Science Unit be funded at up to \$300,000 per year. To address prioritizing NSHA research projects each year, we suggest posting a Call for Applications with funding available to address specific research questions. It is anticipated that researchers answering the Call for Applications will come from health-related faculties at Dalhousie and/or at other NS Universities. Matching funds will be needed from the parent university(ies) of the researchers, thereby increasing the number of research projects that can be done. As an alternative, up to three more researchers could be hired as part of the Health Outcomes and Implementation Science Unit. However this is likely a more costly option.

36. Matching Funds to support research are necessary and currently unavailable. Many research funders, such as Genome Atlantic; CIHR and others have grant competitions that require institutions to provide matching funds for projects. At present there is no designated budget for this at NSHA. If we are unable to provide these matching funds, we will not be competitive for many research opportunities. A recommended budget of \$200,000 per year be devoted to support projects that require matching funds. A policy has been drafted and approved by the Research Advisory Committee regarding how to allocate these funds.
37. That bridge funding be available for project teams between grants. The VPR receives requests throughout the year for funding support to “tide researchers over” until the next funding competition so they can maintain their programs of research and pay their staff. Partnerships with the academic departments where the researchers are based can also help extend these funds –The amount of \$100,000 per year is suggested to be available to provide bridge funding when necessary.
38. That funding support for biobanks at NSHA be available. Currently there are several tumor banks at NSHA including: lung; pituitary; myeloma; and a brain tissue bank. Other tumor banks are needed. It is noteworthy that planning is underway for comprehensive strategy re: biobanks. The infrastructure to store this material is in place in the pathology laboratories. Since this material will mainly be used for research, it is reasonable that this cost be included as part of the overall research budget. The amount of \$80,000 per year is recommended.
39. That a fund for graduate students be created at NSHA. Graduate students are essential to growing the research enterprise at NSHA and training the next generation in research techniques that will be beneficial to patients and the health care system. The home for these students would naturally be the Dalhousie Department of Community Health and Epidemiology but as the program expands, graduate students from nursing, physiotherapy, pharmacy would have a home in Dalhousie Faculty of Health. Recommended amount: \$100,000 per year.

Module #7- Research Chairs at NSHA

40. That \$4 million be the amount required for an endowed Research Chair.
41. That all hospital Foundations in NS be engaged in a plan to raise money for endowed Research Chairs through a closer relationship with VPR.
42. That NSHA ELT have input into the discipline(s) for the next Research Chair(s).
43. That the President and CEO NSHA meet with the CEO’s of the various foundations to indicate the preferred disciplines for the next Research Chair.
44. That the Chair in Addictions Medicine be located outside Central Zone – preferably in Annapolis Valley or Sydney.
45. That a plan for Research Chairs in Health (other than Medicine) be developed in conjunction with leaders in NSHA and Faculty of Health.
46. That researchers and NSHA leadership develop a comprehensive plan to recognize and acknowledge the contributions of QEII Foundation and other Foundations and their donors to research at NSHA.

Module #8- Internal Funding**TRIC**

47. That the TRIC program continue, largely unchanged, at NSHA/QEII/IWK with a shared peer-review committee.
48. That TRIC grants outside NSHA Central Zone be encouraged, and that potential TRIC applicants be supported to link with research partners in other Zones in order to build research capacity in the Zones (e.g. a Central Zone researcher and a Western Zone administrator could co-lead a TRIC grant in Western Zone).
49. That the QEII Foundation continue to fund TRIC grants based at the QEII Health Sciences Centre, and that a stable funding source for TRIC grants across NSHA Management Zones be secured.
50. That TRIC research projects requiring IT resources/support/adaptations be considered as important clinical initiatives with potential to improve health care.
51. That Level 2 and 3 funded teams complete:
 - “Exit” interviews with the TRIC program manager and/or VPR to determine project successes and challenges; to discuss next steps for the research and the potential for scaling up successful health system changes in other Zones.
 - A follow up survey with the research and administrative co-leads two years post-project to assess whether the system change has been sustainable.
52. That teams with multiple successful TRIC grants, turn their attention to applying for external funding sources to support further implementation science research.

NSHA RF

53. That NSHA Research Services introduce a post award follow up program. Awardees will be contacted to gather further information on publications, presentations or related larger scale funding resulting from their funded NSHA RF projects.
54. That an Observer Program, similar to NSHRF and TRIC, be created to increase the involvement and education of learners and potential future applicants in the review process.
55. That NSHA Research Services work to Improve Zone representation on the NSHA RF Review Committee by increasing understanding of NSHA RF and executive support outside of Central Zone.
56. That NSHA Research Services facilitate the matching of researchers in Central Zone with those interested in conducting similar research in other NSHA Zones and encourage Central Zone researchers to expand their research to other Zones.
57. That NSHA Research Services review the NSHA RF program every 5 years to review and revisit the purpose of the NSHA RF, NSHA RF Review Committee, the meeting of objectives and identify any room for improvement.

Module #9- Interdisciplinary Research at NSHA

58. That nursing leadership at NSHA form a taskforce in conjunction with their colleagues at Dalhousie School of Nursing and develop a comprehensive plan about how to grow nursing research at NSHA.
59. That NSHA and Dalhousie School of Nursing consider joint nurse researcher hires.
60. That NSHA and College of Pharmacy at Dalhousie consider one or more research pharmacists as joint hires.
61. That ethnobotany be explored as a research opportunity by pharmacists in Eastern Zone.
62. That NSHA and Dalhousie create a research task force to develop a plan on how to grow non-physician-led research at NSHA that is solutions oriented, collaborative and interdisciplinary.

Module #10- Building Research Capacity Outside Central Zone

63. That zone leadership determine what they need in terms of a research program.
64. That **where possible** research experience should be a job requirement for all new NSHA job postings at the Management or Director levels.
65. That a research literacy program be made available to all physicians and employees.
66. That zones outside central each identify and or recruit 2 -3 individuals with research skills and provide them with protected time to build a research program for that zone.
67. That graduates of the health impact fellowship program at NSHA be retained as employees at NSHA to further enhance research.
68. That NSHA work with Doctors NS to obtain an Academic Funding Plan (AFP) for 2 -3 physicians in each zone outside central so that they can spend one day per week on research.
69. That the leadership of zones outside central consider an investment in research each year.

Module #11- Fostering Relationships between Academic Institutions & NSHA

70. That research relationships between NSHA and all NS Universities and Community Colleges be further developed and enhanced.
71. That the appointment process for NSHA affiliated scientists be improved (this is underway) to enhance recommendation #65.
72. That as research relationships with Universities other than Dalhousie mature, agreements re: research overheads and intellectual property ownership be negotiated.
73. That NSHA Zone leaders and Vice Presidents of Research at Universities outside Central Zone prepare a strategy for research collaboration in their zone.
74. That individual investigator collaboration be encouraged across all sectors and institutions to enhance research in NS.

Module #12- Future Directions for Research at NSHA

75. That a task force be formed to develop a plan for Artificial Intelligence (AI) research and implementation at NSHA.
76. That NSHA form a standing task force to advise on opportunities for research and care applications in digital health.
77. That NSHA be a partner in the Integrated Health Research plan for NS.
78. That NSHA develop a plan for systematic patient engagement in research.
79. That NSHA develop a plan for systematic patient engagement in research.
80. That NSHA form a multidisciplinary committee (representatives from legal, privacy office, researchers, information technology, data analytics and Health Data NS) to improve access to patient data.

Module #1 - Vice President Research, Innovation & Knowledge Translation NSHA

The job description for the VP Research, Innovation & Knowledge Translation (VP Research) was developed with input from Research Advisory Committee NSHA, Dean Faculty of Medicine, Vice-President Research Dalhousie and Executive Leadership Team at NSHA. The job description follows and is reproduced here so the commentary that follows the end of the position description makes sense.

POSITION DESCRIPTION

Position Title: Vice President	Portfolio/Program: Research, Innovation & Knowledge Translation
Location: Provincial Office	Zone: n/a, province-wide

REPORTING RELATIONSHIPS

The Position Reports to: President & Chief Executive Officer

Titles and Number of Positions Reporting to this Position:

Direct report:

- Director of Research Services
- Executive Assistant
- Health Outcomes Scientist
- Program Leader, Research Development

Indirect reports:

- Zone Research Facilitators
- Researchers, clinical scientists

PORTFOLIO/PROGRAM AREA

Briefly describe the program area. The description can include whether the services provided are multi-site, multi-disciplinary, provincially or regionally focussed, nature of population cared for, etc.

Nova Scotia Health Authority provides health services to Nova Scotians and select specialized services to Maritimers and Atlantic Canadians. We operate hospitals, health centres and community-based programs across the province. Our team of health professionals includes employees, doctors, researchers, learners and volunteers that provide the health care or services you may need. Partnerships are important to us. We work in partnership with universities, colleges, community groups, schools, governments, foundations and auxiliaries and community health boards. Whether we are hosting wellness programs in the community, conducting innovative research in labs, or helping a patient recover in hospital; we are creating a healthier Nova Scotia.

Nova Scotia Health Authority provides sustainable safe and high quality health care which is accessible, people-centered, promotes health and wellness, and optimizes the health of all Nova Scotians. This is accomplished across four management zones which are responsible for the operation of acute care health centres and the provision of a variety of inpatient and community based programs and services including mental health and addictions, primary health, public health and continuing care.

Across the health sector internationally, knowledge, innovation and the public demand for access to high quality care is exploding. At the same time, healthcare providers and funders are being challenged to deliver more services while competing for limited resources – whether that is talent, money, technology or information. To become agile and adept at managing this change, the Nova Scotia Health Authority will strive to act as a ‘continuously learning health system.’ This will be reflected in our ability to generate, translate and integrate knowledge derived from research into practice that improves the quality and efficacy of our healthcare, improves our population health status, and contributes to the success and health of our communities.

In its academic and research mandate, NSHA works closely with Dalhousie University and other education and research institutions to promote research and innovation. The Vice President has provincial responsibility for the following areas: executive leadership for research and innovation; research activity and implementation science; research vision and strategies; research ethics; talent development; and knowledge translation.

POSITION SUMMARY

Briefly, (2-3 sentences) describe the main purpose of the position.

Reporting to the President and CEO, the Vice President Research, Innovation & Knowledge Translation is a member of the executive leadership team contributing to the overall vision and priorities of the organization. The Vice President provides leadership on all matters pertaining to research, innovation and translation of knowledge into learning and practice. Working in partnership with senior leaders, clinicians and researchers, the Vice President is focused on defining key health policy and delivery questions, and implementing research and evidence-based science to improve the quality, effectiveness and sustainability of care, as well as patient/population health outcomes. The Vice President Research has a leadership role in creating a vision and coordinating the research efforts within NSHA with those of the IWK Health Centre, Nova Scotia universities, NS Community College, department of health and wellness, healthcare foundations, non-government organizations and the broader community we serve.

Duties include:

- Establishing extensive partnerships with research and academic institutions, government departments, and research funders to increase research activity within NSHA.
- Developing, executing and evaluating strategies focused on investigator-driven research, clinical trials and health outcomes research to support a rich research and academic health sciences environment, and ensuring that the mandate of research and innovation is represented throughout the organization’s work.
- Providing strategic and operational leadership to the Research Services Department and the RMU, MSSU and to ensure that research vision, decision-making, resource allocation and activities are consistent with NSHA strategic orientation and focused on research to improve health outcomes.
- Building capacity for research within the organization, by attracting and fostering research talent, building research capacity, providing training and mentorship opportunities to new researchers.
- Coordinating research ethics and adherence to standards and policies.
- Promoting and mobilizing knowledge translation so that results of research and innovation are translated into improved people and family-centered care and services within NSHA.

SPECIFIC ACCOUNTABILITIES

Beginning with the most important, provide 4-7 main responsibilities as well as the expected end result. It should be in the form of a statement including the accountability and the expected result or a broad heading with the most important specific tasks and end results.

Demonstrating leadership behaviours and capabilities consistent with LEADS in a Caring Environment framework, which include *Leads Self, Engages Others, Develops Coalitions, Achieves Results* and *Transforms Systems*, the position, (as outlined in Section B, “Competencies”), is accountable for the following:

Vision, Strategy and Systems Performance:

In collaboration with the leadership team and the research and clinical community, create a compelling vision for research and knowledge translation that complements the organizational mission, vision and values and is focused on improving health outcomes. Oversee the development, execution and evaluation of research and innovation strategies to advance health care innovation, and improved quality and outcomes. Establish and monitor performance metrics and targets to evaluate progress and results. Foster innovation throughout the organization by contributing to a culture of continuous improvement informed by research and science. Actively participate in health services planning and defining the evaluation component including patient-driven outcomes research measures are incorporated into the plan.

Quality Research Service Delivery:

Provide executive oversight for the operations of the Research Services department and the Clinical Research Centre and NSHA-wide research activity. Oversee research activity that includes clinical trials, investigator-driven research and health outcomes research that uses implementation science to inform evidence-based decision-making. Ensure the maintenance and dissemination of inventories of research and innovation activity, publications, presentations and grant applications. Ensure that appropriate resources, policies and processes exist to address ethical and legal issues related to research and academic inquiry, and quality plans exist for continuous improvement.

Engagement and Partnerships:

Initiate, establish and continually enhance relationships and partnerships with key stakeholders. These include, but are not limited to: IWK Health Centre, Maritime SPOR Support Unit, academic institutions throughout Nova Scotia, provincial and federal governments, research institutes, the private sector and regulatory agencies, to inform decision-making on research, and knowledge translation to advance innovation opportunities and decision making in health care programs and services. Create a culture of awareness of the value, impact and relevance of research within the organization and with external partners. Work with communications colleagues to develop communication strategies to support and strengthen the research and innovation components of NSHA’s mission, and to disseminate results. Develop partnerships and relationships with industry to advance the research enterprise in the province. Advocate for and represent NSHA locally, provincially, nationally and internationally as required.

Talent Development

Lead a healthy, safe, diverse and respectful workplace by championing sound human resource management practices and by attracting, recruiting and retaining high calibre research talent, establishing and monitoring performance objectives, providing on-going learning and development, promoting teamwork, and ensuring that employees, researchers and scientists have the tools and resources they require to perform at their best. Contribute to the development of a culture of openness to learning and innovation within the senior team, the portfolio team and the larger organization.

Financial Stewardship and Accountability:

Lead a fiscally responsible research department by championing and following sound financial management through accurate business planning and forecasting, monitoring revenues and expenditures, reporting in accordance with the Accountability and Risk Management frameworks, following procurement guidelines, and acquiring goods and services in the most effective manner. Develop funding proposals to grow revenue for research, innovation and knowledge translation.

KNOWLEDGE

Include the minimum level of formal education required, including any mandatory certification and/or licensure required to perform the accountabilities of the position.

- Must have a MD or be PhD scientist
- Must have, or secure as part of hiring process, an academic appointment in the appropriate discipline at one of Nova Scotia's universities

COMPETENCIES

Include knowledge, special skills, abilities and behaviours required to be able to competently achieve the accountabilities. Include the nature and amount of relevant previous experience.

Relevant Skills and Experience:

- Minimum of 10 years' experience at a senior leadership level at an academic health science centre involved in planning and implementing a variety of research, innovation and knowledge translation activities provided across several locations with multiple partners and stakeholders.
- Extensive experience with, and understanding of, the academic and clinical environments.
- Demonstrated scientific excellence and record of success in research, translating knowledge into practice, and/or research administration. (*Note: personal research must be secondary to administration of research with NSHA.*)
- Experience engaging, mentoring and empowering teams and stakeholders in a collaborative, participatory manner to respond to the mission, vision, goals and objectives of an academic health science centre.
- Knowledge of the health research funding environment in Canada.
- Exceptional communications and presentation skills, both verbal and written, tact and diplomacy.
- A demonstrated understanding of budgets and long-term financial planning.
- Ability to exercise initiative and vision, be resourceful, work independently, work cooperatively, adapt easily to changes in direction and to provide effective leadership.

KEY RELATIONSHIPS

Include the relevant relationships and contacts, (both internal and external) required to competently achieve the accountabilities. Include the nature of the relationship.

Work with Executive Leadership Team on embedding research into patient care and health services.

Work with CFO on budgetary requirements to ensure success of the strategic plan for research

Work with communications to publicize the results of research and promote NSHA researchers

Work with NS Department of Health and Wellness to ensure that their needs are met re: research to improve the delivery of health care in NS.

Support and maintain good relationships with NSHA researchers.

Foster strong working relationships with the following:

- CEO NSHRF and Research Nova Scotia
- VP Research and Innovation for IWK
- VPR Dalhousie University and Associate deans for research at key faculties, particularly medicine and health
- VPRs for other Nova Scotian Universities with health research mandates

Work with national and international research bodies, healthcare foundations and private sector partners

DECISION MAKING

Include how knowledge and skills are applied in decision making and the freedom to act. Include the usual types of decisions, the context of decision making (i.e., stakeholder consultation) and level of authority (i.e., provision of analysis and recommendations)

The position has authority to establish the vision, goals and objectives for research, innovation and knowledge translation that supports NSHA’s strategic plan, and to establish systems to monitor progress against the goals and objectives. Responsible to collaborate provincially to ensure programs are integrated and consistent with provincial objectives, and also nationally and internationally in support of the mission of NSHA and its stakeholders.

The position has operational responsibility for programs and services promoting research, innovation and knowledge translation.

STRATEGIC THINKING

Describe the typical creativity and problem solving applied in competently achieving the accountabilities. Include the need to make revisions to existing approaches, develop new solutions, determine courses of action, make recommendations, etc.

Responsible to develop, implement evaluate and monitor programs and services within the functional areas of responsibility, while meeting the goals and objectives of NSHA.

DIMENSIONS

Include the most relevant approximate, measurable areas, both direct and indirect, that the job impacts. These areas must include the number of staff managed and the annual budget if applicable. Other examples number of clients, number of committees supported, meals, number of sites managed, value of payroll, etc.

Approximate Budget	\$32,000,000
Approximate FTE	93
Active Researchers	300
Research Projects	1200
Research Board ethics reviews	350 - 380
Research staff (employed by researchers)	450

IMPACT OF RESULTS

Include the typical impact of the achievement of the accountabilities on the organization, department, program, unit, patient, etc.

The Vice President Research, Innovation & Knowledge Translation provides leadership through collaboration with others to ensure the ongoing development and delivery of a high quality, integrated health system that is provincially focused, safe, people-centered, sustainable and responsive to provincial needs. The impact of the Vice President is the growth of research endeavours and knowledge translation and transfer into practice across the NSHA. These should contribute to the development of both cultural and operational attributes that contribute to our performance as a 'continuously learning health care system', such as:

- **Culture of Continuous Learning:** Research and knowledge translation becomes a core capability/competency integrated in decision making, clinical and administrative practices, and strategic planning.
- **Collaborative Partnerships:** sustaining and growing partnerships across the health research, innovation and knowledge spectrum, including government, academic, research and economic partners to continuously raise the profile, reputation and clinical/academic/economic footprint of health research in the region.
- **Research Productivity** – measured by such things as number of grants, publications, citations, etc.
- **Translation into Practice** – improvements to clinical/administrative practices that evolved through research, innovation and knowledge translation initiatives
- **Talent Attraction** – net increase in recognized/respected researchers and academics
- **Economic impact** – commercialization, patents, company spin offs, number of employees working in health-related research industry

WORKING CONDITIONS

Consider the usual environment in which the position is performed and describe the degree of exposure to unavoidable physical, sensory and mental pressures.

PHYSICAL ENVIRONMENT

- Normal office environment
- Responsibilities are provincial in scope as a result regular travel throughout the province and nationally (sometimes internationally) is required

PHYSICAL EFFORT

- Normal office environment

SENSORY ATTENTION

- Regular requirement for consultation, development and review of plans and reports
- Frequent and prolonged use of technology

MENTAL PRESSURES

- Regular requirement to deal with competing, time sensitive demands in a 24/7 operation

OTHER INFORMATION: Briefly describe any other relevant, position related information that is not included elsewhere. N/A

The challenge with this job description is that it doesn't allow for operationalization of a research agenda in a complex organization where other VPs control the resources that are necessary to move forward. For example, some projects have taken up to two years to have a final decision made, as in the example that follows. In this particular case there were six different departments/entities had to review the proposal before a decision was possible. The problem is that these reviews are done sequentially. If each took two months to review, then 12 months would have elapsed before a decision was made. Clearly the way to do this is for all six entities to review the proposal concurrently. Then a meeting could be held with VP Research and the applicant, and a final decision made, e.g. proceed or resubmit following amendments. Currently the VP Research has no authority to execute this process. This issue was discussed at ELT on December 18, 2017 and a solution is expected in early 2018.

The VP Research is a member of the NSHA Executive Leadership Team. This is important as it allows this VP Research to advocate for research and to be aware of what is happening across the Health Authority. However, the VP Research has no operational responsibility within the Health Authority and hence can make minor, or no contribution to most ELT discussions. Being in attendance at 50% of the scheduled ELT meetings would allow the VP Research to accomplish the advocacy and knowledge goals and would allow for more time to devote to the research portfolio. The VP Research, by nature of the position, has more front line hands-on activities than the other VPs.

There are some areas not covered in the job description and these are given as recommendations. It is important to note that a 2017 review of research at NSHA by Drs Hill and Finegood, commissioned by the CEO, had a number of observations about the qualities required for a VP Research. Most of these are reflected in the VP Research job description. After extensive consultation, the review team concluded that a servant leadership style was most important. While the VP Research should be encouraged to have an active research program, this program should not consume more than 40% of their time and the VP Research should not be eligible to apply for NSHA research funding as this could be perceived to be a conflict of interest.

Recommendations

1. That the VPR work with ELT to develop the necessary tools to allow VPR to be successful.
2. That the VPR attend two ELT meetings per month.
3. That the VPR be sited within Research Services at the Centre for Clinical Research.
4. That the VPR chair the Research Advisory Committee.
5. That the VPR visit each Zone outside Central at least once per year.
6. That VPR not be eligible to apply for NSHA funding.
7. That the VPR have up to 40% of their time for their personal research program.
8. That the VPR have a yearly performance appraisal by the CEO and that researchers have input into this evaluation.
9. That the VPR, working with department heads, ensure that mentoring is available for all new researchers and for any other researchers who need it.

Module #2 - Infrastructure for Research at NSHA

The Interim Vice President Research, Innovation & Knowledge Translation was appointed on September 5, 2017 for a six month term with a mandate to develop a Blueprint for Research for the NSHA. There is substantial infrastructure in place to support research within NSHA but there are also significant challenges.

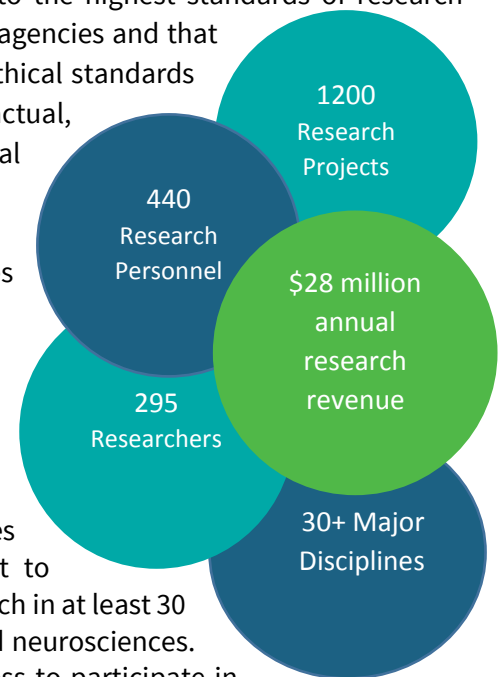
The NSHA was formed April 1, 2015 bringing nine former health authorities into one. It currently has a budget of approximately \$2 billion and employs over 23,000 people. There are 3,200 physicians including 500 residents; 5,500 learners; 7,000 volunteers, 41 hospital foundations and 37 community health boards. NSHA includes one tertiary/quaternary hospital – the QEII Health Sciences Centre; 8 regional hospitals and a number of community hospitals. In 2016-17 there were 3.6 million outpatient visits and 574,181 Emergency Department visits.

