



Feasibility study for a Clinical Research Centre in Sault Ste. Marie

Final Report

18 July 2006

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A recent CIHR* report identified 5 essential elements for a successful clinical research endeavour

Success element	Element for success
Leadership	A clear vision with strong leadership is required to advance clinical research enterprises forward
Resources (operational + infrastructure)	Clinical and population-based research requires infrastructure to bring communities together as well as provide financial resources to support healthcare professionals in conducting research
Coordination and linkages	Creating successful partnerships with different regions and disciplines is necessary to successfully compete in a national research enterprise
Multidisciplinary research focus	Active participation by many research professionals and modalities is required for clinical research to be conducted and findings to be translated into impactful outcomes
Community engagement (public, hospitals, industry, education, etc.)	Engage communities at all levels to ensure a long lasting sustainable enterprise

Determine the feasibility of creating and operating a clinical research centre in Northern Ontario that possesses the following characteristics:

- Enables clinical research* excellence across Northern Ontario
- Creates the opportunities for **national and international research** excellence
- **Attracts** and **retains** healthcare professionals
- Promotes new **training** opportunities for healthcare professionals
- **Improves** the **health** of Northern Ontarians
- Ensures that future capabilities (**market push**) align with multi-sector demand (**market pull**)
- Focuses on healthcare **research** and not commercialization

*Clinical research is defined as research involving discovery, testing, validation, dissemination, adoption and evaluation with human subjects or materials, specimens, or data derived from human subjects or populations with clear defined relevance and outcomes to human populations.

CIHR* has indicated that a critical demand for clinical research exists in Canada

- CFI/CIHR's \$450M **proposed** clinical research fund will begin to fill the gap in Canada's clinical research infrastructure
- Over 10 clinical research networks across Canada are built or are in development to meet the national demand for clinical research
- From 1999-2005 CIHR **increased** its budget for Health Services and Population Research

Industry interactions validate that clinical researchers are in demand in the market

- In the US, 8% of principal investigators conducting industry clinical trials are younger than 40 years old indicating a gap between future demand and ability to meet that demand.**
- Approximately 19.8 million people are now needed to respond to industry sponsored clinical trials in the US**
- \$760M new annual granting capacity through foundations in the US for clinical research**

CIHR* found significant gaps in clinical research infrastructure across the country

52% of CIHR clinical researchers indicated that their current infrastructure is inadequate to meet their needs. Specifically, they require the following (% respondents):

1. Core facilities (96%)
2. Operational research staff (94%)
3. Space (92%)
4. Equipment** (90%)
5. Networking abilities (90%)

Greatest gaps in support are:

1. Nurse practitioners – 73% do not have access
2. Epidemiology – 60% do not have access
3. Equipment technicians - 52% do not have access
4. Study Design / methodology – 35% do not have access
5. Biostatistics / analytic support – 69% do not have access

*2005 CIHR Clinical Research Infrastructure Survey

**Biological specimen banks, databases, communication technology, molecular/cellular equipment for clinical testing, dedicated research suites and imaging

NOSM web survey

- Two week survey had 144 validated responses with contact information
- Previous NOSM surveys (medical education) had approximately 80 people respond to a similar distribution list
- Survey:
 - ✓ confirms primary interviews
 - ✓ determines demand and extra capacity
 - ✓ aids to calculate economic benefits
 - ✓ provides clinical research regional profile
 - ✓ generates a baseline against which future progress can be measured

Survey participants were both *regionally* and *professionally* represented

- **Location of the respondents**

- ✓ 3% North Bay
- ✓ 40% Sudbury
- ✓ 17% Sault Ste. Marie
- ✓ 35% Thunder Bay
- ✓ 1% Dryden
- ✓ 1% Timmins
- ✓ 3% Other

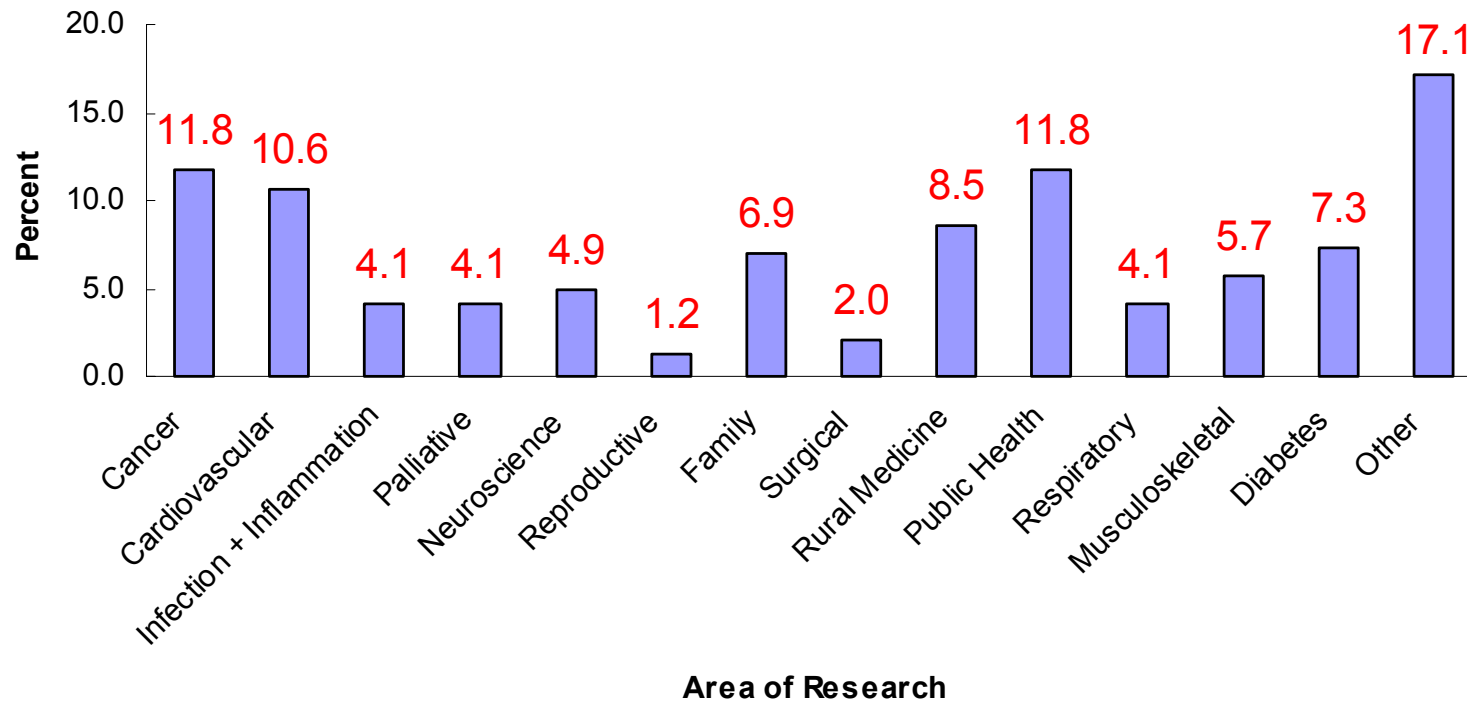
- **The profile of the respondents***

- ✓ MD 37%
- ✓ PhD 19%
- ✓ MSc 7%
- ✓ RN 12%
- ✓ Registered Therapist 7%
- ✓ Other (e.g., B.Ed.) 19%

Note: Total of 144 validated responses

*Greater than 100% because some people have two degrees

Survey participants spanned the entire spectrum of clinical research

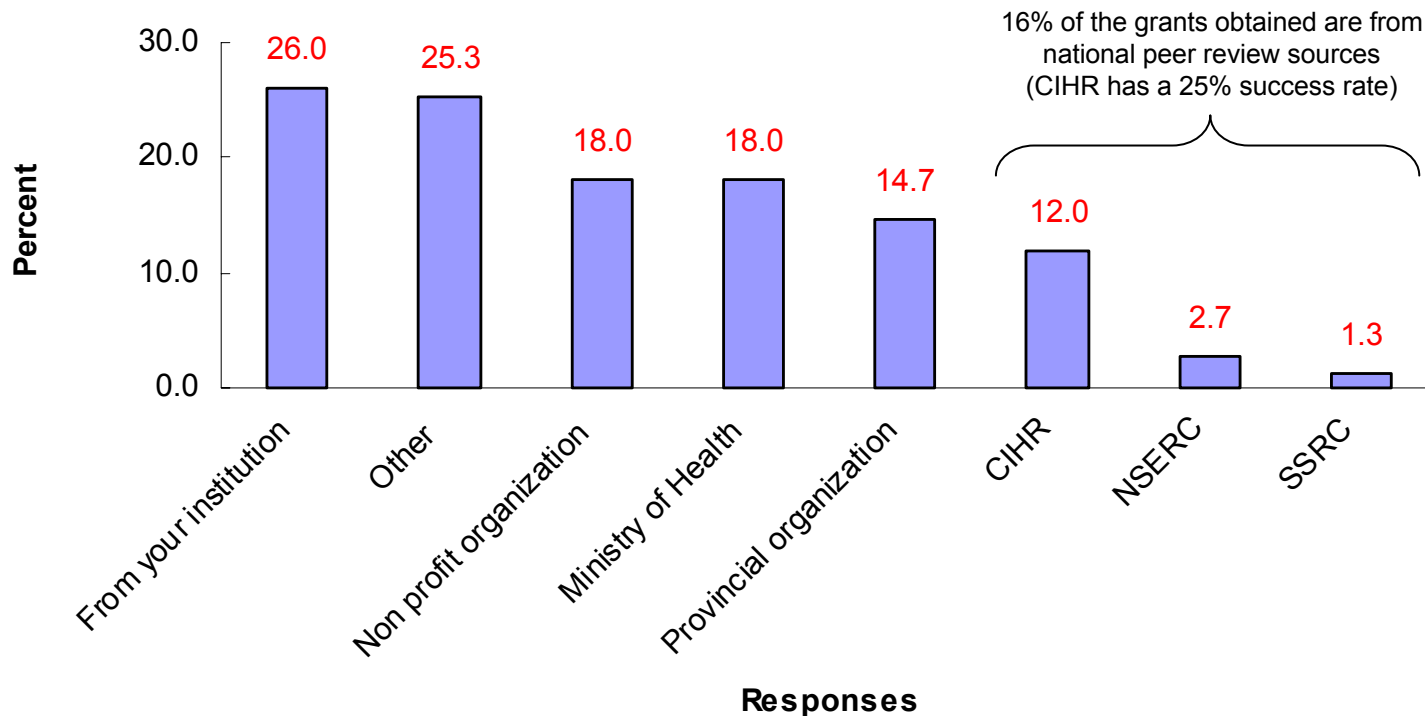


Note: Total of 144 validated responses

Note: red indicates actual percent response

Survey participants are receiving funding from a variety of sources

Where do you obtain funding for your clinical research?



