

Creating a Sustainable Health Research Industry in Northern Ontario

Appendix 2: Stakeholder Consultations – Public and Private Sector Leaders Report

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**Northern Ontario
School of Medicine**



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I. Summary of Key Findings & Recommendations

Recommendation 1: Develop niche expertise in clinical research and the provision of health care services

The first recommendation common to all leaders interviewed was for NOSM to develop a niche specialty that would be unique to the geographic and demographic nature of the region served by NOSM. In addition, it is recommended that NOSM leverage any natural synergies between its present and future foreseeable capabilities and its local geographic, industrial and demographic asset base. As explored in greater detail below, the following areas were suggested as potential niche areas:

- Rural and Remote Health Care Delivery;
- Clinical Research;
- Clinical Trials;
- First Nations (FN) Health Care; and
- Environmental/Industrial Medicine.

Each leader interviewed recommended that NOSM should pursue clinical research first and foremost over basic scientific research. Reasons for this varied, ranging from duplication of services to funding and relocation issues. The main reason offered however was that NOSM's mandate primarily constitutes education of rural physicians and related health care providers combined with optimal health care delivery to the local and regional populace.

All leaders interviewed viewed Northern Ontario as having its own unique demographic, geographic and industrial characteristics, which in turn were capable of being leveraged in the provision of niche clinical specialties and services that would be less or completely unavailable elsewhere. The current initiative was seen as a unique opportunity for NOSM to leverage its present and future foreseeable capabilities into a best practices global benchmark for delivery of rural and remote health care services.

Recommendation 2: Take a leadership role in facilitating critical local, regional, national and international partnerships

All leaders interviewed saw the need for and strongly recommended that NOSM partner with other organizations in order to ensure its success. This was true both with regard to other regional health care providers in Northern Ontario as well as larger provincial and national and international research centres and health care organizations. The following partnering opportunities were viewed as necessary to ensure a sustainable health research industry in Northern Ontario:

- Regional and national academic, health care and health services organizations;
- Regional and national industry partnerships;
- Provincial and federal government funding and technology mentoring institutions;
- Local charitable foundations and grass-root support mechanisms;

- National and international capital sourcing, investment and non-profit partnerships; and
- World Health Organization.

Partnering was seen to be critical to NOSM's success on several levels. First, partnering would help to ensure that resources are harmonized within the Northern Ontario region. It would also provide NOSM with an important leadership opportunity to ensure that the current regional actors are working with rather than against one another. Second, partnering has the potential to produce a self-sustaining a networking process, whereby local, regional and national resources are pooled and leveraged. This was seen to serve NOSM on several important fronts, including enhancing efficiencies, capabilities and leadership potential. Finally, partnering was viewed as an important mechanism to develop a critical mass on several levels, including, including

- research and health services capabilities;
- ability to attract biotech, pharma and other industrial partners;
- ability to attract venture capital interest and funding;
- ability to attract high level government funding;
- providing high level showcases for technology successes and knowledge-sharing; and
- providing researchers and management with important opportunities to network and collaborate with accomplished people outside of Northern Ontario.

Recommendation 3: Take strong steps to publicly value, promote and implement a technology commercialization focus

Notwithstanding their industry affiliation, all of the leaders interviewed recommended that significant effort be put into the development of an integrated well-networked technology commercialization process. A business-minded and non-bureaucratic technology transfer office that was favourable to inventors was seen as a key component for leveraging the commercial potential of technologies resident in Northern Ontario. The following recommendations were made:

- Create a commercialization culture that is vibrant and strongly promoted by leaders/champions;
- Manage expectations of researchers and management right from the start;
- Hire researchers and management that are pro-commercialization;
- Develop intellectual property policies that provide incentives to inventors and technology management;
- Create a Technology Transfer Office that is business-oriented and not bureaucratic;
- Develop a consortium, or partner, with other local and regional technology transfer functions to gain critical mass;
- Partner with provincial and national technology transfer offices and organizations (MaRS, Queen's Parteq, Association of Technology Transfer Offices, Westlink Innovation Network, MDS Capital, Ventures West). This will enhance efficiencies

- and capabilities, and also facilitate interest from VCs, angel investors, incubator labs, and biotech companies;
- Widen the definition of success of technology transfer to include job creation and facilitating health services quality and delivery;
 - Create technology internships through co-partnering (Westlink) to train local and other trainees in commercialization, technology transfer and VC funding;
 - Build a university-specific or regional-specific seed fund, which could be professionally managed (MDS Capital), etc;
 - Work with local and provincial governments to create tax incentives, such as tax credits and economic development zones;
 - Leverage new federal funding initiatives aimed at technology transfer e.g., national group and POP grants, funds to build angel networks, and funds for mentorship programs; and
 - Develop a technology incubator to support commercialization and encourage investment interest and partnering opportunities.

