

A NORTHERN RURAL MEDICAL SCHOOL

**Increasing rural
medical graduates in
Ontario**

A Preliminary Proposal

**Presented by
The NORMS Liaison Council,
Laurentian University and
Lakehead University**

**To The Expert Panel on Health
Professional Human Resources
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Northern Rural Medical School

Increasing rural medical graduates in Ontario

1 EXECUTIVE SUMMARY

This proposal is based on the well-grounded view that training physicians on-location in the region where they are needed is the best long term solution to chronic problems of physician recruitment and retention in rural, northern and remote areas.

The McKendry Report (p. 72) notes that Ontario already spends \$65 million on various incentives and training schemes aimed at alleviating the problems of underserved areas. One can only anticipate that this figure (based on 1998 data) will sharply increase in the future if a permanent solution is not found.

Laurentian and Lakehead Universities, based on the recommendations in the McKendry Report, propose the establishment of a new decentralized multi-campus medical school, the Northern Rural Medical School, in time for a first entry of students by September 2002, with an intake of 55 students per year.

The decentralized model proposed does not call for significant new capital spending. Existing health science buildings at both Lakehead and Laurentian sites have the potential for expansion at a relatively modest cost. This level of cost could be seen as readily falling within the ambit of current capital infrastructure funding envelopes.

The “steady state” cost of the proposed program is estimated at \$21 million per year for an annual intake of 55 students per year accumulating to 220 over the four years. This includes the major travel and accommodation costs necessary for effective Northern and rural contextual learning to occur. The initial capital costs required to establish the program amounts to \$18 million. Of this \$10 million relates to space and \$8 million to telecommunications and information resources.

The establishment of a decentralized Northern Rural Medical School is not without precedent. Rural schools already exist in northern Norway and in Australia, and England is currently considering establishing a twin campus rural medical school.

This project must surely be viewed as a long-term investment aimed at securing significant long-term benefits. To the extent that the program is successful in addressing increasingly acute recruitment and retention issues, it will eliminate the need for many of the short-term measures and their associated costs that are currently in operation. The potential offset is considerable.

The cost of failing to address the health service needs of northern and rural populations in an effective and sustainable manner must also be assessed. These costs can be thought of as the dollar figures needed to meet the spiraling costs of incentive schemes aimed at stemming the exodus of current health expertise to the urban south. They can also be thought of as the human costs that accrue to people living in medically underserved areas marginalized from the main core of medical expertise.

The community-based program to establish this new Northern Rural Medical School has been developed in partnership with healthcare agencies, physicians and educators throughout northeastern and northwestern Ontario. The program is designed to produce highly qualified physicians with state-of-the-art medical education (EFPO/CanMeds 2000) by focusing on the following.

- Preparation for professional practice and life-long learning.
- The population determinants of health especially in northern and rural contexts.
- Extensive training in communication skills including the use of telehealth technology and health informatics.
- The interdisciplinary nature of contemporary healthcare.
- A research and education agenda that is responsive to northern, franco-ontarian, rural and Aboriginal needs and that evolves to reflect changing health needs and priorities.

Students will be admitted directly to the Northern Rural Medical School and spend four years learning and living in northern and rural environments. The pre-clerkship educational experience (years 1 and 2) will be spent in small group (6-8 students), patient-centred, clinical problem-based, systems organized, rural and northern contextual learning in Sudbury, Thunder Bay and Northern network learning sites. The pre-clerkship clinical experience will occur at a variety of clinical learning sites, including Sudbury/Thunder Bay, francophone communities, rural, remote and Aboriginal locations..

The clerkship rotations (years 3 & 4) in the major specialties will occur in Thunder Bay, Sudbury and other major centres using the preceptorship model and will include experiences in rural/remote and Aboriginal settings. The clerkship will last 16 months to allow for a consolidation in the spring of the 4th year.

NORMS acknowledges the need for the training of physicians capable of comprehensive medical practice in the French language. The proposed program will encourage the application of francophone students and will offer both clinical experience and teaching support in French where numbers warrant

The Northern Rural Medical School will build on the experience of the current residency programs run by NOMEAC and NOMP. Extensive quality assurance and curriculum management arrangements will be adhered to in order to ensure the parity and quality of student experience.

The research strategy of the School will complement the educational program by building on existing research strengths targeted at issues which are special relevance to northern, rural and Aboriginal populations. The goal is to give Northern Ontario a national and international profile for the excellence of its northern and rural health research.

There could not be a better time to consider the development of a new medical school located in the north and addressing the needs, not only of Northern Ontario, but of rural areas throughout the province and Canada which find themselves marginalized from the centres of medical expertise. Northern Ontario communities have an outstanding record of making partnerships work across institutional boundaries. The North also has adopted innovative ways of extending postgraduate medical education opportunities for northern residents, and we possess an information technology capacity for addressing issues of distance that is unequalled in other Canadian regions. The creation of the Northern Rural Medical School will present an exciting opportunity to take advantage of the latest developments and approaches in medical education and to adapt those developments to the mission of rural health education.

The determining factor is the resolute will across the region to make this initiative work, to aim for the highest level of excellence and to direct that excellence at health issues which have long suffered neglect.

2 INTRODUCTION

Northern Ontario is a unique region: it encompasses a vast geographic area rich in cultural diversity and with a history that readily shows the human traces of a fluctuating resource-based economy adjusting to the harsh realities of global commodity markets. This uniqueness occasions a diverse set of health challenges, such as the high incidence of specific diseases (e.g. cardiovascular disease, certain cancers, diabetes), the problems of delivering health care service in a mixed urban and far-ranging remote rural environment and the associated and chronic issue of the recruitment and retention of highly qualified health personnel. This situation, not dissimilar to that faced by many other communities across Canada, has drawn together health care and education leaders in Northern Ontario to find new ways to address the problems of population specific health concerns, and of innovative and flexible modes of health delivery in remote environments. They have concluded that the need for highly trained health professionals who are willing to work in the north and prepared for its challenges is not being met by the existing medical education programs. Thus a vision was born -a vision for excellence in health care education, research and services through a network of partnerships drawing on the strengths of existing centres of excellence, but located in the north. The proposed school is the cornerstone to a broader strategy that would make the north self-sufficient in the delivery of its primary, secondary and tertiary care needs and self-sufficient in the education and training of the professionals who deliver that care and in the development of health research infrastructure and practice that will directly address northern and rural health needs.

3 BACKGROUND

The current crisis in the under-supply of physicians across Canada is experienced particularly acutely in Northern Ontario and in other rural and northern jurisdictions. It is apparent that merely increasing the enrolment in existing academic health science centres does not resolve the issues faced by underserved areas. The attractions that urban areas provide are still there, leaving no concrete proof that increasing the number of students in existing medical schools will lead to more graduates choosing to practice in rural/remote, northern locations, or First Nation communities and to remain there. There is a developing consensus that physician maldistribution together with physician supply are root causes of underservicing of rural/remote and northern areas. These problems have been exacerbated by the recent overall shortage of physicians and specialists in Canada. The Ministry of Health and Long Term Care is currently seeking new initiatives in medical education in response to the chronic problems of recruitment and retention of physicians and specialists in northern and rural areas.

In July 1999, the Minister of Health and Long Term Care appointed a Fact-Finding Commissioner to provide advice on the scope and nature of physician supply, mix and distribution issues. Dr. Robert McKendry submitted his report entitled "Physicians for Ontario Too Many? Too Few? For 2000 and Beyond" in December 1999. This report contained the following recommendations related to medical school enrolment.

Recommendation 4.1.1 (p.79)

Ontario should increase undergraduate enrolment in the province's existing medical schools by approximately 10% (55 students) beginning in the year 2000 and allocate these positions to those schools that give priority to training rural physicians.

The new positions should be allocated among at least two medical schools, based on their ability to provide an effective, high quality rural training experience at both the undergraduate and postgraduate level, and their demonstrated ability to produce graduates who go on to practice in rural areas. The Ministry of Health and Long-Term Care and the Ministry of Training, Colleges and Universities should work with the Council of Ontario Faculties of Medicine to identify the most appropriate locations for the positions.

Recommendation 4.1.2

Ontario should consider the advisability of creating a new medical school in rural medicine with a specific mission to attract students who are interested in working in the province's small, rural and remote communities.

A new school could build on the base of nurse practitioner and other health professional education programs already in place at Laurentian and Lakehead Universities in Sudbury and Thunder Bay. Its goals would be to teach students the skills and competencies, and give them the practical experience they will need to practice in smaller communities and in rural settings. The suggested class size for the four-year program is approximately 55 students with 25 to 30 students at each site.

The current proposal is premised on the view that both of these options will need to be pursued as parallel initiatives in order to address the current physician supply and distribution crisis in Ontario. What recommendation 4.1.2 illustrates is that Dr. McKendry has reached the same conclusion as community leaders in the North have that it is time to approach the issue of physician supply and distribution in a new way. It is time to develop a capacity for health science education and training located in the areas where the need is greatest. *It is time to establish an innovative northern medical school, building on the successful models in Australia and Norway.* It will serve, not only this region, but also regions across the province and the country, which face special health challenges and are disadvantaged by their distance from metropolitan concentrations of health expertise.

This recommendation provides both the challenge and the opportunity to develop a new medical school model to best meet the needs of rural and northern people. It is an opportunity to build such a model based on the best available medical education evidence, incorporating both community involvement and advanced medical informatics to go beyond what currently exists.

A Northern Rural Medical School, NORMS will have the following characteristics.

- NORMS will focus on rural, underserved, Aboriginal and northern health care. It will provide state-of-the-art, high-quality medical education that produce graduates who have the knowledge, skills and interest to practice in rural, northern and underserved communities.
- NORMS will seek full accreditation as a self-standing medical school with a distinct admission process and its own degree-granting status. However, it envisages extensive collaboration with existing medical schools in the development and offering of its program. Opportunities for northern based students to gain southern rural experience and for southern based students to participate in the northern clinical experience will be actively pursued and encouraged as part of this collaboration.

- Clinical training, and academic support services will be offered in French in cases and situations where numbers permit.
- Most of the students' medical education will be provided in Northern Ontario utilizing modern technology to provide connection and support. The quality of their medical education will equal or exceed that of the existing 16 medical schools.
- NORMS will furnish a living and learning experience for students in the north throughout their medical education, which could not be duplicated by medical education based in Southern Ontario.
- Placing a medical school in Sudbury and Thunder Bay will be a powerful recruitment tool to address the need to attract new specialists to both of these locations.

4 STRATEGIC ISSUES

SERVICE CHALLENGES AND GAPS IN NORTHERN ONTARIO

Background

The Canadian population is in a period of expansion and aging. Unfortunately, the overall number of physicians in Canada is aging and shrinking. Even the most optimistic predictions used the Physician Resource Evaluation Template model of the Canadian Medical Association indicate a significant reduction in the number of physicians per population in Canada over the forthcoming 20 years.

To make matters worse, by the agreement of all provinces, the medical school enrolment was reduced by 10% in 1993. While this has not caused the current shortage of physicians in rural underserved and northern areas, this reduction will seriously aggravate that shortage, particularly as the first reduced crop of family physician graduates is 1999 and for specialists 2002.