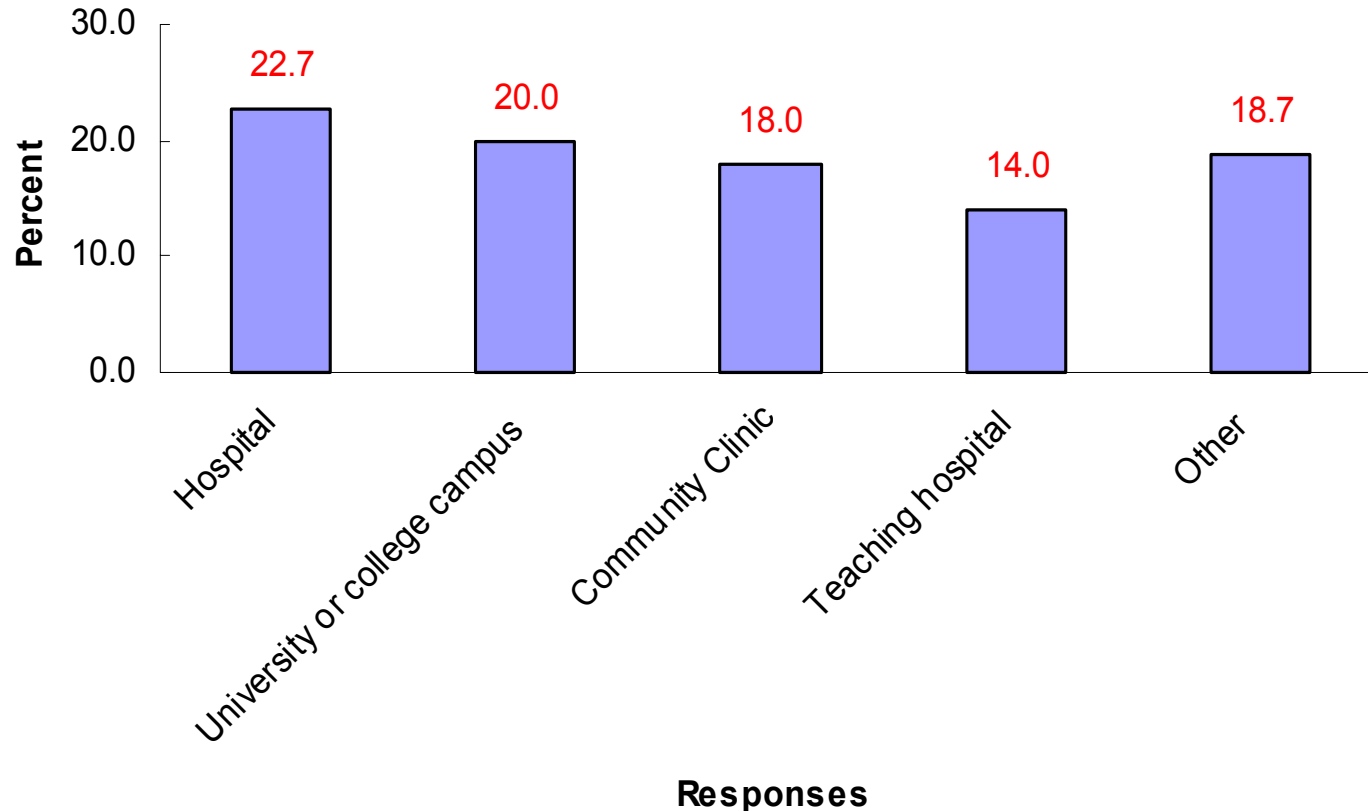
Note: The total is greater than 100% as researchers can have funding from multiple sources

Note: red indicates actual percent response

Note: Total of 144 validated responses

Clinical research is not isolated to one institution or organization

Where is your clinical research conducted?



Note: the total is less than 100% since some respondents did not complete this question

Note: red indicates actual percent response

Note: Total of 144 validated responses

Survey data indicates strong interest in clinical research

- Of the 144 respondents:
 - ✓ 82% have been involved in clinical research at one time
 - ✓ 55% are currently involved in clinical research
 - ✓ **98% want to participate in clinical research**
- 64% of the respondents **do not have the resources** to effectively conduct clinical research today
- 75% predict that they **will not have the resources** in the future
- 64% would not be impacted by the location of the desired clinical research infrastructure

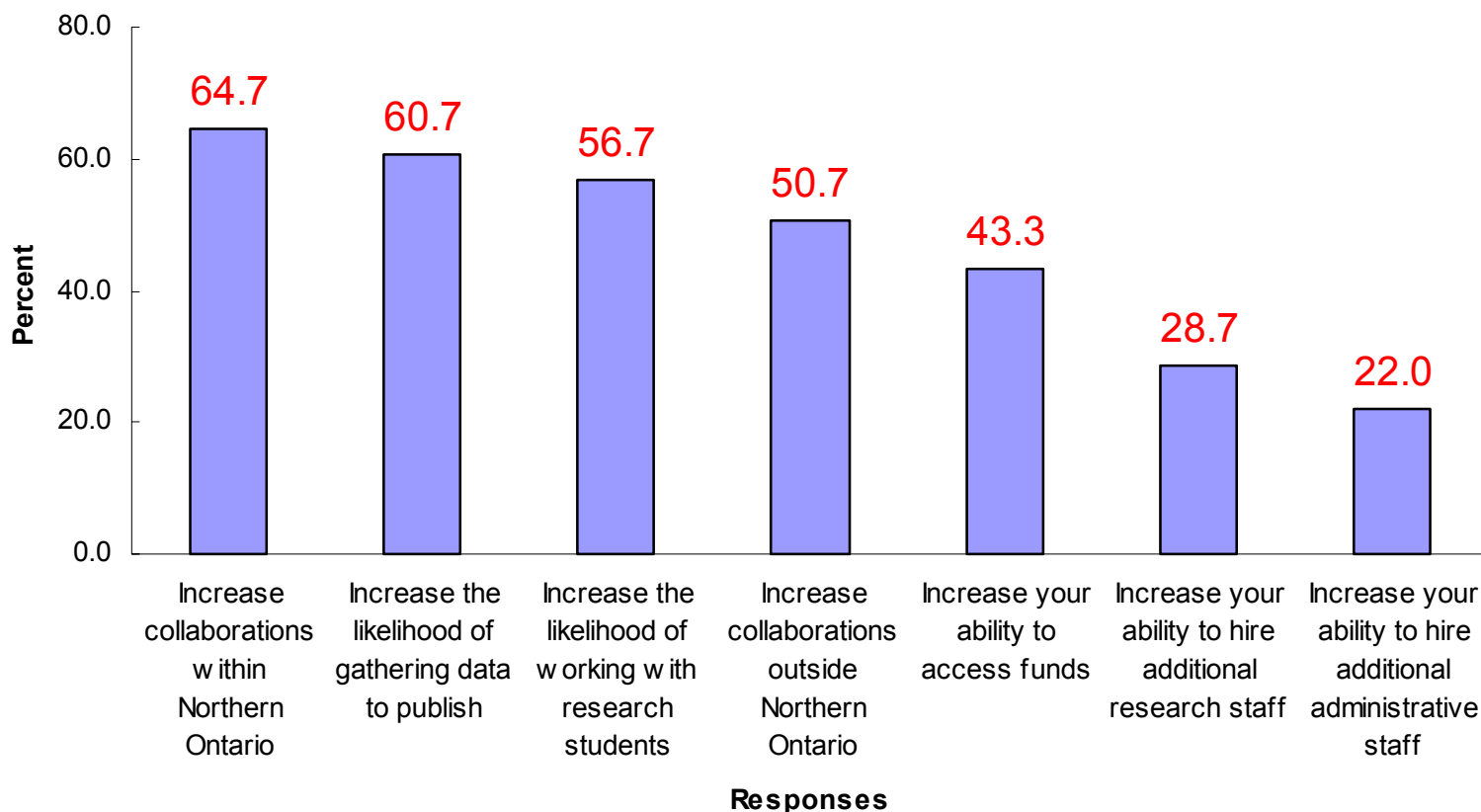
There is strong demand for clinical research support services and specialized infrastructure for clinical researchers across Northern Ontario

		Operational Research Staff		Percent response	
		Utilize Today	Require in the Future	Utilize Today	Require in the Future
support services	biostatistical and analytical support	27	46		
	epidemiological support	24	50		
	nurse practitioners	38	49		
	systems analysis	22	52		
	grant writing support	22	54		
	administration support	25	57		
	ethics support/review	32	46		
	study design and methodological services	22	50		
	equipment technicians training	33	52		
	training	28	50		
	research methodology	26	46		
	clinical research program management	27	51		
	writing research papers for publication	29	48		
infrastructure	Equipment				
	Biological specimen bank	28	44		
	Enhance personal health information databases	29	51		
	Information communication technology	38	44		
	Electronic records management	36	47		
	Space				
	Interview Room	47	46		
	Interview Room with video conferencing	30	58		
Records/data storage	36	49			
Administrative space	35	54			

Note: Total of 144 validated responses

Provided with appropriate resources, clinical researchers could significantly increase their collaborations, productivity and ability to access new funds

If you had the previously listed resources, how would this affect your research?



Note: the total is greater than 100% since respondents were asked to indicate how additional resources would affect all aspects of their research

Note: red indicates actual percent response

Note: Total of 144 validated responses

Interviews were conducted across Northern Ontario to determine:

- Current scope of clinical research activities
- Key assets within the region
- Factors inhibiting and promoting clinical research
- Community needs assessment
- Opportunities for the future
- Infrastructure which would enable increase in research productivity
- What each person or institution could contribute to a Clinical Research Centre

Multiple stakeholders across Northern Ontario offered their insight into what could be provided to and, hopefully, gained from a clinical research centre

Organization	Title	Person	Location
NOSM	Division Head Clinical Sciences	Tim Zmijowskyj	Sudbury
	Division Head Human Sciences	Nancy Lightfoot	Sudbury
NOMEK	Program Director	Tom Crichton	Sudbury
Research Hospital	Basic Clinical Scientists	Amedeo Parasenti	Sudbury
	Surgeon	Tim Best	SSM
	VP Research	Michael Power Janet Northan	Thunder Bay
Community Clinic	Clinical Practice	Silvana Sapadifora	SSM
	Clinical Practice	Chris Rossi	SSM
Small Community Hospital	ER Physician, Chief of Staff	Sean Moore	Kenora
Public Health	Public Health Unit	Alan Northan	SSM
	Public Health Research Unit	Susan Snelling	Sudbury
First Nations	Social Scientist	Gayle Broad	SSM
	First Nations Clinic	Pam Nolan	SSM
Information Technology	GIS Mapping	Paul Beach Tom Vair	SSM
Research Institute	CRaNHR	Raymond Pong	Sudbury
University College	Dean	Arthur Pelini	SSM
City Official	Economic Development	Bruce Strapp	SSM

There is limited demand for *hard infrastructure*

Organization	Title	Research space	Administrative space	Tissue / Specimen bank	Patient interview rooms	Laboratory space	IT infrastructure
NOSM	Division Head Clinical Sciences		✓				
	Division Head Human Sciences			✓			
Research Hospital	Basic Clinical Scientists						✓
	Surgeon				✓		✓
	VP Research						
NOMEK	Program Director						
Community Clinic	Clinical Practice				✓		✓
Small Community Hospital	Chief of Staff						
Public Health	Public Health Unit						
	Public Health Research Unit						
First Nations	Social Scientist						
	First Nations Clinic						✓
Information Technology	GIS Mapping		✓				✓
Research Institute	CRaNHR						✓
University / College	Dean						
Total		0%	13%	6%	13%	0%	40%