Recommendation 4: Miscellaneous recommendations

The leaders interviewed made additional recommendations relevant to NOSM. These include:

1. Work to develop NOSM as the nexus of health care in Northern Ontario.
 - NOSM should be the major identified public link/nexus between the population and best in class medical services for that unique population;
 - It should capitalize on existing opportunities to develop into a leader and global benchmark for rural and remote health care delivery;
 - There is a need for pilot studies in rural health care delivery, particularly involving information and telecommunications. Take the initiative to conduct these studies; and
 - Marketing, public education and networking with community health centres, high schools, non-profits etc. to ensure this message is heard.
2. Incentives for re-location:
 - Provide as large a financial compensation package as possible to attract excellent researchers;
 - This includes salary, lab space and a supportive research, collaborative and commercialization culture; and
 - Provide a positive non-bureaucratic work environment that is collegial and sharing. It will help to offset lack of high salaries found in large urban centres.
3. Efficiencies and Reduction of Tension
 - Avoid Duplicate services and internal tensions. This will be particularly important for the Thunder Bay-Sudbury split;
 - Choose one major focus per site; and
 - Ensure that providers of similar services are networked and partnered to the degree possible in order to facilitate long-term working relationships and increase efficiencies.

II. Academia

Discuss current trends in global health research and highlight potential opportunities for Northern Ontario

Develop niche specialty and leverage natural synergy between NOSM capabilities and local assets:

1. First Nations (FN)

- Large FN population resident in the area
- Develop niche specialty in health care issues unique to FN population
- Diabetes, infectious diseases, addiction, FAS/FAE, dietary supplements for children
- Must watch sensitivities
- Attracts federal funding
- Unique and “closed” population can be leveraged with respect to genomics studies (cf. Quebec)
- Medicinal plants/traditional medicine apps

2. Environmental Medicine

- Large and unique regional industrial presence
- Localized to region but issues common to all of Canada
- Unique local ecology and geology
- Includes mining, forestry, fisheries, natural resources
- Evaluation of environmental/industrial impact and health care issues, novel treatment regimes

3. Rural and Remote Health Care Delivery

- Large and remote population
- Attract good people who desire to live in rural area or are interested in rural health issues
- Unique opportunity to utilize alternative/high tech delivery systems
- Telemedicine, telesurgery, videoconferencing
- Remote x-ray etc. analysis (now cheaper to read x-rays in India than in US)

4. Clinical/Health Services Research

- Concentrate on clinical research and health services delivery, not basic science
- Cost for developing basic research expertise is too massive and geography is a large deterrent
- Can't compete with universities etc. in Southern Ontario for people
- Focus on training good MDs, nurses etc.
- Tissue banking
- Telemedicine, telesurgery
- Rural health-specific epidemiology
- Aging/home health care. Northern population aging even faster than rest Canada due to attrition of youth
- Leverage “translation” of research not just into hospitals, but also into rural/remote community

5. Clinical trials

- Part of clinical/health services focus
- Facilitate partnering with industry and government and bring in funding
- Tie into unique focus on local demographics or environmental/industrial issues
- Expand notion of clinical trial from drug trials to therapies and approaches to rural care

6. Organize activities around one common theme

- If possible, relate all research into one common theme e.g., St. Mike's and "inner city issue" research
- Rural/Remote health care research and service delivery
- Industrial medicine

What role should the new medical school play in engaging potential partners from the local and international community?

1. Partnering with regional academic and health services organizations

- Crucial for developing critical mass
- Develop a core strength, and then make linkages. Leverage other centre's capabilities
- Academic cross-appointments with Toronto/McMaster/Queen's etc. foster idea-sharing and knowledge/technology dissemination

2. Industry a potentially very valuable partner

- Unique ecology and industry presence
- Large number of regional employees
- Employers in natural resources, so looking for "good" PR
- Can work with industry e.g., partnered internships
- Provincial and local government provide incentives for partnering, such as tax credits, setting up local economic development zones to gain favoured provincial status

3. Government Institutions

- Leverage northern status for funding opportunities
- Appetite in government now for university/government partnering

4. Charitable Foundation

- Additional resources may be gained from local community
- Local pride in new medical school

5. World Health Organization

- Possible support for indigenous health care issues?