Research Services is committed to creating an environment where researchers in all health care disciplines can fulfill their potential and to ensuring that NSHA research is conducted according to the highest standards of research practice. As a health district that receives funding from major federal granting agencies and that conducts research involving humans, NSHA is required to establish rigorous ethical standards and review procedures. In addition, there are sophisticated, financial, contractual, human resources, quality improvement, methodological and physical infrastructure support services that are integral to the research enterprise.

Ultimately, Research Services is committed to supporting research that improves the health outcomes of the community we serve.

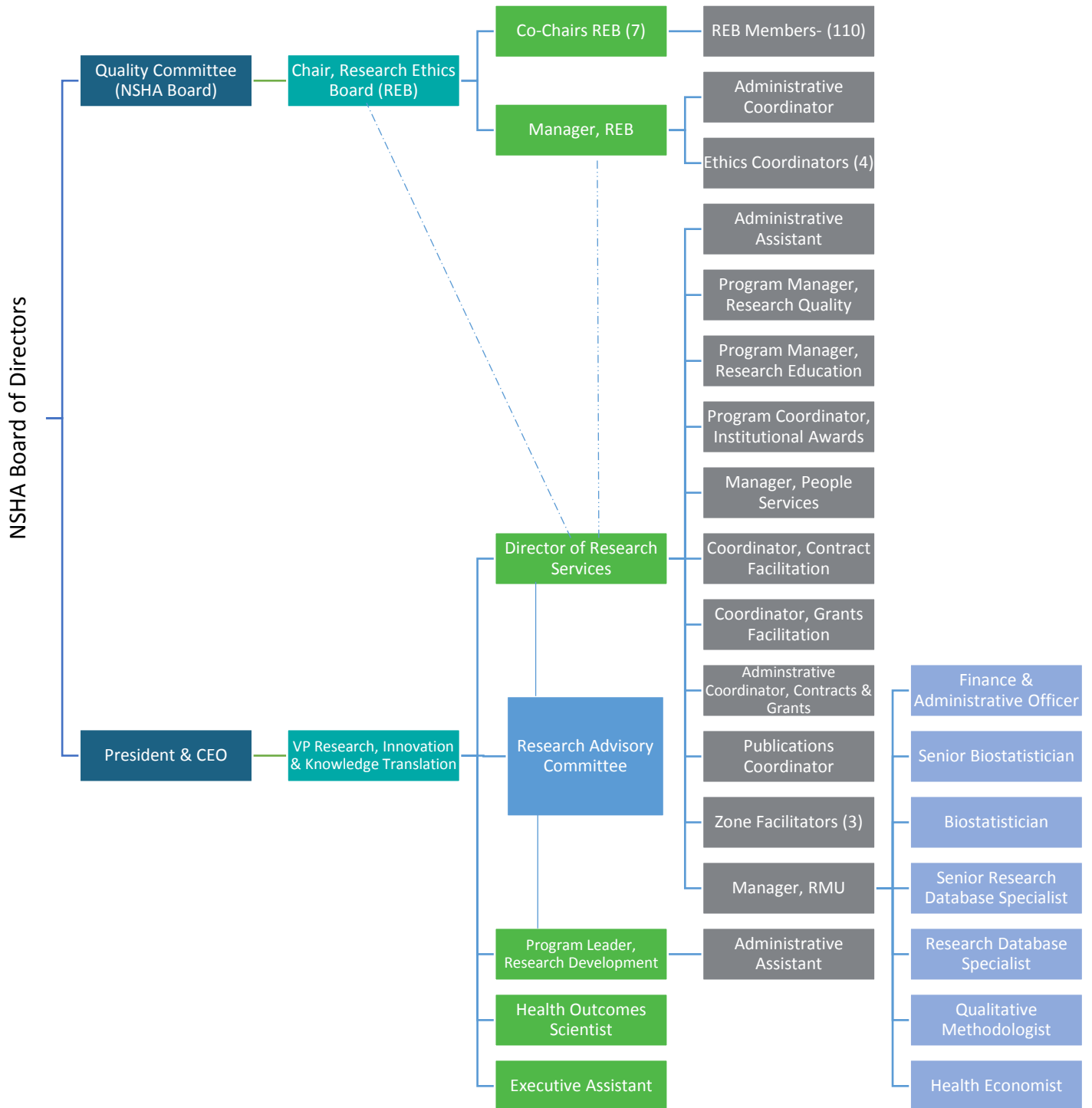
The Research Enterprise

Research Services was established in 1992 and has experienced growth over the past 25 years. The services offered are funded from overhead funds from successful research grants. In any given year, approximately 295 researchers are engaged in more than 1200 research projects across Nova Scotia. This translates into about \$28 million in annual research revenues and providing support to approximately 440 dedicated research personnel. We have active clinical research in at least 30 major disciplines including specialty areas such as cancer, cardiac sciences and neurosciences. Our exceptionally stable patient base with a traditional interest and willingness to participate in health-related studies offers invaluable continuity, particularly for multi-year studies. Close affiliation with Dalhousie University Medical and Health Faculties and other universities throughout the province ensures strong basic research support and maximum crossover from laboratory to clinical application.



Research Services provides specific support (grant/contract budgets, human resources, research education) but also faces some high level challenges. Some of these challenges include: increasing grant capture and sustaining financial self-sufficiency in an increasingly demanding setting, expanding research opportunities to include a broader range of health professionals, maintaining a streamlined administrative process while simultaneously satisfying complex guidelines and regulations as well as building research capacity across Nova Scotia following the 2015 amalgamation. During the consultation process for this report, it was identified that researchers appreciate the support offered by research services. It was indicated however that in view of the changing research landscape, additional support is needed including writing development. The development of translational research programs that are resource intensive require new and important capacities and researchers need help in developing these.

Research Services Organization Chart

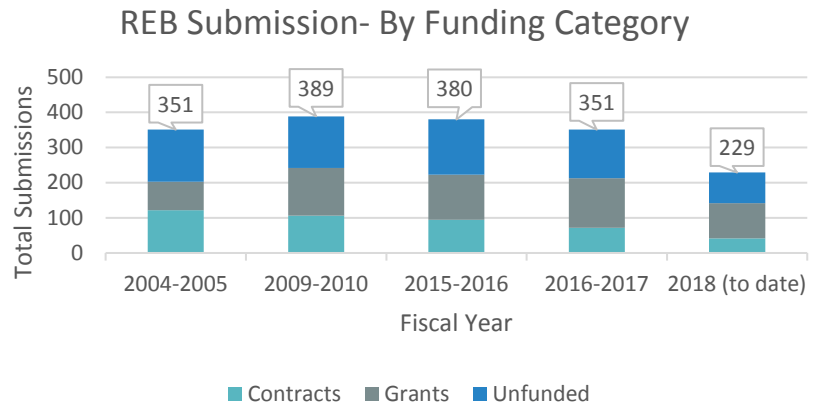


Research Services at a Glance

The task of starting a research project is a complex one, involving the review and documentation of information to identify study-specific requirements and the follow up required to ensure that these requirements are met. Research Services provides services in a number of areas:

Research Ethics Board

The NSHA Research Ethics Board (REB) is responsible for safeguarding the rights, safety and well-being of participants in all human based research involving NSHA patients, staff, resources or data. Research involving human participants within NSHA is reviewed to ensure that it is scientifically valid, ethically acceptable and that it conforms to the ethical guidelines of the Tri-Council Policy Statement and Health Canada Division 5 Food and Drug Regulations.



The REB consists of 110 members divided into 4 Working Groups containing representation from all 4 management zones. Each group includes 2 Co-Chairs, 5 legal representatives, 4 community members, 6 staff physicians, and 8 to 10 general members and meets once per month, so effectively the REB meets once per week. The REB has implemented an electronic web-based submission and review process using the ROMEO Platform from Process Pathways. From submission date to full ethics approval, the average timeline is 77 days for full board approval (interventional drug/device studies) and 49 days for delegated reviews (minimal risk protocols). The REB received 365 new submissions in the fiscal year 2016/17. Currently, there are 1266 active research studies being conducted at NSHA with an anticipation of approximately 400 new submissions in fiscal year 2017. Pre-review services and workshops are offered by the REB to improve the quality and success of submissions.

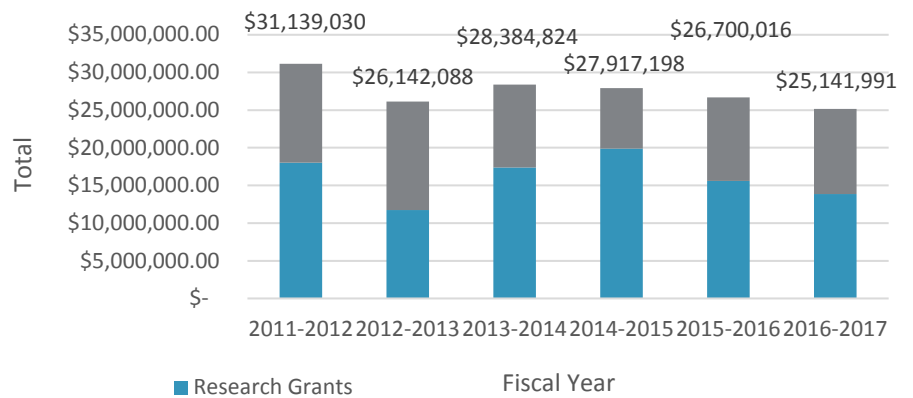
Contracts, Grants & Institutional Awards Facilitation

The Contract & Grant Facilitation Support Team is committed to serving the intricate needs of the research community. The Team provides support through all administrative levels of a research study. At the preliminary stages of a research project, the team ensures that all legal, financial and infrastructure requirements are met. During the project, the team provides on-going management support including contract and budget amendments. All research activity in the Contract and Grant Office is managed through an electronic database (ROMEO) that is linked to the REB Research Portal. This allows for reporting accuracy, collaboration and transparency.

Specifically, the Team is responsible for assisting with, preparing, reviewing, and approving all research agreements and budgets for Industry Sponsored and Investigator Initiated research studies being conducted at NSHA. Examples include: Non-Disclosure/Confidentiality Agreements, Clinical Trial Contracts, Site Agreements, Funder Agreements, Collaborative Research Agreements, Data and Material Transfer Agreements. The Support Team assists research teams with funding applications and budgets, evaluating the applicable funding status and hospital service impact of a proposed research study. The Support Team also facilitates the opening of all research related accounts and acts as a liaison between the research community, various hospital service departments and research department heads within NSHA.

Institutional Awards Support is dedicated to providing assistance to researchers and their teams in developing their research capacity, in order to obtain and manage large scale Institutional Awards (CIHR, ACOA, JELF etc...). Institutional Awards Support includes: application assistance and oversight, award administration, regular financial and project reporting, procurement, facilitating legal and intellectual property agreements, commercialization factors and stakeholder engagement. These awards frequently require collaboration with industry and commercial partners and/or development of spin off companies in the Atlantic Provinces. Institutional Award Support fosters collaboration with industry leaders, commercial partners, agencies and Dalhousie University. Institutional Award Support also proactively seeks out potential external funding to enable research teams' success and growth. Through knowledge mobilization, researchers are able to maximize their opportunities and build relationships with industry partners. The need for Institutional Award Support has evolved since the first AIF project funding was received in 2006 to include other large institutional awards and complex partnerships.

Awards for Research Conducted at NSHA



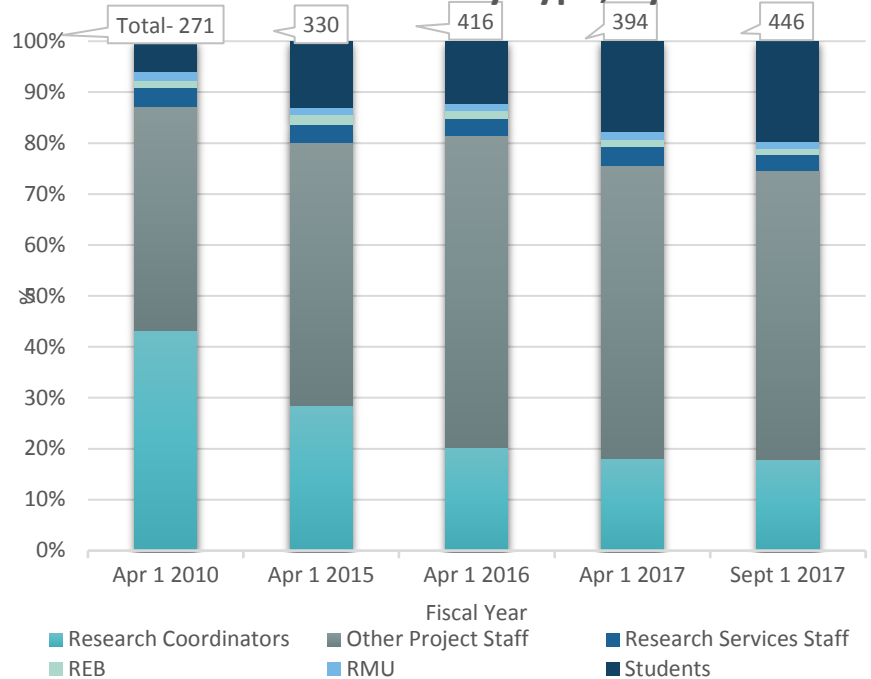
Research Financial Services

In 2010, eligibility for the first CIHR grant, as well as an increase in research activity, provided the impetus for the creation of the Financial Oversight Team. This team now supports all research projects at NSHA. Financial Services assists researchers and staff with their financial responsibilities and supports the financial administration and management of all research projects.

People Services

Research People Services meets the Human Resources (HR) needs of the research group at NSHA. The HR Manager is responsible for hiring employees as well as providing knowledge and support in the areas of labour relations, recruitment, recognition, retention, position development/compensation and benchmarking/policy development. The majority of research staff are research coordinators who are designated health professionals including registered nurses. Research coordinators are responsible for coordinating research projects, which includes the administration of the study, caring for the study participants and the management of documents and data collected throughout the study period. The research coordinators are often integral members of the interdisciplinary healthcare teams providing quality patient-centered care at NSHA.

Research Staff- By Type, By Year



Research Education

The Research Education Program responds to the needs and interests of a diverse local health research community. Servicing a complex and dynamic environment requires a multi-faceted, collaborative and multidisciplinary approach. Main mandates include: ensuring investigators initiating research projects are informed and supported in fulfilling their regulatory responsibilities, expanding the local knowledge base and educating researchers and staff on the latest Health Canada regulations. Educational offerings are available in-person and online and are well attended by researchers and staff from Atlantic Canada. The Research Education Program has organized its educational offerings into different streams of interest: Services and Supports for Researchers, Building Research Capacity and Research Standards and Regulations and the program also offers staff and investigator orientation, research placements for students and organizes the local Society of Clinical Research Associates (SoCRA) chapter.

Research Quality

The Research Quality Program is a comprehensive and evolving initiative designed to help researchers meet the dynamic and increasingly rigorous standards for research conduct, standards and regulatory requirements. The program focuses on developing and enhancing internal systems that support and monitor the achievement of local, national, and international research requirements. To achieve these objectives, staff conduct internal quality audits & study reviews of research studies, help teams prepare for external audits and assist with regulatory inspections.

Zone Facilitators

Research Facilitators identify research and innovation opportunities and provide support for Researchers in the Eastern, Northern and Western zones. Spread geographically across the NSHA, each facilitator is a liaison between their respective zones and Research Services located in the Central Zone. The facilitators host development opportunities to increase research capacity and quality and facilitate projects taking place at local healthcare facilities.

Research Development

The Research Development Office takes a pro-active, coordinated and strategic approach to implement new initiatives that enhance the research and innovation vision at NSHA. The office aims to grow research and innovation through the development of partnerships with universities, hospital foundations, industry, government, community agencies and other partners. The Research Development Office provides leadership for implementation science research at NSHA through the management and delivery of the Translating Research into Care (TRIC) Healthcare Improvement Funding Program. Other initiatives include: MicroResearch NS, Exercise is Medicine NS and the Innovations Rounds series.

Research Publications & Promotions

Communication plays an integral role in developing and maintaining a cohesive research community. A multimedia, storytelling approach reaches local, regional and global audiences. Research stories raise awareness, attract industry, celebrate NSHA research and inform stakeholders. The local research community is informed of upcoming education & funding opportunities via a variety of channels such as social media, online news, Annual Report, Research Focus and others.

Research Methods Unit

The RMU was created in 2010 to support clinical investigators and other health professionals at the NSHA, IWK Health Centre and Dalhousie University. Since 2015, RMU has been supporting clinical investigators and other health professionals across the amalgamated NSHA. They are committed to promoting and supporting clinical and health research and research capacity in Nova Scotia by providing research methods resources, services and training to individuals and teams. Our approach is facilitative and collaborative. Current partners include the NSHA, the IWK Health Centre and the Dalhousie University Faculties of Medicine, Health and Dentistry. Partnerships are developing and evolving.

RMU’s mandate is to increase the quantity and quality of health research in Nova Scotia. They do this by making available research expertise in areas that are commonly needed/used by investigators, including research design and methods, biostatistics, data management, and health economics.

The RMU team is made up of experienced consultants who provide expertise and support to health professionals and investigators at all stages of a research project through consulting, training and mentorship. RMU consultants' work meets the high standards required for credible and reliable research.

Consulting Services include:

- Biostatistical consulting (e.g., sample size, power calculations, data analysis planning, analysis)
- Study design/Epidemiology/research methods (review of study design and protocol, quantitative, qualitative and mixed methods, research question)
- Database development and data management support (e.g., database setup, data linkage, data management)
- Health economics consulting (e.g., study design, analysis planning, analysis, economic health technology assessment)

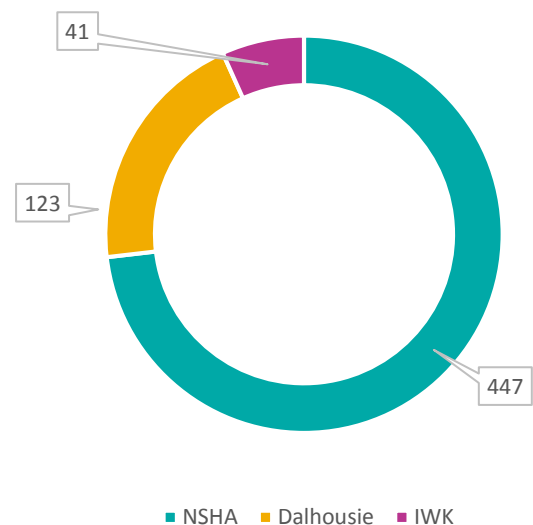
RMU Utilization 2017/18 Fiscal Year (to-date)

- 86 new project intakes
- 126 continuing projects from previous years

RMU Utilization 2017/18 Fiscal Year (to-date)

NSHA		Dalhousie	
Medicine	36	Medicine	3
Surgery	9	Pharmacy1	3
Psychiatry	7	CH & E	2
Other	4	Other	2
Emergency Medicine	3	Pharmacology	1
Family Medicine	2	IWK	
Critical Care Medicine	2	Emergency	2
Anesthesia, Pain Management & Periop	2	Obstetrics/Gynaecology	1
Urology	2	Other	2
Pathology	1	Pediatrics	2
Psychology	1		

RMU Total Utilization Since 2012



The Maritime SPOR SUPPORT Unit

The Maritime SPOR SUPPORT Unit (MSSU) is one of several SUPPORT Units across Canada, bringing health research to life by helping to integrate findings into patient care. The MSSU engages with patients from across Nova Scotia, New Brunswick, and Prince Edward Island, and collaborates with the research community on governance, priority setting, and the planning and conducting of research. Through this meaningful and active collaboration, the MSSU contributes to an enhanced health system, engaged health research, and improved health outcomes. The MSSU is dedicated to supporting patient-oriented research and decision-making that will reflect the needs and values of Maritime patients.

The MSSU and other Support for People and Patient-Oriented Research and Trials (SUPPORT) Units across Canada are administered by SPOR, the Strategy for Patient-Oriented Research. A Canadian Institutes of Health Research (CIHR) initiative, SPOR is focused on integrating health research more effectively into care.

Dr. Jill Hayden was appointed the Scientific Lead of the Nova Scotia node in January 2018. Dr. Hayden is an Associate Professor with Dalhousie University's Department of Community Health and Epidemiology. Dr. David Anderson, Dean of Medicine, Dalhousie University, is the interim Nominated Principal Investigator.

MSSU consultants can provide the following in-kind supports to researchers:

Patient Engagement (a more in-depth review of patient engagement in research is given in *Module# 12*)

Patient Engagement is an emerging movement in Canadian healthcare and health research. It is the act of meaningful and active collaboration in governance, priority setting, conducting research and knowledge translation. The MSSU supports patient engagement in the following ways:

- Consult with research teams on patient engagement;
- Consult with research teams on preparing grant applications that include patient engagement;
- Support research teams through the planning and implementation of patient engagement strategies;
- Provide resources and tools for patient engagement; and
- Provide training in patient engagement.

Knowledge Translation

Knowledge Translation is the process of putting knowledge into action. It goes beyond passive dissemination, and focuses on ensuring knowledge is packaged and delivered in a way that ensures it is actively taken up and effectively used in practice. The MSSU can support researchers in the following ways:

- Consult with research teams on integrated and end-of-grant KT;
- Support research teams through planning and implementing KT strategies;
- Provide resources and tools for KT; and
- Build capacity for KT in the MSSU community through training.

Evidence Synthesis

Evidence synthesis (also commonly referred to as knowledge synthesis) is the attempt to systematically collate all pertinent information on a given topic to address a research question. MSSU can support researchers in the following ways:

- Consult with research teams on evidence synthesis projects;
- Literature search support;
- Support research teams through planning and execution of evidence synthesis projects;
- Evidence synthesis tools & resources; and
- Training in evidence synthesis.

Privacy & Ethics

The MSSU's Privacy Officer can help with the following:

- Answer questions about privacy legislation;
- Provide education/training about privacy, ethical and legal standards, policies and best practices;
- Consult with research teams about ethical principles and legal requirements related to research: privacy and confidentiality, consent, and conflict of interest; and
- Review and/or assist with drafting data sharing agreements.

Methodological Support

The MSSU can also provide methodological support to research teams, in both study design and implementation. This might include:

- The development of patient engagement and knowledge translation strategies;
- Assistance with patient recruitment and stakeholder engagement;
- Literature search support, including search strategy creation or review; or
- Reviewing and assisting with drafting data sharing agreements.

MSSU researchers also work with governments and the health authorities on identified priority areas for policy and health service planning and conduct research to support decision-making. Research is currently being conducted in the areas of: understanding the use and variation of alternate levels of care across the Maritimes; the rise in the number of Nova Scotians without a family doctor; and the public's values on fairness and equity in health care. Another important MSSU project is the Nova Scotia Health Atlas. Launched in December 2016, [Health Atlas](#) is an interactive, web-based mapping tool that illustrates differences in measures of health status, health service use, and the social determinants of health across geographic areas of Nova Scotia. To learn more about MSSU-led research projects, visit the MSSU's [website](#).

The MSSU will continue to establish itself as a centre of expertise in patient-oriented research methods and implementation. A primary focus of the upcoming year will be to further increase research productivity and evidence implementation. The MSSU will facilitate stronger collaborations between decision-makers, health care professionals/organizations, citizens and health researchers in the province. We will also continue to provide a high level of service in development of data infrastructure in collaboration with Health Data Nova Scotia, develop and share best research methods, and provide methodological support for grant development. In order to build capacity for the next generation of health systems researchers, the MSSU will continue to provide funding, training and employment opportunities for post-graduate students at the Masters, PhD, and post-doctoral levels who are engaged in patient-oriented research.

Additionally, a proposal to CIHR for renewal is being developed to secure an additional five years of funding for the MSSU. In preparation for phase two, a systemic evaluation of the MSSU and its provincial operations will be completed. The MSSU looks forward to engaging in an active partnership with the NSHA as we move forward.