There is strong demand for soft infrastructure

Organization	Title	Clinical design analysis, stats	Grant writing	Epidemiologist	Ethics	Standardization for databases	Research coordinator	Training coordinator
NOSM	Division Head Clinical Sciences		✓	✓			✓	✓
	Division Head Human Sciences	✓	✓			✓	✓	✓
Research Hospital	Basic Clinical Scientists			✓	✓	✓		✓
	Surgeon	✓	✓		✓		✓	✓
	VP Research		✓			✓		
NOMECC	Program Director		✓	✓	✓		✓	✓
Community Clinic	Clinical Practice	✓	✓	✓		✓	✓	✓
Small Hospital	Chief of Staff	✓	✓	✓	✓		✓	✓
Public Health	Public Health Unit	✓	✓			✓	✓	✓
	Public Health Research Unit							✓
First Nations	Social Scientist	✓	✓	✓	✓			
	First Nations Clinic	✓	✓	✓		✓	✓	✓
Information technology	GIS Mapping	✓		✓		✓	✓	✓
Research Institute	CRaNHR					✓		
University / College	Dean		✓	✓	✓	✓		✓
Total		53%	73%	60%	40%	60%	60%	80%

Healthcare professionals wanting to participate in research lack the support system to effectively conduct projects and publish the results

Pillar of success	Status in Northern Ontario
Leadership	<ul style="list-style-type: none"> • Transformational leadership is critical • Risk of the research community acting alone without knowledge or context of larger opportunities that exist in the country
Resources (operational + infrastructure)	<ul style="list-style-type: none"> • Exporting operational overhead, utilizing consulting services for data analysis, statistics, epidemiology to Ottawa, Queens and the US • Researchers are waiting to submit grants so they can utilize NOSM
Coordination and linkages	<ul style="list-style-type: none"> • Researchers are: <ul style="list-style-type: none"> – unaware of the assets currently in existence across Northern Ontario – unaware of assets (such as databases) that are proposed in other regions and therefore cannot lend support to the proposal or they are writing competing proposals – uncertain how to effectively utilize the assets that currently exist for their projects • Physicians and other healthcare professionals are unable to access key research components and do not know where to find the help or partners
Multidisciplinary research focus	<ul style="list-style-type: none"> • SSM is integrated (public health, community medicine and health delivery) in its approach to addressing clinical research in Northern Ontario
Community engagement <small>(public, hospitals, industry, education, etc.)</small>	<ul style="list-style-type: none"> • There is a demand by healthcare professionals for educational resources such as epidemiology and study design • Strong public participation in research • Established and novel partnerships with resource-based industries (e.g., mining) • Limited emphasis on ensuring research is published in peer reviewed journals

Areas of Uncertainty Around the Local Need/Demand

Some potential gaps in knowledge specific to this study

Concern	Specific points
Research knowledge	<ul style="list-style-type: none">• We cannot accurately determine if people are over-estimating their actual capacity to conduct clinical research. e.g., everybody would like to conduct research, but do they understand the full process• We are uncertain of the depth of each individual's clinical research knowledge• Investigators have participated in clinical research projects but the number and size of research projects as well as peer reviewed publication generated from each project remains uncertain.
Research capabilities	<ul style="list-style-type: none">• It is not certain how quickly people can “scale-up” their research to utilize the services• Even with additional support, how successful will people be in obtaining national operating grants and will these operating grants be of an appropriate size to partially support the services provided by this centre
Support expertise	<ul style="list-style-type: none">• If positions are identified, how easy will it be to attract nationally recognized people from outside Northern Ontario to fill these roles?• Will there be any conflict of interest between different groups accessing the same service at the same time?
Differences between consultations and online survey	<ul style="list-style-type: none">• Online surveys indicate a demand for services and infrastructure, but the consultations indicate only a demand for support services• During the consultations, people recognized that many of these services may operate on a cost recovery basis; whereas, survey respondents may think the services are “free”

- ***There is both a global need and a global demand***
- ***There is local demand and local need***
- ***Given the demand, what barriers exist that do not allow the demand to be addressed?***

Here Is Why Demand Is Not Being Met in Canada

Within each pillar, CIHR* and JAMA identified the existence of numerous barriers that prevent clinical research excellence**

Pillar of success	Barriers within each pillar	Specifics
Leadership	Engagement of policy makers	Clinical research policy lags behind basic science policy and priorities Essential to have linkages between: 1) Research and policy and 2) Research and policy makers
	Clinical research leadership	Difficult to find leadership that effectively bridges the gap between research and clinical medicine
Resources	Funding	Majority of research funding targets basic science and not clinical medicine
	Incentives (time, financial, resources)	Mechanisms are required to compensate physicians for their participation in clinical research
	Infrastructure	Canada lags behind the US and EU in clinical research infrastructure
Coordination and linkages	Information systems	Numerous databases, information systems and standards hinder obtaining the data sets required to produce high impact research
Multidisciplinary research focus	Institutional/organizational barriers	Clinical research requires multi-stakeholder participation and often results in multi-party bureaucracy
Community engagement (public, hospitals, industry, education, etc.)	Privacy, ethics and regulation	Myriad of ethics and privacy regulations with multiple institutions and agencies that hinder clinical development
	Public participation	The need for public participation is increasing dramatically
	Recruitment of young investigators	Attracting and retaining clinical research investigators remain a significant problem across North America
	Training environment	Difficult to properly train health professionals for clinical research as it is a dual modality profession. Excellence is required in <i>health</i> and <i>research</i>
	Academic opportunities	Large obstacles in establishing a clinical research practice

Rural/community research barriers are even more significant

Pillar of success	Status of rural research in each pillar
Leadership	<ul style="list-style-type: none"> • Canada lags behind Australia and US in rural research capacity and funding • Canada lacks an advocate to drive a rural research agenda on the national stage while galvanizing the local community
Resources (operational + infrastructure)	<ul style="list-style-type: none"> • Limited funding opportunities can be correlated with a lack of policy creation and advocacy • Funding priorities focused mainly on top (urban) centres with significant critical mass and not based on needs of communities even though 1/3 of Canadians live in a “rural community”
Coordination and linkages	<ul style="list-style-type: none"> • Rural research is fragmented and uncoordinated across Canada but this is slowly being rectified with rural research centres being created in regions such as BC and Northern Ontario • Linking within centres is a challenge since physical distance remains a significant barrier
Multidisciplinary research focus	<ul style="list-style-type: none"> • Fragmented rural research environment reduces research impact • Researchers across communities are not working together to address the needs of the community
Community engagement (public, hospitals, industry, education, etc.)	<ul style="list-style-type: none"> • Lack of national strategy has prevented Canada from taking a significant leadership role in the international arena • Significant distance between communities prevents interaction and cooperation • Industry is focused in urban areas thereby accessing people, resources and infrastructure

Health Canada has three classes of rural demographics: 1) rural metro-adjacent 2) rural heartland and 3) rural remote

CIHR – Building a Strong Foundation for Rural and Remote Health Research in Canada, 2001

Seven sites were initially examined to find regions that have successfully built research centres (see appendix for full list)

Site criteria

- Research network – are they a part of a larger network?
- Local Health Integration Network like structure to mirror the new environment in Northern Ontario
- Linked with other centres and engaged in the community

Key insights from the preliminary examination

- Many rural research centres in the US and Canada have a strength in health policy research and development in order to put rural health needs on a government's health agenda
- Many centres focus on integrating the cultural values of the region into the research program
- Data analysis and support is usually a key aspect to the centre

Two key sites were selected based on a variety of different criteria

Memorial University

- Smaller centre facing similar issues to Northern Ontario region
- Similar population profile – resource-based, smaller communities
- Focus on clinical medicine
- Multidisciplinary approach but on a small scale
- Regionalized health system
- Focus on health policy

Vancouver Coastal Health Research Centre

- Large prestigious centre with competing institutional priorities such as hospitals, clinics and universities
- Regional health system
- Multiple world-class regional institutes each with its own affiliations
- Focused on multidisciplinary teams affecting patient care
- Centre focuses on “soft infrastructure” such as training and some grant writing

Key insights garnered from each institution (see appendix for full analysis)

Memorial University

- Focus research on niche areas – for Memorial it was population genomics
- Develop mentoring programs to support younger researchers
- Hire project coordinators to identify opportunities (e.g., new grants), bring together a research team, assist in writing the grant and facilitate carrying out large projects
- Incorporate learning at all levels of research including researchers, healthcare professionals and students
- Actively reach out to the public to explain the research outcomes and the impact on community medicine

Vancouver Coastal Health Research Centre

- Focus on specific research themes
- Create multidisciplinary research teams that focus on one specific condition or disease
- Participating institutions financially support centres by funding a percentage of their grant overhead
- Integrate with the community hospitals and smaller centres
- Ensure that the institute has influence in key health institutions

Northern Ontario has unified its medical education program that addresses needs of the region but the current clinical research enterprise does not have a central unifying focus. A model is needed to create a focal point that facilitates partnerships in the local, national and international arena.

- **Commitment.** There is a strong commitment for funding basic science research in the major centres, yet clinical research does not have a similar commitment across the region.
- **Leadership.** Like the country as a whole, Northern Ontario needs a single voice to articulate and champion a focused research vision across the region and the country.
- **Advocacy.** Northern Ontario researchers need to have an advocate that represents their interest on regional, national and international stage.
- **Services.** With research spread out across the region, Northern Ontario needs to provide better access and / or develop tools and services that enable health professionals to participate in research and respond to new opportunities.
- **Capital.** Building a regional clinical research enterprise requires a defined structure with ongoing budgets to support critical services, hiring personnel and support in a regional, national and international partnerships.
- **Brand.** NOSM is building a national identity by training physicians for community medicine. What is Northern Ontario's clinical research brand?
- **Competitiveness.** NOSM fills a need in community medicine that Southern Ontario cannot fill. Northern Ontario's clinical research program will need to become defined in a similar manner in order to remain nationally competitive and relevant.

- ***Barriers exist preventing clinical research activity***
- ***Others have overcome them***
- ***Northern Ontario can overcome them too***

Northern Ontario and SSM have many assets that can contribute to a vibrant research community (see appendix for full list)

Infrastructure

- Excellent electronic infrastructure across the region that ties together Northern Ontario and provides excellent electronic access to Southern Ontario
- Majority of hospitals moving towards electronic databases
- Wide variety of large databases (e.g., diabetes, pediatric, tumour samples)

Research

- National and international leaders in aboriginal research
- Established research partnerships with clinical sciences and public health research
- Leaders in rural medicine research
- 14 specialized research centres across the North
- Strong public health research programs
- Diverse and innovative research programs with industry (e.g., cancer and mining)
- Strong ties to patient communities (e.g., aboriginal and rural)
- Multi-disciplinary research focus in SSM

Training

- NOSM spans two sites and represents a new methodology for conducting medical education
- Becoming nationally recognized as leaders in public health e-learning
- Training for 9 of 21 registered health professionals in Northern Ontario
- Great turn out and multi-disciplinary representation for the Northern Ontario Clinical Research meeting

Health Delivery

- LHIN's 13 + 14 (the regional healthcare networks) represent 90% of the geographic area of Ontario
- Leaders in community medicine health delivery

Northern Ontario: Weaknesses

Infrastructure

- Databases for health delivery and research are being built or sought without potential interoperability or economies of scale (e.g., clinical research database being sought in Sudbury that could be utilized by other researchers)
- Lack knowledge of assets (e.g., databases) that exist in communities

Research

- Research is fragmented and isolated within groups across the region
- Limited peer reviewed publication across the region

Personnel

- Younger investigators would like to participate in research but lack the required training or resources
- Lack of support personnel, such as clinical and population epidemiologists, data analysts and grant writers, hinders research participation, interpretation and translation.
- Some research personnel (e.g., epidemiologists) are in other centres and are at capacity or their services are not publicized across the North
- Clinical research will not be part of NOSM's recruiting strategy until full accreditation in 3-5 years

Northern Ontario: Weaknesses continued...