Discuss recommendations for technology commercialization

- Make commercialization easy for researchers
- Keep university bureaucracy to a minimum
- Be attuned to needs of business

- Participate in “Westlink” Innovation Network organization to obtain interns in commercialization at reduced cost

Discuss any other recommendations for success in Northern Ontario

1. Incentives

- Given the distances involved, must provide as large a financial compensation package as possible to attract researchers
- This includes salary, but also lab space
- Necessary to provide positive work environment; collegial and sharing. Will help to offset lack of high salary

2. Avoid Duplicate Services/Offerings

- Particularly important for Thunder Bay-Sudbury split
- Choose one major focus per site
- Do not develop CVD, neurology, nephrology etc. at both sites or worse at many sites throughout region

III. Industry

Discuss current trends in global health research and highlight potential opportunities for Northern Ontario

Develop niche specialty and leverage natural synergy between NOSM capabilities and local assets:

1. First Nations (FN)

- Large FN population resident in the area, and expanding
- Develop the community as active receptors of services
- Develop niche specialty in health care issues unique to FN population
- Diabetes, infectious diseases, addiction, FAS/FAE, obesity, dietary supplements for children, youth health (suicide, depression, substance use)
- Focus on health care delivery
- Can spin this as “personalized medicine” for a narrow demographic
- Develop educational programs for FN and non-FN. Important for people in region to understand FN issues
- Partner with pharmaceutical companies to leverage large homogeneous patient populations

2. Environmental Medicine

- Biotechnology of industrial/environmental accidents, clean ups, etc.
- Includes mining, forestry, fisheries, natural resources
- Evaluation of environmental/industrial impact and health care issues, novel treatment regimes, toxicology
- Occupational medicine

3. Rural and Remote Health Care Delivery

- Leverage the opportunity to use new technology for health care delivery e.g., telemedicine, wireless devices, remote sensing equipment, remote x-ray etc. analysis, online learning for continuing medical education, electronic assisted living for seniors
- Focus on specific diagnostics to determine whether a patient needs to be transported to a large urban medical centre
- IT-related health care may represent a significant funding opportunity for CFI and CIHR because no other region in Canada is doing it
- Bring in IBM and other telecoms as possible partners
- Form other partnerships around specific equipment e.g., Seimens/x-ray and other imaging equipment for remote diagnosis or analysis
- Pilot studies needed for health care delivery in remote area: communications, transportation, etc. Take initiative to conduct.

4. Clinical/Health Services Research

- Focus on activities that improve health care in region, not basic research
- Leverage unique rural and FN demographics
- Conduct genomics analysis, biomarker studies

- Other health care research unique to these populations, including epidemiology of prevalent diseases
- Facilitate access to FN population for CVD and diabetes
- Set up tissue bank (partner with OCRN)
- Focus on youth problems (suicide, depression, substance use)
- Services could include counselling
- Also focus on aging population, which is selectively increasing in rural/remote areas

5. Clinical trials

- Need enrol 100-200 patients per disease faster than urban rate with less drop-out
- Recruitment time is one of biggest costs in running trials
- CROs can set up in the medical school for Phase 1 and Phase 2 clinical trials

What role should the new medical school play in engaging potential partners from the local and international community?

1. Partner with regional universities, schools, hospital etc.

- Obtain critical mass
- Similar or overlapping interests, needs and challenges compared to Southern Ontario

2. Industrial development funding

- Facilitate industrial development funding or infrastructure for companies unique to region

3. Partner with other local/regional health care providers

- So they view NOSM as an opportunity to leverage best in class protocols, procedures, resources rather than a threat
- Leverage economics of shared benefit
- Leverage “care abouts” to provide incentives (as opposed to forcing) regional partnerships and collaborations

4. Partner with local/regional industries

- Occupational medicine focus
- Have students do placements/internships with workers
- Fee for service partnership with local/regional industry e.g., MD Anderson and surrounding oil and gas industry partnership had students in the companies providing health care targeted to the needs of those industries in exchange for 5-7 year revenue blocks
- Could set up non-profit board to oversee technology transfer office and business development (as Roswell Cancer Institute in Buffalo, NY has done)

5. Partner with larger organizations on specific initiatives

- Set up tissue bank (partner with OCRN and MDS)
- Partner with MDS on radio-isotope/nuclear medicine research (e.g., TBRHSC Cancer Re-fit initiative)

- Target receptor companies based on synergies between NOSM expertise and that of target company