QEII Redevelopment

Another important part of the infrastructure for research at NSHA is the QEII Redevelopment Project. The QEII Redevelopment Project is the plan to move programs and services from the Victoria and Centennial buildings at the QEII Health Sciences Centre to several alternate locations and eventually demolish these buildings. However, this is much more than replacing the aging buildings – this is an important step in re-imagining health care for all Nova Scotians. The QEII Redevelopment Project is a once-in-a-generation opportunity to rethink and rebuild the way we deliver health care in Nova Scotia. This project is about enhancing access to care in facilities designed to promote healing and wellness; enhancing distribution and integration of services; and enabling leading-edge research and new technologies that advance the treatment and patient care.

The QEII Redevelopment Project includes:

- Expansion of facilities and services at Dartmouth General Hospital
- Renovating and opening a second operating room at Hants Community Hospital in Windsor
- New construction at the Halifax Infirmary campus of the QEII Health Sciences Centre, to include a new ambulatory care building and an acute care building to accommodate additional operating rooms, critical care units and inpatient beds
- A new community outpatient facility in the Bayer's Lake Park
- Consolidation of specialized outpatient cancer care services.

The QEII Health Sciences Centre has a broad academic mandate. Affiliated with Dalhousie University's Faculty of Medicine and Faculty of Health, as well as dozens of post-secondary institutions across Nova Scotia, thousands of students gather first-hand health care experiences at the Centre every year. In addition, hundreds of researchers work at the QEII in pursuit of medical advances and breakthroughs that will improve the lives of people in Atlantic Canada and worldwide.

QEII Redevelopment Project planning has included enhanced facilities to support students, residents and fellows at all levels, as well as facilities to support the continuing education needs of professional staff. In clinical areas, provisions have been made to accommodate both research and learning needs at the point of care, including clinic/exam rooms to support clinical trials and teaching, and decentralized classrooms. A redesigned interdisciplinary Simulation Learning Centre is being planned that will integrate the existing SKILL Centre, the Simulation Lab and the Registered Nurses Professional Development Centre simulation facility into one.

The final portion of research infrastructure at NSHA is the support for research in the three zones other than central which is addressed in [Module #10](#). It is crucial that the redevelopment team work to ensure that the research and education mandates of NSHA are provided for as infrastructure changes occur at the VG site. Consideration must be given to replacing the CCR building and the 50,000 sq ft. of research space it includes. Having an active voice in infrastructure planning and development will be essential for the future of the research enterprise.

Leveraging Existing Services

There is extensive research infrastructure and support available for researchers (especially in Central Zone) at NSHA but some gaps exist such as grant writing support. Furthermore existing services are not always as widely utilized as they should be. Physicians and staff, especially outside Central Zone, should take advantage of these services to build their research capacity. Recently the VP Research had the opportunity to review submissions for NSHA Quality of Care Awards. Many of these submissions were excellent but data presentation and analysis were weak in all of the proposals. Consultation with RMU, MSSU and other research experts would have greatly improved the competitiveness of these projects.

Recommendations

10. That physicians, health care professionals and those with an interest in research avail themselves of the education offerings and consultation services to help grow research expertise.
11. That all those involved with Quality of Care Projects consult with RMU re research design and methods, data management, data presentation and analysis.
12. That Research Services hold consultation sessions with researchers to determine what new supports are needed.
13. That the redevelopment team work to ensure that the research and education mandates of NSHA are provided for as infrastructure changes occur with the QEII redevelopment.

Module# 3 - Research Culture at NSHA

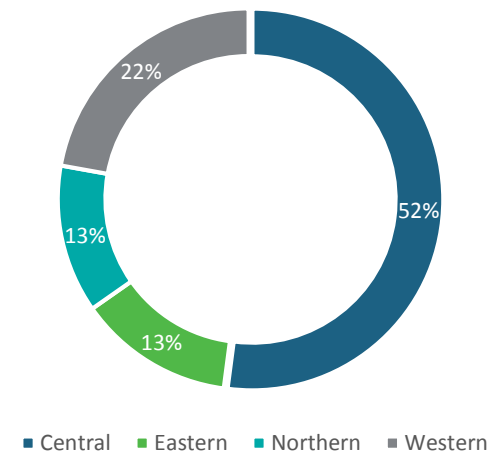
Culture is defined as the ideas, customs, and social behavior of a particular people or society. It is often what makes something work or not work. In order to better understand the research culture at NSHA we invited all 23,000 NSHA employees to complete an on-line survey.

Results from the On-line Survey of NSHA Employees

Demographics

All NSHA employees were invited to participate in the survey and 2,799 responded. Approximately 1,000 people started, but did not complete the survey. Just over half the respondents were from the Central Zone. The respondents came from just over 200 different occupational groups. We collated these into 10 core occupational groups. There was diverse representation across zones. Clerical/support staff constituted the largest number of respondents at 22.5%. 3.4% of respondents identified as researchers/research staff. The majority of respondents (62%) have been working at NSHA for 11+ years.

Working Zones of Respondents



Prior Participation in Research

Overall, 14.4% of all respondents were or had been a researcher at NSHA and 38.7% had been a participant in a research study. The majority of respondents who had been a researcher (80.4%) or who have been part of a research study (61%) were from the Central Zone. Physicians/Residents (62%) and Researchers/Research Staff (71%) were the occupational groups with the highest participation in research.

Research on the Units

52% of the Central Zone respondents were aware that research was done on their unit; the corresponding percentages for Eastern, Northern and Western zones were 17.6%, 12.5%, and 15% respectively. Furthermore 75% of these respondents knew what research was being done on their unit(s).

Please Note: 184 respondents did not answer questions referenced below and were excluded from the analysis of responses to these questions.



NSHA Core Occupational Groups

Job titles are displayed here by size proportional to participation

Importance of Research in Delivering Good Patient Care

Just over 92% feel that research is very important in delivering good patient care and there was little variation across the zones or by occupational group when they were asked “**How important is research in delivering good patient care?**”

Health Authority’s Budget Designated for Research

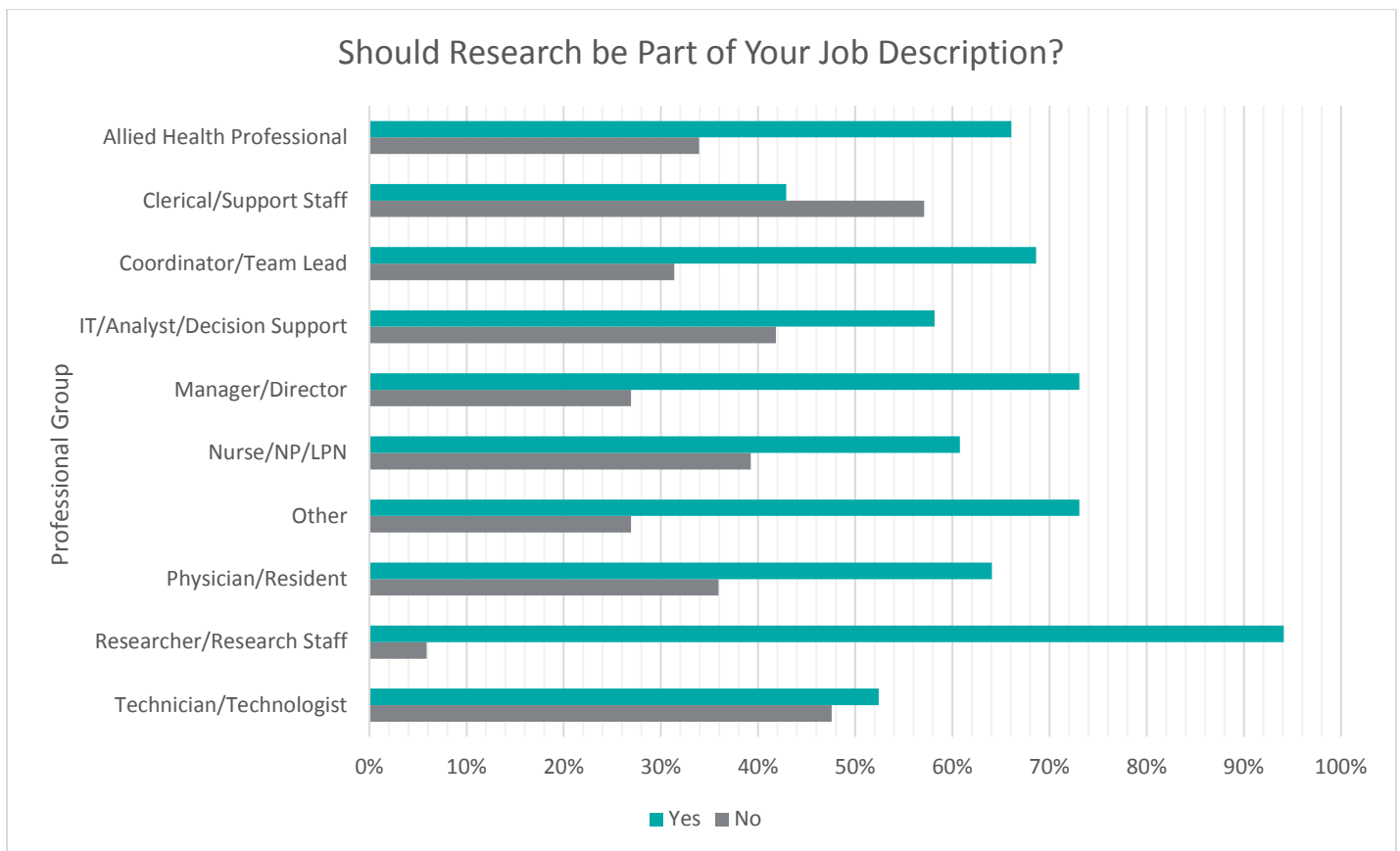
Most – 92.6% felt that some of the health authority’s budget should be designated for research that is designed to improve patient care. This response was consistent across zones and occupational groups.

Hospital Foundations Supporting Research

Most of the respondents also felt their hospital foundation(s) should support research that is designed to improve patient care but more so in the Central Zone. There is an opportunity for leadership to encourage hospital foundations to have research mandates and promote opportunities for staff outside Central Zone.

Research as Part of Job Descriptions

The responses to **Should helping the research mandate be part of your job description at NSHA?** are shown below, and there is a great deal of variation. Overall 61% felt that helping the research mandate should be part of their job description and this was slightly lower outside Central Zone. However there was variation according to occupation – 73% of the managers were in the “Yes” category vs 43% of the clerical/ support staff. Interestingly not all researchers/research staff were in the “Yes” category.



Overall Research Culture

Only 25% of the respondents felt that the research culture at NSHA was excellent. There was considerable variation across zones and across occupational groups.

	High Research Culture (4-5)	Total
Overall		
	619 (25.3%)	2449
By Zone		
Central	396 (30.3%)	1306
Eastern	61 (19.9%)	306
Northern	54 (18.6%)	290
Western	107 (19.8%)	540
By Professional Group		
Allied Health Professional	62 (18.8%)	330
Clerical/Support Staff	182 (34.0%)	535
Coordinator/Team Lead	21 (23.1%)	91
IT/Analyst/Decision Support	37 (39.8%)	93
Manager/Director	62 (21.6%)	287
Nurse/NP/LPN	112 (23.0%)	486
Physician/Resident	24 (12.2%)	196
Researcher/Research Staff	23 (27.1%)	85
Technician/Technologist	61 (30.5%)	200
Other	33 (28.0%)	118

**recalculated row percentages to exclude non-responses*

Focus Group Discussion on Culture

There are exemplars of research culture at NSHA. These include Hematology and Radiation Oncology. The latter program has been very successful at integrating graduate students into their research program.

The Personal Health Information Act (PHIA), a provincial law, came into force on June 1, 2013, which by virtue of its mandate would reduce the ability to assess a patient's options for treatment within a research protocol in a timely manner. On June 21, 2013 the summary document - *Hematology Research: Access to Personal Health Information Justification of Access within the Circle of Care* was submitted for review and approval to the Chair of the Capital Health Research Ethics Board. The board accepted this outline for justification for access.

Research is embedded in the day-to-day activities of the Division of Hematology. To that end, all hematologists participate in research studies as either a Principal Investigator or Sub-Investigator. As a group, they believe the best treatment and management of patients is often through research. They feel patients should be presented with options for diagnosis or treatment of their condition in a uniform, organized, and timely manner. These options will include both standard of care protocols and research protocols. While it is recognized that research visits for patients can take longer and require more comprehensive review than standard of care visits, this is offset by the primary nursing role incorporated into the Research Coordinator role.

Research Coordinators are frequently seen as a resource for nurses and physicians alike.

Patients who are enrolled into a clinical trial are followed by the Research Coordinator as opposed to the clinic nurse. This activity reduces the workload of the nursing staff in the clinic. While visits can often require extra blood work and/or monitoring, the time required is offset by the cost savings of medications. In most research protocols, administration of study drugs replaces the need for other costly medications. Research Coordinators also include ad hoc training as it relates to specific patients/studies and are frequently seen as a resource for nurses and physicians alike. Managers for the clinical areas and research are in frequent communication and address any and all issues in the hopes of streamlining processes that support excellent patient care. In one clinical area staff consistently forgot to obtain all vital signs measurements as per the research protocol. Outside of retraining and summary sheets it was noted access to a vital signs monitor was difficult. Research dollars paid for another machine in this area, improvement has been seen.

Unfortunately, not all clinical areas are equal and some research teams are subjected to a lot of negative behaviors. Research is perceived as added work and it is perceived and verbalized that it is not the job of clinic staff. Sometimes it has been the role of the research team to do the majority of identifying patients because the clinic staff don't have time

Some research coordinators feel that they are unsupported at their research institution

or believe it is not part of their role to support research. There are many patients that research staff feel are not being given the opportunity to participate in research because of the time

it takes to revisit charts and ask staff for permissions, especially since PHIA came into effect. Some research coordinators feel that they are unsupported at their research institution. A common feeling among research staff is that PHIA has sent a message that research is a separate part of patient care, it has redefined where research fits in and now the culture doesn't support clinical collaboration.

Next Steps

[A portion of the next module](#) addresses the ways to improve access to patients by research coordinators while we are awaiting the Provincial **One Patient One Record**. It is very apparent that throughout the organization there is great support for research – we now need to translate that into concrete actions. The recommendations below must be implemented as soon as possible across the province if we are going to improve the research culture at NSHA. The fact that the CEO has included research as one of the 2018-19 priorities for NSHA is the first step on this road. It is imperative that everyone in the organization have research and education as part of their job descriptions. For most this will mean they are “facilitators” of research and education. NSHA's communications strategy should reflect that we deliver the best possible patient care through education and research.

Acknowledgements - Many people worked to make this module a reality – Bethany McCormick, Matt Moore, Courtney Denaro, and Steve Carrigan from the Data Analytics Unit; Daniela Meier from RMU, Amy Wilson from Research Services; Susan Pleasance from Hematology and Debbie Wilson from Cardiology.

Recommendations

14. That NSHA leadership articulate that research and education are priorities for NSHA.
15. That Education and Research be part of everyone's job description at NSHA. This can be done immediately for those who are in management positions and at the time of new contracts for others.
16. That Physicians who are Chiefs of Departments work with their members to recognize that research is a priority and of their responsibility to make their patients aware of research projects within the Department.
17. That the Hematology Division model re: research be adopted wherever possible.
18. That a specific public relations strategy be developed promoting research and education within NSHA. This should include but not be limited to – signage; research and education on our letterheads, website and other communication materials.
19. That the VPR have an annual award for the team that has improved the research culture within its unit.
20. That opportunities to work within PHIA framework to increase research opportunities for public and patients in NSHA be explored and implemented.

Module# 4 - The Business Case for Removing Barriers to Research at NSHA

In health care, the primary reasons to do research are to find cures for what now is in-curable, improve care and to critically evaluate clinical care practices (in other words find what is working and what isn't). **Most importantly research saves lives, allows for better decisions to be made in health care and provides the public with data so they can arrive at their own conclusions.** For policy makers it achieves a level of transparency that is beyond repute. In addition to clinical benefits, there are also economic spin offs and commercialization opportunities from research projects which can be an important way for the health care system to save money, boost the local economy, innovate and with re-investment allow it to do more research.

Economy Boost

There are now 446 highly qualified persons paid from research funds. In any other sector of the NS economy this alone would be considered a highly successful big employer. *Now or Never: An Urgent Call to action for Nova Scotians* recommended that NS Universities and NSCC double research funding to \$300 million and double the research and development partnerships from 1,000 per year to 2,000 per year (Nova Scotia Commission). Nicholson and Larsen in a report to the NS government indicated how research could be a driver for the NS economy (Nicholson). They noted that since 2001, Innovacorp has made 63 investments in 43 startups – 33 are still active; 11 are health-sciences companies. An investment of \$30 million resulted in leverage of \$51.3 million; these companies now have export sales of \$36 million, a payroll of \$37 million and they employ 490 skilled people. It is generally accepted that research funds have at least a 1.5 times multiplier effect on the local economy (Frank). From a business standpoint, commercializing research is important. Several spin off companies have been founded by NSHA researchers and the number of people they employ.

NSHA Researchers Who Have Spin Off Companies

Company Name	Website	Researcher	Department or Division	# EEs
Dementia Guide	https://www.dementiaguide.com/ Helping people affected by dementia	Ken Rockwood	Geriatric Medicine	unknown
DMF Medical	http://dmfmedical.com/ ZeroSorb, a CO2 removal device which uses membrane technology rather than absorbent chemicals to remove toxins, creating safer delivery of anesthesia	Michael Schmidt	Anesthesia	unknown
Daxsonics Ultrasound	http://www.daxsonics.com/ Ultrasonic and micro-imaging technology design. Provides product development consulting services for ultrasound-based medical devices	Jeremy Brown Rob Adamson	Biomedical Eng Otolaryngology	18
OrthoMX Technologies Inc	https://www.instrideweb.com/ InStride® is a smartphone app designed to track walking patterns using a mobile device.	Michael Dunbar- Barbara Campbell is the owner/founder of OrthoMX	Orthopaedics	1

Panag Pharma	https://www.panagrx.com/ Treatment of pain and inflammation with canabanoids	Mary Lynch (CEO) Orlando Hung (Director) Christian Lehmann, (Director) Melanie Kelly, (CFO)	Anesthesia	2
3DBolus	http://3dbolus.com/ Improving the Accuracy and Efficiency of Radiation Therapy	James Robar	Medical Physics	8
Densitas	https://densitas.health/ Data-driven solutions for clinical decision making re. breast imaging	Mohamed Abdoell	Diagnostic Imaging	14
DeCell Technologies	http://www.decelltechnologies.com/ developing tissue products for use in wound healing and surgical reconstruction	Paul Gratzer	Surgery	3
ABK Biomedical	http://www.abkbiomedical.com/ interventional radiology	Daniel Boyd Bob Abraham	Diagnostic Radiology	14
Audioptics Medical Inc.	Develops endoscope for clinical otology	Rob Adamson	Otolaryngology	1
Enginuity MED	https://www.enginuityinc.ca/ monitors fluid levels on intravenous bags, alerting medical staff when empty	Orlando Hung	Anesthesia	1
Halifax Biomedical Inc. (HBI)	http://halifaxbiomedical.com HBI-world leading provider of micro-instability assessment services using very precise proprietary Stereo Orthopaedic Radiography (SOR) imaging technology (HALIFAX exams). HBI focuses on 2 clinical problems: detection of implant loosening for total hip and knee replacements, and quantification of instability of the spinal column in patients with chronic low back pain.	Chad Munro, CEO Mike Dunbar, AIF Project Leader	HBI Orthopaedics	unknown

Innovation Impact

The *Now or Never* report indicates that innovation in health care is “the greatest opportunity for innovative impact among all services delivered by the Province”. The **One Patient One Record** project has been identified as essential for innovation in health care. Two of their recommendations: 1. that NSHA, IWK and Dalhousie Medical School create a multidisciplinary center for innovation in health care delivery and 2. extend the Translating Research Into Care (TRIC) grant program model, both deserve further consideration. The first of these recommendations is indeed under consideration and will emerge as Integrated Health Research NS. The report also notes that several new strategies have recently been implemented in Nova Scotia. These include:

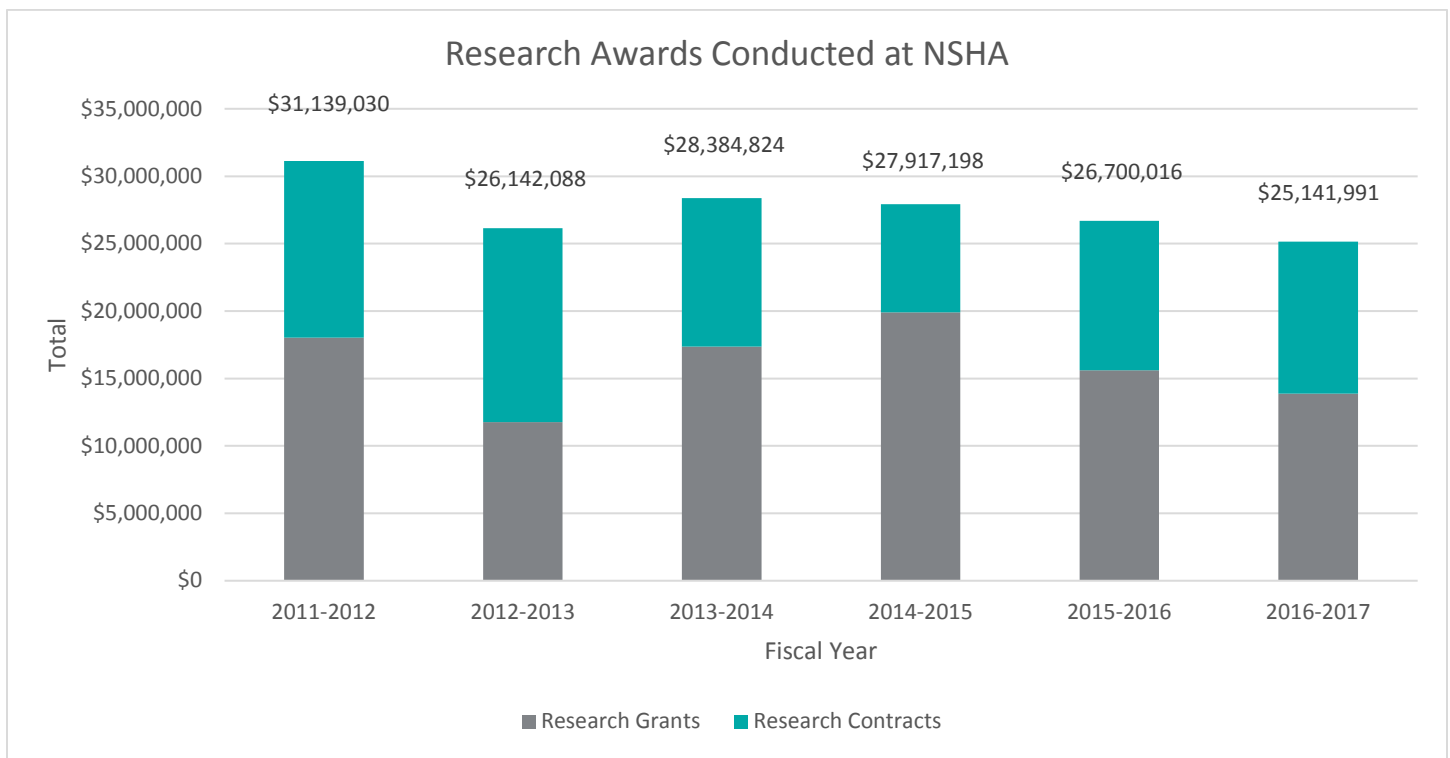
Social entrepreneurship - a new mechanism for addressing complex social issues by engaging private and third sectors to develop solutions that produce better outcomes with potentially less funding.

Change laboratory action research institute at SMU (partnership with CBU, MSVU, SFX, U ST Anne, and NSCC). This laboratory addresses complex social issues such as obesity, sexual violence, racism, mental health, and aboriginal justice. The approach is designed to allow non-traditional solutions to emerge through collaboration.