Collaborations

- Limited number of regional, national and international collaborations
- The region is not on the radar of provincial or national clinical research consortiums as there is no unified representation for the region (NOSM is starting to fill this role)

Training

- Lack of research mentorship across the region
- Lack of training programs for specific aspects of the research process such as grant writing and writing papers for peer reviewed journals

Northern Ontario: Opportunities

- **Tony Clement.** Federal Minister of Health is also the Minister for the Federal Economic Development Initiative for Northern Ontario (Parry Sound–Muskoka)
- Ties with the **aboriginal** community is unique across Canada
- SSM GIS mapping could be utilized by the LHINs in the near future to assess healthcare delivery. If successful, this could be scaled up for larger regions (e.g., the whole province)
- Potential to integrate a research component into **medical education curriculum**
- Planning for the **Ontario Clinical Trials** Network has just begun and input from academic centres will be sought
- CFI/CIHR ~\$450M **Research Hospital Fund** will likely occur within the next 12 months
- **Leaders** in the emerging technology of GIS/Healthcare mapping
- Potential leaders in **e-learning** initiatives for epidemiology
- Participation in **national** clinical research studies (e.g., CLSA) or national networks (stroke network)
- Build links with international population genomics organizations (e.g., P3G) once sufficient critical mass is built
- Potential to **standardize** clinical research database software (GEREQ, ORACLE) for the region and to link in with national and international opportunities
- **Large demand** across the region to conduct clinical research (as indicated by the survey and the recent clinical research conference in SSM)

Northern Ontario: Threats

- **Major institutions** (U of T and UBC) are building rural and community medicine practices
- Many institutions tout their access to **rural populations** for clinical research (e.g., Hamilton)
- The North is continually forgotten by the South
- Regional **clinical research partnerships** are forming and they could be divisive and not inclusive
- Being unprepared for a **Research Hospital Fund** could catapult other groups past Northern Ontario or leave Northern Ontario unable to partner with major initiatives
- **Regional consortia** are assembling in a variety of different forms to compete in the national and international arena - Northern Ontario might be left out

- ***You have existing strengths***
- ***You have significant opportunities***
- ***Your weaknesses are fixable***

Overview and Introduction

The Health Research and Innovation Strategy that was recently completed by SHI Consulting, identified an opportunity for a Sault Ste. Marie-based Clinical Research Centre. This feasibility study was undertaken to determine if demand existed for such a centre and outlined the impacts to the clinical research environment, the health status of Northern Ontarians, as well as the economic benefits such a centre would provide. Through telephone and in-person interviews, web surveys and secondary research, SHI Consulting has concluded:

Demand/Need

- There is an increasing global, national and local demand for clinical research
- Canada lacks the necessary infrastructure, services and personnel to meet these demands
- Rural and community medical research has few funding opportunities and subsequently there is a greater need for clinical research across the health research continuum compared to more urban-based research
- A strong local need exists for research support services that will enable:
 - Healthcare professionals to conduct clinical research
 - Increased funding opportunities
 - Greater collaborations
 - Better health for the community

Clinical Research Centre

- A Sault Ste. Marie Clinical Research Centre would address these needs by providing:
 - Leadership to guide a regional clinical research centre
 - Support services that will facilitate high quality research being conducted
 - Research training opportunities for both students and healthcare professionals
 - Infrastructure that would enable these activities to occur

Feasibility of the Centre

- This centre would fulfill many of the current needs across the region
- Sustainable funding sources have been identified for both infrastructure and related personnel
- This centre would have positive research, health, social and economic benefits to both Sault Ste. Marie and the rest of Northern Ontario

Vision

Community-based clinical research

Mission

***To enable local health professionals to identify
and address the community's needs through effective research***

Foster interdisciplinary research

The Centre would enable research from multiple disciplines to address locally relevant healthcare issues. This facility would bring together people within the healthcare professional communities (e.g., physicians, nurses, occupational therapists and public healthcare professionals) as well as non-medical personnel (e.g., computer science and technology, sociology and economics) to approach medical research in innovative and relevant ways.

Train, attract and retain health professionals to participate in clinical research

Creating a sustainable clinical research enterprise within a region requires not only an increasing number of healthcare professionals willing to participate in research, but also personnel who are continually upgrading their skills, knowledge and stature. The Centre would aid in developing an environment that would:

- Attract current students into health research
- Attract healthcare professionals residing in the region who are not currently engaged in research but would like to participate
- Attract healthcare professionals to the region who want to conduct clinical research
- Provide training opportunities for healthcare professionals to develop their research skills and become nationally competitive

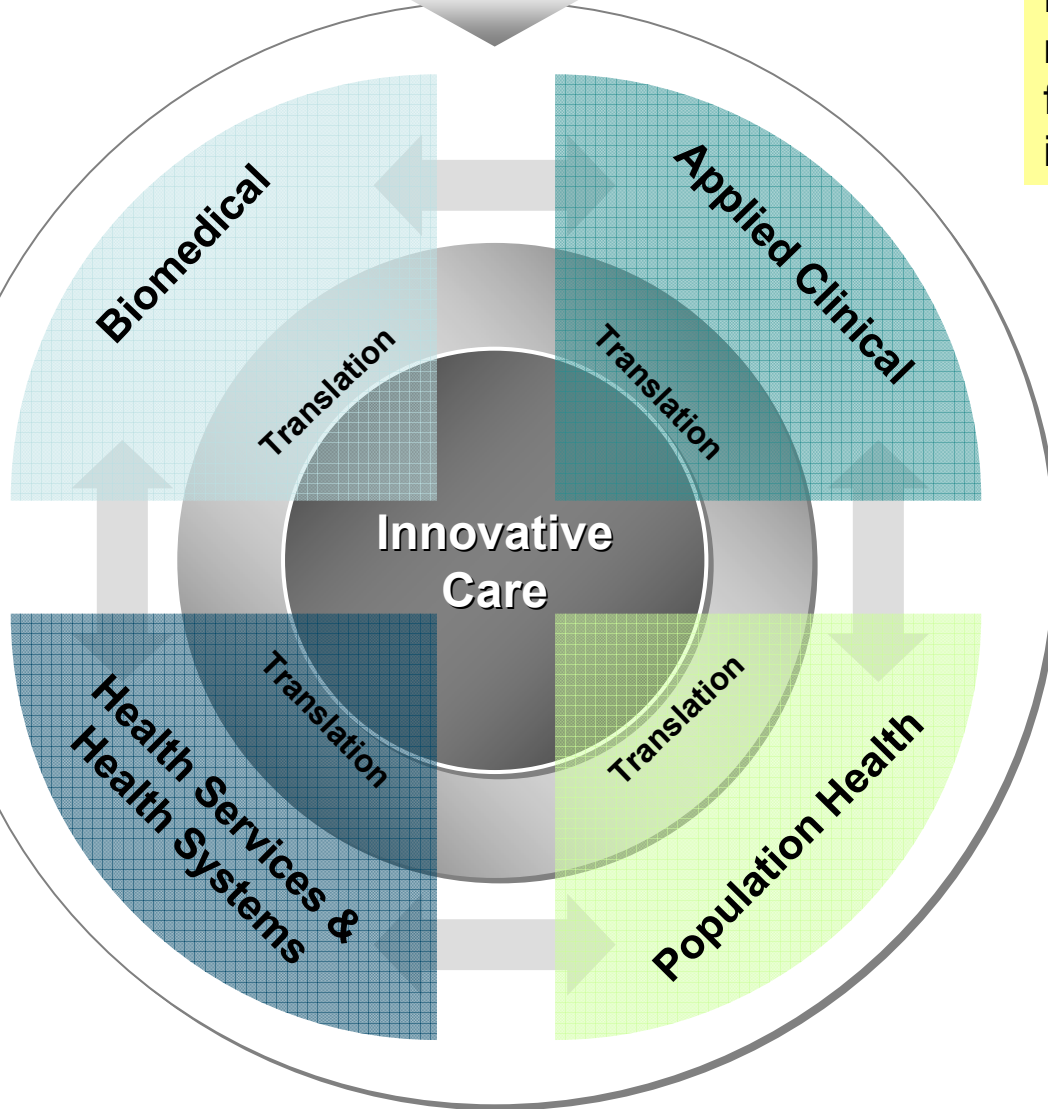
Enable research to occur across the region

By providing the necessary infrastructure, tools and personnel, it is envisioned that this centre would promote and foster a distributed research program that links researchers across the region. This would build the necessary critical mass of investigators required to conduct internationally competitive research that is regionally relevant.

Enhance the effectiveness of regional healthcare

To enable the discovery, testing, validation, dissemination, adoption and evaluation of innovative practices and policies that measurably advance patient care and improve the effectiveness and efficiency of the healthcare system.

**CLINICAL
PROBLEM**



Building capacity in each of these clinical research pillars has been the primary focus across Canada and within the international community.

Northern Ontario has the opportunity to increase capacity by bridging each pillar to develop innovative healthcare practices that stem from basic biomedical, clinical, health services and population research.

Physical and HR Requirements

The majority of clinical research occurs at the point of contact between the healthcare professional and the patient. This paradigm creates a model in which research cannot be concentrated in centralized laboratories, as is the case for basic biological research, but is dispersed throughout hospitals, community clinics and offices of healthcare professionals. This paradigm creates a challenge for clinical researchers to overcome. These challenges (gaps) would be addressed by specific activities that would occur at the Clinical Research Centre.

Administration

- Grant administration for individual and regional projects that are not tri-council grants (e.g., NOHFC, non-profit agencies such as the Heart and Stroke Foundation)
- Human resources: Managing clinical research administrative personnel
- Contracting-Ability to handle fee-for-service type activities such as payment for epidemiologists or data analysis support

Project coordination

- Identification of grants and initiatives from local, provincial, national and international agencies and partners
- Identification of potential participating research professionals for grants or initiatives. These personnel or consortia would be situated either in Northern Ontario or other regions that could participate in future studies
- Project facilitation and completion to ensure projects remain on schedule and there is adequate participation and interaction among researchers. This would be accomplished by organizing virtual or in person meetings and setting up specialized communication websites for research teams (e.g., SharePoint software). Also, to ensure, upon completion of the project, that appropriate agencies and groups are notified of the results (e.g., papers published, local impact, and changes in health delivery standards)

Clinical trial coordination

- Academic clinical trials occur across multiple sites and regions. Recruiting and coordinating trials can be accomplished at larger centres but can be problematic with smaller centres that lack the appropriate infrastructure or scale. A clinical trials coordinator would enable smaller centres to recruit, carry out and manage the trial. This person would liaise with other centres such as the Sudbury Regional Hospital and the Thunder Bay Health Sciences Centre.