Rural Physician Supply and Distribution in Ontario

PHYSICIAN SUPPLY

What are our needs? Rural Canada needs 1,652 more family physicians to bring the number of family doctors per population up to the Canadian average. (Canadian Medical Association/Society of Rural Physicians of Canada. January 2000) Rural Ontario needs 494 more family doctors to bring the number of rural Ontario family doctors per population up to the Ontario average (Table 1).

TABLE 1 Active Physicians in Canada and Ontario

	Canada	Ontario
Population	28,846,761	10,753,573
Rural Population	6,396,906	1,596,138
Active Physicians	55,896	20,638
GP/FPs	28,983	10,215
Active Rural Physicians	5,531	1,165
Rural FP/GPs	4,775	1,022

From Tables 1, 2, 3 of the CFPC Report 1999. (Original data from CMA Masterfile January 1998.)

Canada has relied on a significant number of foreign-trained physicians to fill the gap in physician supply. Currently 25% of Canada's physicians are foreign medical graduates (26% of

rural physicians). In Ontario, IMG's account for 27% of the physician population but only 17% of the rural physician segment. (CMA Datafiles)

The Physician Workforce Report by the Canadian Medical Forum Task Force, states:

We recognize and acknowledge the complexity of health care delivery and the interrelationship between work force issues and health care delivery models. We acknowledge that increasing enrolment in medical schools and postgraduate training (residency) programs is not the only solution to this complex problem. Nevertheless, it is our position that there is sufficient data and evidence to justify a rational managed increase in enrolment in Canadian Medical Schools at both the undergraduate and residency levels for the following reasons. First, increased enrolment is a logical component of a short-term and long-term strategy. Second if we delay the decision to increase enrolment, Canada will sacrifice the principle of self-sufficiency in physician workforce supply. We will deny outstanding Canadian students positions in medical schools and we will be faced with increasing our reliance on international medical graduates (IMG) to meet an inevitable shortage of physicians.

The Report went on to make the following recommendation:

Increase medical school enrolment from 1,577 to 2,000 by the year 2000. This increase in medical school enrolments needs to be appropriately funded and free of coercion.

PHYSICIAN DISTRIBUTION

In the recent ICES Report: Supply of Physicians' Services in Ontario, one of the key messages that the author, Ben Chan imparts is that "the geographic maldistribution of doctors in Ontario has increased. Doctors continue to practice in urban centres while underserved areas continue to lose doctors."

The report further states that "Ontario's physician supply has remained stable, in terms of the number of physicians available to serve a growing and aging population. However significant concerns have been raised about the growing geographic maldistribution in the province".

By the Ministry's own figures, the number of underserved communities in Ontario in 1996 was 68. As of October, 1999, the Ministry of Health says there are 100 underserved communities in Ontario, lacking a total of 534 physicians. (McKendry Report 1999) According to this report, 33 of those underserved communities are in Northern Ontario and the region requires 95 physicians to overcome this situation. (See Table 2)

Table 2 Status Underserved Communities

	Family Doctors Needed	No. of Underserved Communities
January 2000		
• Southern Communities	320	67
• Northern Communities	<u>95</u>	<u>33</u>
TOTAL	415	100
September 1996		
• Southern Communities	31	21
• Northern Communities	<u>69</u>	<u>47</u>
TOTAL	100	68

Based on the facts presented, it becomes apparent that the strategies currently in place to address the physician supply and distribution problems in Northern Ontario are not providing the relief required. Even with these strategies in place there are 33 underserved communities in the North indicating the need for the development of new and innovative approaches, including the establishment of a Northern Rural Medical School.

EVIDENCE ON RURAL MEDICAL EDUCATION

There is extensive literature to support the value of rural-based medical education (J. Rourke 1996) Twelve of 126 medical schools in the United States produce over 25% of rural physicians. (Rosenblatt 1992) Schools which are most successful in producing rural physicians are those with a stated mission and goal to graduate rural physicians, are located in large rural areas, and provide a rural-oriented medical school curriculum that includes early and repeated rural medical learning experiences.

Rural medical education streams have been shown to be dramatically more effective than traditional medical school training, even at the same medical school. The most well-studied is the Physician Shortage Area Program at Jefferson University (Philadelphia).⁸ (Rabinowitz H 1999) This small program, averaging 15 students per year, has graduated 1% of the state’s medical school graduates and 21% of the physicians entering rural practice. Other well-established rural stream programs include WAMI; (Hunt 1995, Ebbesson 1988) University of Minnesota Rural Physician Action Program; (Verby 1988, Verby 1987) University of Minnesota Duluth; (Boulger 1991, Lampert 1991) University of New Mexico; (Mennin 1996, Kaufman 1989) Michigan Upper State Peninsula; (Brazeau 1990) University of North Dakota School of Medicine; (Stratton 1991) and University of Illinois, RMED. (Stearns 2000).

The key ingredients for success include:

1. A separate admission process that emphasizes known markers for rural career practice choice including background, experience, interest and commitment to the rural life and practice, in addition to high academic criteria.
2. Rural-oriented curriculum and experience that grows the interest in rural medicine and rural life.
3. Well-developed student and rural faculty support and connectivity.
4. Effective rural medicine coordinating office or program.

The successes of the rural medical school developed in Tromso, northern Norway, which is in many ways very comparable to Northern Ontario have been well-described in the medical literature. Rural medical schools developed in Japan. The most recent example is James Cook University in Townsville, Australia which has just admitted their first class. Again, this school is situated in a region that has very similar needs and focus to Northern Ontario.

The evidence on rural medical education initiatives supports that:

- Rural physicians are much more likely to come from rural backgrounds and rural background students are much more likely to choose rural practice.
- Rural-based medical education produces more graduates who choose rural practice.
- Students who undertake rural-based medical education do equally well on the exams as their urban counterparts, provided that the appropriate infrastructure and communications and faculty development is provided.
- In Northern Ontario, the current high quality rural and northern medical education demonstrates good results at both the undergraduate and postgraduate levels.
- Both NOMEAC and NOMP have demonstrated the ability to provide high quality undergraduate elective experiences by developing a significant preceptor base and furthermore have developed two of the most successful family medicine training programs in Canada which are matched among the highest in Canada with excellent exam outcomes.

The need to incorporate rural training experiences into undergraduate education is reinforced by the recent ICES Report which states:

“Increasing the physician supply, without considering how and where physicians should be practising will not address the underlying concerns raised in this study.”

In their report *Improving Access to Needed Medical Services in Rural and Remote Canadian Communities: Recruitment and Retention revisited*, Barer and Stoddart explain why physicians chose to practice in urban settings.

For their part, most Canadians who are accepted into the medical schools across the country have grown up in urban settings; the bulk of their medical training occurs in urban settings; that training takes place largely in tertiary hospitals which are only found in urban settings; much of the training is provided by physician-educators who work in urban settings; there are (even in per capita terms) more practice opportunities in urban settings; access to specialist colleagues and other complementary treatment and diagnostic resources are more plentiful in urban settings; hours of work are more likely to be ‘regular’ in urban settings and, in particular, call schedules are less onerous; and there are many more social, educational, recreational, employment and cultural opportunities for physicians and their families in urban settings. One might be led to wonder why any physician would choose to practice elsewhere. Historically, relatively few have.

5 NORMS - THE NORTHERN ONTARIO RURAL MEDICAL SCHOOL

VISION:

To establish an innovative, community based medical school in Northern Ontario to train physicians for practice in rural and remote environments with the goal to provide improved rural and northern health care. NORMS is born from the conviction that Northern Ontario cannot meet the health needs of its population through dependency on expertise concentrated outside of the region. The North has reached a point in its development where it has the capacity, the organization and the will to build its own health education and research institutions and to shape their products to meet the health needs of northern and rural populations.

The following is an outline of the Northern Rural Medical School Model developed to match needs and resources. It emphasizes living and learning in the north as the most effective method to educate physicians who will both practice in and be leaders and field faculty in rural, northern, underserved, francophone and Aboriginal communities.

Building on the success and strength of the Northern Academic Health Science Network (NAHSN), NORMS will be a partnership of Lakehead University and Laurentian University with strong linkages to each of the existing Ontario medical schools. NORMS will have two main campuses, at Thunder Bay and Sudbury, and a network of learning sites throughout Northern Ontario. Integral to both the development and function of NORMS will be constructive collaboration involving communities, hospitals, physicians, allied health professionals, medical and non-medical organizations, governments and other key stakeholders, including First Nations communities and francophone organizations.

MISSION STATEMENT:

NORMS will:

- Provide high quality medical education in the rural and northern context
- Conduct and apply rural and northern medical education research
- Develop rural and northern academic and clinical leadership

NORMS OBJECTIVES:

NORMS has several sets of objectives that it has set in order to meet its vision and mandate. These objectives and the specific areas they relate to are listed as follows.

Medical Education

UNDERGRADUATE

- To graduate highly qualified physicians with state-of-the-art medical education (EFPO/CanMeds 2000).
- To graduate physicians with exceptional knowledge, skills and interest in Aboriginal, rural, northern, and underserved healthcare.
- To graduate more physicians who will both practise in and be leaders and field faculty in rural, northern, underserved and First Nation communities.
- To graduate more physicians with the capacity to deliver comprehensive medical practice in the French language.

The modified EFPO/CanMeds 2000 defines the roles of physicians as follows:

- medical expert/clinical decision-maker
- communicator
- collaborator
- manager
- health advocate
- learner/scholar
- scientist
- teacher
- person

POSTGRADUATE

- To continue to develop northern family medicine training through NAHSN (NOMEAC and NOMP-FM)

- To develop Northern Ontario general specialty training through NAHSN in collaboration with existing medical school specialty training programs

CONTINUING MEDICAL EDUCATION (CME)

- To develop, provide and support CME for rural and northern physicians

Medical Research

- To develop rural and northern health research capacity (expand CRaNHR role and function).
- To facilitate, support and conduct studies of Aboriginal, rural, and northern health determinants, illnesses and health care.
- To develop substantial research infrastructure capacity in collaboration with hospital and cancer centre partners at both Northwest and Northeast sites
- To conduct relevant basic and applied medical research.

Academic and Clinical Leadership

- To work with all stakeholders to advance medical care in Northern Ontario
- To facilitate and support recruitment and retention of academic and clinical physicians to Aboriginal, rural, and northern areas.

THE NORMS UNDERGRADUATE MODEL

Students will be admitted directly to NORMS and spend four years learning and living in Northern Ontario. The pre-clerkships educational experience (years 1 and 2) will be spent in small group (6-8 students), patient-centred, clinical problem-based, systems organized, rural and northern contextual learning in Sudbury, Thunder Bay and Northern network learning sites. This experience will include the complete integration of basic science and clinical education experience in the small group experience. Furthermore, the pre-clerkship clinical experience will occur at a variety of clinical learning sites, including Sudbury/Thunder Bay, rural, remote and First Nation communities spread throughout the North.

The clerkship rotations (years 3 & 4) in the major specialties will occur in Thunder Bay, Sudbury and other major centres using the preceptorship model and including experiences in rural/remote and Aboriginal settings. The clerkship will last 16 months to allow for a consolidation in the spring of the 4th year.

Opportunities for collaboration with existing southern based rural training programmes (Southwestern Ontario Rural Medical Program (SWORM) and the Rural Ontario Medical Program (ROMP) will be actively sought in order to open up the possibility of exchanges in both clinical experience and clerkship rotations between the northern and southern programs.

The following sections provide more details on the specific segments of the NORMS model.