Research Nova Scotia, an umbrella organization formed which will include NS Health Research Foundation. The amount of provincial funding to this organization on a yearly basis is to be determined.

Current Status of Research at NSHA

The NSHA currently has over \$25 million in research funding over half of which comes from research contracts, the majority of which are clinical trials. An important aspect of clinical trials is that patients enrolled in clinical trials have better outcomes than those with the same illness who are not enrolled in clinical trials (Albert).



If we are to double our research revenue as called for in the Now or Never Report and fulfill the mandate of the Nicholson report we must remove the barriers that make research difficult in our environment. **Doubling our research revenue means going from approximately \$24 million to \$48 million per year.** To do this we must not only remove barriers to research but we must be nimble.

Current Barriers to Research at NSHA

A prime example of what can be done to improve research efficiency at NSHA is the Research Ethics Board (REB). There is now one REB for all of NSHA (previously there were 9 and if you wanted to do a province wide study your protocol had to be submitted to all 9 REB's) and there is some reciprocity with Dalhousie and IWK. Overall turn-around time for review of research applications is a mean of 52 days – an exemplar for such Boards. For full board review the turn-around time is 56 days while for delegated reviews it is 49 days.

Teams from Dalhousie and NSHA are addressing some of what seems like minor but can be very troublesome issues such as transferring funds from a grant held at Dalhousie to one held at NSHA. Contracts have been lost because deadlines have been missed due to delays in processing of the contracts by IWK and Dalhousie. Another team is dealing with issues internal to NSHA such as financial services for research and information technology. Most important here is for researchers to communicate with Research Services when they have issues that are not solved after a reasonable time. It is likely that there will always be issues that need resolution so good communications are key.

I have been impressed that when decision makers in finance or IT (as examples) are made aware of issues that are impairing research they work promptly to resolve these issues. However some issues such as financial ones, where the services are paid for from research overheads are best dealt with by having financial personnel resident in research services. As professionals, they would report to finance managers.

One area where there are processes in need of change is the area of approval of projects that require multiple levels of review e.g. -- by a clinical manager; information technology; legal; finance etc. These are now done sequentially. Even if a reasonable time of two months is taken by each service, 8 months have elapsed even if there is no back and forth correspondence re: amendments. One investigator had two projects that took two years in one case and over one year on the other to get approval. A simple way of dealing with this is to review these projects concurrently. After two months, representatives from each area can meet with VP Research and the investigator and make a decision such as approval or identify one or more areas that have questions to be answered. In the latter case a new time line can be set and a meeting reconvened in a month. ELT at NSHA will have to decide how to operationalize such decisions.

Another challenge is working within the Personal Health Information Act (PHIA). Research staff are not considered part of the circle of care when they access personal health information for research purposes which means patient consent is required to provide personal health information to a researcher to identify potential study participants. However there are measures that we can take that will help in this regard. Clinics such as the multiple sclerosis clinic, as an example, ask patients if they are willing to be approached about research studies and have patients sign the "Access to Personal Health Information Consent Form" for this when they visit the clinic. The same could be done for any patient at any venue within NSHA, however the challenge is where to best store these signed consent forms to allow for access between health care providers. Thus, until **One Patient One Record** is achieved this is not a practical solution. Within the **One Patient One Record** a portal should be available to the public so that they can take advantage of this option at any time. This will provide researchers with a more efficient process for contacting and communicating with patients about research studies. In the meantime clinicians caring for patients should be aware of research studies that are being done on their unit and they should ask their patients for permission for a research associate to come and get consent to review their record to see if they qualify for a study. After that, the informed consent process would proceed. The Hematology Division has integrated clinical care and research and is a model that should be emulated by others. [See Module#3- Research Culture](#) for further details.

NSHA has a large amount of data dealing with many aspects of encounters with the health care system. Access to these data can be problematic. However these data should be regularly examined by researchers and it is very likely that the findings will improve health care delivery.

Research culture at an institutional level is another challenge and is addressed in [Module#3](#).

One of the biggest challenges to doubling our research dollars is the lack of grand plan and the collaboration necessary to achieve this. The current alignment of government, NSHRF (soon to be Research NS), Dalhousie VP Research, Deans of Health Faculties at Dalhousie, NSHA and IWK provides the opportunity for development of such a plan.

Finally we have to be nimble – taking weeks to months to get things done does not work in an entrepreneurial setting. Examples of how to achieve nimbleness are given throughout this report. However adoption of research as a priority for NSHA and ownership of the research agenda by NSHA leadership are key to nimbleness – without this we will continue to fumble.

Acknowledgements- Thanks to Andrea Dean; Debbie Wright; Matt Holland; Amy Wilson for help with various aspects of this document.

Recommendations

21. That researchers communicate with Research Services when issues are unresolved after a reasonable time/effort.
22. That financial personnel who deal with research finances be sited in Research Services Unit.
23. That proposals needing reviews by multiple disciplines (legal, IT, etc.) be done concurrently with a two month target to completion.
24. That an overarching **Provincial Health Research** plan be developed in conjunction with, NS Department of Health and Wellness, VP Research Dalhousie, NSHRF, VP Research IWK, Deans Faculties of Medicine, Health and Dentistry that has as its focus health outcomes and implementation science research.
25. That all those who are in the circle of care promote the research process by asking their patients for permission to be approached by a research staff member to get permission to review their record to see if they are eligible to participate in a research project.
26. That the VPR report to ELT every six months on progress regarding removal of barriers to research.

Module# 5 - The Missing Link– A Combined Outcomes Research/Implementation Science Unit

NSHA currently is in exactly the same position that the National Health Service (NHS) in the UK was in 1991. At that time Michael Peckham was appointed to lead research in NHS. In an interview he stated “the NHS is beginning to understand that research is not a luxury but something that is essential”. NSHA has a budget of about \$2 billion and has undertaken a large number of projects designed to improve the delivery of health care to Nova Scotians. The challenge for NSHA is that there is no overall plan to rigorously evaluate whether these interventions work or not and how to implement province wide those interventions that do work. Equally important is the lack of expertise to select and operationalize implementation strategies that can correct unfavorable variability in processes of care. Also important are strategies to de-adopt or de-implement low value, ineffective or even harmful processes.

There are two areas of endeavor that we can draw upon to solve these issues – these are health outcomes research and implementation science. A paper commissioned by the CD Howe Institute reviews the field of health outcomes research and while there are many measures available, from the patient’s perspective the most important outcome is - was the treatment a success?; and am I better than before the intervention? (Veillard). Many institutions now use Patient Reported Outcome Measures (PROMS) to monitor how successful a treatment was (Rotenstein). These PROMS have been customized for almost every disease state. Implementation Science is the study of methods to promote the adoption and integration of evidence based practices, interventions and policies into routine health care (Fixsen). This field borrows heavily from behavioral science, since guidelines, policies and or educational information alone or practitioner training are often not effective. Longer term multilevel implementation strategies are more effective.

What are some of the key questions facing NSHA?

On October 23, 2017 eight members of the Executive Leadership Team (ELT) in response to a question from the VP Research articulated questions from their respective portfolios that require answers using rigorous research methodology:

- In continuing care, what funding model appropriately addresses geographic differences in the Province?
- Mental Health – what measure of improvement is most appropriate to evaluate the success of the system transformation that we are implementing?
- Are collaborative care centers better than the traditional model of primary care?
- Is our current approach to palliative care improving patient satisfaction?
- Are collaborative emergency centers cost effective?
- Do networks improve health outcomes?
- What is the relationship between culture and safety in health care?
- How does employee engagement relate to attendance at work?
- How do members of the public like to receive information about NSHA?
- Does public engagement make a difference in people’s perception of the Health Authority?
- How does housekeeping impact infection control?
- How does the condition of our facilities impact patient care?
- How do we reduce duplicate and or unnecessary diagnostic tests?
- Is my health better than when I came here for treatment?

There are also many other issues that need to be addressed. There is currently evidence of variation in processes of care and outcomes amongst various sites delivering care such as:

- Hospital Standardized Mortality Ratios
- Length of stay in hospital
- Hospital readmission rates
- Fall rates
- Medication Reconciliation
- Antibiotic Prescription Practices / Antimicrobial Stewardship
- Hand Washing adherence rates
- Rate of hospital acquired pressure injury
- Emergency Department wait-time from triage to physician assessment
- Wait-time for home support and continuing care service
- Patient Satisfaction – as measured by patient experience surveys
- Employee and Physician satisfaction – as measured by Work-life pulse survey
- Ventilator associated pneumonia
- Sepsis
- Clinical staff to patient ratios, and support staff to patient ratios
- Program structures and management models

What is Currently in Place to Facilitate Improvement and Change?

Since 2015, NSHA’s System Performance Team has focused on establishing a performance improvement strategy that is founded in evidence based decision making as detailed in NSHA’s Quality Improvement, Safety and Performance Framework (Nova Scotia Health Authority-Quality Framework). NSHA relies on a coordinated planning process to focus planning activities on strategic areas and enhance accountability. Application of an evidence based decision making model (Figure 1) brings attention to the multiple factors to be considered during planning. NSHA leaders develop plans and make decisions by reviewing and evaluating information in four key areas including:

- Best available evidence including research, and organizational data
- Patient and population values, preferences, and needs
- Relevant experience and judgment of key stakeholders
- Political, socioeconomic and operational context

Planning for high performance and accountability begins with the development and communication of the organizational strategy. The second step is the development and implementation of a multi-year action plan specifying the priority areas, actions, and targets that will be carried out each fiscal year. The third step includes incorporating the priority areas as a focus within the Business Plan and local improvement plans. The measurement of indicators at the strategic/system level and the operational level serve to monitor the success in achieving the strategy.

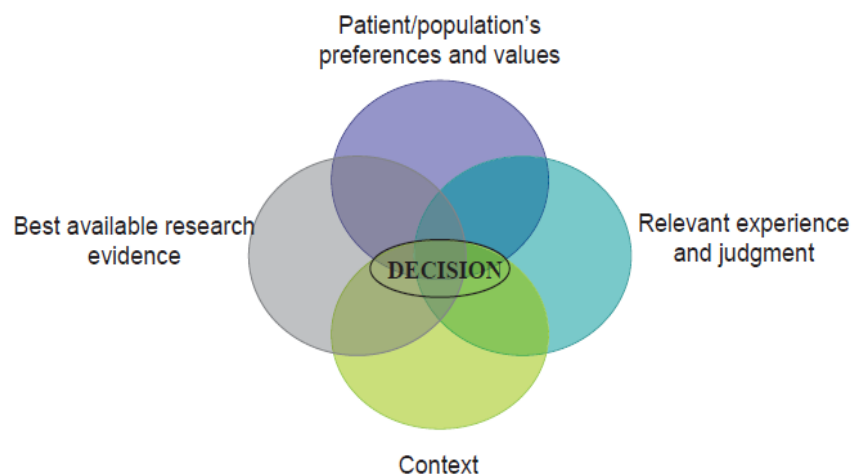


Figure 1. Evidence Based Decision Making Model

Specific goals of the planning process include:

- Aligning activities and actions with the direction of the organization
- Matching the business planning cycle to strategic direction accomplishment
- Coordinating plans and improvement activities across the organization to collectively focus on achieving strategic goals
- Establishing clear reporting requirements within the organization and governance structure

NSHA uses a conceptual model (Figure 2) to show the relationship between planning, performance monitoring, measurement, analytics and performance improvement across all levels of NSHA. The model guides and facilitates the establishment of strategic priorities, goals, objectives and performance targets. The model enables the use of the best available evidence and information to inform planning and decision making through the application of an evidence based decision making model.

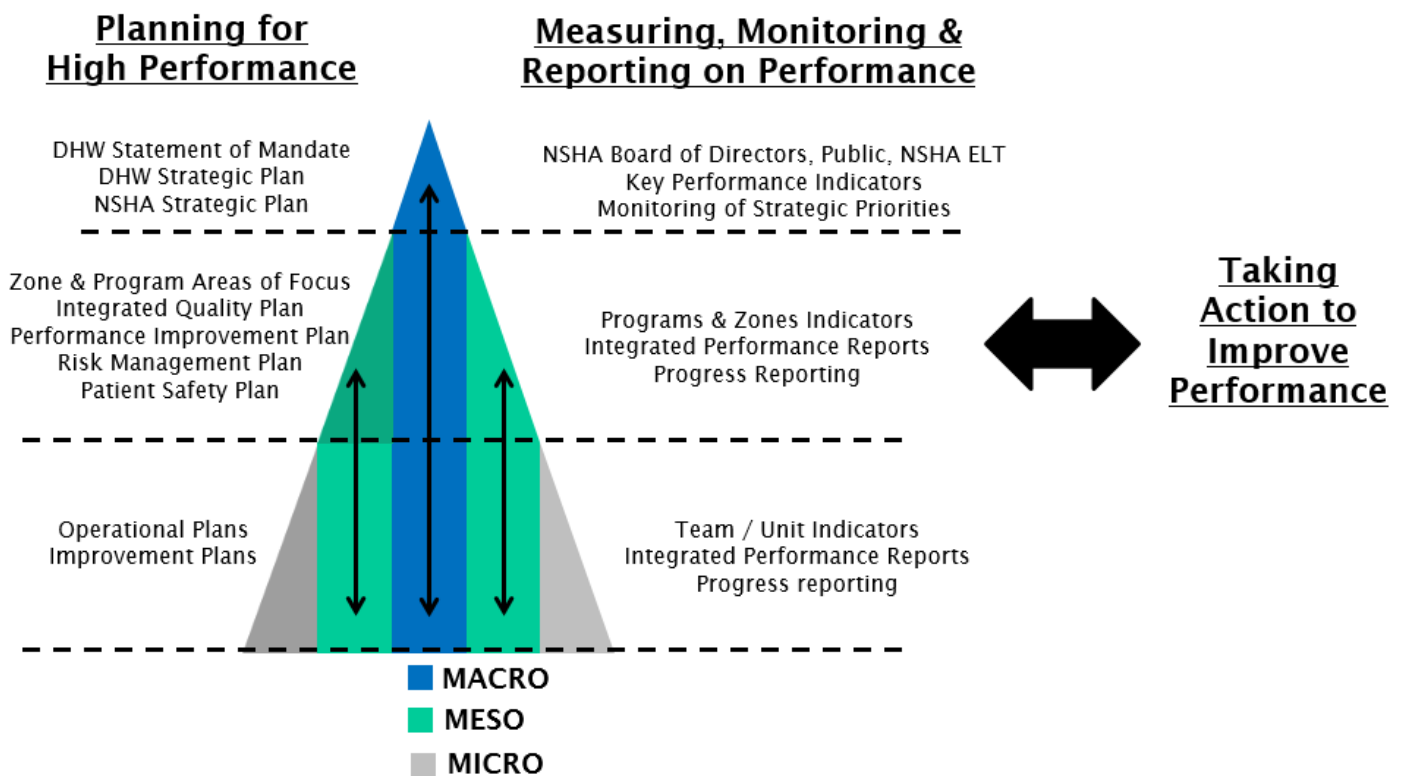


Figure 2. Performance and Accountability Conceptual Model

The Performance and Accountability model displays the interconnections of the key elements: Levels of Indicators within the Organization, Planning Mechanisms, Reporting Mechanisms/Tools and the Performance Improvement Process. There is a two way relationship between planning and measurement such that plans at each level will influence what indicators should be measured, and in turn, the indicator/performance results may influence the focus of a plan. In addition, performance monitoring and reporting cascades upward and downward within the organization, across all levels (i.e., macro, meso and micro). Taking action to improve performance and quality is essential, and the performance improvement processes should be applied at each level or across levels as indicated. The three levels within the framework are explored below.

NSHA's Quality Improvement, Safety and Performance framework incorporates structures to support and enable quality, safety and performance. These include our NSHA, Zone and Program Quality Councils, antimicrobial stewardship program, the infection control surveillance strategy, appropriateness of care initiatives, etc. In addition, NSHA employs a comprehensive performance measurement approach that brings information and evidence to the intended audience in a user friendly format. Performance measurement and monitoring includes the collection, analysis, reporting, and dissemination of operational data, indicator results, and in depth analytics reports. At each level within the organization performance measurement is tailored to align with planning, accountability and decision making requirements. NSHA employs data governance principles and data quality processes to enhance the usefulness and trustworthiness of the information reported.

NSHA has many performance and quality improvement initiatives underway. NSHA has enabled mechanisms and opportunities to share information and spread improvement activities across the organization, such as Quality Improvement and Safety Council, Quality Summit, Leadership Forum, and local quality teams. In addition, NSHA completes quarterly status reports on our top priorities. This includes measuring identified indicators, progress of action plans, and risks. There continues to be opportunity to enhance coordination, spread and sustainability of improvement initiatives.

Monitoring and reporting of indicators across multiple domains are vital activities for every health organization, to support and inform activities aimed to improve quality, safety, performance, health system sustainability and accountability. Proactively monitoring in key areas such as: patient safety, quality of care, access, population health, efficiency and effectiveness provide an integrated view of NSHA's performance. When performance is not as expected, a comprehensive review of the underlying data and organizational context helps to inform what is contributing to the performance result. In depth analytics are applied to achieve a greater understanding of the underlying performance drivers, pinpoint strengths and identify areas where targeted improvement activities should be implemented.

Performance measurement and reporting is a key driver of continuous improvement. Proactive monitoring of data and indicator results serves as a trigger for an organization to recognize areas where continuous quality improvement efforts are indicated. While monitoring and measurement are key components of a high performing health organization, using the results to drive change, and improve quality, safety and performance is essential. It is important to have a well-defined performance and quality improvement process that incorporates the following steps:

- Measurement, monitoring and reporting of data and indicators
- Issue identification
- Data review, analytics, in-depth analysis and investigation
- Stakeholder engagement
- Action plan development and implementation
- Re-evaluation

Within NSHA an array of processes and quality improvement methodologies are applied to support performance improvement. The chosen methods are matched to the issue and intended outcome. Whether applying LEAN principles, process mapping, project management, or a plan, do, study, act approach, it is important to clearly define the goals, objectives, activities and indicators.

Major change initiatives and quality improvement projects within NSHA align with fiscal priorities and organizational strategy. Within NSHA, the processes and structures undertaken to support planning, implementation, and evaluation of such initiatives remains under development.

In 2017-18, there was an increased focus of coordination of planning, implementation, and evaluation of such initiatives. The pursuit of some initiatives are dependent upon the approval of a business case submitted to government. Conversely, other initiatives are approved internally by NSHA ELT.

Similarly, a request for data and analytics reports and information can be made through a centralized intake process. Through this process, information is sourced, analyzed and packaged to meet the requester's requirements. In addition, a resource from the decision support and analytics team is assigned to high priority initiatives to provide ongoing support and analytics.

NSHA's Quality and System Performance teams are available to support planning, implementation and evaluation of improvement projects. These teams include quality and safety leaders, project managers, industrial engineers, and decision support and analytics analysts. There is a centralized intake process established in NSHA to request a resource from the Project Services and Process Improvement team – which includes the industrial engineers and project managers. These resources are preferentially assigned to ELT's priority areas.

It is apparent that there are many innovative people who work in NSHA. An example of such innovation is the team at the Aberdeen Hospital that put in place a process to reduce pressure injuries and reduced the number of such injuries from 33 (point prevalence survey) to 3 in less than one year. Thus another strategy is to enable/empower teams to solve local issues and then scale them system wide where necessary.

The majority of major initiatives within NSHA put in place the following: a NSHA steering committee, project sponsors, implementation teams, project manager resources, and project plans. These initiatives rely on the expertise of many key stakeholders, such as: program sponsors, researchers, project managers, industrial engineers, quality leaders, decision support and analytics analysts, change management consultants, engagement and public relations leaders, etc. In many instances, the individual leader(s) tasked with implementation of evidence based practice are not given dedicated time to lead this work. Rather, this deliverable is embedded within their overall workload and accountabilities. The absence of dedicated time for project leads / sponsors (embedded in the program area) to lead the initiative is a fundamental limitation of implementation. In some instances, programs have made the request for enhanced project management resources in efforts to fill this leadership gap. However, a project manager is not the best solution for this requirement, as s/he does not have the subject matter expertise, nor the influence required to lead within the program area. In addition, a good portion of the support services (e.g., project managers, industrial engineers, decision support and analytics analyst, communication, etc.) are assigned to multiple competing projects and initiatives at a given time. There are opportunities to enhance dedicated time for the planning, implementation, and evaluation of major initiatives. In addition, an increased focus on outcome measurement and the science of implementation are needed. The spread and sustainability of evidence based care is an area requiring additional focus.

Strategic Plan Champions- A Health Outcomes/Implementation Science Team

In order to help answer questions such as those posed above, and to support the performance and analytics capabilities within the organization, a health outcomes/health implementation science team should be formed. First and foremost the ELT must take ownership of this team. The VP Research will be the team leader and will be involved with all new projects undertaken by his/her fellow VPs. The implementation science team will augment the structures, processes and accountability mechanisms currently in place across NSHA. The mandate of the health outcomes/implementation science team is to take the issues identified by the quality team and or the analytics team and work with the front line care providers to resolve these issues.

There are currently two scientists on staff who can participate in this team – Kathryn McIsaac PhD and Tara Sampalli PhD. Kathryn is currently the Health Outcomes Scientist and is responsible for providing strategic and operational leadership in the development, management, and evaluation of health outcomes projects in sites across NSHA. She works closely with senior health systems leaders to provide leadership in the design, conduct, analysis, reporting, and publishing of research on health outcomes and quality improvement across the NSHA. Currently the Health Outcomes Scientist plays a key role in health services planning at the NSHA by using scientific evidence to guide the redesign of the seven clinical priority streams following the creation of the new health authority in 2015.

Tara is a mid-career scientist working within primary care with expertise in implementation science who should be added to the team. In addition there will be a scientific director associated with each scientist. The scientific director will be an MD (or equivalent clinician – psychologist for example) who is part of the program in which the research is being carried out. A day of that individual's time per week will be purchased. The PhD member of the team will be embedded in the program that has the question to be answered (e.g. Hip and Knee replacement program) for as long as it takes to answer the question and or implement a strategy. NSHA resources such as HR, communications, IT and administrative leadership will be key components of the success of these teams. This unit will also have the capacity to train graduate and other students. For example these activities are a good training ground for Health Impact Fellows (a program sponsored by CIHR).

There are also many scientists both within NSHA and at NS Universities with expertise to answer some of the questions posed by the ELT. For example, the Faculty of Medicine in October 2017 announced that one of its research priority teams will focus on the health research priorities of the Maritime Provinces (Wave II Health Research Priorities team). This priority initiatives team is comprised of over 100 clinicians and scientists, many of whom are embedded in NSHA. Dr. Lucy Savitz at Kaiser Permanente from her experience at Inter Mountain Health found that working with teams with a problem to be solved is the best way to ensure improvement is sustained.

Dr. Robin Urquhart in the Department of Surgery is heavily involved in implementation science. In her research, she identifies the multi-level factors (e.g., at the patient, provider, organization, community, and system levels) that influence our ability to move the best available evidence into frontline practice or policy. Based on this information, she designs and tests strategies to more effectively move evidence-based tools and practices into care delivery so that our patients and our health system benefit. Her work spans areas such as testing educational/skills-building programs to improve care of hospitalized older adults with frailty, to audit and feedback interventions for cancer surgery to e-consultation platforms to improve coordination of care between primary and oncology care. She also works closely with the NSHA Cancer Care Program to design, implement, and evaluate quality improvement projects using implementation science knowledge and approaches. She recently received a 5-year CIHR Foundation Scheme Grant (the only researcher in Atlantic Canada to receive one in 2017) to use cutting-edge implementation science methods to improve care and outcomes for cancer survivors.

Dr. Michael Dunbar who holds an Arthroplasty QEII Endowed Chair is focusing on outcomes in patients who have had hip or knee arthroplasties. He has already found variations in several processes of care and now is working to remove these variations. Currently the clean wound infection rate following arthroplasty surgery averages around 2% with a range of 0.5 to 3.3%. The goal is to reduce the clean wound infection rate following this surgery to 1% or less. This will save \$ millions but more importantly will prevent a lot of pain, suffering and disability.