Partnership development

- Identification and maintenance of potential regional, national and international research networks.

Standards development

- Databases - There are many electronic databases that exist or are being proposed across Northern Ontario. With electronic databases becoming increasingly ubiquitous, it is important that there is the potential for interoperability among databases. If there is interoperability then privacy must be tightly controlled. This requires standards to be developed, implemented and monitored.

Groups are acquiring or building new clinical research databases (e.g., clinical data samples and specialized library databases) that could be used across the region. It is important that there is a coordinated effort across the region to achieve the necessary critical mass to conduct large research projects or enable researchers in smaller communities to have access to sophisticated data collection tools that are internationally recognized.

- Ethics - There is a need to unify the ethics approval process across Northern Ontario in order to conduct regional studies. This could involve standardization of ethics forms across the region, assisting smaller centres with their ethics approval process and having mutual approval recognition between centres.

Training and continuing education and collaboration

- Coordinating student research projects (e.g., medical school students, residency training, nursing, and other healthcare training programs) with health professionals and pairing with research projects. This would facilitate multidisciplinary research teams addressing specific problems
- Specialized training programs such as e-learning for epidemiology and patient research methodology
- Coordinating mentorship programs
- Training all healthcare professionals
- Conference organization. The Northern Ontario Clinical Research Conference is an example of the types of conferences that build critical mass and momentum

Research services

- The quality of these services must be comparable to national and international standards to ensure that these services are utilized and the resulting work is appropriate for high impact journals. At first these services are envisioned to be located in SSM, but can link to other Northern centres with similar capabilities. The Clinical Research Centre could then coordinate all of the research services for Northern Ontario. These services include:
 - Data analysis
 - Epidemiology
 - Grant writing
 - Study design and methodology

This Centre will serve a variety of functions from administration, project coordination, providing research services as well as coordinating and training clinical researchers

Administration and service delivery

- Offices and associated infrastructure are required for the Scientific and Executive Directors as well as associated personnel

Training

- There is an identified need for specialized examination rooms with video cameras that are designed to conduct training sessions. These rooms would be utilized to teach health practitioners the methodologies for conducting research in clinical settings

Information technology

- Databases are becoming ubiquitous throughout clinical research. This centre would have the necessary infrastructure to host databases for smaller centres or manage its own databases for research purposes

Key elements of this structure include:

- **Centre.** Structure to formalize the clinical research activities and create a central focus for research services, partnerships and funding
- **Management Board.** The management board would consist of the executive management team as well as other key individuals (e.g., from NOSM) who would actively oversee the ongoing management of the Clinical Research Centre
- **Advisory Board.** An advisory board would eventually need to be formed consisting of key stakeholders within the first year of the centre. The board would review the activities of the centre on an annual basis provide key stakeholder input
- **Acting Director of the Clinical Research Centre.** During development and implementation of a Clinical Research Centre, an Acting Director is needed to oversee many of the startup tasks. These tasks include: obtaining the startup funding for the Centre, arranging the governance structure, obtaining the required space and acting as the lead person to search for a Scientific Director. This person would not be a candidate for the Scientific Director position
- **Scientific Director.** A leader with strong scientific and medical (e.g., MD and PhD) credentials mandated to articulate, champion, oversee and be accountable for the vision and strategic growth across the region and to advocate on the national and international stage
- **Executive Director.** A senior administrator with strong managerial credentials mandated to oversee research services (from identifying national research initiatives and grants to building a regional research team), research development (including logistics of major projects) and business development (such as partnerships). This person would report to the Scientific Director
- **Administrative and Support Staff.** Specialized staff to support the services required by the research healthcare professionals
- **Research Personnel.** It would be anticipated that the clinical researchers associated with this centre would be drawn from members of the NOSM faculty and other interested clinical researchers from other professions

Stakeholder consultations and an electronic survey indicates significant demand for research support services across Northern Ontario

Future clinical research resource demand in Northern Ontario								
	Number and type of personnel that could utilize the resources at a Clinical Research Centre			Potential demand				Total personnel required within three years to meet the resource demand
	Number of healthcare students that could utilize the resources	Number of medical residents that could utilize the resources	Number of investigators that could utilize the resources	Hours predicted per researcher	Hours predicted per student	Total hours (potential demand)	Total FTEs (1500 hrs/FTE/year)	
Management								
Scientific Director								1
Executive Director								1
Administration								
Research services			81	10		810	0.54	1
Contracts and financial administration			81	10		810	0.54	
Training								
Mentorship coordinator		2	80	2	3	166	0.11	2
Student research coordinator								
Medical students and residents	208	32		5	5	1200	0.80	
Nursing students and other health professions	60				6	360	0.24	
Training programs coordinator								
Epidemiology			59	20		1180	0.79	1
Statistics and data analysis			70	20		1400	0.93	1
Research services								
Study design and methodology	268	32	70	10	0.5	850	0.57	1
Biostatistical and data analysis support			70	10	1	700	0.47	
Epidemiology	328	32	59	10	1	950	0.63	1
Population health								
Clinical research								
Research paper writing support			61	10				
Grant writing support			74	10		740	0.49	0.5
Ethics support			67	10		670	0.45	0.5
Database design, maintenance and electronic records management			33	2		66	0.04	0.5
Total personnel								10.5

Note: survey respondents indicated that they would not utilize support services if they were not located within the same city. The Clinical Research Centre could hire people outside of the main centre or could organize services at other Northern Ontario institutions.

Location and Proposed Governance

Sault Ste. Marie is well positioned for a clinical research centre that facilitates clinical research across Northern Ontario

- **Location.** Situated between Sudbury and Thunder Bay, Sault Ste. Marie is well positioned to act as a bridge between major centres and rural communities
- **Clinical/community research.** Group Health Centre has a well-defined model for clinical care delivery and clinical research and is recognized throughout the region for its model
- **Community presence.** As NOSM has specifically situated itself away from tertiary hospitals to train physicians for more remote communities, this research centre could be specifically situated in the community to address community needs and be removed from larger centres
- **Multidisciplinary research activities.** Health services in the region are moving towards integration across *all health services* and Sault Ste. Marie has a significant lead compared to most other centres in working in multidisciplinary research and care delivery teams
- **Number of services.** With limited duplication of services or infrastructure (e.g., one of everything) the city is able to become a “living lab” for clinical research. The results obtained can be easily assessed from many different perspectives
- **IT infrastructure and services.** Sault Ste. Marie has a long history of embracing technology for increased efficiencies (GHC databases, GIS system integration and e-learning for public health). This history makes it ideally situated to test, evaluate, adopt and utilize new technologies
- **Community participation/rapport.** The research community works with a variety of community groups in a multidisciplinary manner and enjoys excellent dialogue with many diverse community groups such as the aboriginal groups
- **Meeting point.** Sault Ste. Marie is a traditional meeting point for all Ojibwa aboriginal groups and thus is a recognized centre for aboriginals to congregate

A number of factors aid in determining the ideal location for a Clinical Research Centre both for the short and long term

Healthcare Personnel

- Ideally, this centre would be situated in close proximity to medical students, residents and physicians, as well as other healthcare professionals (e.g., nurses and public health practitioners). This would increase the interactions between these groups and foster a research culture within the local medical community

Medical Infrastructure

- This centre would be situated near healthcare institutions to take advantage of specialized infrastructure that could be utilized for clinical research (e.g., examination rooms for clinical trials)

Distinct Identity

- To serve the needs of clinical researchers across Northern Ontario, it is important that this centre maintain its own distinct identity as an autonomous Clinical Research Centre even if the centre is within a medical institution such as Sault Area Hospital or Group Health Centre

Funding and Space Requirements

- Funding should be directed primarily towards support personnel (e.g., study design, data analysis, grant writers) and if warranted, towards infrastructure

Given time, resource, funding and personnel factors, the Centre would be located within an institution and then migrate to its own space thereby effectively utilizing the available resources.

	Phase I: Within an institution	Phase II: Stand alone infrastructure
Concept	In the early stages, when there are limited resources and few personnel, the Centre would reside completely within a healthcare institution such as Sault Area Hospital or Group Health Centre. These institutions would provide the space and effectively act as the Centre's landlords.	Once the Centre has built sufficient critical mass and it is self-sustaining, a stand alone independent building could be financed. This could be in a pre-existing building or one that is built specifically for the Centre.

As a representative of all the physician clinical research faculty for Northern Ontario, NOSM will manage the Clinical Research Centre operations which will effectively make this an extension of Lakehead or Laurentian University

Clinical Research Centre

Physical infrastructure could be provided by another institution for the centre

NOSM Administration (Lakehead or Laurentian)

Scientific Director

Executive Director

Administrative Staff

Other

Project Staff

Management Board

Function:

To provide active guidance for the ongoing operations of the facility

Key participants:

To be determined during the business plan phase

Advisory Board

Function:

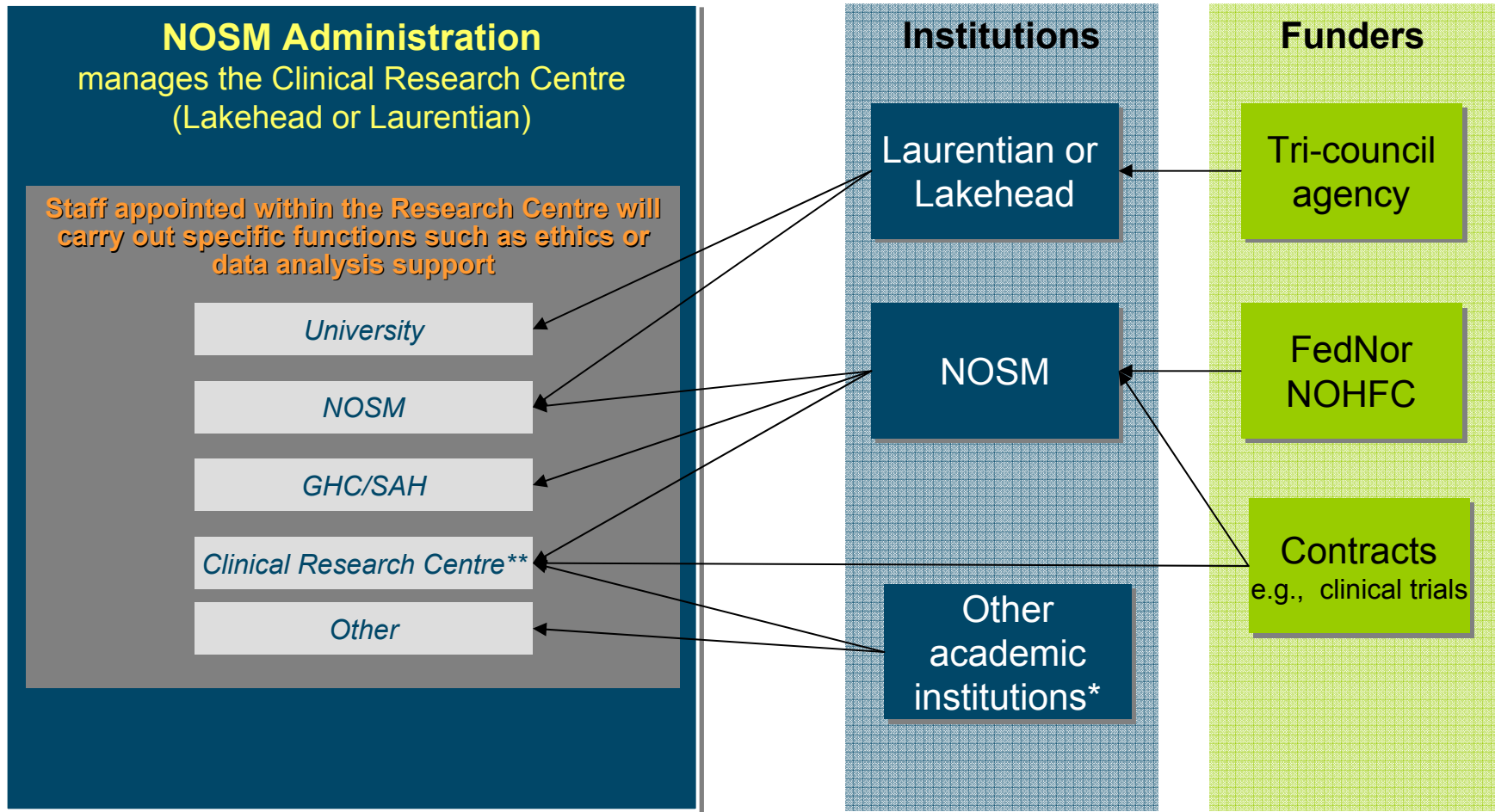
To provide support and guidance to achieve the centre's goals