6. Leadership

- If undertake partnering efforts or networking with other organizations, take the lead
- Build a centralized forum for industry and other academic centers to engage with NOSM
- Foster key areas of excellence and synergies

Discuss recommendations for technology commercialization

1. Technology Transfer

- In terms of commercialization, it is important to manage expectations early on; this goes for researchers and administrators
- Commercialization culture developed but not too aggressive. May turn off VCs
- Ensure realistic valuations
- Don't rely too heavily on industry funding
- Critical to minimize bureaucracy
- Technology transfer must be overseen by business-minded people
- Widen definition of success to include job creation, facilitating health services delivery
- Partner with developed and established technology transfer offices (MaRS, Queen's Parteq, Association of Technology Transfer Offices)
- Develop consortium of regional technology transfer offices to gain critical mass
- Keep technology transfer office as arm's length from the university as possible to encourage independence and objectivity
- Develop core competency in an area and then charge a fee-for-service or service-for-service
- Proximity is a fundamental challenge
- Venture Capital managers want proximity to interact with their investments. The scale up of firms may occur most effectively and profitably in Toronto, as it is tough to attract talent and capital elsewhere.

2. Seed Fund

- NO-specific seed fund of \$5M
- However, other VC leaders have said to set a small regional VC fund of this type would be difficult, as it is just enough capital to see them fail.
- An alternative would be to build a university-specific life cycle fund that could support several rounds of funding. The model could be a public fund for applied research to bring technologies closer to their commercial potential (as opposed to seeking a ROI).
- Professionally managed (MDS Capital interested)

3. Commercialization Culture

- Institutional leadership on value and promotion of commercialization culture is critical
- Hire entrepreneurial people
- Showcase successes
- Develop IP policies that are favourable to inventors

4. Partnering

- If lack regional resources, could either partner or use an external technology transfer office at another university or through a VC firm
- Partnering (MaRS, Queen's Parteq, Roswell Park Cancer Institute, Association of Technology Transfer Offices) will facilitate interest from VCs, angel investors, incubator labs, and biotech companies, and will showcase successful technologies.
- MaRS has expressed an interest in partnering, but will have to give up control of some IP
- Set up sooner than later so partners can share in revenues or have right of first refusal
- Co-develop a local training program with Westlink for internships in commercialization, technology transfer and VC funding
- Watch "sales rep" effect of having a big Southern Ontario office

5. Government

- Local and provincial governments to create tax incentives, such as tax credits

6. Technology

- Therapeutics remains a very attractive area, especially for intractable diseases such as cancer; or chronic diseases as diabetes, arthritis, etc.
- Detecting diseases, e.g., early detection test, blood test for cancer markers, etc. is also very attractive from a market perspective
- The financing community is currently less excited about research tools, platform technologies and medical services, as these often do not have commercial value unless they are related to a foreseeable final product. It has been difficult to get a good return on these investments
- Generic developers and manufacturers are booming in North America

Discuss any other recommendations for success in Northern Ontario

1. NOSM as nexus

- Medical school should be the major known link/nexus between the unique population and service identifiers (e.g., FN, rural/remote health care delivery etc.) and best in class medical services for that appropriate population and service portfolio
- Speak with one voice and lobby regional and municipal governments, and work to educate governments and city councils to reduce fear of new technologies and commercialization opportunities
- This includes education of public, networking with community health centres, high schools, non-profits etc.
- Must be for profit via leveraging of IP and partnerships. Or otherwise will be consistent consumer of public resources

2. Gap analysis for partnering

- Understand the unique assets of the region
- Then undertake a gap analysis to identify complimentary and collaborative incentives for joint research and health care delivery
- Increase efficiencies

- Create collaborative network
- Create critical mass
- Attract larger partnering and funding opportunities

3. Look Forward 5-10 Years to Determine Vision

- NOSM should not be looking at what are the current trends, but should focus on what will be the trends in 5 to 10 years. It is about what NOSM can do today that will that will be big in 5 years
- Do not look at the VC trend, it is too short term. Trends in VC funding will shift quicker than a research institute can

IV. Government

Discuss current trends in global health research and highlight potential opportunities for Northern Ontario

Develop niche specialty in one or a small number of themes, and leverage natural synergy between NOSM capabilities and local assets:

1. Rural and Remote Health Care Delivery

- Large and remote population
- Focus on health care management and delivery
- Telemedicine, telesurgery, videoconferencing
- Focus on problems unique to local population e.g., addiction, diabetes, renal failure
- Significant percent population is aging
- Resurgence of tuberculosis, antibiotic-resistant bacteria