Model for Preparation for Clerkship (Pre-Clerkship Years 1 & 2)

PRINCIPLE:

Integrated learning of clinical skills, basic medical sciences, community health and health care delivery through small group work carried out in collaboration with other health care students and professionals in Northern Ontario

CONSTRAINTS ON THE MODEL:

- 1) It must be educationally sound and capable of graduating physicians with attributes within the range of Canadian medical graduates.
- 2) It must provide exceptional experience and training in rural and Aboriginal medicine.

- 3) It must be able to be delivered in Northern Ontario, enhancing and utilizing the educational infrastructure of Lakehead and Laurentian Universities, and the health care facilities of the region.
- 4) It must produce highly qualified physicians who have exceptional knowledge, skills and interest in rural, remote, Aboriginal and northern health care and who can practise in French where appropriate.

REQUIREMENTS:

Students completing pre-clerkship:

- 1) Must have sufficient clinical skills to be able to carry out a complete physical exam and take a full history.
- 2) Must have sufficient knowledge of anatomy, biochemistry, physiology, pharmacology, genetics, microbiology, immunology and pathology to support and promote the academic and clinical requirements of the clerkship.
- 3) Must have established ethical and moral attitudes consistent with the practice of medicine.

PRINCIPLES OF LEARNING:

- 1) Students will accept responsibility for their own education.
- 2) The level of skill and knowledge required will be clearly and precisely described
- 3) Assessment will support learning throughout the learning period
- 4) Final assessment will confirm mastery (i.e. pass/fail)

LEARNING FORMAT:

- 1) Small learning groups will be the main learning structure.
- 2) Learning will be identified through consideration of cases.
- 3) Cases will be patient-centred, problem-based, and systems-organized.
- 4) Cases will have integral rural, Aboriginal, and northern context.
- 5) Content will be identified by content experts who will act as consultants and resources.
- 6) Clinical skills learning will take place in weekly or bi-weekly with patients with conditions related to the case and system being studied.
- 7) Longer clinical placements will be undertaken in rural, remote and First Nation communities.
- 8) Lectures and gatherings for the entire Sudbury and Thunder Bay cohorts will occur periodically.

LEARNING ORGANIZATION:

- 1) Pre-clerkship training will occur in both Thunder Bay and Sudbury and northern regional rural, remote and Aboriginal learning sites.
- 2) Students will be formed into 6-8 member learning groups.
- 3) Each group will have a family physician as tutor/facilitator.
- 4) Each group will have rotating systems resource clinicians, i.e. a cardiologist for cardiovascular system, a neurologist for the neurovascular system and OB/GYN for the reproductive system, etc.
- 5) Each pair of students will have a rotating clinical skills instructor for each system.
- 6) Each student will have a rural mentor.
- 7) Each student will be equipped with a lap-top computer preloaded with all courseware.
- 8) The groups will each study a different system at any one time (rather than simultaneously) so that teaching resources and clinical material will be spread out rather than overloaded.

MODEL COMPONENTS:

The components of the Pre-Clerkship may include the following:

- homeostasis and development
- haematology and neoplasia
- infections and host response
- cardiovascular
- respiratory
- renal
- endocrine
- human sexuality and reproduction
- musculoskeletal
- nervous system
- special senses
- dermatology
- mind
- gastroenterology
- community health
 - ↳ rural placement
 - ↳ Aboriginal placement

FACULTY AND STAFF:

This section outlines the faculty and staff resources required for the NORMS model. One of the key elements in the success of NORMS will be adherence to the principle that faculty will be valued and fairly compensated.

1. The Faculty Content Team

The Content Team will develop the cases and determine the key content and learning objectives so that by the end of the pre-clerkship years 1 & 2 the students will meet the knowledge skills and attitude requirements. The Content Team will have horizontal and vertical members (not sleeping and standing members!)

- a) **Horizontal Members** will consist of 1 or 2 tutors/facilitators and medical scientists in fields of anatomy, biochemistry, physiology, pharmacology, genetics, microbiology, medical imaging, immunology and pathology and medical informatics and library experts, community, rural and aboriginal health experts.
- b) **Vertical members** will be the systems resource clinicians who will be clinical specialists for each of the major systems.

2. Tutors/Facilitators

One tutor will be required for each group of students and could be per term or per year or for the whole 2 years. Their role will be to facilitate and guide the small group learning process, providing a horizontal cohesiveness. The tutors will be family physicians and their number will be dependent on the number of small groups (for example, 9 groups of 6 students each, will require 9 tutors per year one and 9 tutors for year two).

3. Systems Resource Clinicians

Systems resource clinicians will be practicing clinicians whose first role will be as members of the Content Team. They will also function as knowledge and clinical application resource to each group when that group is studying their system. A third role will see these clinicians acting as coordinators for the clinical instructors for their particular system. The total number of system resources clinicians needed will be dependent on the number of cases and systems studied.

4. Clinical Skills Instructors

These Clinical Skills Instructors will primarily be general specialists who will provide clinical skills teaching to pairs of students at the clinical skills time – weekly or bi-weekly sessions on patients with conditions related to the case and system being studied. Some clinical skill instructors will be rural physicians who will provide longer clinical skills and learning experience in rural and First Nation communities.

5. Co-ordinators

Co-ordinators will be required at both Thunder Bay and Sudbury for basic science, clinical skills and community health.

6. Support Staff

Support staff will be required, particularly for information technology, library resources and site and travel co-ordination. Preliminary estimates show that each administrative support person and technical support staff will be assigned two student groups, or a total of 12 students per resource. Additional staff will be added as required.

7. Infrastructure and Resources

Every NORMS student will be equipped with a lap-top computer preloaded with all courseware and each learning site will have complete medical informatics and telehealth connections as well as appropriate clinical facilities, faculty, faculty support and accommodation and travel.

Clerkship (Years 3 & 4) Rotations:

In years 3 and 4, the medical students will embark on clerkship rotations in major specialties and these rotations will be developed in Thunder Bay, Sudbury and other major centres – North Bay, Timmins, Sault Ste. Marie, Fort Frances, Dryden, Sioux Lookout, etc. utilizing the preceptorship model and involving experiences in rural/remote and Aboriginal settings. These clerkships will likely last 16 months to include fall of 4th year with some elective/selective time which may include a month at existing medical school tertiary/quaternary care setting with option of choices.

Consolidation will take place in the spring of spring of 4th year (2-4 months) which will involve lectures and small group learning with the purpose of tying the learning and experiences of the four years together as the student heads towards graduation.

RESOURCES

Each specialty, including family medicine and Aboriginal health, will require a coordinator (Northeast and Northwest) in charge of learning objectives, teaching organization and evaluation. In addition, support staff will be required particularly for information technology, library resources and coordination and each learning site will be equipped with complete medical informatics and telehealth connections as well as appropriate clinical facilities. This segment of the program will require funding for faculty support and accommodation and travel for both faculty and students.

POSTGRADUATE MEDICAL EDUCATION

Post-graduate education is, of course, an integral part of medical education and is as equally important as undergraduate medical education, basic sciences and research.

Principles for post-graduate education in a medical school will need to accommodate at least its own graduate numbers which will mean that when our post-graduate program was fully operational, we will need 54 intake positions (and, of course, 54 outtake positions on the other side). This will ensure a clear balance.

We are very fortunate in that we already have in place through the NOMEK and NOMP programs, 30 intake positions in family medicine which are fully operational, proven effective and graduate first rate family physicians who are anxiously sought after throughout northern and rural areas. Their education and training program has been excellent since the first year of inception. (cost neutral).

As well, NOMEK and NOMP are currently partnered in the “pan” - Northern Academic Health Science Network (NAHSN). NAHSN is funded by the Ministry of Health and Long Term Care and has a mandate to develop and coordinator northern medical education, with linkages to all medical schools. The Council of Ontario Faculties of Medicine (COFM) has endorsed this mandate.

The largest component of NAHSN funding addressed the need to increase the opportunities for northern clinical experience for postgraduate specialty residents. Clinical stipends for preceptors, travel, accommodation and learning supports for academic linkages with the parent medical school are provided to ensure that the northern placements meet accreditation requirements when they are not solely elective rotations.

This NAHSN initiative is a centrepiece for the development of postgraduate specialty training programs in the North, be it as a building block for the NORMS or as a continuation for strengthening postgraduate specialty clinical training opportunities in the rural context of practice. It is envisioned that approximately ten funded specialty residency positions (salary component and other academic costs) be added to the pool and be allocated to NAHSN immediately. NAHSN (NOMEK and NOMP) will then work with the medical schools to

negotiate involvement of the North in the selection process for the residents, academic resources to be provided, the accreditation of northern community sites for clinical placements, and all other resources. The goal will be to increase the exposure of the most “rural minded” specialty residents to northern and rural clinical practice, without eroding the existing resident pool and clinical service support they provide at the five Academic Health Science Centres. To date, the challenge with the NAHSN funding component for Specialty training has been the difficulty of negotiating prolonged periods of resident time away from their teaching centre, as the residents’ service is critically needed at the teaching hospitals.

NAHSN will initiate this expansion to postgraduate specialty residency training using, in part, its current funding for postgraduate specialty rotations (travel, stipends, accommodation etc.) and develop specialty training program partnerships with existing medical school specialty programs. Further, NAHSN would work immediately with the University of Ottawa and McMaster Health Sciences Centre, with whom they are affiliated, to develop the details of the initiative. They will also work with the Southwestern Ontario Rural Medical Program (SWORM) and Rural Ontario Medical Program (ROMP) to strengthen the availability of parallel opportunities for clinical placements in the southern rural environment.

As NORMS is developed and the first year undergraduate enrolment flows through, the postgraduate specialty residents will be available in the North for time periods to enhance the interaction with the undergraduates. The number of positions for specialty postgraduate residents could be adjusted with time and coupled with NORMS development. In any case, if medical school enrolment is increased in the Province, residency numbers must be increased and northern postgraduate specialty medical training must receive commitment through additionally funded and designated positions with NAHSN direction and without detriment to the five Academic Health Science Centres.

What then needs to be added are additional postgraduate intake positions for the development of NORMS, which will involve bringing the total to 24 (from the number phased in with NAHSN above). These resident positions will be for 7 core specialties (anaesthesia, general surgery, internal medicine, obstetrics/gynaecology, orthopaedics, paediatrics, and psychiatry). The specialty residency training positions could be fully developed over several years and there are several implementation strategies which could be very effective and, over a 5 to 8 year period develop these first class residency training positions, fully integrated, that will graduate first class Canadian specialists to serve our communities needs. (Of note for funding of these specialty residents, no matter where we added new medical student, funding will be needed for the programs.)

Other Post Graduate Education

There are unique opportunities for the development of other graduate level programs in epidemiology and public health at Laurentian and Lakehead Universities, especially as they relate to the determinants of health in northern areas and among aboriginal people. Other areas that may provide opportunities include the following:

- public and population health
- occupational health
- palliative care
- care of the elderly
- addiction studies

CONTINUING MEDICAL EDUCATION (CME)

NORMS will develop a strong office of continuing medical education directed at advancing the development of rural, Aboriginal and northern continuing medical education and support of physicians in practice.