Key participants:

To be formed after the management board and key participants are determined (during the business plan phase)

Potential Sources of Ongoing Support for Personnel

The source of funding would likely determine the affiliation of the personnel within the Clinical Research Centre



Representative and does not indicate all funding options

Estimated Costs and Funding Sources

The total square footage (s.f.) required to house a full complement of administrative and support personnel

SPACE REQUIREMENTS	Number	Required s.f. per unit	Total s.f.	Cost to build	Costs
Human Resources					
Scientific Director + EA	1	150	150	\$175/sf	\$26,250
Executive Director	1	100	100	\$175/sf	\$17,500
Personnel	9	100	900	\$175/sf	\$157,500
Infrastructure					
Examination teaching rooms	3	150	450	\$175/sf	\$78,750
Student resource centre	1	2000	2000	\$175/sf	\$350,000
Teaching area	1	2000	2000	\$175/sf	\$350,000
IT infrastructure	1	500	500	\$175/sf	\$87,500
Record keeping/storage	1	1000	1000	\$175/sf	\$175,000
Other costs					
IT					\$50,000
Desks etc					\$50,000
Total			7100		\$1,342,500

Potential costs to staff and to build a Clinical Research Centre over three years. Potential revenues have not been accounted for.*

BUDGET	Projected full time salary including benefits	Year 1	Year 2	Year 3	Total
Planning					
Full Business and implementation plan**		\$150,000			\$150,000
Salaries and Benefits					
Acting Director (hired full time Q2 Year 1)	\$120,000	\$90,000	\$60,000		\$150,000
Scientific Director (hired beginning of Q3 Year 2)	\$120,000		\$60,000	\$120,000	\$180,000
Executive Director	\$72,000		\$36,000	\$72,000	\$108,000
Executive Assistant for Acting and Scientific Directors	\$42,000	\$21,000	\$42,000	\$42,000	\$105,000
Epidemiologist	\$84,000	\$21,000	\$84,000	\$84,000	\$189,000
Biostatistician	\$84,000		\$42,000	\$84,000	\$126,000
Training Coordinators	\$60,000	\$60,000	\$60,000	\$120,000	\$240,000
IT person (database expert, 0.5 FTE)	\$60,000	\$15,000	\$30,000	\$30,000	\$75,000
Research Ethicists (0.5 FTE)	\$60,000		\$30,000	\$30,000	\$60,000
Student Coordinators	\$60,000	\$30,000	\$60,000	\$120,000	\$210,000
Grant writer (0.5 FTE)	\$60,000			\$30,000	\$30,000
Building Costs					\$1,342,500
Miscellaneous costs***		\$25,000	\$25,000	\$25,000	\$75,000
Total Expenses					\$3,040,500

*This includes receiving grant overhead, cost recovery for specific services etc. This will be determined when a full business plan is written.

**This is an approximate cost.

***These include offices expenses, travel, rent and other support services. These costs will be further defined and validated when a full business plan is written.

Potential Funding Sources for Salaried Positions

Scientific Director	<ul style="list-style-type: none"> • NOSM research chair that links to the University • Cost could be shared with host institution and NOSM or could be a NOSM funded chair position
Executive Director	<ul style="list-style-type: none"> • NOSM research chair that links to the University • Cost could be shared with host institution and NOSM
Administrative staff	<ul style="list-style-type: none"> • Partially paid through grant overhead. The funds will likely come after 3-4 years of operation
Epidemiologists	<ul style="list-style-type: none"> • Potential support from MOH (LHIN 13/14) to work with GIS and MOH data • Fee for service (cost recovery) basis at \$85/hour (researchers in Northern Ontario are currently paying for these services to Ottawa, Queen's and the US) • NOMEK (now part of NOSM) previously contracted these services for its research students • Fees associated with online and interactive training courses could be used to support positions
Data analysis Study design and methodologist	<ul style="list-style-type: none"> • Fee for service (cost recovery) basis at \$85/hour (what researchers in Northern Ontario are paying today to Ottawa) • NOMEK (now part of NOSM) previously contracted these services for its research students • Fees associated with online and interactive training courses could be used to support positions
Research coordinator	<ul style="list-style-type: none"> • NOMEK had funds available to coordinate research for the residency program. These funds could be directed towards the research centre • NOSM has a research coordinator that will coordinate the research program for 208 students. This could be transferred to the Clinical Research Centre • Other health training programs (e.g., Sault College) employ research coordinators that could be transferred to the clinical research centre. For example, Sault College has 1 FTE to coordinate research projects for 120 nursing students
Ethic support	<ul style="list-style-type: none"> • NOSM could hire this person as a part-time faculty member with the intent of teaching research ethics as a student training session. The remaining portion of the salary could be contributed by participating hospitals and clinics on a pro-rated basis. Specific services, such as writing ethics protocols, could be conducted at a subsidized rate. Institutional Review Board ethics support is not envisioned by this person but could be achieved at the request of NOSM. Ethics support will need further clarification during the next steps.
Database design, coordination and maintenance	<ul style="list-style-type: none"> • If the LHINs utilize the GIS mapping computer infrastructure with health data, then the MOH will require specialized IT personnel. These people could reside at the research centre and be contracted to the MOH on a cost recovery basis • The Clinical Research Centre could partner with the North Network and cost share an IT person • Research grants will be submitted that contain IT support for the design and maintenance of databases. A portion of the funds allocated in these grants could be used to pay for services at the Clinical Research Centre

Majority of the potential stakeholders will contribute to and benefit from this infrastructure

Stakeholder	Bring	Gain	Potential for support
Federal Government	<ul style="list-style-type: none"> • Infrastructure for learning • CFI/CIHR 	<ul style="list-style-type: none"> • E-learning platform • Political capital 	Med
Ministry of Health / LHIN	<ul style="list-style-type: none"> • Access to health information for Northern Ontario • Money for database/epidemiologist support 	<ul style="list-style-type: none"> • Unified system to examine health needs across region (could be used as a pilot project) • Research capabilities to directly affect health outcomes 	High
Research Consortia outside N.O.	<ul style="list-style-type: none"> • Clinical research credentials, methodology, ethics review procedures, trial access, networking and publications (e.g., CTNet) 	<ul style="list-style-type: none"> • Access to unique populations • Regional representation • One point of access 	Low
NOHFC FedNOR	<ul style="list-style-type: none"> • Funding to support the initiative 	<ul style="list-style-type: none"> • Transfer jobs and research money from Ottawa, Queens and the US to Northern Ontario 	Med
Major Hospitals	<ul style="list-style-type: none"> • Research overhead / infrastructure • Support for initiative 	<ul style="list-style-type: none"> • Increased ability to conduct clinical research and address problems directly relevant to their needs 	Med
NOSM (NOMECC)	<ul style="list-style-type: none"> • Funds that are currently used for resident research projects (project coordination, supervision, data analysis and design) • Fund continuing education training programs 	<ul style="list-style-type: none"> • Ability to coordinate multidisciplinary research projects with larger groups (>1 student) • More research services and educational opportunities available for physicians 	High
GHC	<ul style="list-style-type: none"> • Community health model • Healthcare professionals that can conduct research 	<ul style="list-style-type: none"> • Access to common infrastructure • Multidisciplinary research programs • More opportunities for training 	High
Clinical Researchers	<ul style="list-style-type: none"> • Funds for data services • Research projects • Training abilities 	<ul style="list-style-type: none"> • Increased ability to conduct research • Training • Access to student support 	High

Timelines and Critical Path

Over the next three years, numerous activities are required in order to move the project forward including developing a full business plan, creating a governance structure and hiring an Acting Director

Clinical Research Centre Activities	Year 1				Year 2		Year 3
	Q1	Q2	Q3	Q4	H1	H2	
Business Plan							
Develop full business and implementation plan including:							
Capital sourcing strategy							
Infrastructure strategy							
Finalize HR, space and infrastructure requirements							
Identify key partnerships with stakeholders							
Obtain Letters of Understanding for participation in Centre							
Structure and Governance							
Create Clinical Research Centre entity							
Identify and form advisory board							
Funding							
Identify and secure funding for infrastructure and personnel							
Identify criteria for CFI/CIHR infrastructure research hospital fund							
Ensure CFI eligibility							
Develop funding application based on business plan of centre							
Human Resources							
Identify Acting Director							
Appoint Acting Director							
Create profile for Scientific and Executive Directors							
Recruit Scientific Director							
Recruit Executive Director							
Acting Director steps down							
Hire clinical research epidemiologist							
Hire biostatistical support person to assist with study design, data analysis and interpretation							
Hire IT specialist specializing in scientific databases (part time)							
Hire research ethicist (for coordination and developing policy)							
Hire grant writer							
Hire two student research coordinators for 1) medical students and residents 2) other health professionals							
Securing Infrastructure							
Identify potential locations to house personnel and equipment							
Develop a construction/renovation plan							
Begin construction/renovation for desired infrastructure							