The Stroke Program has successfully implemented a number of measures province wide that have resulted in improved outcomes that are better than another provincial comparator.

NSHA should ask for proposals to answer at least two questions per year. NSHA would provide the funding to the selected team to answer the question(s). Partnering with Faculty of Medicine and other Faculties could increase the capacity to answer questions. Expertise is available within the RMU in areas that are commonly needed/used by investigators, including research design and methods, biostatistics, data management, and health economics.

The Maritime SPOR Support Unit formed as part of the CIHR Strategy for Patient Oriented Research also has several services that can help the Health Outcomes / Implementation Science Unit achieve its goals. In the past NSHA did not have an opportunity to work with MSSU. The mandate of MSSU is in the process of changing and now NSHA will be working closely with MSSU. The MSSU is a maritime organization whose provincial mandate within Nova Scotia aligns itself to become a part of implementation science teams.

The vision for a health outcomes/implementation science unit outlined above is just to get NSHA started in difficult economic times. Where should we aim to be? The Ottawa Hospital under the directorship of Alan Forster MD has a combined quality improvement/data analytics and health implementation science team. This team is comprised of 37 professionals; 12 in data analytics; 10 in quality improvement and 15 in implementation science. NSHA has a high quality data analytics team which focuses mostly on business analytics. NSHA ELT could not make decisions without support from this data analytics team – the same is true for Health Outcomes/Implementation Science. NSHA should consider following the Ottawa Hospital model and integrating Data Analytics, Quality Team and Implementation Science team under the direction of two vice presidents – VP Research and VP Quality, System Performance & Transformation. The latter would identify areas that need the attention of the Implementation Science Team.

One of the ways to grow the implementation science agenda quickly is to have a three day workshop to which selected employees from across NSHA are invited to participate. International experts in implementation science supplemented by local expertise would lead this workshop.

Acknowledgements- Thanks to Ms Bethany McCormick and Dr. Robin Urquhart for major contributions to this section.

Recommendations

27. That NSHA form a Health Outcomes/Implementation Science Team nested within the portfolio of VPR.
28. That the ELT formulate at least two research questions per year – one will be answered by the Health Outcomes/Implementation Science team. These can come from the quality or data analytics teams.
29. That at least one question per year be advertised to the NS Health Science Community as a call for proposals to answer this question.
30. That up to \$300,000 (cash/in kind) will be available to fund a team(s) to answer the questions posed in recommendation #3.
31. That a strategy be developed to monitor outcomes of investigator driven projects, including quality of care projects, and where appropriate, implement province wide those that have the potential to improve care system wide in NSHA.
32. That NSHA consider amalgamating the Quality, Data Analytics and Health Outcomes/Implementation Sciences teams into one unit under the direction of VPs Research and Quality, System Performance & Transformation.
33. That NSHA provide a 3 day workshop in knowledge translation and implementation science as soon as possible.

Module# 6 - Budget for Research at NSHA

Currently the Vice President Research has an operational budget of \$807,803. This money supports personnel e.g. VP Research and an administrative assistant; the Program Leader Research Development; Research Director and a Health Outcomes Scientist. The return on this investment is staggering. It includes just over \$23 million in research grants and contracts and the employment of 446 highly qualified support personnel. Then too there is the at least a two-fold multiplier effect of this money on the Nova Scotia economy.

In order to make progress in research at NSHA, it is essential to expand research capacity in several new areas. The amount of funding for each of these is set at a modest amount. Currently it is more important that these new initiatives be accepted in principle and the funding amount can be determined over time and with experience.

These new activities include:

- (1) A Health Outcomes and Implementation Science Unit
- (2) Contract research to enhance this work
- (3) Matching Funds
- (4) Bridge Funding
- (5) Funding for Biobanks
- (6) Funding to support Graduate students

Not included in the current budget are funds for internal grant programs; the NSHA Research Fund competition, the Vice President Research Matching Funds Program and the Translating Research In to Care healthcare improvement grants competition. The NSHA Research Fund and the Vice President Research Matching Funds Program are funded from research overheads and the latter is funded from the QEII Health Sciences Centre Foundation.

While we are recommending an increase over the previous research budget for a total new budget of \$1.880 million beginning in 2018/2019, it is worth noting that Dr. Sally Davis, Director of Research at National Health Service in the UK has over time increased the research budget to 2% of the total budget or 2 billion pounds per year. 2% of the NSHA budget would be \$40 million.

We are proposing a modest increase of \$1.080 million over the previous budget. The recommendations for spending this increase and the rationale for each is given below.

Recommendations and Rationale

34. That the Health Outcomes and Implementation Science Unit – the rationale for this entity is provided in [Module 5- “The Missing Link”](#). We recommend this unit be funded at \$300,000 per year.
35. That contract research to enhance the work of the Health Outcomes and Implementation Science Unit be funded at up to \$300,000 per year. To address prioritizing NSHA research projects each year, we suggest posting a Call for Applications with funding available to address specific research questions. It is anticipated that researchers answering the Call for Applications will come from health-related faculties at Dalhousie and/or at other NS Universities. Matching funds will be needed from the parent university(ies) of the researchers, thereby increasing the number of research projects that can be done. As an alternative, up to three more researchers could be hired as part of the Health Outcomes and Implementation Science Unit. However this is likely a more costly option.
36. Matching Funds to support research are necessary and currently unavailable. Many research funders, such as Genome Atlantic; CIHR and others have grant competitions that require institutions to provide matching funds for projects. At present there is no designated budget for this at NSHA. If we are unable to provide these matching funds, we will not be competitive for many research opportunities. A recommended budget of \$200,000 per year be devoted to support projects that require matching funds. A policy has been drafted and approved by the Research Advisory Committee regarding how to allocate these funds.
37. That bridge funding be available for project teams between grants. The VP Research receives requests throughout the year for funding support to “tide researchers over” until the next funding competition so they can maintain their programs of research and pay their staff. Partnerships with the academic departments where the researchers are based can also help extend these funds –The amount of \$100,000 per year is suggested to be available to provide bridge funding when necessary.
38. That funding support for biobanks at NSHA be available. Currently there are several tumor banks at NSHA including: lung; pituitary; myeloma; and a brain tissue bank. Other tumor banks are needed. It is noteworthy that planning is underway for comprehensive strategy re: biobanks. The infrastructure to store this material is in place in the pathology laboratories. Since this material will mainly be used for research, it is reasonable that this cost be included as part of the overall research budget. The amount of \$80,000 per year is recommended.
39. That a fund for graduate students be created at NSHA. Graduate students are essential to growing the research enterprise at NSHA and training the next generation in research techniques that will be beneficial to patients and the health care system. The home for these students would naturally be the Dalhousie Department of Community Health and Epidemiology but as the program expands, graduate students from nursing, physiotherapy, pharmacy would have a home in Dalhousie Faculty of Health. Recommended amount: \$100,000 per year.

Module# 7 - Research Chairs at NSHA

An endowed Research Chair allows the Chair holder to devote all or a significant portion (e.g., 75%) of their time to research. This time provides for collaboration with other world-class researchers and the opportunity to make unique and important contributions to the accumulation of research evidence and new knowledge that benefits patients and the healthcare system. Endowed Research Chairs are an essential part of building any successful research program. They attract exceptionally talented clinician-scientists and health researchers and give them protected time to work on solutions to our most significant health care problems.

Return on Investment

Chairs attract the most talented students and trainees thereby enriching the local talent pool. The amount of money required to fund a chair needs some discussion. Dalhousie requires \$5 million to establish a Chair. If NSHA/QEII Foundation accepted \$4 million as the amount to fund a chair, we could have more chairs. At interest rates of 4% this yields \$160,000 for the Chair holder's research program. \$120,000 should go towards the investigators salary and what is left over after benefits have been added can be used for the Chair holder's research program. Chairs and their teams publish and present research nationally and internationally showcasing in a positive way, our health authority, universities, and province. Chairs successfully compete for national and international research dollars, new equipment and state of the art research facilities through CFI and other grants. This helps to grow the local economy.

The Current Landscape

In Nova Scotia, in addition to their own named Chairs, Dalhousie University typically administers the research Chairs that are funded by the QEII Foundation. That is, the University takes the lead on the search and selection process and on the evaluation of the Chair at the end of the first term (usually 5 years) and makes a recommendation about reappointment for another five years. NSHA has representation on these committees via the VP Research. Senior leaders at NSHA do need to be more involved in deciding the next discipline to have a Research Chair. This is best done by the President and CEO seeking advice from their team and then working with the CEO's of the various Foundations to decide the focus of the next chair.

A consideration as we move forward is having some Chairs sited in zones other than Central. We could start with having a chair in Eastern (Sydney) or Western (Kentville) Zone that could be a resource for the entire province. Consideration is currently being given to Chairs in the following disciplines: End of Life (Palliative Care), Rheumatology and Addictions Medicine. By virtue of their specialty some Chairs, such as a Chair in Rheumatology, would be sited in Central Zone.

The tables that follow list all the endowed Chairs that are part of the research enterprise at NSHA. For some of these Chairs, the money was entirely raised by the QEII Foundation; for other Chairs the QEII Foundation made a partial contribution; still other Chairs were funded entirely by the Dalhousie Medical Research Foundation or by external agencies such as CIHR. It is important that the entire list be known if there is a possibility of choosing a discipline for the next chair.

QEII Foundation Chairs

The QEII Foundation, now in its 21st year, has been very successful in raising money for many projects including research. The scientists who hold the current QEII endowed Research Chairs have made significant contributions to research programs at NSHA and at Dalhousie University.

The QEII Foundation did the fundraising for all their chairs through designated and undesignated contributions. QEII Foundation also provided Dalhousie with a grant of \$500,000 in 1999 for five of their Chairs in - Alzheimer’s Disease, Internal Medicine, Ophthalmology, Psychotic Disorders, and Surgery.

Chair Name	Chair Holder	Start and End Date per Term	Host Department(s)
1. CCS NS Division Chair in Population Research	Louise Parker	Sept 1, 2007 – June 30, 2012 July 1, 2012 – June 30, 2017	Medicine
2. CBCF – Atlantic Region – Chair in Breast Cancer Research	David Hoskin	July 1, 2008 – June 30, 2013 July 1, 2013 – June 30, 2018 July 1, 2018 – Dec 2019	Microbiology & Immunology
3. Heart & Stroke Foundation of NS Chair in Cardiovascular Outcomes Research	Jafna Cox	April 1, 2010 – March 31, 2015 April 1, 2015 – March 31, 2020	Medicine
4. QEII Foundation Chair in Transplantation Research	Ian Alwayn	Aug 1, 2013 – Oct, 2017	Surgery
5. QEII Foundation Chair in Arthroplasty Outcomes	Mike Dunbar	May 1, 2015 – April 30 - 2020	Surgery
6. QEII Foundation Scholar in Retina Research	Vacant		Ophthalmology & Visual Sciences
7. QEII Foundation Scholar in Glaucoma Research	Jayme Rocha Vianna	March 1, 2017- June 30, 2022	Ophthalmology & Visual Sciences

Mostly Dalhousie Medical Research Foundation Chairs

Chair Name	Chair Holder	Start and End Date per Term	Host Department(s)
8. Joan and Jack Craig Chair in Autism	Isabel Smith	Mar 1, 2014 – Apr 30, 2019	Pediatrics
9. Gibran and Jamile Ramia Chair in Surgical Oncology (\$1 million from QEII Fdn)	Geoff Porter	May 1, 2003 – Apr 30, 2008 May 1, 2008 – Apr 30, 2013 May 1, 2013 – Apr 30, 2018	Surgery
10. Willam Dennis Chair in Adolescent Epilepsy	Alon Friedman	July 1, 2014 – Jun 30, 2019	Medical Neuroscience
11. Dr. Paul Janssen Chair In Psychotic Disorders	Philip Tibbo	July 1, 2008 – Jun 30, 2013 July 1, 2013 – Jun 30, 2018	Psychiatry
12. Sun Life Chair in Adolescent Mental Health	Stan Kutcher	Aug 1, 2006 – Oct 31, 2011 Nov 1, 2011 – Dec 31, 2016 Jan 1, 2016 – Dec 31, 2017 (extension) Jan 1, 2018 – Dec 31, 2023	Psychiatry
13. R. Howard Webster Research Chair in Medicine	Leah Cahill	Apr 1, 2015 – Mar 31, 2020	Medicine
14. Kathryn Allen Weldon Chair in Alzheimer’s Research	Kenneth Rockwood	Jan 1, 2002 – Jun 30, 2007 July 1, 2007 – Jun 30, 2012 July 1, 2012 - Jun 30, 2017 July 1, 2017 – Jun 30, 2022	Medicine
15. Dr. R. Evatt & Rita Mathers Chair in Ophthalmology & Visual Sciences	Bal Chauhan	July 1, 2002 – Jun 30, 2007 July 1, 2007 – Jun 30, 2012 July 1, 2012 – Jun 30, 2017 July 1, 2017 – Jun 30, 2022	Ophthalmology
16. The JD Irving Ltd. Research Chair in Occupational Medicine	Anil Adishes	Mar 1, 2013 – Feb 28, 2018	Medicine
17. DMRF Irene MacDonald Sobey Chair in Curative Approaches to Alzheimer’s Disease	Sultan Darvesh	July 1, 2014 – Jun 30, 2019	Medicine
18. The Sobey Family Child and Adolescent Mental Health Outcomes Chair	Leslie Anne Campbell	Mar 1, 2015 – Feb 28, 2020	Community Health & Epidemiology

The following two tables provide an overview of CIHR-funded Canada Research Chairs through the Faculty of Medicine at Dalhousie.

Tier 2 CRC chairs: (Maximum two terms of five years each)

Chair Name	Chair Holder	Term	Start and End Date per Term	Host Department(s)
1. Early Intervention in Psychiatry	Rudolf Uher	Second	Jan 1, 2012 – Dec 31, 2017 Feb 1, 2018 - Jan 30, 2023	Psychiatry
2. Cellular, Biomaterial & Matrix Interaction	John Frampton	First	May 1, 2014 - April 30, 2019	Biomedical Engineering
3. Human Molecular Genetics	Morgan Langille	First	May 1, 2016 - April 30, 2021	Pharmacology
4. Pain	Javeria Ali Hashmi	First	Oct 1, 2016 - Sept 30, 2021	Anesthesia
5. Translational Microbiomics	Johan van Limbergen	First	Apr 1, 2018 - Mar 30, 2023	Pediatrics

Tier 1 CRC chairs: (Maximum two terms of seven years each)

Chair Name	Chair Holder	Term	End Date	Host Department(s)
1. Bioethics and Philosophy	Françoise Baylis	Second	Oct 1, 2004 – Sept 30, 2011 Oct 1, 2011 – Sept 30, 2018	Faculty of Medicine
2. Viral Vaccinology and Therapeutics	Chris Richardson	Second	Apr 1, 2005 – Mar 31, 2012 Mar 1, 2012 – Feb 28, 2019	Microbiology & Immunology
3. Comparative Genomics and Evolutionary Bioinformatics	Andrew Roger	Second	Jun 1, 2010 – May 31, 2017 Jun 1, 2017 - May 31, 2024	Biochemistry & Molecular Biology
4. Cancer Research	David Waisman	Second	Jan 1, 2006 – Oct 31, 2013 Nov 1, 2013 - Oct 31, 2020	Biochemistry & Molecular Biology
5. Pediatric Pain	Christine Chambers	first	Oct 1, 2015 - Sept 30, 2022	Pediatrics/ Psychology & Neuroscience
6. Addictions and Mental Health	Sherry Stewart	first	Nov 1, 2016 - Oct 31 st , 2023	Psychiatry/ Psychology & Neuroscience

Sitting in a Research Chair

As important as it is to discuss the budget, requirements and barriers to research from a leadership position, it is equally important to take in the perspective of the Researcher. While many conversations and interviews have informed this report, included below are specific accounts of some Chair holders and their research.

Sultan Darvesh MD PhD- Dalhousie Medical Research Foundation Irene MacDonald Sobey Chair in Curative Approaches to Alzheimer's disease

I am a Professor of Medicine (Neurology and Geriatric Medicine) and Medical Neuroscience at Dalhousie University, and I also serve as a Neurologist with a focus in Cognitive/Behavioural Neurology at NSHA, Halifax, Canada. My clinical practice has provided an opportunity to encounter patients with a wide variety of neurodegenerative disorders and to identify clinically relevant questions for basic research. My research program is focused on Alzheimer's disease (AD) with a three-pronged approach: 1) Developing radio-imaging methodology for AD diagnosis during life; 2) Discovering the underlying causes of the disease and 3) Finding curative approaches for the disease treatment that can be monitored through diagnostic imaging.

AD destroys brain cells and is the major cause of dementia worldwide. The underlying mechanism(s) of AD initiation and progression are unclear at present. Current treatments effect modest symptomatic relief; an issue exacerbated by a lack of reliable diagnostic methods early in the disease course when therapy is most beneficial. Currently, definitive AD diagnosis requires post-mortem neuropathological analysis. As a clinician-scientist, my specific research interest relates to the role(s) of the enzyme butyrylcholinesterase (BChE) in AD. In this regard, I have gained international attention for mapping the distribution of BChE in structures important in cognition and behaviour, in the normal human brain, and how the distribution of that enzyme is altered in brain regions that undergo degeneration in AD.

Funding from the Chair has allowed my team to develop and implement a comprehensive multi-modal diagnostic neuroimaging analysis framework (PET/SPECT/MRI/CT) for rigorous pre-clinical assessment of our lead BChE radiotracers in an AD mouse model- [this is a major breakthrough in Alzheimer's Disease diagnostics.](#)

In 2014, I was named the Dalhousie Medical Research Foundation Irene MacDonald Sobey Chair in Curative Approaches to Alzheimer's disease. **This generous endowment has made a significant impact on my research.** In large part, the Chair has allowed me to allocate more protected time to research duties. I have had more opportunity to do dedicated experimenting and thinking about ways we can properly diagnose AD during life. A direct consequence of this has been the publication of a number of significant research papers that have assisted me in securing close to \$1.5 million of funding support from the Canadian Institutes of Health Research.

In addition, the Sobey Chair has permitted me to increase the exposure of the Maritime Brain Tissue Bank (MBTB), a facility which I have directed since its inception in 1994. The mission of the MBTB has been to coordinate the collection of diseased and normal brain tissues, and make this tissue available for neuroscience researchers worldwide. **The MBTB is the only facility of its kind in Atlantic Canada**, providing well-characterized human brain tissue to researchers. Over 1,100 brains have been donated to this facility and many brain tissues have been disseminated locally, nationally and internationally to laboratories engaged in research in neurological diseases. The MBTB represents essential infrastructure needed to support existing and planned high level programs by providing a link between basic science and clinical care, facilitating understanding of the causes of neurological illnesses and nurtures the discovery of their treatments and cures.

Since my appointment as Sobey Chair, I have been able to engage in new regional partnerships (Dalhousie Human Body Donation Program) and national collaborations (CBRAIN; Canadian Consortium on Neurodegeneration in Aging) and to participate in broader community outreach through regional and national media outlets and actively campaign in partnership with the Dalhousie Medical Research Foundation's Molly Appeal, to increase MBTB financial security (\$296,826 donated to the MBTB) and public awareness of the MBTB. Sharing this vital resource will be one of the greatest legacies of the Chair.

Philanthropic funding has been a game changer for me and my program. Governments have already spent billions of dollars trying to find a cure for AD and we are still not there. With more resources put towards research, philanthropy can facilitate greater understanding of this disease. We must find a cure because failure is not an option.

Michael J Dunbar, MD, FRCSC, PhD- QEII Chair in Arthroplasty Outcomes, Nova Scotia

Data analysis and interdisciplinary knowledge translation are the main activities of my expanded research program funded by the endowed chair. With the assembled unique and comprehensive dataset, my research team and I generate presentations, reports and manuscripts related to arthroplasty outcomes in Nova Scotia. We have engaged a broad range of stakeholders including clinicians, administrators, policy-makers and academic researchers. The goal is to provide evidence from a fresh perspective to be used to affect policy change and improve patient outcomes.

The dataset now includes health utilization data for all hip and knee replacement patients in Nova Scotia from 2001-2014. It includes in-hospital and out-of-hospital services (e.g. family physician office visits) which enables the development of a comprehensive profile of health care utilization for arthroplasty patients in the province. **Such an extensive database has not previously been assembled in the province so we anticipate our findings will generate widespread interest.** We have been and are currently engaging stakeholders through a variety settings and presentation approaches to maximize the exchange of information. Evidence showing associations between surgical techniques and patient outcomes has been presented to clinicians at rounds and have also generated much interest. Results related to outcome variations across facilities have definitely sparked the interest of administrators. We continue to generate health system statistics, including costs, that target provincial and district policy-makers. My research team continues to facilitate dialogue between groups to encourage policy changes based on local population-based data, the cornerstone of my research focus through the Chair.

Our preliminary results have caught the attention of all entities that develop policy around and deliver health services in Nova Scotia including the DHW, NSHA and NSHA-Central Zone. We are on their radar with these results derived as a direct result of the Chair.

Each year's activities broaden the depth and scope of research to understand key factors in bettering arthroplasty outcomes in Nova Scotia. As Chair, the strategic broadening of my research team, specifically with a data analyst, has enabled identification of links that were previously not readily accessible.

Research activities directly attributable to the Endowed Chair funding:

- 1. Describing Health Care Utilization, Outcomes and Risk Factors for Individuals with Hip or Knee Replacement Surgery in Nova Scotia 2001-2014:** The purpose of this project is to provide evidence aimed at improving the quality of care for individuals undergoing hip and knee replacement in NS. Dr. Dunbar and his team have been actively collaborating with clinicians throughout NS as well as policy-makers within the NS Health Authority and Department of Health and Wellness to develop strategies aimed at enhancing services province-wide. We have presented preliminary data both locally and at the Provincial level. We will continue to update the data annually to include in the development of this quality project.
- 2. Continuing Improvement through Surgeon Indicators:** The purpose of this initiative is to generate quality indicator reports for the Division of Orthopaedics including stratification by site and surgeon. Work is ongoing with NSHA Decision Support and data analysis has begun. Consultations with the Department of Anesthesia, Pain Management and Perioperative Medicine are ongoing.
- 3. Collaborations Regarding Infection Control:** An apparent increase in infection rates among arthroplasty patients is a major concern for Dr. Dunbar. It is not clear whether comparable methods are being used for reporting infection rates across the province. It is important to develop a province-wide strategy to understand and suggest policies aimed at addressing infection rates. Collaborations with the Department of Anesthesia, Pain Management and Perioperative Medicine have resulted in a successful grant application that looks at transfusion practices at the 5 hospitals that perform hip and knee replacement surgery. We are pleased to report that grand rounds have been presented at Dartmouth General Hospital, Cape Breton Regional Hospital, Aberdeen Hospital, Valley Regional Hospital and the QEII health Sciences Centre to disseminate these results. We hope this knowledge translation activity will enable practice change that will affect better patient outcomes in terms infection related to transfusion rates.
- 4. 48 Hr Hip Fracture Study:** I have several publications as co-applicant/author in the CIHR funded study, *Evaluating the 48-hour Benchmark for Surgery* that examines health outcomes for hip fracture patients exposed to various wait times before surgery. This continues to be a rich data source for suggesting policy around best practice and informs my work locally.
- 5. Establish mandatory submission of implant and patient characteristics to CIHI CJRR:** One of the goals identified by this Chair is to establish robust outcome metrics for arthroplasty care in Nova Scotia and link those to national and international datasets. Collected outcome metrics will be contrasted to national and international standards, such that differences in outcomes as well as regional variability in utilization will be identified. Dissemination of this information to surgeons, hospital administrators, politicians, and the general public will allow for transparency and in itself would result in increased standardization as well as improved outcomes through quality feedback loops and iterative processing. We are pleased that after last year's work NSHA has committed to mandatory provincial CJRR submission from its 5 arthroplasty sites. Dedicated IT/IM project management has been assigned to ensure adherence to security and privacy compliance. This is a tremendous win for quality assurance and standardization across the Province.