2. Genomics

- Have unique population with closed genetics
- Leverage for genomics studies e.g., biomarkers

3. Environmental Medicine

- Look for synergies between environment and health research
- Local environment includes mining, forestry, fisheries, natural resources
- Evaluation of environmental/industrial impact and health care issues, novel treatment regimes
- Does not include medicinal plants, as plant diversity not substantial enough to support drug discovery platforms

4. Clinical trials

- Do not focus on basic research. Insufficient funds and too much competition from Southern Ontario
- Leverage fact that don't have long waiting lists as in large urban areas to increase clinical trial population
- Leverage FN and aging population

What role should the new medical school play in engaging potential partners from the local and international community?

1. Partner/Network with major university

- Must facilitate the effort, not the other way around
- Dynamic leadership important
- Attract funding, expertise and assets

2. MaRS

- Attract VC funding

- Facilitate knowledge-sharing
- Infrastructure-sharing
- Avoid duplication of services and infrastructure
- Facilitate commercialization culture
- Could brand NOSM as “MaRS North”

3. Medical Alley

- Help NOSM to attract VC funding
- Networking, synergies with other researchers

4. CIHR

- CIHR is setting up new clinical research initiative
- Leverage treatment-naïve population for new clinical approaches and clinical trial populations
- CIHR also has mentorship programs for aspiring young scientists (Randomized Controlled Trials Mentorship)

5. Community

- Build ties with community by serving their unique needs e.g., taxol project with FN in SSM

Discuss recommendations for technology commercialization

1. Incentives

- Incentives for faculty to commercialize: salary, IP rights-sharing
- Hire entrepreneurial faculty

2. Technology Transfer Office

- Develop policies that prevent government and bureaucratic interference
- Have IP and technology transfer people on ground
- Link all technology transfer offices in region into one office to increase efficiencies, synergies and avoid duplication

3. Funding

- Be ready to leverage new funding opportunities aimed at technology transfer e.g., POP grants, funds to build angel networks, mentorship programs
- Group grants provide larger ROI than piecemeal grants

4. Incubator

- Incubator will support commercialization
- Encourage VC interest

V. Non-profit Organisations and Foundations

Discuss current trends in global health research and highlight potential opportunities for Northern Ontario

- Focus on one specific niche area that is unique to Northern Ontario

What role should the new medical school play in engaging potential partners from the local and international community?

- Co-brand chattels to attract partnering opportunities e.g., Home Depot and accessibility for spinal cord patients
- Build on local technology transfer experience and ensure people in different locations talk to one another and communicate
- Regional resources should partner and grow research service capacity together

Discuss any other recommendations for success in Northern Ontario

- Endow research chairs to attract personnel
- Facilitate commercialization expertise through commercialization training programs (Westlink) in areas of commercialization, technology transfer and VC funding
- Could leverage FedNor funding to initiate commercialization internships
- Use flintbox technology aggregator (flintbox.com) to provide an online platform for access to early stage academic research for dissemination, download and license

VI. Appendix A: Interview Guide

Discuss current trends in global health research and highlight potential opportunities for Northern Ontario

- If you wanted a new medical school involved in research, in what areas would you concentrate?
- What are some top of mind concerns for you in partnering with a medical school to increase health research?

What role should the new medical school play in engaging potential partners from the local and international community?

- What could a new medical school offer that you need or would like access to?
- What could a new medical school do to attract increased research funding?
- What would be a novel service or approach that a medical school could offer the market?

In what specific areas do you see the new medical school adding value?

- How might a medical school help your organisation to achieve its goals?
- How do you perceive a new medical school's ability to fulfill your organisation's needs?
- Are there specific research programs that would be more applicable to a new medical school in Northern Ontario? (more for government)

Are there specific opportunities for the medical school to engage your organization or other potential partners?

- What could a new medical school do to get involved with your organisation's programs?
- Who might be potential partners for NOSM? What type of services are potential partners interested in from a medical school? What aspects of a new medical school are of particular interest? What might be examples of research collaborations?
- What are potential models for collaborating with industries (e.g. contract research, joint venture partnerships, etc.)? What are the benefits and drawbacks of these models?

- Is there interest from your company to discuss potential collaborations with NOSM? What might be examples of opportunities with your company?

What recommendations would you have for the medical school to facilitate technology commercialization?

- Discuss any factors that contributed to the success or failure of your organization with regard to technology commercialization?
- What infrastructures, resources, policies etc. are advisable?
- Are there any other factors or recommendations?