ADMINISTRATION AND GOVERNANCE

The responsibility for implementing the proposal, for seeking accreditation and for managing the program will lie with Lakehead University in Thunder Bay and Laurentian University in Sudbury. The two Universities will serve as co-equal partners in the creation of a common governance structure that will meet the LCME/CACMS accreditation requirements for clear lines of fiscal and academic quality control responsibility. It is not the intention to create a new legal entity and the existing Senates and Boards of Governors of the two Universities remain vested with their current authority. However, the two Universities agree to create a single Management Board, with one academic council and a single Dean with overall responsibility for the program. Provision will be made within the Management Board for the representation of francophone and Aboriginal stakeholder interests. An Associate Dean will be located at each campus with responsibility for site-specific components of the program.

The two institutions will establish a formal agreement, which will specify arrangements for:

- a common admissions procedure,
- a common tuition fee,
- reaching agreement on curriculum development,
- the attribution of revenue and the allocation of program costs between the two institution,
- assuring the alignment of internal policies and practices to ensure a coherent experience for the student, and
- a common mechanism for granting degrees.

Consistent with the decentralized model envisaged, affiliation agreements will be sought with other post-secondary institutions and with hospitals throughout the region in order to secure their participation as partners in the delivery. The involvement of Nipissing University in North Bay, Algoma University College in Sault Ste Marie and Le College Universitaire de Hearst will be of special importance. Lakehead, Laurentian and Nipissing Universities are currently working with their northern college partners in the development of collaborative nursing education programs which will combine university and college strengths to provide a coherent nursing development strategy for the whole of the north.

The foundation for the current proposal lies within the highly successful Family Medicine Residency and Electives programs that are administered by NOMECE (Northeastern Ontario Medical Education Corporation) in the northeast and NOMP (Northwestern Ontario Medical Program) in the northwest. The management of these programs, together with that of the recently funded NAHSN (Northern Academic Health Science Network) program is expected to remain with their current governing bodies (NOMECE and NOMP) and their current University affiliations throughout the development phase of the School. Both NOMECE and NOMP have played a key role in the development of this proposal and there is agreement that all parties will work together to ensure a rationalization and coordination of undergraduate program planning with post-graduate residency and specialty training programs.

COMMUNITY STAKEHOLDERS

One key component of the raison d'etre of NORMS is its sensitivity to the health needs of the anglophone, francophone and aboriginal community that it serves. NORMS and its faculty will work with all northern and rural stakeholders to enhance medical care throughout Northern Ontario. The current Advisory Board includes representation of key community stakeholder groups and the intention is to retain the input of those groups within the framework of the governance structure. There is particular awareness of the need to reflect the special health concerns of franco-ontarian, Aboriginal and First Nations communities. NORMS will be actively involved in working with communities to facilitate and support the recruitment and retention of academic clinical physicians in Northern Ontario. This will entail developing strong community, university, institutional and government partnerships and functional networks and be part of the mission and mandate of the medical school.

ALLIED HEALTH PROFESSIONS

The NORMS model embraces an interdisciplinary view of medical education that, in addition to furnishing a thorough grounding in the biomolecular science basis of clinical practice, also exposes students to current issues in population determinants of health, public health policy and health systems delivery. The integration of these different perspectives on health will be fostered within the framework of a variety of mixed urban-rural clinical configurations including aboriginal and primary care reform clinical settings. It is anticipated that the confrontation of theory with practice in the face of the tough realities of northern and rural health care delivery will challenge students to adopt innovative and creative views of how different health professions might work together in such settings to the benefit of their patients. Where appropriate within the curriculum, (e.g. in modules on Community Health – Rural Placement – Aboriginal Placement) other health professionals, such as Nurse Practitioners, will be blended into the learning process.

Lakehead and Laurentian Universities have a range of health related programs that will support the proposed Medical School:

- Both Lakehead and Laurentian have well-established Nursing programmes offering B.ScN, Post RN degrees and Nurse Practitioner Certificates.
- Laurentian offers these programmes in both French and English and has a well developed distance education capacity in this area.
- Lakehead University offers a range of nursing programming addressing aboriginal health issues.
- Both universities plan the introduction of Nurse Practitioner programs with special emphasis on northern, rural and aboriginal care settings
- Both universities have programs in Kinesiology, Gerontology and Social Work. Laurentian offers a full four-year program in Native Human Services.
- Lakehead offers a Ph.D. in Clinical Psychology and Laurentian offers Midwifery (conjointly with McMaster and Ryerson).
- Both Universities have programme and research strengths in chemistry and biomolecular sciences. Laurentian University has established, with its health sector partners, a Chair in Cancer Research who will be responsible for developing a Ph.D. program in Biomolecular Science and for Directing the Tumour Biology Research group at the Northeastern Ontario Regional Cancer Centre.

RESEARCH

The development team is committed to a view that health education and health research must develop in tandem. A strong research program is planned focusing on the health issues of northern and rural populations. The goals are to make northern Ontario into a centre of excellence for northern and rural health research. Significant components of that plan have already been established and a concerted effort is now being undertaken to move the research agenda to a new level of national and international profile.

The vision for research development parallels that for the health education program. The goal is to articulate at the regional level the objectives that have been established at the national level for the Canadian Institutes of Health Research, i.e. a cross-disciplinary approach that aims to translate research findings into both innovative preventative measures and evidence driven clinical practice. Health status statistics consistently demonstrate that northern and rural residents do not have the same health profiles as their southern neighbours. The Northern Ontario population shows exceptionally high rates of cardiovascular disease, chronic lung failure, various kinds of cancer and accident related injuries. There are also some very particular health issues that characterize aboriginal populations, such as diabetes, heart disease and cancer. Ranging from the biomedical, environmental and occupational health research to health care systems and applied clinical research, the partners have already established a strong track record in research that addresses the health issues of Northern Ontario. Existing strengths include:

- Health systems delivery research - the Centre for Rural and Northern Health Research (CRaNHR) established at Lakehead and Laurentian University has established a national reputation for the quality of its research addressing the health care delivery needs of northern and rural populations.
- Both Laurentian and Lakehead Universities have strong research records in the biomolecular sciences. A new Chair in Cancer Research with a focus on tumour biology has been established in a partnership between Laurentian University, Sudbury Regional Hospital and the Northeastern Ontario Regional Cancer Centre and Lakehead has research strengths in aging and health clinical psychology, kinesiology and Aboriginal health.
- Special sensitivity to environmental and occupational health issues associated with natural resource based economies (especially mining, forestry, pulp and paper) have lent a strong emphasis to research directed at addressing these issues.
- The network of teaching physicians working through the NOMP and NOMEK programs have laid the groundwork for the establishment of research strength in Applied Clinical Research.
- The Public Health Research, Education and Development Program (PHRED) is based on a partnership between Laurentian University and the Sudbury and District Health Unit directed at undertaking joint education and research initiatives in the field of Public Health.
- Both Lakehead and Laurentian are partners in the Northern Health Information Program (NHIP) which furnishes extensive health data related to Northern health issues.

We estimate that the two Universities and their hospital partners are currently managing research projects totalling \$10 million per year in funding. Both Universities have submitted major funding applications for infrastructure growth and we anticipate a doubling of this volume in the space of five years in concert with the development of a medical school.

LIBRARY

The NORMS students will need access to a state of the art library facility throughout their four year undergraduate experience. Residents who will also be attached to NORMS will need similar access, as will NORMS faculty. The costs associated with establishing such a physical collection are quite high. Therefore the NORMS approach will involve innovative solutions.

Currently in Northeastern Ontario there is a collaborative project between the Laurentian University, the Sudbury Regional Hospital, NOMECC, the Northeastern Ontario Regional Cancer Centre and other health care agencies to establish a Health Information Network, HINET. HINET is a health library and information network that will connect medical, health and scientific information nodes across Northeastern Ontario and that will serve as a regional resource. The initial stage of the plan is focused on connecting Northeastern Ontario and subsequent phases include working with the Northwest to see how their needs can be incorporated. HINET members will support resource sharing among its members. Resource sharing includes:

- providing access to library collections housed by each member through the development of union or shared library catalogues
- sharing resources located in each member library, in particular, sharing all relevant electronic journals, texts and databases
- interlibrary lending of library materials between member libraries
- direct service to all registered users
- arranging common licenses for electronic information products
- providing direct access to web-based resources

HINET will endeavour to deliver most of its library and information services electronically and on-line to desk-top computers, exactly the type of service that the NORMS students will need as they spread out across the North. HINET is in the process of applying to various agencies to acquire the funding necessary.

NORMS will also hire a medical librarian early in the developmental process of the proposed medical school. This individual will work closely with the HINET group in the development of the project to ensure that the needs of students and faculty will be met. A large part of the responsibilities of the librarian will be to work with partners such as HINET and the five medical schools to develop partnerships and negotiate licensing agreements. All efforts will be made to avoid duplicating resources that exist elsewhere in the province and instead these efforts will be focused on forming purchasing and service partnerships in order to cut down on the library costs associated with establishing NORMS.

STUDENT ACCESS

The Universities are committed to broadening access to medical education and the following strategies will be used to achieve this:

- Providing an extensive scholarship system for NORMS students and offering bursaries to cover fees and a contribution to living expenses to students for whom the cost of a medical education is a significant impediment.
- Creating an outreach program to work with local high schools to increase student knowledge and interest in health science careers.
- Lakehead and Laurentian Universities will also review their course offerings in order to enhance interested students' awareness and preparation for medicine and other health professional careers.

- The Universities will also work with First Nations communities and Aboriginal organizations to increase recruitment of First Nations, Metis and Inuit students, and in supporting them when they are accepted in medical school. This will include the establishment of Native Pre-Med programs to help prepare Aboriginal students for medical school.
- Lakehead and Laurentian will also develop a Student Preparation Program that will provide northern students with the skills necessary to succeed with their applications to health professional careers. This program will include such activities as entrance test preparedness training, interview skill development and entrance essay writing seminars.

POTENTIAL CHALLENGES

Initial Staff Recruitment

The initial recruitment and selection of teaching staff will be critical to the quality standards of NORMS. In particular the success of attracting experienced clinical and academic staff to relocate to the North is fundamental and extensive measures will be taken to achieve this including increasing the availability of research facilities. In the development phase of NORMS, funds have been included for initial staff recruitment and training.

Timing and Project Management

To establish the school in the 24 months available before the first student intake is feasible with a rigorous approach to project management. A delay in implementation to 2003 could incur significant cost. Funds have been allowed for project management costs in the period 2000 to 2002.

6 COST ANALYSIS

METHOD

The costing of any university program is never easy since it is never directly clear what component of the university's resources are directly apportionable to a given student's academic program. For example, should the cost of pursuing a research strategy that complements a medical training program be viewed as a cost of the program, or should it be considered part of the university's general mandate? A further complicating factor is that government funding formulae and student tuition fee structures which apply to particular programs may not accurately reflect the actual cost of offering the program and yet this discrepancy may be less than obvious because universities may be reluctant to publish an accounting which shows that some programs subsidize other programs. These complications apply especially to medical training because of the significant clinical training component and the considerable reliance on sources external to the university (physicians, hospitals) as key components of the teaching function.

In acknowledging these inexactitudes, two approaches to costing were taken. As far as possible, all assumptions will be made explicit, so that it will be clear how changing the assumptions would affect the overall cost factors.