Geoff Porter – Gibran and Jamile Ramia Chair in Surgical Oncology

When established in 2003, the **Gibran and Jamile Ramia** Chair in Surgical Oncology was the first endowed chair related to cancer surgery in Canada. In 2018, there are at least five, and ours remains the envy of most academic surgical departments. I can unequivocally state that the presence of this Chair has been the single most important contributor to my academic success via three main mechanisms:

1. **Recruitment:** The Chair has provided sufficient and stable funding to support a primary research scientist within the Department of Surgery (currently Dr. Robin Urquhart, the Ramia Scientist). Adding a second independent investigator has markedly increased both the quantity and breadth of cancer research by our group. Moreover, it has expanded collaborative research endeavors both within and outside our department, and has enabled the development of a true team approach to several research projects. Although new (and often expensive) research equipment is often the focus of research funding needs, it is my opinion that the greatest asset of most research programs are its people – more specifically, outstanding investigators passionate about the research program's work.
2. **Infrastructure and flexibility:** The Chair supports some of the infrastructure needs for our research program, typically those that are incompletely covered by traditional peer-reviewed operating grants (e.g. workspace, telephone lines, administrative support for REB submissions etc.). Although the cost of these are generally modest, they are absolutely essential to our research efficiency. If people are our program's greatest asset (see above), our peoples' most important resource is time. The infrastructure and flexibility benefits of the Chair are critical to efficient use of this precious resource.
3. **Trainees:** The Chair has enabled us to move from a single investigator driven research enterprise to a true program of research. This has increased the breadth of research training opportunities, both for graduate students and clinical trainees. The presence of infrastructure support for trainees is important, and enabled by the flexibility of the Chair funding.

The flexibility enabled by the Chair funding has allowed several opportunistic high impact research studies to move forward which have been constrained by timelines and energy required for typical peer-review submission.

Leah Cahill – Howard Webster Chair, Department of Medicine, Dalhousie

Protected research time is necessary for the deep thinking and multiple tasks that lead to making true scientific contributions. It is difficult to establish a research program in short intervals off the side of one's desk. For example, because I have protected time for research as a Research Chair, I am able to respond to my trainees' discoveries and questions quickly as they arise in addition to holding regular scheduled meetings with each member of my team at least once a week, which is an excellent set-up for research productivity. It creates a great research environment and culture!

Research Chairs are also given priority for Canada Foundation for Innovation (CFI) funding, which can be a fantastic opportunity for universities and health centres to obtain funds to renovate physical spaces for various types of research to be conducted. This funding and infrastructure is a great asset to institutions. Universities and health authorities across the country not only use research chairs as a recruitment tool, but also regularly establish Research Chairs as a means to protect more research time for current researchers who are thriving, thus allowing them additional successes in making important discoveries to further the world, all the while making a name for the institution.

Research chairs have the luxury of established (& respected) protected time for thinking, training staff and students, carrying out studies, applying for funds, traveling to collaborate with others provincially, nationally, and internationally, and sharing research findings. Each of these steps is time-consuming and necessary for establishing an impactful research program.

The Future

Research Chairs make a significant and important contribution to research, training and contributing to knowledge in their field of study. NSHA must consider how the 30+ Health Foundations across NS can become more effectively involved in supporting research chairs. Many of these hospital-based foundations are very small, but by working collaboratively, to fundraise for NSHA-wide endeavors, they could make a significant contribution. Any such plan would have to be fully endorsed by the various Foundations that currently support the NSHA. The VP Research at NSHA needs to have a close relationship with these Foundations and NSHA needs to develop a process to recognize the contributions of these Foundations that support research.

The NSHA needs to consider supporting endowed Research Chairs that are based outside of Central Zone. Consideration should be given to how NSHA engages with Universities outside Central Zone and how we can fundraise collaboratively for new Research Chairs (e.g. in core areas including: Nursing, Pharmacy and Physiotherapy). Hospital Foundations across NS could be asked to support Chairs for their areas. For example, there is a Chair in Occupational Medicine based in Saint John, New Brunswick but he is a resource for the entire Faculty of Medicine.

Indeed any Research Chairs that are involved in clinical research in Nova Scotia will enhance both NSHA and the Faculties at Dalhousie that are involved with health, education and research. It is also possible that Universities other than Dalhousie could be involved in raising money for endowed Research Chairs. We could follow the Dalhousie/QEII Foundation model for these other universities.

Acknowledgements- Thank you to Francoise Baylis, PhD, David Anderson, MD and William Bean, CEO QEII Foundation for helpful comments on earlier drafts of this module.

Recommendations

40. That \$4 million be the amount required for an endowed Research Chair.
41. That all Hospital Foundations in NS be engaged in a plan to raise money for endowed Research Chairs through a closer relationship with VPR.
42. That NSHA ELT have input into the discipline(s) for the next Research Chair(s).
43. That the President and CEO at NSHA meet with the CEO's of the various hospital foundations to indicate the preferred disciplines for the next Research Chair(s).
44. That the proposed Chair in Addictions Medicine be located outside Central Zone – preferably in Annapolis Valley or Sydney.
45. That a plan for Research Chairs in Health (other than Medicine) be developed in conjunction with leaders in NSHA and the Faculty of Health at Dalhousie.
46. That researchers and NSHA leadership develop a comprehensive plan to recognize and acknowledge the contributions of QEII Foundation and other Foundations and their donors to research at NSHA.

Module# 8 – Internal Funding

There are certain sources of funding that are classified as “internal” at NSHA- the NSHA Research Fund (NSHA RF), the Translating Research In to Care (TRIC) healthcare improvement research program and the VPR Matching Funds Program (VPR-MFP). Each source is available to researchers who have appointments at NSHA but each source has a slightly different mandate. The TRIC program supports research that will provide evidence and facilitate the translation of clinical science into improved healthcare policy, service delivery and patient care. The NSHA RF exists to stimulate and support original research taking place at NSHA. The VPR MFP increases researcher’s ability to be competitive in funding competitions that require matching funds.

TRIC

The Translating Research into Care (TRIC) Healthcare Improvement Research Program is an internal research funding program initiated at the QEII Health Sciences Centre in 2013 by Dr. Patrick McGrath, Vice President Research, Innovation & Knowledge Translation, Nova Scotia Health Authority (formerly Capital Health) and IWK Health Centre. In 2017, the program was expanded across NSHA and IWK and is managed by the Program Leader, Research Development, NSHA.

TRIC grants facilitate the translation of clinical science into improved delivery of service and patient care. The TRIC grant program is an important tool for the development of research and changing research culture throughout NSHA. TRIC grants require researchers and administrators to work together, across disciplines, and with patients to co-lead research aimed at positive health system change.

TRIC-funded projects are expected to do one or more of the following:

- improve patient reported outcomes
- improve the safety of healthcare
- identify and reduce unnecessary healthcare costs
- reduce wait times for healthcare
- increase patient/family satisfaction
- reduce the need for healthcare
- reduce unnecessary interventions
- improve access for under-served populations

Funding

Funding support for the TRIC program is provided by the QEII Foundation (approximately \$300,000/yr) for projects based at the QEII Health Sciences Centre and the IWK Health Centre Foundation (for projects based at IWK).

Award Levels: **Level 1** (up to \$3000; Planning grants) **Level 2** (up to \$30,000) **Level 3** (up to \$60,000)

In addition to funding provided by the TRIC program for the research, any operational costs to the health system that result from the project must be approved by the administrative co-lead and covered within existing health centre operating budgets.

Workshops

A series of workshops are offered prior to each competition to support application development. PowerPoint presentations and other support materials are available on the health centre website.

Consultation and Application Pre-review

Consultation about research ideas, pre-review of TRIC applications and the sharing successful applications is encouraged and supported. The Research Methods Unit at NSHA offers support with project design and methodology, health economic evaluation, data management and data analysis.

Peer Review

An interdisciplinary peer review committee composed of QEII and IWK administrators, scientists, foundation and industry representatives, and patients is convened for each TRIC competition. Committee members use templated forms to score applications on scientific and administrative merit and budget, and whether the project will have a substantive and sustainable impact on health care at the QEII/NSHA and/or IWK.

Program Results

Two TRIC competitions are offered annually with deadlines on May 1 and Nov 1. To date, nine funding competitions have been held at QEII/NSHA and 8 at IWK. The IWK did not offer a competition in November 2017 as the program was being internally reviewed. The TRIC program at IWK will resume for the May 1, 2018 competition.

In total, 141 TRIC applications were received from both QEII/NSHA and IWK combined, with 65 funded (46% success rate). On average, we received 10 applications per competition from QEII researchers and 5 from IWK researchers. The success rate for QEII applications is 38% and the 63% for IWK grants. Level 1 (planning grants) applications tend to have a higher success rate than Level 2 or 3 grant applications. Teams applying for Level 2 or 3 grants that have previously held a Level 1 grant have a higher likelihood of success.

A list of all funded TRIC grants can be found in on the TRIC webpage in the “Related Documents” section at: <http://www.cdha.nshealth.ca/discovery-innovation/qeii-fdn-tric-grants>

Who receives TRIC funding?

Research co-leads on TRIC grants are generally Ph.D. prepared scientists or MD’s. Researchers from a wide range of academic backgrounds have received grants including: medicine, psychology, nutrition, nursing, physiotherapy and community health and epidemiology to name just a few. TRIC Research co-leads have also come from medical specialty areas including: surgery (e.g. cardiac, orthopaedic, neuro), nephrology, neurology, radiology, psychiatry, anesthesia, emergency, geriatric and family medicine and so on.

Administrative co-leads on TRIC grants are usually health centre Managers or Directors and occasionally Health Authority Vice Presidents. Most have either a Masters level degree or a Ph.D. Administrative co-leads have backgrounds in various areas including: nursing, nutrition, social work, occupational therapy, pharmacy, health administration, physiotherapy, mental health, and engineering.

Many health service areas have benefitted from TRIC funding include: Primary Care, Emergency Medicine, Rehabilitation and Supportive Care, Mental Health and Addictions, Cancer, Surgery and Nephrology to name just a few.

What are TRIC teams saying about the program?

As of January 2018, 17 TRIC Final Reports (including 15 Level 1 grants and two Level 3 grants) and 7 Interim Reports have been received from QEII/NSHA funded teams. Information from these reports was used to prepare a detailed TRIC Program Evaluation Report.

Summary of Program Evaluation Findings:

- Most teams felt they completely or partially achieved the goals they outlined in their original proposal
- Teams reported that their TRIC grants: improved patient outcomes, improved safety of health care, reduced unnecessary costs and interventions
- Products that resulted from successful projects including: Research presentations and manuscripts, new funding applications (both to TRIC and outside NSHA), researcher/student awards and recognition, media articles and TV interviews, reports, etc. Many projects hired students, trainees and other highly qualified people.

“Our funding through this grant and previous TRIC competitions, has helped us to build a strong team and reputation locally, which laid the foundation for our team’s success in the WAVE competition through Dalhousie Medical School. This TRIC project is also related to a successful CIHR Project Scheme application.”(Level 3)

Improving Research Culture

TRIC funded teams who completed their projects said that the funding allowed them to: think about healthcare improvement differently, work across disciplines, add new members to an existing team, include the patient voice in the research, form a new relationship with a researcher or administrator or to form a new team and engage a trainee in research.

Overall Opinion of the TRIC Program

The response to the TRIC program from workshop attendees, grant applicants, review committee members and others outside the health centres have been overwhelmingly positive. There has been great interest in this program from across Nova Scotia and Canada. The TRIC program has been presented both nationally and locally and projects have been showcased through media outlets. TRIC-funded teams have consistently expressed a positive opinion of the program:

“Two 4th year Nursing students were involved in piloting the nursing assessment in the clinic and by telephone, under supervision of the clinic’s nurse practitioner. This mentoring experience allowed the students to interact with patients, understand the complexity of MS care and gain an appreciation of comprehensive documentation. In addition they are able to listen to the patient’s perspective as it impacted their care”. (Level 1 team)

“Five trainee projects were supported in part through this TRIC grant (allowed us to leverage other student funding opportunities from RIM and MSSU). These projects were the Research in Medicine Unit projects of 4 Undergraduate Medical Education trainees at Dalhousie and one Masters level trainee in Community Health and Epidemiology who have now developed an advanced understanding of research and an appreciation of the benefits of working in collaborative research teams”. (Level 1)

“TRIC grants provide an excellent opportunity to undertake research projects within our institution that directly impact patient care. TRIC allowed INSPIRED to answer some important questions and gain some key insights regarding gaps in diagnosis and support for COPD patients that visit the Emergency Department and use a significant amount of resources. Without funding support from TRIC we would not have had the resources to expand to the ED at the Halifax Infirmary or the Dartmouth General that we will now be able to continue to service, nor would we have identified two key cohorts of COPD patients that were falling through the cracks in the system. We thank you for helping us begin to offer support to COPD patients earlier in their disease trajectory, as we seek to lead in the development and care provision of best practice approaches to COPD care in Canada”. (Rocker/Bond Level 3)

“This is a fantastic initiative that allows us to really test practical health – improvement initiatives that can be directly incorporated (or not) into clinical care after rigorous research testing. The TRIC grants also allow clinical researchers to align themselves with administrative experts in a novel fashion towards the betterment of patient care.”
(Tennankore/Stockman Level 3)

“I am a huge proponent of the TRIC program! This research funding program has enabled our local research team to conduct foundational work on important topics in our local context....For our team, the level 1 TRIC funding provided an instigating reason for us to work together that has led to great collaborations, engagement of students, and subsequent larger funding applications. I am hopeful that our team’s track record of working together on small TRIC grants and the infrastructure that this has helped us to create, will improve our chances of success in larger national competitions.”
(Hayden/Campbell Level 1)

How can the TRIC program improve?

Since the TRIC program began in the fall of 2013, there have been continuous improvements made to all aspects of the program following each funding competition and as feedback is received from applicants. This process of continuous review, modification and improvement will continue as the program evolves.

“One, it would be great for the program’s scope/focus to expand to include not only studying the translation or implementation of evidence into practice, but to also undertake important “fundamental” research around critical issues related to implementation – e.g. observational inquiry related to the determinants of implementation in order to generate knowledge/tools that help us understand how to implement innovations in a more effective and efficient way”. And Two, there is a huge lack of research on sustainability and at the end of 1-2 years, we have no real understanding of how or why the innovations are sustained (or not) in practice. It would be great if there were opportunities to be able to evaluate/study sustainability through this program. For example, allowing the team to “delay” one year of funding for 3-4 years later or to “stretch out” the funding so that the team has the funding available to study the sustained use of the new knowledge or tool and to understand what factors facilitate or impede sustainability. This knowledge is absolutely critical to ensuring that more patients receive beneficial innovations”. (Urquhart/Sullivan Level 1)

“Acknowledging that I was one of the earliest recipients of a TRIC award, I have already seen improvements in the TRIC grant evaluation process. The focus is now on using lower level awards to fund pilot initiatives, but reserving the larger awards for initiatives that already have preliminary data showing benefit. This change is important and will help satisfy the goal of the TRIC grants”.
(Tennankore/Stockman Level 3)

Program Manager Observations:

- It was sometimes challenging to distinguish between a quality improvement project vs. and an evidence-based implementation science research project (e.g. a TRIC grant).
- Patient engagement in research was a relatively new priority in health care and TRIC workshops on patient engagement and consultations with the CDHA patient engagement office and the Maritime SPOR Support Unit Patient Engagement Coordinator were helpful in supporting teams to understand and meet this program requirement.
- Applicants who attended workshops and submitted their project for pre-review were much more likely to be successful in the competition because problems could be identified and fixed before the final application was submitted.

- At the outset of the TRIC program in 2013, it was surprising how often researchers did not know who their administrative co-lead should be. They were advised to consider who was responsible for the budget for their department or the budget that would be affected by the health system change. Even then, it was sometimes difficult for them to determine the appropriate administrative co-lead. This seems to have been resolved over time.
- Having one interdisciplinary peer review committee with diverse representation (e.g. from IWK, NSHA, Dalhousie, Foundations, industry and patient representatives) to review all applications worked very well.
- All TRIC applicants received extensive constructive feedback on their grant applications. Level 1 grants were reviewed by a researcher and an administrator. Level 2 and 3 grants were reviewed by a primary research reviewer, a secondary research reviewer, an administrative reviewer and a patient/foundation or industry representative.
- Having a researcher and an administrator co-chair the TRIC peer review committee is an excellent model that further promotes the intent of the program.
- Anecdotal evidence from several TRIC teams suggests there has been an improvement in “research culture” in their areas. This is attributed to researchers working collaboratively with health centre administrators on projects. In at least one instance, a research project idea was conceived by an administrator who then approached researcher to collaborate on the project’s development.
- In most cases, the researcher or a research staff member completed the interim and final reports. As a result, there is little data available from the perspective of the administrative co-leads. To address this gap, an administrator survey will be developed and data will be collected through REDCap (a secure web application for building and managing online surveys) with assistance from the NSHA Research Methods Unit (RMU).
- TRIC applicants are advised to make better use of existing supports and services including the Research Methods Unit, the Maritime SPOR Support Unit and IWK Consulting Scientists, to improve their research methodologies, data analysis plans and to show the economic impact of the health system change they propose.
- Almost all of the Level 2 and 3 grants (and many of the Level 1 grants) required no-cost time extensions in order to complete the research. There were numerous reasons for this, for example: delays in preparing Research Ethics Board applications; high staff workloads and competing priorities; restructuring of the provincial health authority; challenges with accessing IT platforms; slow patient recruitment and/or data collection, staffing – leadership changes, illnesses, leaves and so on.

Conclusions

The Translating Research into Care (TRIC) healthcare improvement research program is still relatively young and many funded grants are still in progress. Researchers really appreciate this new local source of funding for implementation science research. There have been important spin offs from TRIC grants including: the opportunity to create new/expand existing research teams, to involve administrators and students and patients in research, and to contribute to the scientific literature through publications and presentations. TRIC grants have also been instrumental in laying the groundwork for teams to achieve success in other funding competitions, both locally and nationally.

It will be important to monitor the sustainability of the health system changes from the completed Level 2 and 3 projects over time. Will the health system changes be sustainable? Can the changes be scaled up? Can they be modified for use in other hospitals or NSHA management zones? What other spin-offs have resulted from these projects?

Acknowledgements: Thank you to Dr. Patrick McGrath, former Vice President Research, Innovation & Knowledge Translation at NSHA & IWK for initiating the Translating Research into Care Health Care Improvement Research Funding Program, and for his guidance in the early years of the program. We are grateful to the QEII Foundation and their donors for supporting this program. Without this funding support, the TRIC program would not be possible. Thank you to the TRIC peer review committee co-chairs and committee members who spend many hours considering the applications and providing feedback to applicants. Thank you to the applicants and to the many individuals who have supported the applicants by providing workshops, research advice and consultation on the grants.

Recommendations- TRIC

47. That the TRIC program continue, largely unchanged, at NSHA/QEII/IWK with a shared peer-review committee.
48. That TRIC grants outside NSHA Central Zone be encouraged, and that potential TRIC applicants be supported to link with research partners in other Zones in order to build research capacity in the Zones (e.g. a Central Zone researcher and a Western Zone administrator could co-lead a TRIC grant in Western Zone).
49. That the QEII Foundation continue to fund TRIC grants based at the QEII Health Sciences Centre, and that a stable funding source for TRIC grants across NSHA Management Zones be secured.
50. That TRIC research projects requiring IT resources/support/adaptations be considered as important clinical initiatives with potential to improve health care.
51. That Level 2 and 3 funded teams complete:
 - “Exit” interviews with the TRIC program manager and/or Vice President Research Innovation and Knowledge Translation to determine project successes and challenges; to discuss next steps for the research and the potential for scaling up successful health system changes in other Zones.
 - A follow up survey with the research and administrative co-leads two years post-project to assess whether the system change has been sustainable.
52. That teams with multiple successful TRIC grants, turn their attention to applying for external funding sources to support further implementation science research.

NSHA RF & VPR-MPF

NSHA (through NSHA Research Services) offers two internal funding competitions. These competitions, the Nova Scotia Health Authority Research Fund (NSHA RF) and recently established (March 1, 2018) Vice President Research Matching Funds Program (VPR-MFP) are aimed at stimulating and supporting original research at NSHA and the viability of applying for research funds where matching funds are required as part of a funding competition.

Nova Scotia Health Authority Research Fund (NSHA RF)

The Nova Scotia Health Authority Research Fund exists to stimulate and support original research at Nova Scotia Health Authority. It supports Nova Scotia Health Authority’s mission of putting patients first and achieving, through constant improvement and commitment to quality and patient safety, excellence in care and services.

Funding

There are four application categories ranging from \$5,000 - \$50,000 in funding over timelines of 1-3 years (see Table 1)

Nova Scotia Health Authority Research Fund Categories			
Title	Eligibility	Funding	Notes
Category One			
Category One New Researchers with Matching Funds	<ul style="list-style-type: none"> You must be within the first five years of your research career (have completed all academic and research training and are conducting research as an independent investigator) and within the first two years of your appointment at Nova Scotia Health Authority. In addition to the above, your position at NSHA must have a research mandate with at least 20 per cent protected time dedicated to research. Eligibility is also contingent upon matching funds from your Department. Multiple sources of matching funds will not be accepted. 	<ul style="list-style-type: none"> Maximum funding is \$50,000. Your department at Nova Scotia Health Authority must provide matching funds to the amount requested (up to a maximum of \$50,000) in support of the proposed research project budget. All matching funds must be transferred from your department directly to your NSHA RF account, prior to the research starting. Your study budget must identify and reflect the costs associated with use of the NSHA RF funds and the matching funds. Funds for this category must be used within 36 months of award notification. Extensions will not be considered beyond this award period. 	<ul style="list-style-type: none"> You must provide the names, addresses, telephone & fax numbers, & email addresses of three arms length reviewers who will review the application. This list cannot include the expert reviewer, department head or co-applicants included on the applicant's signature page. Please ensure, in advance of submitting an application for funding, that the reviewers are willing to be contacted by the Committee to review your application. At least two of these reviewers must be external to the Dalhousie University/NSHA community.

Category Two

Category Two
Staff Members

- You must be a Nova Scotia Health Authority staff member or have an active medical staff or affiliate scientist appointment at Nova Scotia Health Authority.
- If you are a staff member applying for funds to support a research study to fulfill a degree, thesis or academic requirement, you are required to apply as a Category Three Trainee.
- Maximum funding is **\$25,000**.
- Funds for this category must be used within **24** months of award notification.
- Extensions will **not** be considered beyond this award period.

Category Three

Category Three
Trainees

- You must be a Nova Scotia Health Authority medical resident, fellow, or other student conducting an independent research study at Nova Scotia Health Authority. Research in Medicine (RIM) projects are **not** eligible.
- You must demonstrate that you will have the supervision and support of a member of Nova Scotia Health Authority staff or someone who has a Nova Scotia Health Authority appointment.
- Maximum is **\$5,000**.
- Costs associated with a research assistant or third party service for data analysis is not an eligible expense. It is the expectation that trainees be responsible for the collection, analysis, and interpretation of research findings.
- Funds for this category must be used within **12 months** of award notification.
- Extensions will **not** be considered beyond this award period.
- These funds are to be used solely for the costs associated with an independent research study and may not be used for trainee salaries or summer studentships.
- These funds may **not** be used for travel or knowledge dissemination purposes

Category Four

Category Four
Health Professional Researchers
(Non-Physicians)

- You must be a Nova Scotia Health Authority employee who is a **health professional** (non-physician).
- You must, as the Principal Investigator, have conducted fewer than three research projects at NSHA.
- Maximum funding is \$10,000.
- Funds for this category must be used within **24 months** of award notification.
- Extensions will **not** be considered beyond this funding period.
- You must develop your study application **in conjunction with** the **mentor** you have chosen.