Critical Path to Building a Centre

	Phase A	Phase B	Phase C	Phase D
	Project Feasibility	Business Plan Development	Secure Financing and Finalize Space Plans	Hire Key Personnel and Open the Centre
Objectives	<ul style="list-style-type: none"> To establish overall project definition & vision To assess the feasibility of developing a research & development facility in SSM based on analyses of financial, market and physical parameters 	<ul style="list-style-type: none"> Development of a full business plan that finalizes the findings in the feasibility study to determine: <ul style="list-style-type: none"> –ownership and legal structure –exact space required –finalization of services and personnel required –location of building –full set of financials 	<ul style="list-style-type: none"> Secure the required funding for start-up and ongoing activities at the centre Conduct site planning (if required) Develop programs Set up administrative and corporate structure Begin the process to hire key personnel Identify and involve key clinical researchers in the project 	<ul style="list-style-type: none"> Prepare detailed design drawings and specifications for competitive construction pricing (if required) Identify and hire key personnel Formalize arrangements with participating institutions
Key Questions Addressed	<ul style="list-style-type: none"> Is there an agreed upon set of parameters for the project? What are the financial conditions for funding the project? What are the needs of the region and partnering institution? 	<ul style="list-style-type: none"> What are the most viable options in terms of financing, ownership and activities? What would be the work plan for implementation? What is the full budget for the project? What are the parameters within which the facility must be designed? What are the exact profiles of the staff and what are their affiliations? 	<ul style="list-style-type: none"> Where will financing come from? What is the best internal layout of the building and external site plan use (if required)? What projects will be undertaken first? Who can assist in generating momentum to build excitement about the project? 	<ul style="list-style-type: none"> Do the construction documents properly describe the work (if required)? What are the formal contract and supplementary conditions? Who will staff the centre? Is specialized approval required by institutions to open the centre?
Deliverables	<ul style="list-style-type: none"> Report indicating the need for a centre, activities to address the need, potential governance model and high level estimate of start-up and ongoing costs. This report determines the feasibility of such a centre in SSM 	<ul style="list-style-type: none"> Complete business plan with detailed budgets, financing options, timelines, milestones and key personnel Obtain letters of intent from all involved parties 	<ul style="list-style-type: none"> Transactional: secured financing Planning: schematic design, design development, preliminary ops plan Designing services and obtaining initial contracts Identify key personnel to hire Write grants to secure appropriate funding 	<ul style="list-style-type: none"> Facilities operations plan Hire Acting Director Hire administrative personnel

Impacts and Future Opportunities

A Northern Ontario clinical research centre would specifically address many of the barriers preventing high quality clinical research

Pillar of success	Barriers within each pillar	Specifics
Leadership	Clinical research leadership	The Scientific Director will aid in galvanizing the regional, national and international research community
	Engagement of policy makers	A strong leader will further a national rural and community research agenda with the goal of Northern Ontario taking a strong lead across the country
Resources	Funding	This centre will provide the tools and training necessary for all clinical researchers to obtain grant funding for their research projects
Coordination and linkages	Information systems	This centre will directly address the disparity in information systems across the region by coordinating the procurement and use of information systems across the region
Multidisciplinary research focus	Institutional/organizational barriers	The demonstrated ability to work in multidisciplinary health teams is one of Sault Ste. Marie's clinical research strengths. This centre will be modeled after this approach to ensure that research projects involve many health modalities which can be facilitated through NOSM regional presence
Community engagement (public, hospitals, industry, education, etc.)	Privacy, ethics and regulation	By developing more harmonious ethics and privacy standards, larger clinical research projects can be undertaken that span regions, communities and research modalities
	Public participation	This centre will actively engage the various communities to ensure that the research process is inclusive and participatory
	Recruitment of young investigators	The centre will assist in attracting young investigators by providing additional research services, training opportunities and enabling better access to research students to assist in conducting research
	Training environment	Many healthcare professional students (e.g., medical and nursing) engage in clinical research as part of their course work. This centre will aid in coordinating these activities to ensure projects have greater impact and that the results are published in peer reviewed journals
	Academic opportunities	This centre will host specific research training courses that will further the skills of healthcare professionals across the region

A Northern Ontario clinical research centre could benefit many different sectors of the Northern Ontario community

Increase in the number of grants

Number of Northern Ontario investigators who would increase their likelihood of obtaining grant funding with the assistance of a clinical research centre*	65
Number of researchers on one grant**	3
Success rate for CIHR***	25%
Average award for a 3 year grant	\$111,483
Potential increase in grants obtained for Northern Ontario in three years	\$603,866
Notes: *Determined from the SHI Consulting web survey. **Assumed that investigators will be required to collaborate to increase their chance at obtaining the grants. ***CIHR is used as a representative granting agency.	

Decrease costs in healthcare delivery

In the US, each additional dollar spent on healthcare services research produced a health gain valued at \$1.55 to \$1.94 Source: Luce BR. The return on investment in health care: from 1980 to 2000. Value in health. 9 (3) 2006.
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Community research benefits the health of all populations in the north

<p>Researchers will work with remote, rural, First Nations, and many other communities to directly address their needs. Since researchers will be working with communities, findings from all studies will be reported back and integrated into the community's medical care and NOSM's educational practices. All northern communities will benefit from the increased access to clinical research. These benefits will include:</p> <ul style="list-style-type: none"> • Increased health status • More appropriate use of healthcare resources once the health issues are identified and characterized • Greater ability to attract and retain high quality healthcare professionals
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Positive economic impact in Northern Ontario

Activity	Investment	Economic Impact (4 times multiplier)+
Salaries for new personnel	\$1,219,500	\$4,878,000
Infrastructure	\$1,342,500	\$5,370,000
New grant funding	\$603,866	\$2,415,465
Total economic impact		\$12,663,465

+NOSM assigns a 4 times economic multiplier to determine economic impact. Thus, every dollar brought in by the Clinical Research centre generates four dollars of economic activity.

Regional	<ul style="list-style-type: none"> • Participation in Ontario's Clinical Trial Initiative that will create a sector innovation network for the province • Partner with MOH through the LHINs (#13/14) to conduct research that directly assesses healthcare delivery and outcomes • The centre should approach ICES (Institute for Evaluative Clinical Studies) to ensure northern clinical research has significant impact across Ontario through new linkages with researchers and policy makers
National	<ul style="list-style-type: none"> • Develop research partnerships with regions such as Atlantic Canada (AC4R initiative) • Potential to work with Federal agencies looking to partner with leaders in Northern healthcare delivery and research (e.g., Public Health Agency of Canada) • A clinical research centre could be a research node for such consortia as the Canadian Longitudinal Study on Aging (CLSA), or research networks such as the Canadian Stroke Consortium and Consortium of Canadian Centres for Clinical Research (C5R)
International	<ul style="list-style-type: none"> • Become international leaders in GIS mapping/epidemiology research. The National Institute of Health (NIH) in the US and the National Health System in the UK are both beginning to examine this technology for use in their research and healthcare delivery systems • Partner with research centres with a similar rural and community medicine research focus (e.g., Australia, Washington State University)

Sample Research Project

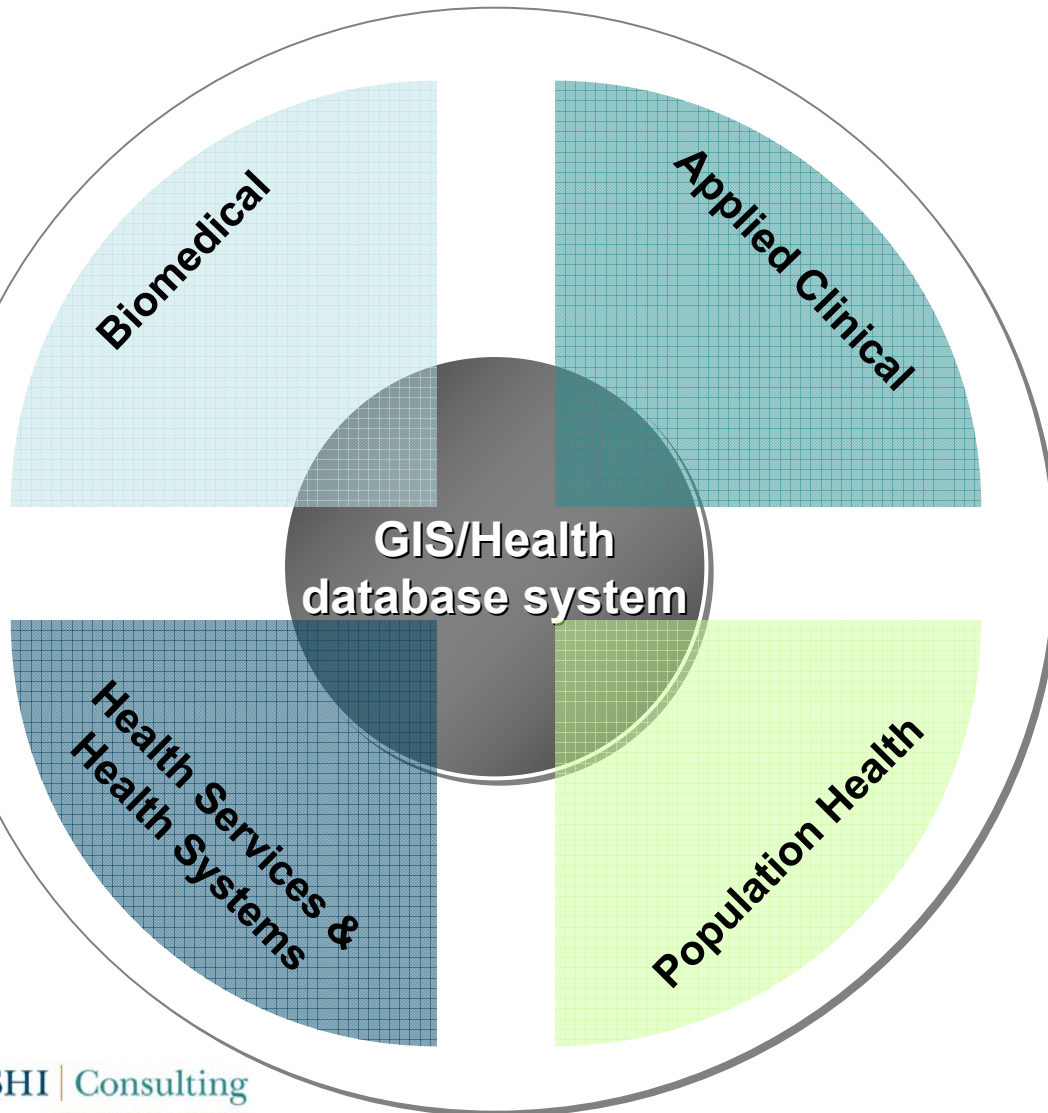
Building a competitive research centre requires positioning the North for long-term growth



- Sample criteria for initiatives that the centre would facilitate
 - Direct impact on the region with opportunities to expand to the province, country and abroad
 - Multi-stakeholder participation
 - Multi-disciplinary
 - National leadership potential
- Builds critical mass:
 - National asset
 - Knowledge translation platform



Developing a new GIS/Health research database impacts all sectors of health research while building a platform for international growth and leadership



New methodologies and tools to assess:

- Healthcare resource utilization
- Disease prevalence
- Healthcare outcomes

Tools could be used by:

- Clinical researchers
- Hospitals
- Public health
- LHINs
- Province
- Other regions outside of the province

GIS platform could provide a significantly greater benefit than the costs associated with the project