1. **Line Item Costing Method.** This method was used to estimate the expected line-item costs of the resources required for each of the different components of the proposed curriculum design. Thus a cost was developed for each module and then used to calculate the overall cost of the undergraduate program. The value of this approach is that it is a more inclusive model which takes into account the effects of operating at a distance and in different cultural contexts. It also is explicit about the level of resources

made available to specific components of the program. Its weakness lies in the unreliability of estimating costs of specific components for which there may not be a readily available template (e.g. is the cost of making an anesthetist in Timmins available as a resource to the program comparable to the cost of an anesthetist in Toronto or London?).

2. **Aggregate Costing Method.** This method used budget information of existing programs of a similar scale to that planned. As a crude measure, an *average cost per student* per year is calculated. What this does is to give us a general idea of what it costs to fund a four year undergraduate program for a given number of students. We had to add the additional costs of training students at distant and remote sites.

The line item costing method was used and the results of this exercise were compared with the budget information from similar sized schools in Canada. Of course, the additional costs associated with a distributed medical program had to be taken into account. The results of these two methods produced similar results and provided the preliminary cost analysis for NORMS

ASSUMPTIONS

When approaching the costing of the NORMS medical school several assumptions were made:

- a) NORMS would have an annual intake of 55 students
- b) That years 1 and 2 would consist of 9 student groups (8 of 6 students and 1 of 7 students) each for a total of 18 student groups.
- c) That there would be a phase-in approach taken, i.e. one year would be added at a time until the full four years were offered (if first class is admitted in September 2002 then September 2005 would be the first year that all four years were offered)
- d) Post-graduate education is currently funded through NOMEK and NOMP and it is expected to remain so for the first five years of the NORMS project. Therefore, post-graduate education was not included in the cost analysis
- e) That there would be an adherence to the principle that faculty will be valued and fairly compensated.
- f) That travel and accommodation costs would be high due to the distributive nature of the school
- g) That library, teaching materials and telematics figure is based on a percentage of the total costs of the steady state situation (15%)

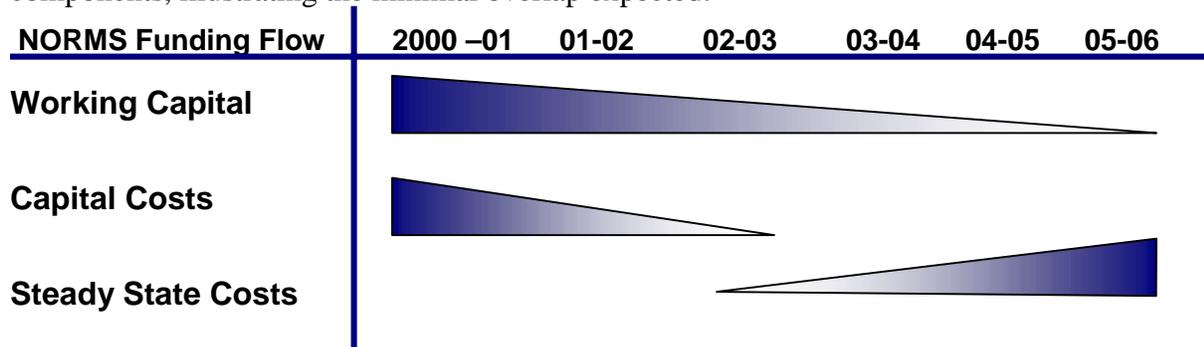
Further assumptions pertaining to each of the specific cost components are contained in the relevant section.

THREE COMPONENTS

The cost analysis model divides the costs into three interrelated components.

1. ‘Steady state’ costs – costs incurred when all four years of the medical school is operational with September 2002 as a start date for the first year and ramping up the four one year at a time from that point on, the steady state cost situation would occur in 2005/06).
2. Capital costs, - the initial capital costs associated with establishing the NORMS school, expected to run over a three year period.
3. Working capital costs –establishment of a new medical school will require substantial development funding and the term “working capital” refers to the funds required as NORMS grows over six years to the steady state cost situation, including funds for faculty, staff and the development of learning materials. After 2002, each new year of students will provide additional revenue from fees and government sources that will cause a corresponding decrease in the amount of working capital required until it finally ceases in 2006 when the steady state situation is achieved.

The following diagram illustrates the anticipated rate of flow for the different funding components, illustrating the minimal overlap expected.



UNDERGRADUATE PROGRAM

The following shows a preliminary analysis of the costs associated with the four-year undergraduate program proposed by the Medical Education Design Team and taking into account costs associated with similar sized programs in Canada.

Category	Cost	Totals
Undergraduate Medical Education Program	\$ 21,163,200	
Library, teaching materials, telematics	\$ 4,674,480	
Research	\$ 10,000,000	
Subtotal		\$ 14,674,480
Total		\$ 35,837,680

The costs associated with the undergraduate program include the clinical experiences in the four years, program administration costs and the costs associated with remunerating practitioners who participate as faculty in the program. Also factored in are the major travel and accommodation costs necessary for effective Northern and rural contextual learning to occur.

The research dollar amount included is based on the current level of health research funding at the two universities plus a factor for the anticipated increase with the establishment of the medical school. The dollar amount shown is a fairly conservative estimate for research funding, the potential increase could be much larger

CAPITAL BUDGET

The Capital Budget relates to both space and equipment needs as a derivative of the curriculum and the distributed locations.

Infrastructure

TEACHING AND CLINICAL SITES

Pre-Clerkship Training (years 1 and 2) will be centred on the university campus facilities at Laurentian and Lakehead. Dedicated teaching, skills laboratory, it and telematic facilities will be provided on both campuses to support phase 1. Significant time will also be spent in local healthcare settings and will include rural and Aboriginal placements.

Clerkships Years (years 3 and first four months of year 4) will be taught in facilities associated with NORMS such as the regional hospitals at Sudbury and Thunder Bay and similar sites in other northern communities. Each student will spend this time in working and learning in various rural communities, including at least one clinical experience in First Nation communities.

Practical teaching and demonstration will be carried out in existing outpatient clinics, hospitals, clinics, and diagnostic facilities within which there is sufficient existing capacity owing to the distributed nature of NORMS.

Additional facilities, some presently available, will be provided at each training centre and will include: extended library facilities and study places; seminar and lecture facilities; dedicated IT workstations and telematic centres.

The dedicated teaching premises will each be equipped with a teaching and video conferencing room also providing LAN access to the IT material available at the NORMS campuses.

All students will be equipped with laptop computers to allow flexible access to the IT material both at the workstations provided at hospitals and practitioner premises, and through remote access from home.

RESIDENTIAL FACILITIES

Due to the distributive nature of NORMS, the school will provide accommodation at no charge for students throughout the four years when they are away from their base locality. This provision may include additional private sector or community sponsored accommodations at certain centres.

The total estimated capital costs are:

Category	Cost	Totals
Space Development at NE/NW Sites	\$ 10,000,000	
Telecommunications	\$ 6,000,000	
Information Resources	\$ 2,000,000	
Total		\$ 18,000,000

The capital costs listed above are a very preliminary look at the potential categories and figures. Further analysis will be done for the final proposal. The model proposed does not envisage

significant new expenditure on buildings. The existing Health Science buildings at the Lakehead and Laurentian sites both have capacity for expansion at quite modest cost.

WORKING CAPITAL

Clearly, a new medical school requires significant 'working capital' as it builds to the 'steady state' - staffing, initial development of learning materials, staff development (particularly relating to teaching and learning), equipment and physical facilities will all need to be available ahead of the students who will provide the income stream.

Given assumptions about timing, then working capital needs between September 2000 and September 2005 is estimated at \$20 million.

This working capital is comprised of the costs associated with a two-year development period for the project. Additional costs will be incurred during the three-year phase in of the students as full revenue will not be realized until the end of this period.

The majority of the working capital funds will be used to recruit and hire the faculty and staff necessary to development the content for the program, implement an administrative structure and ready the two sites for the students.

Category	Cost	Totals
Five Year Working Capital Funds	\$ 18,416,000	
Educational Materials	\$ 2,000,000	
Total		\$ 20,416,000

REVENUE ESTIMATES

The following sources of revenue have been identified, indicating which are relevant to operating funding and which are related to program development and capital funding. We have not attached dollar figures to our revenue estimates because of the current tentative nature of the exercise and the need for buy-in from the proposed funding agencies. However, we are convinced that the unique and innovative character of the proposed school lends it a capacity to attract new revenue from sources that will not impact on the funding of existing Medical Schools.

Potential Sources of Funding	Funding Category
Provincial funding sources	
MTCU	Operating (BIU)
MoHLTC	Clinical placements
MEST	Research Chairs (ORDCF), Research infrastructure (OI)
MNDM (through the Northern Ontario Heritage Fund)	NOHFCo Costs associated with economic development
Federal funding sources	
Health Canada	Aboriginal Programming Medical Services Branch Health informatics Development costs Health research capacity
DIAND	Aboriginal programming Aboriginal health research
Industry Canada	Rural Secretariat - development costs FedNor - development costs CFI - research infrastructure
CIHR	Research operating
CIHR/NSERC/SSHRC	Millennium Chairs development of health research chairs student scholarships northern experience costs information technology.

While the primary responsibility for Medical School operating funding lies with the relevant provincial ministries (MTCU, MoHLTC), it is anticipated that there is a potential for a significant level of federal participation. The development of the current proposal was assisted by a grant from FedNor and it is expected that the level of future federal participation will depend on a) the extent to the proposed school can be seen as compatible with the federal mandate and to serve federal objectives in areas such as Aboriginal health care education and research and the development of health informatics infrastructure and b) the openness of both federal and provincial governments to view this project as a vehicle for federal/provincial co-operation in the development of innovative health education capacity.

Private Sector Funding

Preliminary investigations suggest that the development of the first new medical school in Canada for 30 years would have significant funding potential from the private sector. Areas

targeted for private sector support will be: a) the development of health research chairs, b) student scholarships, c) northern experience costs, and d) information technology.

Can NORMS be a cost-effective means of meeting the northern and rural need?

This proposal is based on the well-grounded view that training physicians in the region in which they are needed to practice is the best long term solution to chronic problems of recruitment and retention in rural, northern and remote locations. The question remains as to whether a stand-alone northern-based school is a cost-effective means for meeting current and foreseeable recruitment/retention needs. The following arguments support the stand-alone model.

- The costing provided here is within the range of "cost-per-student" estimates computed for 4-year undergraduate medical programs of similar size in other jurisdictions. The relatively high costs of northern travel, accommodation and information technology support associated with decentralized community based teaching place our costing in the upper levels of the range. The same costs would be incurred if this program were to be administered from an existing medical school - in fact, if anything, the costs would be higher because of the greater distance involved and the advantages of the northern identity of Laurentian and Lakehead would be lost.
- The decentralized model proposed does not call for significant new capital spending. Existing health science buildings at both Lakehead and Laurentian sites have the potential for expansion at relatively modest cost. This level of cost could be seen as readily falling within the ambit of current capital infrastructure funding envelopes.
- Those elements of the program responsible for higher costing are precisely the elements which will make the program eligible for federal support (e.g. programming targeted to First Nations communities with an Aboriginal training component, the development of health informatics and telehealth network capacity, training modules especially adapted to northern and rural health education). The development of a new and innovative Medical School aimed at addressing northern and rural health needs could be of special appeal in view of Health Canada's strong commitment to meeting rural health needs.
- The funding for the research strategy, which will complement the northern/rural focus, is already largely in place. The development of a new Medical School will significantly enhance the research funding opportunities from both national granting agencies and from private sector partners.
- This project must be viewed as a long-term investment, which will secure significant long-term benefits. To the extent that the program is successful in addressing increasingly acute recruitment and retention issues, then it will obviate the need for many of the short-term measures and their associated costs that are currently in operation. McKendry (p. 72) notes that Ontario already spends \$65 million on various incentives and training schemes aimed at alleviating the problems of underserved areas. One can only anticipate that without NORMS this figure (based on 1998 data) will sharply increase in the future. The potential offset is considerable when NORMS is fully functional.