Education and Application Support

This competition is now open to all Zones of NSHA and calls for applications are on March 15 and September 15 (assuming funds availability). NSHA Research Services holds information sessions prior to each NSHA RF competition date. This session is an opportunity for interested applicants to ask questions and to gain further information on application specifics, expectations, process, dos and don'ts. This funding opportunity is meant to support research being conducted at NSHA and is open to researchers with an NSHA appointment or trainees conducting research under the supervision of an individual with an NSHA appointment.

NSHA Research Services, through the Coordinator of Grant Facilitation and Support, provides guidance as researchers plan and develop their applications. Reviews cover the budget, timelines, formatting and readability of the application. No comments or suggested revisions are offered based on the scientific or theoretical content.

The Committee: Review and Funding Decisions

Once funding applications are received and assessed for completeness, application reviews and funding recommendations are made by the NSHA RF Review Committee. This Committee is led by two Co-Chairs and consists of approximately 25 members representing 18 different NSHA clinical or research departments or specialties. Committee members commit to serving for a minimum of three years. The Committee uses criteria related to quality and scientific merit, feasibility, relevance to NSHA, the research team, knowledge translation and dissemination as well as past research performance, when reviewing and making decisions on which applications will be funded.

Each application is assigned to two Committee members for review. There is a primary and secondary reviewer. Each Committee member assigns a score on a **five-point scale** or a fund or no-fund status, as applicable. Once all Committee responses have been collated, decisions to fund applicants will be based on the number of applications received, the quality and merit of the application and the available funding. The "fundable" score cut off will also vary by competition, based on these factors. Priority is given to applications for research studies that: generate external funding support (i.e., grants and/or industry funding); lead to presentations at scientific meetings and to publication; and/or include a plan for dissemination of study results.

Funds Awarded and Successful Applications

The NSHA RF has existed and been supporting research at NSHA (and health research in Central Zone/QEII Health Sciences Centre prior to the creation of NSHA) since 1996. During this time approximately \$7.7 million has funded over 550 research projects. Over the last 10 years (Sept. 2007- Sept. 2017), this fund has supported more than 275 research projects/investigators with financial investment of over \$3.7 million. Of these, there were approximately: **Category 1** (Up to \$50,000) – 10 awards, **Category 2** (up to \$15-25,000) - 170 **Category 3** - 100 (up to \$5,000) and **Category 4** - 3 (up to \$15,000). This is a significant investment in the research endeavors of staff, new investigators, learners and health professionals at NSHA.

Reporting

Upon completion of the funded research project, applicants are required to submit a final report. Applicants are asked to report on whether he/she achieved the research goals/objectives of their application and to describe the activities and results of the funded research project. Applicants are also asked to describe the impact the research has had on patient care at NSHA and about resulting publication, presentations, or pending knowledge translation activities. Applicants are also asked to reflect on how the research project and funds obtained have helped to further his/her career as an NSHA researcher.

Online Resources

The NSHA RF Brochure, Guide, Application Form and Final Report Template are located on the NSHA Research [webpage](#). As well, contact information, funding/award recipient reports and other related resources are included. All information is updated in real time as required.

How Can the NSHA RF be improved?

1. Evaluation framework- While there is currently no formal evaluation framework in place for the NSHA RF, the guidelines and research guide are constantly updated to address ongoing needs and issues that may arise during and between competition periods. All changes are discussed with and reviewed by the NSHA RF Co-Chairs and the NSHA RF Review Committee. It may be beneficial to incorporate an evaluation framework to provide ongoing measurement, planning and necessary implementation of the objectives, delivery and impact of the NSHA RF.
2. Collation of Final Reports and Identification of Impact- Another source of information that can better inform the success, outcome, investment return and impact of the NSHA RF are the final reports. The information contained in the reports received thus far have not been collated or considered as case studies to inform the outcomes and impact of the funding received. Information regarding resulting publications, abstracts, presentations or additional funding obtained based on the funded research is not collected post award but could be used to better inform the benefits of the NSHA RF and its ongoing impact on furthering the academic or funding success of its researchers.
3. Observer Program/Successful Applicants as Committee Members- Most funding agencies have implemented an Observer Program. This gives potential applicants first-hand experience in observing and gaining a better understanding of how peer review committee makes their deliberations and funding decisions. It is anticipated that this first-hand knowledge will encourage well-conceived future funding applications.
4. Better Zone representation- Currently there is no representation from Western and Eastern Zones on the NSHA RF Review Committee. In order to ensure a meaningful representation of NSHA, we continue to look for members from these Zones. The Zone Research Facilitators are working to identify individuals and gauge interest. To date, interest has been minimal but this does coincide with the research culture in Zones outside of Central and is something that is a priority for NSHA Research Services to support and change. With the increased commitment to support and provide research resources in the other Zones, it is anticipated that there will be an increase in research being initiated in these Zones and an increased interest in researchers to participate in the NSHA RF Review Committee.

The VPR Matching Funds Program

The VPR Matching Funds Program was introduced in order to increase NSHA researchers' ability to be competitive in funding competitions that require matching funds. The maximum matching funds request is \$50,000 per year per researcher and funding competition. Requests are sent to NSHA Research Services and will be reviewed and assessed based on the Program requirements and guidelines. This opportunity will have a funding envelope of \$300,000/year (subject to availability).

Program Guidelines:

- NSHA Investigators/applicants may have only one outstanding request for matching funds at a time;
- NSHA Investigators/applicants may receive approval for matching funds for only one project at a time;
- A maximum of \$50,000/year may be requested;
- Matching funds are to be held at NSHA (funds may be transferred to external sites only with prior approval from NSHA Research Services);
- Please note: there is no guarantee of matching funds approval;
- All approvals are subject to fund availability;
- Funding approval is at the discretion of the NSHA VP Research/Research Services; and
- In the event that the matching requirements of the funding agency and/or application budget change as a result of additional project funding being received, or a cut in your funded budget, the approved final matching funds amount may be revised.

Future Direction

1. Evaluation

An evaluation framework and process will be developed in order to measure the impact of this funding opportunity. It will provide an opportunity to identify areas for change or improvement, what is working well, and whether the need for this support is meaningful and required.

2. Ongoing consultations

Ongoing consultations with the NSHA research community and stakeholders will take place on an annual basis to ensure that the matching funds program is meeting the needs of the NSHA research community.

3. Reporting/Measuring Impact

We will measure the increase in applications submitted to agencies that require matching funds; success rates of applicants; impact (knowledge translation, outcomes, improvement in health, healthcare, health system, process, and policy) of funded research projects.

Recommendations- NSHA RF

53. That NSHA Research Services introduce a post award follow up program. Awardees will be contacted to gather further information on publications, presentations or related larger scale funding resulting from their funded NSHA RF projects.
54. That an Observer Program, similar to NSHA RF and TRIC, be created to increase the involvement and education of learners and potential future applicants in the review process.
55. That NSHA Research Services work to Improve Zone representation on the NSHA RF Review Committee by increasing understanding of NSHA RF and executive support outside of Central Zone.
56. That NSHA Research Services facilitate the matching of researchers in Central Zone with those interested in conducting similar research in other NSHA Zones and encourage Central Zone researchers to expand their research to other Zones.
57. That NSHA Research Services review the NSHA RF program every 5 years to review and revisit the purpose of the NSHA RF, NSHA RF Review Committee, the meeting of objectives and identify any room for improvement.

Module #9 – Interdisciplinary Research at NSHA

The 23,000 employees at NSHA fall into just over 200 different occupational groups. In an ideal world every such group would have a scholarly component to their work. Currently most of the research at NSHA is done in the discipline of Medicine by physicians. There is an urgent need for more interdisciplinary and non-physician led research at NSHA. NSHA has a number of advance practice nurses and pharmacists who do research in their teams and there are opportunities to take this nursing and pharmacy led research at NSHA to the next level.

Growing Nursing Research

Actively Recruit Nurses to Research Programs

- Encourage graduating nurse scholars who have the philosophical and methodological expertise to move research into practice, policy and health system change.
- Support nurses in NSHA to pursue graduate education at Dalhousie School of Nursing and conduct research in their area of practice. This will support individual nurses as well as practice areas.
- Identify the PhD and Masters-prepared nurses already working in the health system, determine their interest in being actively involved in research and target them with information about what education and supports Research Services, the RMU and the MSSU can offer.
- Create opportunities for coaching and capacity building specifically in targeted nurses such as clinical nurse specialists and nurse practitioners e.g., a mentorship network, partnership with the Centre for Transformative Nursing and Health Research (CTNHR).
- Involvement of Advanced Practice Nurses (APN's) with industry-sponsored projects and provincial and national database management. These projects are often associated with significant resources which may have considerable potential for student or nurse academic projects.
- Disseminate information about what databases are available that hold information about or are relevant to nursing practice and disseminate that information to targeted nurses.
- The School of Nursing and NSHA should consider joint hires i.e. an established nurse researcher at Dalhousie would spend 50% of their time practicing at NSHA. This practice would in turn inform the research program. Compensation would be split 50/50 between the two institutions.

Support Research for Nurses at an Institutional Level

- Develop an organizational research strategic plan that promotes interdisciplinary research.
- Be visible at the NSHA to ensure strong relationships and build a sustainable presence for nursing research.
- Target portfolios that are active in research. For example, Dr. Marilyn Macdonald works closely with NSHA continuing care, not only to conduct research, but also to participate in Quality Improvement initiatives. Academia needs to infiltrate service on a basis other than research to get started, get known and then research follows.
- Provide senior Directors, administrators, managers with a program of learning on how academic learning centres develop and promote research, TRIC is a great mechanism.
- Commitment by middle management to provide time and support in schedule for project/research work.
- Establish a reappointment and reporting structure yearly to map milestones and outcomes; link reappointment to activities related to promoting nursing research through education; training; mentorship; collaboration and consultation.
- Identify all existing partnerships and encourage new partnerships with researchers e.g., in the Dalhousie School of Nursing, Healthy Populations Institute, Building Research in Primary Care (BRIC-NS), support and encourage nurses in NSHA to participate as research partners with Dalhousie faculty.

- Expand current joint NSHA/IWK Interdisciplinary Research Services to include a consulting nurse scientist position- similar to the IWK model years ago – (Margot Latimer, Erna Snelgrove-Clarke, Janet Curran and Sheri Price all worked in this capacity).

Build Research Roles Specifically for Nurses

- Include research as a role component for all graduate prepared nurses in advanced practice roles - with established research outcomes.
- Create a community of practice for graduate prepared nurses at NSHA similar to the Advanced Practice Nursing Group at the IWK.
- Create nurse scientist affiliations at NSHA for PhD prepared nurses- an honorary staff appointment that formally links nurse scientists with clinical programs or areas aligned with their research.
- Fund and dedicate a position to developing research and innovation in Nursing (similar to the Director of Research in Primary Care) at NSHA.

Include Research in Professional Practice

- Ensure the nursing professional practice strategic plan has a strong research thread.
- Introduce research concepts on the agenda of nursing unit staff meetings.
- Increase awareness among nurses of existing resources in the organization such as library scientists who do provide support to nurses if asked.
- A focus on high level quality improvement projects may also be an excellent way to leverage support across stakeholders and mobilize resources for nurse led projects.
- Engage research users in determining relevant process and outcome indicators and tools to measure progress and successes.
- Explore nurses' proximity to researchers already conducting research and suggest/create mentorship or partnerships to augment existing programs for some early adopters for success. There are likely some obvious ones e.g. Dr. Fred Burge's work and also with Dr. Mike Dunbar.

Promote Nurse-Led Research Stories

- Showcase nursing research projects using existing communications channels (newsletter, Annual Report, media pitches, social media, poster day at participating institutions etc...) .
- Share faculty and student scholarly publications and presentations as well as innovative community-based knowledge sharing via social media, Café Scientifiques, deliberative forums, videos and newspaper and television spotlights.
- Support dissemination of results (both presentation, social media and peer review publications) and highlight how they have affected care, completing the link between research and progress.

Extend Working Relationship with Dalhousie

- Build trusting relationships with teams at NSHA, which means being present in the organization, consistently, through scientific appointments, committees (Research Ethics Board, Scientific Review Committees, and team based research committees if they exist) and at Rounds (health centre wide and team specific rounds), trying to negotiate space near care teams and spend time there so we are seen and can begin to build relationships.
- Provide active adjunct appointments at Dalhousie School of Nursing for NSHA graduate prepared nurses and engage them in activities through the CTNHR, Joanna Briggs Institute (JBI) and World Health Organization/Pan American Health Organization Collaborating Centres (WHO/PAHO CC).
- Support ongoing research through CTNHR, JBI, WHO/PAHO CC and NSHA.
- Share the resources Dalhousie has and invite them to be part of our research centre.
- Submit joint applications for external research funding.
- Joint research conferences and workshops.

- Leverage Graduate students who can then establish linkages. For example, several graduate students are volunteering to work with teams at the IWK to help them redesign small practice change initiatives. They are building capacity in front line nurses including how to find and examine evidence based literature and exposing teams to the research process.

Leverage Nurses to participate in Knowledge Translation (KT) & Implementation Science

- Promote the integration and sustainability of research findings and evidence into healthcare policy and practice by engaging health professionals, community members and various health decision-making groups.
- Conduct cutting-edge research focused on implementation science, which explores methods to effectively translate evidence into policy and planning.
- Share commitment to conduct collaborative research and use evidence to inform practice.
- Explore the existing mechanisms, research programs, and NSHA alliances with KT experts (Janet Curran, Audrey Steenbeek), and whether NSHA have senior nurse policy advisors.
- Providing expertise in using a variety of monitoring and evaluation methods (e.g.: health outcome measures, outcome mapping).
- Try to meet the needs/the questions of those who are carrying out the practice. The Evidence Based Practice (EBP) fellowship implemented at IWK is an example.
- Develop evidence based strategies to share best practices and tools related to social and health research (e.g. resource repository, FAQs, knowledge dossiers, videos, interactive e-learning tools, simulation learning, webinars, online communication programs such as Elluminate, Face Time).
- Knowledge Synthesis through faculty expertise in conducting national and international literature reviews and syntheses (e.g., policy briefs and analyses, realist reviews, Joanna Briggs Institute reviews). Joanna Briggs Institute (JBI) is one part of the solution. Presentations on what JBI does and connecting with Nursing Policy advisors.
- Provide network opportunities to link KT and researchers at Dal School of Nursing with projects aligned with NSHA priorities. There are some scientists already at NSHA, like Robin Urquhart, who we should be partnering with to get us in the door as well.

Expanding Pharmacy Research

The Pharmacy Department at NSHA has an active research program. They run a residency program in conjunction with the Dalhousie College of Pharmacy and this helps support their research. In addition, they have a research committee and a research plan. Some of the Pharm D's who are embedded in programs such as oncology, geriatrics, infectious diseases, intensive care have research programs often in conjunction with teams in these areas. One of the researchers in this group has a grant pending a decision at a national funding agency. Pharmacy is now ready to go to the next stage of applying for more national grants and having pharmacists with dedicated time for research.

For pharmacists in Eastern Zone there is a real opportunity for ethnobotany research in conjunction with faculty members at Cape Breton University.

Other Disciplines

There are over 200 occupational groups at NSHA so clearly this module cannot deal with all 200. The feedback that I received on this module urged us to concentrate on interdisciplinary research.

Acknowledgements- Thank you to Dr. Gail Tomblin-Murphy, Professor and Director of the School of Nursing at Dalhousie and Assistant Dean of Research, Faculty of Health who convened her team to gather their insights into building a nursing research program at NSHA.

Recommendations

58. That nursing leadership at NSHA form a taskforce in conjunction with their colleagues at Dalhousie School of Nursing and develop a comprehensive plan about how to grow nursing research at NSHA.
59. That NSHA and Dalhousie School of Nursing consider joint nurse researcher hires.
60. That NSHA and College of Pharmacy at Dalhousie consider one or more research pharmacists as joint hires.
61. That ethnobotany be explored as a research opportunity by pharmacists in Eastern Zone.
62. That NSHA and Dalhousie create a research task force to develop a plan on how to grow non-physician-led research at NSHA that is solutions oriented, collaborative and interdisciplinary.

Module #10 - Building Research Capacity Outside Central Zone

NSHA's goal is to deliver the same quality of care to those who need it irrespective of where they live in Nova Scotia. The same is true of research and education. However, research is not well developed outside Central Zone. Just like any other special skill research requires a period of training to acquire that skill. Most practitioners within NSHA outside Central Zone have as their primary mandate the delivery of clinical care and there is no time set aside for research. Also most have not had formal training in research methodology. There are several initiatives in place to assist with developing research outside Central Zone but there is still room for improvement and expansion.

Supporting Research from the Central Zone Outward

Since Research Services is well established in the Central Zone, it was relatively straight forward to expand many of the programs and services offered across the province. The REB and the contracts and grants team is available to researchers across the province as well as the RMU, which provides many services including: research design and methods, biostatistics, data management, and health economics. Both the RMU and the Research Education Program are committed to strengthening research capacity and building research excellence. Program delivery for Research Education is mainly via training sessions which have now been expanded to include researchers and staff outside the Central Zone via Skype. The same can be said for Innovation Rounds (a monthly series that brings people together to learn and discuss innovative ideas and solutions for the health care system and to build relationships between researchers, industry and others) and Comprehensive Research Education Online (Creo) an online learning platform that offers research education and information.

At the unit level, the opportunity to participate in clinical trials is available to all those throughout NSHA and specifically in Primary Care, researcher Tara Sampalli PhD, has been providing support to primary care personnel who have wanted to do a research project. During the last two years (2016 – 17) the Canadian Health Services and Policy Research Alliance (CHSPRA), of which NSHRF is a member, with funding support from the CIHR Institute of Health Services and Policy Research (CIHR-IHSPR) developed the Training Modernization Strategy. The strategy was developed with the aim to modernize Canada's Health Services and Policy Research doctoral and post-doctoral training programs for stronger career readiness and increased health system impact. In conjunction with NSHRF, NSHA has two such fellows and an application in for a third. These individuals will emerge from this program with the skill set to make major contributions to the health care system. They should be recruited by NSHA and where possible, be sited outside Central Zone.

Facilitating Research on the Ground- Zone Research Facilitators

There is a half-time research facilitator for each zone (outside Central) – Western – Daniel Marsh PhD; Northern – Robin Latta MA; Eastern – Chrissy Boyle RN. They are in place to identify research and innovation opportunities, facilitate projects at local healthcare facilities and liaise with research services in the Central Zone. Over the past year and a half, a lot of work has gone into increasing awareness of Research Services available in the zones. Building capacity, assessing strengths and barriers, and building relationships have been the focus of the research facilitators. Understanding that each zone is unique and having a dedicated facilitator in each zone has helped to highlight the barriers and resources in each zone.

Within **Northern zone**, there have been concerted efforts to raise the profile of the research facilitator in concert with research services. A number of education sessions (originating in central) have been hosted by the research facilitator. Robin has promoted education sessions to leaders within northern zone, building relationships with new leaders in the area. The research facilitator also attends the monthly Northern Leadership forum to create visibility for leaders.

At **Eastern Zone** there have been a number of individuals and teams from across programs who have connected with the research facilitator to receive more information on funding opportunities as well as looking for assistance in moving research project ideas forward. With the recent expansion of scope of the research facilitator, there is a strong expectation of one to two applications coming forward to the next round of funding with the assistance of the research facilitator. A recent key focus has been relationship building with

local academic institutions including St. F.X. University and Cape Breton University. St. F.X. has a new Bachelor of Arts and Science in Health degree and NSHA staff have been working together to strengthen the relationship between the Health Authority and the University including being a part of their Capacity Building Workshop last fall. A diverse group of faculty exists at Cape Breton University including a Clinical Trials team that operates out of the Cape Breton Regional Hospital. They have been working very diligently and independently for years. With the support of Research Services, they are getting increased support and infrastructures in place to become even more vibrant and successful. Future projects include organizing a research symposium in conjunction with the Research department at CBU for March 2018.

“I have connected with hundreds of people within the Eastern Zone who are interested in or involved in research on some level. I am happy to be helping out new and seasoned researchers to try and enhance the health of Nova Scotians. I continue to be available for support, and I am continually promoting research education and resources, including funding opportunities, to the Eastern Zone.”

- Chrissy Boyle, Research Facilitator, Eastern Zone

In the **Western Zone**, the research coordinator is well positioned on a number of Zone committees (as a Site Manager and/or as an RC) including Leadership Forum, Site Leaders Council, Occupational Health, Safety and Wellness Council, Emergency Medicine Council, and the Quality Improvement and Safety Council. At each of these Zone meetings, there is an opportunity to promote research activities, opportunities for research education and funding, and research supports and services that are available. In addition, considerable effort has been made to reach out to primary care physicians and Family Medicine residents to promote research opportunities within NSHA and to facilitate completion of research ethics applications, methods support from the RMU and supports from NSHA Library Services.

In the first year there was general interest and optimism in facilitating research. However, that early interest has not been sustained but has been preempted by budget concerns, Accreditation issues, recruitment challenges and general priority for delivery of program services. The barriers to expanding research continue to be substantial. Even the most likely targets for research uptake have resisted changing their insular thinking beyond every day delivery of services and continue to just meet base standards and expectations. Innovative ideas are not often generated. If they are, the idea is quickly squashed by a budget conscious or time watching Program Director/Manager, and it never gets a chance to breathe or gain momentum to become a quality initiative or research question. Frequently, if a research question is proposed, the department/program quickly decides that they do not have the expertise, time, or people to devote to the research project.

Zone Targeted Funding

Funding is a key barrier to doing research and even though some targeted efforts have been made, there is lots of room for improvement in this area. Specifically, NSHA has focused attention around some specific opportunities and funding for innovation in the Western Zone as well as expanding its internal funding opportunities across the province.

The Chronic Disease Innovation Fund. Initiated by the Department of Health and Wellness with strict criteria for funding. Three WZ projects received funding and one project was planned but not funded.

NSHA Innovation and Emergency Fund. A one-time funding opportunity rewarded on the merits of a business case points scale. The research facilitator was involved in the preliminary planning stages of an application to this fund, but progress was limited due to the program Director taking a leave of absence from her role.

Nursing Strategy Innovation Fund. Funding managed through the Interprofessional Practice nursing office. There were a few successful applications awarded in the Western Zone. The opportunities for funding innovative quality improvement projects are limited, often a one-time offer, and are rarely connected to a research question for follow up.

Translating Research into Care (TRIC) Grants. Translating Research into Care (TRIC) Healthcare Improvement Program is an internal research granting program initiated in 2013 at the IWK Health Centre and the QEII Health Sciences Centre with funding from the two health centre foundations. In 2017, the TRIC program expanded to include all of NSHA; however additional funding support for TRIC grants taking place outside QEII and IWK will be necessary.

There are three grant levels available: Level 1 (\$3,000) - Planning grant; Level 2 (\$30,000) and Level 3 (\$60,000). Any operational costs to the health system that are associated with the research project must be supported by administrators and covered within existing health centre operating budgets. Adjudication of TRIC grants is by a peer review committee of QEII and IWK administrators and scientists. An administrative reviewer from Western Zone was added to the TRIC grant peer review committee for the Nov 2017 competition.

2017 saw increased participation in TRIC workshops from people outside Central Zone through Skype for Business. The Zone research facilitators and TRIC program manager have supported grant development with assistance from RMU and IWK consulting scientists. To date, four TRIC grants based outside of the Central Zone have been submitted for review; and two have been successful. The two successful grants are co-led by researchers based at the QEII, although the projects are based in Northern and Western Zones:

1. Supporting psychosocial distress in diabetes care: a patient centred integrated care management initiative – Western Zone. Vallis/Edwards/Comeau (\$60,000)
2. Improving patients' understanding of the goals of cancer treatment – Northern Zone. Urquhart/Murray (\$3,000)

Multi-Zone, Multidisciplinary Collaboration- Micro Research Nova Scotia

Imagine a paramedic, a community health nurse, a policeman, a shelter worker, and an immigrant physician are introduced for the first time, and challenged to find a community health problem they are all passionate about solving. This is MicroResearch NS – community members learning to tackle the health problems they experience every day. The MicroResearch concept was developed in Africa, by Drs. Noni MacDonald and Bob Bortolussi of Dalhousie University. Now in Nova Scotia, MicroResearch teaches community members how to solve local health problems through measures that fit local culture, context and resources: i.e. to bring about improved health in Nova Scotia communities. MicroResearch NS has been offered in Truro, North End Halifax, Antigonish and New Minas and has examined issues ranging from needs of suicidal youth following hospital discharge, to soft drink consumption in the Paqtnkek First Nations reserve, to what alcohol-addicted homeless men want to improve their lives. Additional workshops are planned for Halifax (NSHA and IWK), Cherrybrook-Preston and Cape Breton in 2018. MicroResearch NS is making a difference, empowering communities through their own research.