	Metric	Output	Impact	Time		
				Short	Med	Long
Revenue	Health	Identifies the healthcare needs of specific regions	H			
	Personnel	Attracts new skill set to the research paradigm	M			
	Research	Opportunity to be at the forefront of an emerging field	H			
	Political	Supports policy development	M			
	MOH	Better understanding of where to direct resources with high specificity and how to run controlled trials	H			
	International Reputation	NHS and NIH are determining how to use these systems, but no one has effectively combined all the data points Could be a significant asset to aid in population mapping for consortia such as P3G and therefore used around the globe	H			
	Training	Building e-learning to export techniques internationally	L			
	Expansion	Ability to take this anywhere on the globe, link with other provincial databases	H			
Expense	Infrastructure	Limited resources required; these can be shared. Further leverages investments already made by the community	L			
	Operating	Reduced costs as more users join the system	M			
	Coordination	Requires people to manage privacy between data points	M			
	Developers	System integration is required to bring healthcare information into the database	L			
ROI			H			

Appendix

Seven sites that were examined as models for growth in a similar type of environment

Clinical Research Network	Regional healthcare structure e.g., LHINs	Site focus	Leadership	Smaller centre (limited resources)	Coordination and Linkages	Multi-disciplinary research focus	Community engagement
Memorial University	✓	Genomics Health policy Population health	Strong leadership in translational medicine	Yes	Regional partnership with Atlantic Canada	Yes Linking genomics, healthcare delivery and policy together	All levels including patients, faculty and students
Maine Rural Health Research Center		Policy development	Yes for rural policy research	Yes (Portland Maine)	Linked to Washington, Wyoming, Alaska, Montana and Idaho (WWAMI)	Policy for • Chronic Illness, and Aging • Healthcare Access and Finance • Mental Health • Public Health • Healthcare Management • Children's Health and Welfare	Limited
Vancouver Coastal Research Institute	✓	CNS, ophthalmology, musculoskeletal; clinical epidemiology; immunity and infection; prostate cancer; dermatology; interventional cardiology; emergency medicine; women's health	Strong leadership for each individual research theme	Large centre	Coordination and links between major institutions	Strong multi-disciplinary teams ranging from engineers and clinicians to sociologists and occupational therapists	Community involvement has not been a major focus
NCIC		Cancer	Strong leadership across the country	Crosses many centres	Strong coordination for trials, policy, ethics	Yes-ranging from clinical trials to basic research. Organized in teams	Strong engagement with the research community through funds and clinical trials

Clinical Research Network	Regional healthcare structure like the LHINs	Research focus	Leadership	Smaller centre (limited resources)	Coordination and Linkages	Multi-disciplinary research focus	Community engagement	Notes
Washington, Wyoming, Alaska, Montana, and Idaho (WWAMI network)		Policy-oriented research on issues related to rural healthcare	National leadership in the US	Yes, but main centre in Seattle	Funded by US federal government Links to 8 states	No	Yes	Acts as information clearing house 8 individual sites were also examined
Alaska Clinical Research Center		Clinical trials in urology and gynecology	Only state leadership	Not linked to a medical school	Limited		No	Industry-focused research Similar to CRO
Center for Alaska Native Health		Increase research capacity and address Alaska Native disparities	Local leadership for culture issues		1) Yukon-Kuskokwim Health Corporation 2) University of Alaska Fairbanks 3) University of Alaska Anchorage	Established 5 research support cores: 1)Administrative, 2)Epidemiology and Bioinformatics, 3) Genetics, 4) Cultural-Behavioral, and 5) Knowledge Application and Dissemination		Hired researchers, data analysts, and staff to design and conduct community-based Alaska Native healthcare studies



Starting in the 1970s, Memorial focused on attaining achievable success to build a local, provincial and national reputation

Initiated clinical research	<ul style="list-style-type: none"> • Medical school founded in 1969 with research starting shortly thereafter • Initiated translational research program in 1994 with active recruiting of research personnel
Profile	<ul style="list-style-type: none"> • Medical school based in St. John's NL • Even with its small size it has attracted \$11.2M in external funding in 2003 • Focus on community medicine
Research focus	<ul style="list-style-type: none"> • Focus on niche areas in: <ul style="list-style-type: none"> • Genomics (in 1995): working with founder populations • Healthcare policy: genetics, environment, economics and social legal healthcare issues • Healthcare services: examination of the efficiency and outcomes of procedures
Partnerships	<ul style="list-style-type: none"> • Begun with partnerships with Memorial in biostatistics, clinical and basic sciences • Partnered with Toronto and Halifax on multi-centered research projects • Now entering a pan-Atlantic research consortium called AC4R
Pathway to growth	<ul style="list-style-type: none"> • Created a clinical epidemiology unit • Actively recruited clinical researchers • Built critical mass supported by senior administrative support • Strong focus to publish findings in peer reviewed journals

As a small centre, Memorial has built an excellent reputation for clinical research in specialized areas

How a centre can aid in overcoming challenges conducting research in a smaller community	Research	Focused on niche areas
	Faculty	Develop mentoring programs between Sr/Jr staff
	Infrastructure	Utilize technology to connect people
	Administration	Hire project coordinators to identify funding, build teams, manage progress, track outcomes and facilitate communication with researchers and the community
	Education	Incorporate learning at all levels including students, staff, faculty and the public
Keys to success	<ol style="list-style-type: none"> 1. Available infrastructure onsite 2. Ability to attract seasoned researchers (actively sought individuals for over 2 years) 3. Positioning research personnel to obtain team grants 4. (Multi-disciplinary) team grants facilitates better publications and increases further partnership opportunities 5. Communication at multiple levels <ul style="list-style-type: none"> • Researchers / Administration • Students • Public 6. Commitment for long-term research growth with medical students <ul style="list-style-type: none"> • Research days • Honours projects • Mentors 	

Recognizing the need to address healthcare needs of the local population, a research institute was created to bridge clinical research, patient care and healthcare outcomes

<p>Initiated clinical research</p>	<ul style="list-style-type: none"> • Founded in June of 2003 as a partnership among the University of British Columbia (UBC), the Vancouver Coastal Health Authority (VCHA) and Vancouver General Hospital (VGH)/UBC Hospital Foundation • Created to advance the development of research activities that impact the people within VCHA, British Columbia, Canada and international realms • From five provincial health authorities, this is the only one (similar to LHIN) with a research mandate 	
<p>Profile</p>	<ul style="list-style-type: none"> • 25% of BC's population • 15 First Nation's communities • 8,500 acute, rehabilitation and residential beds • 275 Principal investigators • \$71M in research funding 	
<p>Research focus</p>	<p>CNS, ophthalmology, musculoskeletal, clinical epidemiology, immunity and infection, prostate cancer, dermatology, interventional cardiology, emergency medicine, women's health</p>	
<p>Partnerships</p>	<p>Educational Institutions</p>	<p>Simon Fraser University University of British Columbia British Columbia Institute of Technology</p>
	<p>Health Institutions</p>	<p>VGH, UBC, St. Paul's, BC Children and Women's Hospital BC Cancer Agency GF strong rehabilitation centre</p>

Creating the institute is considered a success in moving the research agenda forward...

How a centre can aid in contributing to multi-disciplinary clinical research?	Research	Focused on specific research themes that integrate research and care delivery into one continuum
	Faculty	Actively promotes research with faculty who are not traditionally involved in research by pairing people/groups with differing experience levels
	Infrastructure	Services such as epidemiology and clinical trial administration support ongoing research efforts
	Administration	Administrative support assists with granting process and provides matching funds for key programs
	Education	Assesses the needs of the research community and designs specific seminars for researchers/students to increase learning and interaction
Keys to success	<ol style="list-style-type: none"> 1. Creating multi-disciplinary research teams focusing on the whole research continuum from discovery to knowledge translation. For example, in spinal cord injury research, a group consists of basic scientists, engineers, medical doctors, nurses, physical therapists, sociologists and occupational healthcare professionals 2. Participating institutions contribute part of the research overhead to support administration, student grants and educational seminars 3. Focus on specific problems around which multi-disciplinary teams can be brought together and produce innovative research 	

...but is having difficulty delivering on part of its overall mandate

Creation of the institute was reactionary

- Institute was created to address the lack of clinical research commitment by hospital boards

Limited links with community health

- Focus is with the major research groups and not with community hospitals or physicians
- Research priorities and outcomes are not linked to improving patient care outside of downtown Vancouver

Limited influence with major players

- Institute has limited or no representation at other institutes
- Many local centres have similar services as VCHRI and do not coordinate these services

Key highlights of Northern Ontario Clinical Assets (SSM in Red)

Many assets exist that can contribute to a vibrant research community

<p>Infrastructure</p>	<ul style="list-style-type: none"> • Large electronic/telecommunications infrastructure <ul style="list-style-type: none"> –North Network (Canada’s busiest with 100 sites), KO Net (largest aboriginal network) • EMR – GHC has over 62,000 electronic healthcare records, Hospital systems standardizing on Meditech • Many individual electronic databases <ul style="list-style-type: none"> –largest child EMR in North Bay –GHC largest diabetic roster in Canada • World leaders in GIS mapping which can be linked to healthcare records and to other data • GHC patient call centre • 44 hospitals in Northern Ontario and more than 3500 public beds
<p>Research</p>	<ul style="list-style-type: none"> • Strong local research ethics board (GHC) • National and international leaders in aboriginal research • Established partnerships with public health and community medicine • Diverse clinical research programs from public health to industrial research (cancer and mining) • 1 of the 5 Public Health Research Units (PHRED) in Sudbury • Well established cohesive clinical research program at GHC • NOSM is building trust with all communities in Northern Ontario • Medical researchers with training at major centres are scattered throughout the region • Numerous specialized research centres including: <ul style="list-style-type: none"> –CRaNHR, Health and Aging, Healthcare ethics
<p>Training</p>	<ul style="list-style-type: none"> • Training for 9 of 21 registered healthcare professionals (Audiology and Speech-Language Pathology, Dental Hygiene, Massage Therapy, Medical Radiation Technology, Medicine, Midwifery, Nursing, Pharmacy, and Respiratory Therapy) • National leaders in e-learning for public health (epidemiology) • NOSM has built strong community links that bridge the distance gap • Successful clinical research conference was held this month in SSM
<p>Healthcare delivery</p>	<ul style="list-style-type: none"> • LHIN 13/14 represent ~5% Ontario’s population • GHC’s community medical model

Northern Ontario has a unique population profile with specific healthcare needs that are not being addressed

Populations and communities	<ul style="list-style-type: none">• 4.6% of Ontario's total population• High aboriginal representation (8% in NE, 21.7% NW)• Remote populations are sometimes not accessible during the winter months• Varied community profiles<ul style="list-style-type: none">–populations on reservations–small communities with no migration–larger centres such as Thunder Bay and Sault Ste. Marie• Resource-based populations - mining, steel and forestry• Aging population compounded by outward migration of youth• Sault Ste. Marie is the traditional meeting location for all Ojibway people in North America• Algoma University works closely with First Nations
Health	<ul style="list-style-type: none">• Higher morbidity and mortality of chronic diseases<ul style="list-style-type: none">–CVD, diabetes, mental health, obesity and smoking• Higher hospitalization rates for chronic diseases compared to Southern Ontario• Occupational diseases• Aboriginal communities have a significantly different health profile compared to<ul style="list-style-type: none">– non-aboriginal communities–other aboriginal communities

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