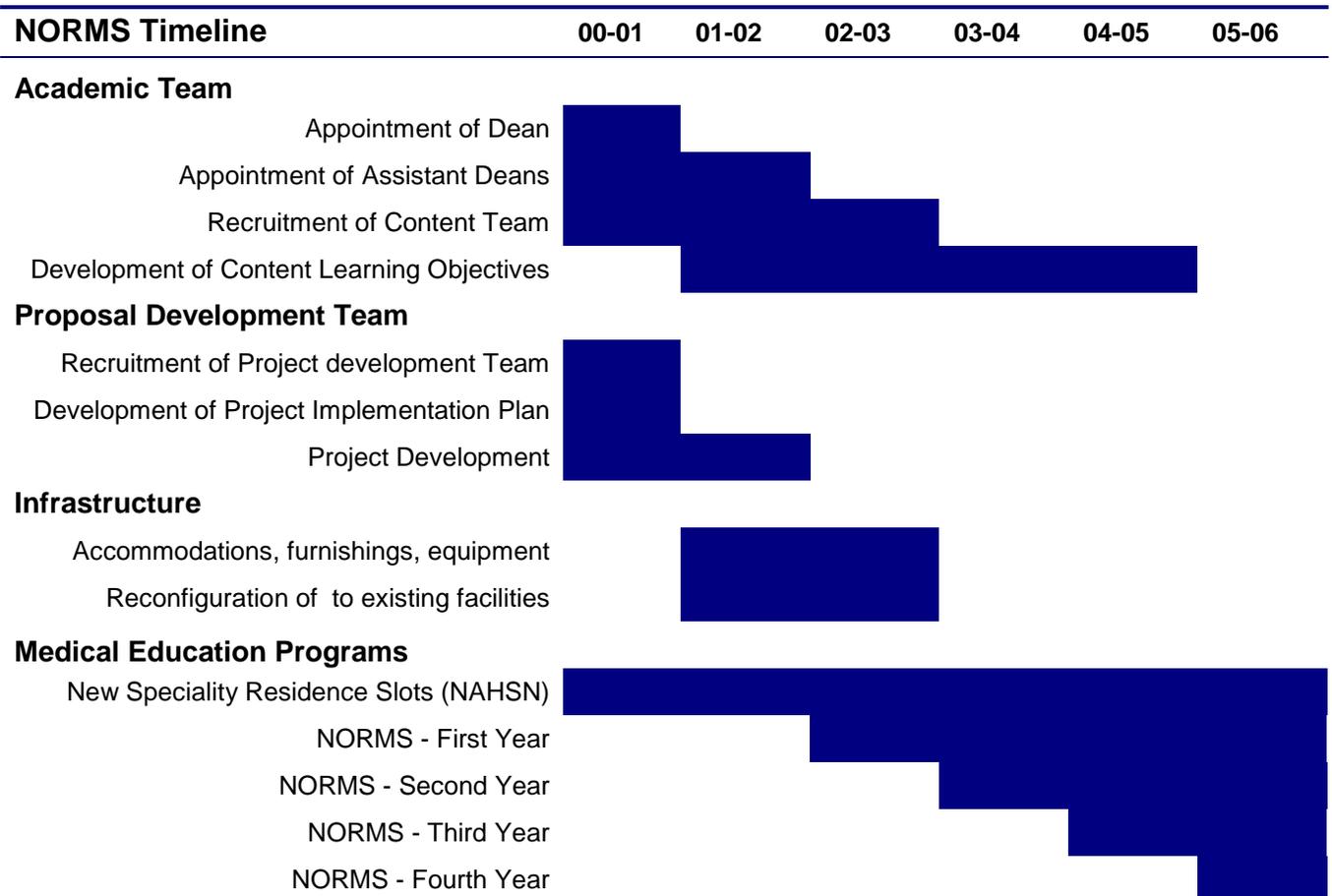
- Finally, the cost of failing to address the health service needs of northern and rural populations in an effective and sustainable manner must also be assessed. These costs can be thought of as the dollar figures needed to meet the spiralling costs of incentive schemes aimed at stemming the braindrain of current health expertise to the urban south. They can also be thought of as the human cost, which accrue to people living in medically underserved areas marginalized from the main core of medical expertise.

7 NORMS TIMELINE AND IMPLEMENTATION PLAN

Lakehead and Laurentian Universities believe it is feasible to establish NORMS in time for a first entry of students in September 2002. In September 2000, Laurentian and Lakehead will be ready to move directly to an implementation phase. Once the funding has been received for NORMS and the province approves the project, the first step will be to appoint a Dean, followed by core support staff and a dedicated project development team. The project team, in support of the Dean, will coordinate all aspects of implementation.

The provision of facilities and associated capital expenditure programs will be managed within the Universities and their partner organizations concerned, but monitored through processes established by the project development team. The Dean will coordinate key academic appointments, which will be made in most instances at least 12 months in advance of student contact. Other teaching support, management and administration posts will be filled by the partner organization concerned according to the principles agreed between the Universities.

PROJECT TIMELINE



The arguments presented here are practical ones. They are intended to show that it is entirely feasible to create a new school that would be modest in its capital needs and cost effective in operating expenditure. The acknowledged success of the existing northern based Family Medicine Residency programmes, both in meeting the highest quality standards and in showing impressive recruitment and retention results, should allay concerns about the capacity of the north to manage its own programs. What is proposed here can be done and all the evidence suggests that it would be successful.

There could not be a better time to establish a new medical school located in the north that addresses, not only the needs of Northern Ontario, but those under-served areas of rural and remote regions of Canada. Unlike the established medical schools that train physicians and specialists to work in well-equipped and well-staffed hospitals, the proposed northern medical school would prepare its graduates to set up practices in some of the most marginalized health care facilities in the province. Furthermore, the northern medical school would address the growing needs of the Aboriginal population in terms of patient care access and health education, too long denied to Canada's First Peoples.

The proposal also shows the exciting opportunities that lie in using the health challenges of northern and rural contexts as a natural learning laboratory in which to deliver an ambitious state-of-the-art curriculum. This is an occasion not merely to extend what is already there and modestly adapt it to a northern context, but to make the context itself the integrating factor behind the development of new knowledge and of new ways of seeing health issues. This is a rare opportunity to create a model of northern and rural medical education that can serve as a model for the rest of the country. Thirty percent of Canadians live in rural or northern environments. We have to stop thinking about their location as an educational and service hinterland and evolve models that fit their circumstances.

While the doctor shortage has become acute only recently in the Southeast and Southwest, the North has over three decades of experience developing strategies to recruit and retain physicians and specialists. All of the short-term incentives and programs have failed to bring a consistent supply of MDs to the North. It is clear that only a long-term approach can solve the doctor shortage not only in the North but in other under-served regions of the province as well. This new innovative medical school can indeed address many of the increasing serious health care issues in Northern, rural and remote regions of the province. We have the will, the experience and the capability to make it happen.

APPENDIX A - ANALYSIS OF OPTIONS FOR RURAL UNDERGRADUATE MEDICAL EDUCATION

In developing the NORMS proposal, the following steps were undertaken:

1. Determine the needs
2. Establish goals and objectives
3. Review current models and rural medical education evidence
4. Develop potential models and options
5. Match model to needs and resources

Extensive studies (The McKendry Report and others) show clear needs in Ontario for:

- More doctors
- More rural doctors
- More northern doctors, especially specialists
- More doctors to provide Aboriginal health care
- More tertiary care in the north, particularly in Sudbury and Thunder Bay
- Rural and northern health care research/health determinants/studies/Aboriginal studies

The undergraduate medical education objectives established included:

- To graduate highly qualified physicians with state-of-the-art medical education (EFPO/CanMeds 2000) *
- To graduate physicians with exceptional knowledge, skills and interest in rural, northern, underserved and Aboriginal health care
- To graduate more physicians who will both practise in and be leaders and field faculty in rural, northern, underserved and Aboriginal communities

The most important strategic choices involve the admission and pre-clerkship (years 1 and 2) components of medical education. The following charts provide an analysis of the options pertaining to increasing opportunities for rural training in undergraduate medical education that were considered. This analysis identifies the different areas of undergraduate medical education that could provide opportunities for inserting rural training and/or rural clinical experiences.

ADMISSIONS

Since the admissions process is where undergraduate medical education begins, several strategies to increase the opportunities for rural training right from the start were analyzed.

OPTION DESCRIPTION	COMMENT
<p>1. Admit students to the existing medical schools with separate northern/rural stream admission process</p>	<ul style="list-style-type: none"> ▪ This option requires much less commitment by the medical students to living and learning within the rural/Northern Ontario context and may be more suited to the development of a rural/regional Southern Ontario stream ▪ It is hoped that any such rural/regional Southern Ontario stream would have some northern medical education component.
<p>2. Admit students to the 5 traditional medical schools with application to northern/rural stream during year 2 for years 3 and 4.</p>	<ul style="list-style-type: none"> ▪ Except for increasing numbers, this option would not affect the admission process at all. ▪ Students entering medicine through the existing medical schools and the existing admission process, however can be encouraged to consider rural and northern practice as a career by increasing the rural and northern components of their medical education. ▪ Rural and northern experiences or streaming at the year 3 and year 4 are to be encouraged for all possible students.
<p>3. Admit an increased number of medical students to traditional medical schools using traditional medical school admission process and no separate northern/rural stream.</p>	<ul style="list-style-type: none"> ▪ Currently the graduates of existing medical schools practise predominantly in large, urban settings. The percent that choose rural and northern practice is less in the 90's than it was in the 80's and the 70's. (Dr. Peter Coyte) (Dr. Robert McKendry) ▪ While this would produce more physicians for Ontario, it would be unlikely to have a positive distribution effect.
<p>4. Admit students directly to a Northern Rural Medical School with separate, defined new admission process.</p>	<ul style="list-style-type: none"> ▪ Students from a northern and rural background and students who have a significant interest in northern and rural medical education and ultimate practice location in a northern or rural location will be much more likely to apply than students who are largely southern/urban background and/or who are most interested in doing their medical education in a large southern urban location and ultimately practise in a large southern urban location. ▪ A separate admission process is a major factor in success of rural-focused medical schools and rural streams in their success at producing from 5-10 times more physicians who practise in rural areas than traditional urban-based medical schools.

PRE-CLERKSHIP TRAINING (YEARS 1 & 2) MEDICAL EDUCATION

During years 1 and 2 of medical school, students combine both the clinical learning experience and the basic science components. The options outlined here discuss the potential strategies for providing these components in such a way as to integrate the experience and knowledge required for rural practise.