Science Literacy Building Research Capacity across the Province

Scientific literacy is the knowledge and understanding of scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity. Scientific literacy also implies the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately. A scientific literacy program should be defined and it can be delivered online. It can also be part of a professional development opportunity and can also be delivered in partnership with local universities and or community colleges. NS Health Research Foundation has had over 2 decades experience fostering health research throughout Nova Scotia and they indicated that an important cornerstone for research capacity building is science literacy.

Zone Specific Research Programs

It is clear that leadership in each Zone will have to decide what they will have in the way of a research program. There are already some supports for this in place and the ability to expand others. Key priorities in expanding research into other zones start with building a critical mass of researchers, specifically recruiting individuals with research skills and giving them protected time, a Research Literacy professional development program and a budget. They can be supported by local university students. Research experience should be a job requirement for all new NSHA job postings at the Management or Director levels and prioritized.

Acknowledgements- Thanks to Ms Krista Connell and her staff at NSHRF for a review of this document and for many valuable suggestions.

Recommendations

63. That zone leadership determine what they need in terms of a research program.
64. That **where possible** research experience should be a job requirement for all new NSHA job postings at the Management or Director levels.
65. That a research literacy program be made available to all physicians and employees.
66. That zones outside central each identify and or recruit 2 -3 individuals with research skill and provide them with protected time to build a research program in that zone.
67. That graduates of the health impact fellowship program at NSHA be retained as employees at NSHA to further enhance research.
68. That NSHA work with Doctors NS to obtain an AFP for 2 -3 physicians in each zone outside central so that they can spend one day per week on research.
69. That the leadership of zones outside central consider an investment in research each year.

Module #11 – Fostering Relationships between Academic Institutions & NSHA

The Nova Scotia Health Authority is a province wide organization with a Mission “to achieve excellence in health healing and learning by working together”. NSHA is responsible not only for the delivery of health care but also for education and research. NSHA should be aware of health related research being done at academic institutions and should have a plan for interacting and cooperating with these institutions. The education mission is currently better understood than the research mission and agreements regarding education are already in place.

There are many existing collaborations but also opportunities for new collaborations for NSHA and post-secondary institutions across Nova Scotia. These collaborations may best be worked out at the unit level. For example, NSHA leaders in Eastern Zone would work with both St. FX and CBU. Such arrangements should not impede individual investigators from collaborating with any other investigator be he or she in NSHA, a University or a Community College. To facilitate the development of the Blueprint for Research at NSHA, the Interim VP Research, Innovation & Knowledge Translation spoke to selected faculty members at local Universities and NS Community Colleges. An inventory of current relationships garnered from these conversations follow.

Note: Relationships with the private sector (biomedical and Pharma) were not explored as part of this report. These are important to the future of health care research in NS and should be explored by the next VP Research.

Dalhousie University, Halifax

Alice Aiken PhD

This is the largest university in the province and one with Faculties of Medicine and Health. There is a long standing relationship between Dalhousie University and NSHA (and its predecessors). All physicians who provide care at NSHA in Halifax are faculty members at Dalhousie. Many members of the Faculty of Health also have appointments at NSHA. These appointments are governed through an affiliated scientist category. Dalhousie’s Faculty of Medicine/NSHA staff physicians and PhDs do most of the medical research in the province. Affiliation agreements govern these relationships. The Faculties of Engineering, Business and Computer Science also have interactions with NSHA. Drs. Alice Aiken (VP Research Dalhousie) and David Anderson (Dean, Faculty of Medicine, Dalhousie) are currently leading a planning group to develop a Nova Scotia Integrated Health Research Strategy in partnership with Department of Health and Wellness, IWK, NSHA, NSHRF, Dalhousie and others.

Saint Mary’s University, Halifax

Malcolm Butler PhD

SMU is home to the Change Laboratory Action Research Institute which involves a partnership with Cape Breton University, Mount Saint Vincent University, St. Francis Xavier University, Université Ste. Anne, and the NS Community Colleges. These investigators tackle tough social and economic development issues such as: obesity, sexual violence, racism, mental health, and aboriginal justice. Their approach is designed to allow non-traditional solutions to emerge through collaboration.

Mount Saint Vincent University, Halifax*Gayle MacDonald PhD*

MSVU is growing its research capacity. They currently have 150 faculty members, 3 Canada Research Chairs and 3 named chairs. Areas in which there is synergy with NSHA include nutrition, child psychology, and aging. A number of these professors currently work with NSHA researchers. Examples include: Ian Pottie, a biochemist, who is working with Sultan Darvesh on the basic science of Alzheimer's disease; Zachary Zimmer who works with Ken Rockwood on aging and Janice Keefe who has a chair in aging and a Seniors Adding Years To Life program. MSVU is building a new research facility in a decommissioned church on campus.

Saint Frances Xavier University, Antigonish*Richard Isnor PhD*

SFX has 180 faculty members and is developing a new center for health innovation. They are focusing on health equity and social determinants of health for which they have a national collaborating center and use of art to influence health outcomes. Two faculty members have research interests in addiction and one psychologist is part of a CIHR funded Multiple Sclerosis team. There is a new Canada Research Chair in studies of the elderly and the Arts in Health program uses music, dance and theatre therapeutically. Two faculty members work in the area of determinants of health and there is also a public policy and government research area. They have a new educational program – Bachelor of Arts and Science in Health. These students need opportunities for projects within NSHA.

Acadia University, Wolfville*Anna Redden PhD*

Acadia has a school of Kinesiology. Work on diabetes is performed in this school as part of an exercise and health program. There is also some interest in cancer research. NSHA Research Development Office has partnered with Faculty member and NSHA Affiliate Scientist, Dr. Jonathon Fowles, on a research program called *Exercise is Medicine*. In 2017, 200+ primary care professionals from across NS received training on physical activity counselling and exercise prescription in health care.

Cape Breton University, Sydney*Tanya Brann-Barrett PhD*

There is a focus on opioids in the School of Arts and Social Science. They are studying the health effects of birch bark oil in conjunction with First Nations. They also have a School of Nursing.

NS Community Colleges*Margaret Champion MHA, BSc OT; Dean School of Health and Human Services; Anna Burke MBA*

NSCC has 900 faculty members, 16 campuses and learning centres across NS. They offer over 120 programs in IT, creative fields, trades, technology, business, healthcare and human services. NSHA has a very close educational relationship with NSCC with respect to several programs such as medical technology, practical nursing, and health information management. There is also an opportunity for research collaboration. Health is an emerging domain for NSCC and in particular they are interested in big data and IT analytics. The Lawrencetown campus which houses the Centre of Geographic Sciences is working on applications for health. Currently NSCC has 7 research scientists, one of whom is in the area of Geomatics. There are 24 programs with Health and Human Services (some of which have been mentioned above) and others where we could have additional collaborative relationships such as addictions community outreach, child and youth care, continuing care, mental health recovery and promotion and therapeutic recreation.

Recommendations

70. That research relationships between NSHA and all NS Universities and Community Colleges be further developed and enhanced.
71. That the appointment process for NSHA affiliated scientists be improved (this is underway) to enhance recommendation #70.
72. That as research relationships with Universities other than Dalhousie mature, agreements re: research overheads and intellectual property ownership be negotiated.
73. That NSHA Zone leaders and Vice Presidents of Research at Universities outside Central Zone work out a strategy for research collaboration in their zone.
74. That individual investigator collaboration be encouraged across all sectors and institutions to enhance research in NS.

Module #12 - Future Directions for Research at NSHA

Predicting the future is foolhardy but we should do our best to be prepared for it.

Artificial Intelligence

With contributions from: Alan Fine DVM, PhD; Mohamed Abdoell M.Sc., P.Stat.

Artificial intelligence (AI) is a broad term applying to any techniques that enable computers to mimic human intelligence using logic, if-then rules, decision trees, machine learning and deep learning (Editors of TIME).

Human beings are good at making sense of dimensional data, but have significantly more difficulty with the addition of more dimensions. Given the massive volumes of medical imaging, laboratory and administrative data routinely generated, and the large patient care data holdings containing clinical outcomes, NSHA is ideally positioned to develop and adopt AI technologies.

Prof. Mohamed Abdoell is a biostatistician at NSHA who has 25 years' experience modeling medical data and has a special interest in machine learning applications in health care, focused on identifying high-risk patients. His research interests have led him to establish a medical software device company, Densitas Inc., to commercialize proprietary fully automated algorithms that process digital mammograms to evaluate mammographic density, image quality and patient-specific risk for more rapid, standardized, and reliably reproducible results, augmenting radiologists' mammography exams. These technologies have the potential to improve radiologist and radiological technologist efficiencies, reduce or eliminate the need for double reads, optimize appropriate use of follow-up imaging modalities and frequency of follow-up visits, decrease false positive and false negative rates, lower rates of interval and missed cancers, and decrease over-diagnosis. Standardization, automation and risk-stratification have the potential to significantly improve clinical outcomes while saving the healthcare system many millions of dollars annually.

Other major research thrusts in AI at NSHA include work done as part of a \$3.5 million collaboration with GE Healthcare (co-PIs Drs. Sharon Clarke & Steven Beyea). As part of this collaboration, the NSHA has a research agreement with GE Healthcare surrounding the development of novel approaches to using AI to improve analysis of MRI images. In a specific project, led by Dr. Clarke, AI is being used to automatically detect and classify prostate cancer. This research is being submitted for IP protection through patent filing, with potential for commercialization through the industry partner. As part of this collaboration Dr. Beyea has recently hired Dr. Alessandro Guida, who will work as part of the BIOTIC research centre at the QEII Health Sciences Centre on various health projects, including the prostate cancer detection work. Dr. Guida has many years of experience in applying AI to big medical data, most recently having a lead role in Alliance against Cancer (a network of 21 cancer research hospitals in Europe). Through this project he led the development of a genomic screening panel for precision medicine that was key for the launch of a national screening program in Italy in the fall of 2017.

Drs. Alan Fine and Thomas Trappenberg at Dalhousie also have expertise in AI and handling big data at Dalhousie and have other applications that can help the health care system.

Risk stratification can help health systems to optimize clinical workflow, improve system efficiencies, and create cost-effective and sustainable population health management programs. As an example, stratification of patients into risk categories can help to improve health system efficiencies by establishing optimal follow-up protocols in heart failure patient populations, such that high risk patients can be flagged for more aggressive surveillance and preemptive intervention with medication reconciliation, home visits, or follow-up appointments (Wachter).

Some examples of where machine learning can be applied successfully to address health system challenges include [adapted from (Wachter)],

Reduce readmissions in a targeted, efficient, and patient-centered manner. Clinicians can be alerted daily with names of patients most likely to be readmitted, and how that risk may be reduced.

Reduce hospital acquired infections (HAIs) such as central-line associated bloodstream infections (CLABSIs) —40 percent mortality rate— by identifying which patients with a central line will likely develop a CLABSI. High risk patients can be monitored closely and interventions focusing on patient-specific risk factors can be made to reduce their risk.

Reduce hospital Length-of-Stay (LOS) and improve patient satisfaction by identifying patients most likely to have prolonged LOS and following best practices.

Predict chronic disease. Identify patients with undiagnosed or misdiagnosed chronic disease, assess the likelihood of patients developing chronic disease, and present tailored prevention interventions.

Predict no-shows. Assess the risk of a no-show for scheduled appointments, improving patient care and the efficient use of resources.

To develop a strategy for AI research and application at NSHA we need to:

- Systematically reach out to clinical stakeholders with the offer to discuss opportunities for improving appropriateness of care in their domains of specialization. Let their interest drive the initiative.
- Determine if the data sources are suitable for the application of AI (e.g. clinical history, surveillance, demographics, disease registries, medical imaging and lab results, tissue banks, clinical outcomes, etc.) and can be fused together to develop a training algorithm. Most critically, determine that the data inputs to the algorithm can be fed to the algorithm at point-of-care when implemented in the field.
- Establish suitable practicable data sharing agreements with academia and industry, while respecting data protection, safety and security.
- Ensure that AI initiatives produce actionable results. Stakeholders committed to adopting validated AI solutions in their clinical practice or policy decisions must be engaged upfront and part of the initiative.

Furthermore, once we decide to work in this area we will only be successful if:

- We are nimble. Delays and barriers to data access will result in a loss of opportunity and collaborations will go elsewhere where doing research and doing business is friendlier.
- We have a suitable environment i.e. an environment and processes that simplifies data access and management is critical; including administrative, legal and technical aspects.
- We streamline the process for engaging academics and industry collaborations by establishing agreements that maintain integrity of the existing hospital processes while structuring them for simplicity and speed.

Digital Health

One just has to look outside health to see the major impact or disruption that the digital world can have on the establishment. Uber and Airbnb are well known to everyone. Digital health has exploded across the world and is likely to make major advances in patient care in the next decade. We have had some important success stories in Nova Scotia. Strongest Families started as a research grant from the CIHR at the IWK and now has about 70 employees. This group continues research in this style of e-health. A second example is an effort under development at IWK, Chez NICU, which received substantial funding from ACOA. NSHA examples include the development of surgical and other simulation by Dr. David Clarke. Dr. Michael Dunbar has pioneering programs in e-health to help with follow-up of patients post arthroplasty.

Nova Scotia as a Living Laboratory

The Living Laboratory concept is not new. The European Network of Living Labs was founded in 2006 and had 212 members by 2010. Dr. Ray Le Blanc (VP Research Capital Health) commissioned Branham Group to produce a business proposal for “NS Digital Health Living Laboratory” in 2012. Progress has been made by individual researchers as cited at several locations in this report – however we have not moved forward as an organization. We now have an opportunity to change that – namely Integrated Health Research initiative led by Drs. Anderson and Aiken. This plan is currently under development and will be appended to this report.

Liquid Biopsies

An emerging technology is the ability to monitor tumors non-invasively by extracting cancer cells from blood using ct DNA. Our advantage in having a close relationship with Dalhousie Faculties of Medicine, Health and Dentistry is that this partnership will ensure that we remain at the forefront of new technologies – our challenge is the timely operationalization of these technologies.

Patient engagement in research

There is little doubt that this is the way of the future. NSHA encourages patient engagement in a number of areas. Ms Debbie Lelievre who manages this area indicates that the recruitment step is often the most important in engaging patients. Dr. Michael Dunbar has successfully engaged patients in his research. We are fortunate that the MSSU has significant experience in this area and can guide us in the future.

Lessons from the Maritime SPOR SUPPORT Unit’s (MSSU) experience with patient engagement –

Brian Condran; Kelly McDonald

Definitions and a brief history

Patient Engagement (PE) in health research refers to patients and researchers working together through “*meaningful and active collaboration in governance, priority setting, conducting research and knowledge translation*” (Strategy for Patient-Oriented Research [SPOR], 2014, p. 5). Canada’s Strategy for Patient-Oriented Research defines patients as “*individuals with personal experience of a health issue and informal caregivers, including family and friends*” (SPOR, 2014, p. 5). Through these partnerships, patients contribute to the planning and conduct of health research, and in the dissemination and application of findings.

Established in 2011, the Strategy for Patient-Oriented Research (SPOR) is a pan-Canadian initiative that fosters “...evidence-informed health care by bringing innovative diagnostic and therapeutic approaches to the point of care, so as to ensure greater quality, accountability, and accessibility of care” (Canadian Institutes of Health Research [CIHR], 2017, para. 3). PE is a core element of patient-oriented research, and of SPOR. SPOR SUPPORT Units such as the Maritime SPOR SUPPORT Unit (MSSU) champion PE in health research and support researchers and patients as they conduct patient-oriented research. SPOR draws inspiration and guidance from international organizations such as INVOLVE in the United Kingdom and PCORI in the United States. These organizations have championed PE in research since 1996 (INVOLVE, n.d.) and 2012 (Patient-Centered Outcomes Research Institute [PCORI], 2014), respectively. PE also shares values and methods with community-based participatory research, the North American HIV/AIDS movement, and indigenous health research.

Patient Engagement in the Nova Scotian Health System

PE is one of NSHA’s strategic directions for 2016-19 (Nova Scotia Health Authority- Strategic Plan) and an important element of governance within the IWK Health Centre. The NSHA engages patients and the public in a variety of ways, including as members of quality and safety teams and Community Health Boards. Much of this work is supported by the NSHA Public Engagement team. The IWK includes parents and youth on advisory councils that inform policy decision-making. Post-secondary institutions have also engaged patients in educating health professionals. One example of this was Dalhousie University’s Health Mentors program.

Patient Engagement in NSHA Research

PE is increasingly fundamental to health research at NSHA. This is exemplified by programs such as the Translating Research into Care (TRIC) grants, and the Micro Research program. Patients are increasingly included on grant review committees and NSHA-led research teams. The MSSU has supported TRIC grant applicants through targeted capacity development opportunities, individual consultation services, and offering funding opportunities for research planning and team building. The MSSU works with SPOR Networks such as BRIC-NS to initiate and support patient-oriented research with academic and patient partners from the NSHA.

Lessons learned by the MSSU

Patients can contribute to research in a variety of ways (Crocker, Boylan, Bostock, & Locock, 2017; Shippee et al., 2015). SPOR strives to engage patients as team members who contribute to all phases of research. PE can also include patients acting as members of an advisory board, taking part in the review of grant applications, or delivering training to research team members. PE is challenging for all involved. It takes time to plan for engagement, to train and orient team members (both researchers and patients), and requires a careful balance between planning and action. Engaging patients early in a project is ideal as this provides time for patients to help determine how it ultimately takes shape. Before engaging patients, however, researchers must consider their rationale for engaging patients, how they will identify the right patients to include, and how they will support, train, and compensate patients so they can contribute in a meaningful way.

1. PE is an ongoing process that develops and changes with time

MSSU Patient Advisors sit on internal governance committees, contribute to research projects, co-deliver training with staff, and contribute to event planning. One of the MSSU’s key lessons has been the need for ongoing dialogue with our Patient Advisors regarding things that work well, and those that don’t. Through this collaboration we have strengthened our approach to engagement and provided new opportunities for Patient Advisors to contribute to MSSU activities. Another key lesson has been the value of learning from others undertaking PE. SPOR includes partners across Canada and collaboration with these organizations has been important to our successes to date.

2. Building relationships is a key element of successful recruitment

Connecting patients with the right opportunity takes time, effort, and experience. The MSSU has employed a variety of strategies for recruiting patient partners, including the distribution of posters, advertisements in radio, newspapers and social media, and patient mailing lists. Patient partners can also be identified through direct referrals from patients, researchers, clinicians, and their networks.

Some important lessons learned by the MSSU around recruitment include:

- Patients and researchers need opportunities to come together for face-to-face events or meetings (Foresythe et al., 2016). The relationships that lead to meaningful engagement take time to develop.
- Public visibility of health research and engagement opportunities is also important. The more people know about opportunities to engage in research, and the stronger the relationships between researchers and patient communities, the easier it is to find the right people for an engagement opportunity.

3. Institutions can take action to support PE in health research

Providing funding to support teams at the early stages of research helps patients and researchers come together to plan grant applications, develop research protocols and strengthen their team (Boote et al., 2015; Walker & Pandya-Wood, 2015). Opportunities for training and consultation with subject matter experts are also key. Teams often need to consult with engagement experts during grant development, and later as work begins and challenges or new opportunities arise. These services must be responsive to the needs of individual teams as each will come with different objectives, resources and levels of experience.

Some other considerations regarding institutional support for PE include:

- Increasingly, institutions are reviewing and updating policies and practices to support PE in health research. These policies can include Research Ethics Board review guidelines, reimbursement policies, volunteer policies, and others. This process provides fantastic opportunities for collaboration between patients, researchers, and institutional leadership.
- Capacity development opportunities are needed not only for patients, but also for researchers, administrators, research support staff and REB members.

4. Teams will have different needs based on the research they are doing, and their experience with PE

Many teams will need instructions in the basics of PE as they get started. This includes clarifying the definition of PE, distinguishing it from research, describing a process for planning PE, and identifying potential challenges and opportunities. As teams become familiar with PE their capacity development need will reflect specific research objectives, or challenges they have encountered. Priority topics the MSSU is currently aware of include:

- Engaging diverse patient communities, such as indigenous communities, new immigrants, African Nova Scotians, and youth.
- Navigating challenges associated with team members having overlapping roles, such as when researchers also have relevant patient experience, or when patients are members of advocacy groups.
- Evaluating patient engagement to demonstrate its impact on the research process.
- Providing appropriate compensation and support for patient partners.

The CONNECT Project: The MSSU's first patient co-led study

Patient co-led research can be challenging but ultimately offers fantastic opportunities; the CONNECT project is an example of this. The CONNECT project (CONtinuity of care and support for the autism spECTrum disorder) aims to break down barriers and understand the needs and challenges faced by adults living with autism spectrum disorder. Led by MSSU Research Associate Dr. Caroline Jose and Patricia George-Zwicker, Autistic advocate, the CONNECT project is the MSSU's first patient co-led research project. Additionally, within the Maritime provinces, CONNECT is the first interprovincial, multidisciplinary team working to make evidence-informed improvements to health and support services for autistic adults.

On November 17 and 18, 2017, more than 100 participants gathered at the Multipurpose Centre in Shediac, New Brunswick, to attend the Autistic Adults Summit, an initiative of the CONNECT project. The Summit was an exceptional gathering for the emerging autistic community in the Maritimes, bringing participants together to discuss best practices taking place in Canada and the United States to help define the way forward for Autistic adults in our region.

One of the intangible benefits of the Summit, and CONNECT project, is the connections made among the autistic adults and the development of a “neurofamily,” a term they chose to identify themselves. It is important to note that without the involvement of a patient co-lead, these connections would not have been possible. At the Summit, one participant noted that she felt having an autistic adult involved as co-lead signified that the opinions of autistic adults truly mattered to this research study.

Data Access-Our Desired Future

Contributions from James Ellsmere MD; Michael Dunbar MD; Geoff Porter MD

The ability to learn from our patients should be a fundamental goal at NSHA. Thoughtful and intelligent use of health data in a timely way is critical to achieving that goal. Instead of simply ensuring the ability to perform some health services research within our current regulatory environment, we should aim to optimize the use of health data to the benefit of Nova Scotians. Easy and timely access to health data is fundamental to research within NSHA, as it is to effective quality improvement and system performance initiatives of any high functioning health care organization.

Challenges in achieving data access are discussed in several modules in this report. It is fitting that the report should end with the second best present that NSHA could give its researchers, namely easy and timely access to data. Elements of such access are listed below:

- No charge to researchers for data housed in Health Data NS
- Ability for NS health researchers to perform no cost population queries on NSHA data. The queries would return aggregate data that is de-identified so that these queries can be performed prior to approval from the Research Ethics Board (REB). With approval from the REB, researchers can obtain identified medical record information about the patients. This data can then be used to support grant applications, for pre-trial patient cohort identification, and for hospital education and outcomes research.
- Alignment and streamlining of regulatory approvals
- Efficient and useful data access, consistent with current privacy legislation
- Cultural change in NSHA approach to data access and use in health research

Recommendations

75. That a task force be formed to develop a plan for AI research and implementation at NSHA.
76. That NSHA form a standing task force to advise on opportunities for research and care applications in digital health.
77. That NSHA be a partner in the Integrated Health Research plan for NS
78. That NSHA develop a plan for systematic patient engagement in research.
79. That NSHA develop a plan for systematic patient engagement in research.
80. That NSHA form a multidisciplinary committee (representatives from legal, privacy office, researchers, information technology, data analytics and Health Data NS) to improve access to patient data.

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