OPTION DESCRIPTION	COMMENT
<p>1. Years 1 and 2 basic science component at 1, 2 or 5 existing medical schools with clinical component as blocks spent in Northern Ontario.</p>	<ul style="list-style-type: none"> ▪ This option would use the existing medical schools' basic science education structure. ▪ Providing substantial clinical components in Northern Ontario would entail blocks and a significant amount of travel from north to south during years 1 and 2, which would be difficult, disruptive and costly.
<p>2. Years 1 and 2 spent at 1, 2 or all 5 existing medical schools – both basic science and clinical components</p>	<ul style="list-style-type: none"> ▪ This option would be the easiest but least effective way to provide Northern and rural-focused pre-clerkship medical education. ▪ Also, this option would not provide significant linkages or connections to the north during the pre-clerkship years.
<p>3. Years 1 and 2 learning and living in Northern Ontario with both basic science and clinical, mainly in Northern Ontario.</p>	<ul style="list-style-type: none"> ▪ This option provides the crucial living and learning experiences in Northern and rural Ontario from the outset that will consolidate and build on their selection and choice to focus on rural and northern medicine. ▪ It will place them with similar-minded peers, teachers and other social structures and contacts including potential spousal partners. Immediately the students will identify themselves with appropriate role models and their choice of study and practice in a rural and/or northern setting will be continuously reinforced. ▪ This option is contingent on the ability to deliver educationally sound basic science and early clinical medical education in Northern Ontario.

Additional Comments: Both options 1 and 2 would require a significant investment in faculty and space at existing medical schools in order to accommodate the additional students. Neither would provide students with the living and learning experience with the north as their identified home for years 1 and 2. In options 1 and 2, the metropolitan centres in which the existing medical schools are located will become the students' home and the place of development of their social contacts and supports.

PRE-CLERKSHIP (YEARS 1&2) BASIC SCIENCE COMPONENT

When considering options for the basic science component of undergraduate medical education, there are several ways in which rural aspects can be incorporated. The following analysis illustrates the advantages and disadvantages of the strategies considered.

OPTION DESCRIPTION	COMMENT
<p>1. Basic science component taught as part of years 1 and 2 at existing medical schools.</p>	<ul style="list-style-type: none"> ▪ This option has the disadvantages earlier discussed of being located in a large southern metropolitan medical school setting.
<p>2. Basic science component all taught by basic scientists from existing medical schools – flown in for blocks of lectures to Sudbury/Thunder Bay.</p>	<ul style="list-style-type: none"> ▪ This option and the one that follows utilize a more traditional approach to providing the basic science component, combining local and visiting faculty.
<p>3. Basic science component taught in blocks of lectures by a combination of Laurentian/ Lakehead faculty with connection to existing medical school faculty by videoconferencing, computer networking, and information technology.</p>	<ul style="list-style-type: none"> ▪ This option also utilizes a more traditional approach to providing the basic science component, combining local and visiting faculty.
<p>4. Basic science completely integrated into small group, patient-centred, clinical problem-based, systems organized, rural and northern contextual learning in Sudbury, Thunder Bay and Northern network learning sites.</p>	<ul style="list-style-type: none"> ▪ This option provides a fully integrated basic science clinical learning model for the first 2 years that would provide state-of-the-art medical education based on the medical education small group problem-based learning principles developed over the past 25 years combined with modern technology and support and objective-based learning.

PRE-CLERKSHIP (YEARS 1&2) CLINICAL

Clinical methods and clinical exposure has become a vital part of the pre-clerkship medical curriculum. Both the setting and the role models are critical elements of this early clinical learning experience that profoundly influences students' future career direction and attitudes. This experience provides the opportunity to reaffirm and build on or reduce the students' early interest in rural/northern/Aboriginal health care. The chart outlines the different strategies that could provide such opportunities.

OPTION DESCRIPTION	COMMENT
1. At existing university clinical learning sites.	<ul style="list-style-type: none"> ▪ This option, combined with basic science learning at existing medical schools, may be the easiest but least effective option.
2. In Sudbury and Thunder Bay.	<ul style="list-style-type: none"> ▪ Providing the clinical learning in the first two years in Sudbury and Thunder Bay would not go far enough to ensure that students have substantial learning in the rural/remote and Aboriginal/northern communities.
3. Students spend all of their time in years 1 and 2 outside Sudbury and Thunder Bay in rural/remote settings connected by computer distance learning, including their science component.	<ul style="list-style-type: none"> ▪ This option would be the most challenging. It would provide immersion learning experience in rural/remote/Aboriginal communities for the first 2 years. ▪ This radical approach has been successfully accomplished with good learning outcomes in some rural streams (University of New Mexico, for example). ▪ Modern technology can facilitate the learning component of such an immersion experience. ▪ The major drawbacks of this option include social and learning isolation, particularly lack of peer group learning. The very decentralized and intensive immersion learning makes it more difficult to provide standardized, quality-controlled medical education and presents more difficulties to resolve learning problems when they develop.
4. At a variety of clinical learning sites, including Sudbury/Thunder Bay, rural, remote and Aboriginal spread throughout the 2 years.	<ul style="list-style-type: none"> ▪ This option would facilitate social and peer learning groups in the north with substantial learning components spread throughout the northern learning sites including rural, remote and Aboriginal and may provide the optimum balance.

The clerkship models used in Canada are fairly uniform and can be adapted to the Northern Ontario setting as described in the main text. A clerkship mainly in Northern Ontario must be a key component of any plan to educate more doctors for rural, Northern and Aboriginal communities.

The process then centred on developing the model to best match the needs and resources. The result, NORMS, presented in the main text, emphasizes living and learning in the north as the most effective method to educate physicians who will both practice in and be leaders and field faculty in rural, northern, underserved and Aboriginal communities. NORMS will provide unique state-of-the-art medical education in Northern Ontario that cannot be effectively duplicated by other models.

APPENDIX B - ACRONYMS

ACMC	Association of Canadian Medical Colleges
CACMS	Committee on Accreditation of Canadian Medical Schools
CFI	Canadian Foundation for Innovation
CIHR	Canadian Institutes of Health Research
CMA	Canadian Medical Association
CME	Continuing Medical Education
COFM	Council of Ontario Faculties of Medicine
CRaNHR	Centre for Rural and Northern Health Research
CRHD	Centre for Research in Human Development
DIAND	Department of Indian Affairs and Northern Development
EFPO	Educating future Physicians for Ontario Project
FedNor	Federal Economic Development Initiative in Northern Ontario
HINET	Health Information Network
HRDC	Human Resources Development Canada
HRSRH	Hôpital régional de Sudbury Regional Hospital
ICES	Institute for Clinical Evaluative Sciences
LCME	Liaison Committee on Medical Education
LU	Laurentian University – Université Laurentienne
MTCU	Ministry of Training, Colleges and Universities
MNDM	Ministry of Northern Development and Mines
MoHLTC	Ministry of Health and Long-Term Care
NAHSN	Northern Academic Health Science Network
NEORCC	Northeastern Ontario Regional Cancer Centre – Centre régional de cancérologie du nord-est de l'Ontario
NHIP	Northern Health Information Partnership
NOFM	Northeastern Ontario Family Medicine
NOHRI	Northern Ontario Health Research Institute
NOMECC	The Northeastern Ontario Medical Education Corporation
NOMP	Northwestern Ontario Medical Programme
NORMS	Northern and Rural Medical School
NSERC	Natural Sciences and Engineering Research Council
PAIRO	Professional Association of Internes and Residents of Ontario
PHRED	Public Health, Research, Education and Development Program
ROMP	Rural Ontario Medical Program
SRDC	Sudbury Regional Development Corporation
SRPC	Society of Rural Physicians of Canada
SSHRC	Social Sciences and Humanities Research Council of Canada
SWORM	Southwestern Ontario Rural Medical Program

APPENDIX C - NORTHERN AND RURAL MEDICAL SCHOOL - PARTNERS

NORTHEASTERN ONTARIO MEDICAL EDUCATION CORPORATION (NOMECE)

The Northeastern Ontario Medical Education Corporation (NOMECE) directs the operation of medical education programs in northeastern Ontario, including the Northeastern Ontario Family Medicine and Emergency Medicine Residency Programs affiliated with the University of Ottawa, Medical Electives Program and community development of physician manpower. NOMECE's network encompasses approximately 290 physicians throughout urban and rural northeastern Ontario. NOMECE works in close liaison with the Faculties of Medicine of all five Ontario's Academic Health Science Centres. Situated on the Campus of Laurentian University, and drawing on the region's physicians and educational teaching resource, NOMECE has established an excellent track record in addressing physician recruitment and retention issues. This has been accomplished through its medical postgraduate training and undergraduate electives programs, which expose medical students and residents to the rewards of northern practices.

Currently, the Family Medicine Residency curriculum specifies evidence based medicine (EBM) and research components as essential teaching. These are directly applied to primary care settings in a variety of family medicine rotations. There is a need to enrich the experience of the Residents through the association of medicine and science. The Chair in Cancer Research, as a lecturer at medical academic rounds, would enable the application of molecular science to medicine. Also, there would be the involvement of the Residents in research projects where a clinical base can be used to discuss the practical aspects of theory and hone critical appraisal skills. Such a multidisciplinary research team model would be the nucleus of expertise from which innovative molecular medicine solutions in cancer would flow.

NOMECE's vision of the growth of medical education and training function in the North includes developing clinically based research focusing on northern and rural health issues. Physicians involved in medical teaching will require expanded opportunities to participate in research related and complementary to their clinical and teaching activities. The potential lessons to be drawn from the practice of health care in northern and rural settings are considerable as applications for innovations are discussed, studied and implemented. NOMECE will be a key partner in the planned Health Science Research Network, adding diverse opportunities clinical-based research and application.

NOMECE's vision of the growth of health science education and research in the region fits closely with and complements the expanding mandates of HRSRH, NEORCC and Laurentian University. The Board of Directors of NOMECE also includes members from medical societies across northeastern Ontario, representatives from the francophone and aboriginal communities, and the Dean of the Faculty of Medicine and Chair of Family Medicine from the University of Ottawa.

NORTHWESTERN ONTARIO MEDICAL PROGRAMME (NOMP)

Northwestern Ontario has an established network that encompasses experienced clinical teachers in various health professions as well as the regional communities and health care institutions that stretch from Sault Ste Marie to Kenora, Lakehead University, McMaster University's Faculty of Health Sciences and the other Ontario Academic Health Science Centres. Its origin dates back 25 years to a partnership initiated by the Thunder Bay and Northwestern Ontario Medical Societies and McMaster University, supported by the Ministry of Health, and known throughout the province as the Northwestern Ontario Medical Program (NOMP). It is the longest-standing

initiative in any jurisdiction to demonstrate that effective preceptor-based clinical education can be managed and provided by committed practitioners in communities that are remote from the learners' home academic centres; and, that such decentralized training, supported by the regional university, can impact positively on the recruitment and retention of health professionals for the region.

The evolution of programming in northwestern Ontario has demonstrated that shared programming initiatives and support services enhance the opportunities for all aspiring and practising professionals and communities in the region. Over the years, NOMP has successfully supported the following initiatives:

- clinical elective experience for undergraduate medical students;
- clinical elective experience for postgraduate trainees;
- selective and core clinical education for final year medical students;
- Family Medicine North, a program offering fully accredited certification and post certification training for Family Medicine residents;
- Specialty Medicine North, piloted to demonstrate that core postgraduate training in General Surgery can also be provided in northwestern Ontario;
- research-focused elective opportunities piloted for undergraduate students;
- a cooperative pilot program with elders associated with Lake of the Woods District Hospital's Native Healer Program to familiarize learners and practitioners with the culture and traditional healing practises of some regional First Nations communities;
- the McMaster-Lakehead Northern Studies Stream program of decentralized, community-based academic and clinical education for physiotherapy and occupational therapy students;
- the development/demonstration of an integrated, palliative care tutorial for students from five professional disciplines and three academic centres on clinical placements in Thunder Bay;
- the Community Development Officer pilot project to support regional community recruitment and retention of physicians, funded by the Ministry of Northern Development and Mines;
- continuing education in Life Support skills for regional physicians and nurses;
- a SSHRC international research institute on rural and remote health services;
- the ongoing initiatives of the Northern Health Human Resources Research Unit (now the Northern and Rural Research Unit), the Northern Centre for Aging and Health and the Northern Outreach Program;
- the introduction of videoconferencing and other information systems technology to improve access to remote learning opportunities and resources;
- Health Sciences' North's participation in the "Links for Kids" telemedicine pilot initiated and sponsored by the Hospital for Sick Children and Thunder Bay Regional Hospital.

The network that has resulted from these initiatives is well-positioned to sustain its current programs; to solidify the initiatives that have already been demonstrated to hold promise for future programming; and, to initiate a number of new initiatives that will further enhance and encourage the retention of health professionals who have committed themselves and their careers to northwestern Ontario.

NORTHERN ACADEMIC HEALTH SCIENCE NETWORK (NAHSN)

NAHSN brings together the education, research and service delivery components necessary for a viable, effective and functioning Academic Health Sciences Network. The Northern Academic Health Science Network (NAHSN) is a partnership formed by the Northeastern Ontario Medical Education Corporation (NOMECE) and Northwestern Ontario Medical Programme (NOMP).

NAHSN is a complex set of cooperative ventures that links northern Universities, southern Academic Health Science Centres, northern health agencies and institutions, professional Colleges and licensing bodies, governments (Provincial and Municipal) and the health professionals practising in northern Ontario. It ensures that the education of physicians (undergraduate and postgraduate, including specialty training) and other health professionals will result in optimal attitudes and knowledge to meet the health care needs of the people of northern Ontario while being sensitive to the linguistic and cultural uniqueness of the population. Furthermore, NAHSN strives to improve the recruitment and enhance the retention of physicians and other health professionals in northern communities by providing regional support for their professional needs. NAHSN is a broker for the North to address regional health needs with the government of Ontario and the Academic Health Sciences Centres in the South. It promotes better coordination, planning and delivery of all health services going beyond medical education to encompass all health professions and the services they provide for our region.

NAHSN reflects the preparedness of northern Ontario communities, institutions and health professionals to direct and to manage - In the North – For the North - By the North – the programs, services and network initiatives that address the health human resource issues so familiar in this difficult-to-serve region of the Province.

NAHSN's program goals are the following:

1. Increase the health professional applicant pool from the North.
 2. Increase the number of students from the North admitted to Ontario's medical schools.
 3. Enhance undergraduate northern exposure to rural family and community medicine and to the general specialties.
 4. Create other undergraduate opportunities to experience northern health care.
 5. Expand the existing family medicine training programs and place greater emphasis on the skills needed for northern and rural family practice in these programs.
 6. Develop northern Royal College specialty education opportunities in the general specialties and selected sub-specialties.
 7. Increase PGY3 Family Medicine residency and re-entry training opportunities.
 8. Provide for professional development and northern practice skills enhancement.
 9. Expand the Community Development Officer initiatives.
 10. Foster practitioner participation and leadership in northern community-based research and clinical evaluative studies of regional patterns of practice.
 11. Develop telecommunications and consolidate information services.
 12. Evaluate NAHSN's progress.
-

NORTHERN ONTARIO HEALTH RESEARCH INSTITUTE (NOHRI)

The Northeastern Ontario Health Research Institute will be an independent health research facility, founded by Laurentian University, the Hôpital régional de Sudbury Regional Hospital and the Northeastern Ontario Regional Cancer Centre. The Institute will be committed to excellence in basic, clinical and applied research that will produce scientific knowledge that contributes to the understanding of the health issues of importance regionally, nationally and internationally.

In carrying out this mission the Institute will support and closely interact with the Partners with regard to their strategic directions in defined areas of mutual interest. This commitment emphasizes basic and clinical science and the acquisition of new knowledge, based on the belief that the major breakthroughs in health care and treatment originate in fundamental discoveries. It is recognized that new knowledge and innovative approaches to important health issues can only be achieved through research.

To fulfil this mission the **GOALS** of the Northeastern Ontario Health Research Institute are:

- To establish a health research institute of national and international stature.
- To facilitate the application of new knowledge to enhance "bench to bedside" patient care by promoting interaction between basic scientists, clinical scientists and clinicians.
- To foster an interdisciplinary approach to research by bringing together teams of researchers from different specializations.
- To assist and support the partners in their plans for the development of an academic health sciences centre aimed at training health professionals for rural and northern practice.
- To develop strong undergraduate, graduate, post-doctoral fellow and clinical research fellow training programs in health.
- To work closely with Laurentian University and the other Partners to provide an environment conducive to undergraduate, graduate and post graduate education and research.
- To interact with industry and other local, national and international research facilities.

The NOHRI will be constituted by a series of focused research groups based on existing areas of strength and defined by their strategic relevance to both the specific health issues of the population of Northeastern Ontario and their ability to contribute to setting the national health research agenda for the coming years. Six areas of focus are currently envisaged which show varying degrees of development. Some are at a stage where they already function as self-sustaining entities and have both the expertise and resources to pursue their immediate goals. Others are in the process of developing their potential, but meet the criteria of strategic relevance at both a regional and national level and are ready to respond to the opportunities offered by a significant level of expansion of health service, research and educational opportunities. All could benefit significantly from their co-membership in a single institute that could be the source of a quantum leap in the level of infrastructure available to them and which could also provide an organizational framework that would encourage and facilitate cross-cutting interactions between both disciplines and institutions.

CENTRE FOR RURAL AND NORTHERN HEALTH RESEARCH (CRANHR)

The Centre for Rural and Northern Health Research (CRaNHR) is a conjoint research centre based at Laurentian University in Sudbury and Lakehead University in Thunder Bay, Ontario. From 1992 to 1997, the research centre was known as the Northern Health Human Resources Research Unit (NHHRU). It has adopted a new name, the Centre for Rural and Northern Health Research (CRaNHR), to reflect a much broader research mandate and a new partnership structure.

CRaNHR's mandate is to conduct interdisciplinary research on the health workforce and rural and northern health care, with a view to improving access to health services, particularly in rural and northern communities. CRaNHR works in partnership with the health care community and the Ontario Ministry of Health.

Working under the auspices of CRaNHR and with the support of research staff, investigators from various faculties at Laurentian University and the health care community conduct studies and evaluation on the organization, delivery, and effectiveness of rural and northern health services, as well as on various health workforce issues.

CRaNHR is committed to timely dissemination of research findings to the health care community and to use research and evaluation to support health care decision-makers, planners, providers and consumers.

CRaNHR welcomes opportunities to work with professional associations, health care agencies, government ministries, and other research centres. CRaNHR also sponsors seminars on various health care topics, which are open to interested researchers, faculty members, students and the public.

THE HÔPITAL RÉGIONAL DE SUDBURY REGIONAL HOSPITAL CORPORATION

Incorporated in 1997, the Hôpital régional de Sudbury Regional Hospital (HRSRH) is a newly created tertiary level hospital and one of the largest tertiary referral centres in the province. It accommodates over 600 beds, a medical staff of more than 260 physicians, 2,700 employees and 1,000 volunteers. It will be built to the latest standards, equipped with state-of-art technology and operated with an annual budget of \$165.

The HRSRH is built upon a strong foundation of dedicated care and service provided for many years by three former hospitals - the Sudbury General Hospital, Laurentian Hospital and Sudbury Memorial Hospital. In 1996, following a review of local population trends, the prevalence of disease and the availability of services in the Region, the Health Services Restructuring Commission recommended the amalgamation of these facilities into a new hospital entity located on a single redeveloped site.

The programs offered by the Hospital include a comprehensive array of complex tertiary care services and outreach services, such as the following:

- ❖ Cardiovascular sciences
- ❖ Complex continuing care
- ❖ Emergency/trauma
- ❖ Critical Care
- ❖ HIV programs and services
- ❖ Nephrology
- ❖ Respiratory therapy
- ❖ Mental Health services
- ❖ Neuroscience Diagnostic services
- ❖ Rehabilitation
- ❖ Surgery
- ❖ Women's & Children's programs
- ❖ Ambulatory Care services
- ❖ Medical/Surgical Inpatient units
- ❖ Genetics
- ❖ Diagnostic Imaging and Laboratory

The Hospital's vision is in keeping with the recently released Rural and Northern Health Care Framework, a planning document which focuses on access to quality health care in rural, northern and isolated communities. The regional mandate of the Hospital is key to the recruitment and retention of world-class researchers. The vast array of primary, secondary and tertiary services ensures the critical mass required to conduct specialized research.

Education

The HRSRH has a department devoted to teaching and training. It co-ordinates the residency requirements for many university and community college programs in disciplines such as nursing, radiography, ambulance and emergency, pharmacy, respiratory therapy, dialysis technology, therapeutic recreation, speech language pathology and rehabilitation. Through this department, staff members and physicians access continuing education sessions in areas such as non-violent crisis intervention, the aging process and coping with disability. Legal presentations are scheduled periodically on topical issues such as consent to treatment and patients' rights. Members of the public, patients and their families are invited to attend. Tours of the Hospital's facilities are often organized for members of the public, children scheduled to receive elective procedures and expectant mothers.

HEALTH INFORMATION NETWORK (HINET)

HINET is a collaborative project between the Laurentian University, the Sudbury Regional Hospital, NOMECC, the Northeastern Ontario Regional Cancer Centre and other health care agencies in the North. HINET is a health library and information network that will connect medical, health and scientific information nodes across Northeastern Ontario and that will serve as a regional resource. HINET members will support resource sharing among its members including:

- providing access to library collections housed by each member through the development of union or shared library catalogues
- sharing resources located in each member library, in particular, sharing all relevant electronic journals, texts and databases
- interlibrary lending of library materials between member libraries
- direct service to all registered users
- arranging common licenses for electronic information products
- providing direct access to web-based resources

HINET will endeavour to deliver most of its library and information services electronically and on-line to desk-top computers, exactly the type of service that the NORMS students will need as they spread out across the North. HINET is in the process of applying to various agencies to acquire the funding necessary.

PUBLIC HEALTH, RESEARCH, EDUCATION AND DEVELOPMENT PROGRAM (PHRED)

PHRED is based on a partnership between Laurentian University and the Sudbury and District Health Unit directed at undertaking joint education and research initiatives in the field of Public Health.

NORTHERN HEALTH INFORMATION PARTNERSHIP (NHIP)

The Northern Health Information Partnership (NHIP) is one of five Health Intelligence Units developed by the Ontario Ministry of Health & Long-Term Care to provide health planning and research organizations (namely the District Health Councils, Public Health Units and Universities) with efficient access to health information. This in turn will assist with the planning of services, research and curriculum.

The role of NHIP is to facilitate rapid access to health information for our partners in Northern Ontario. However, the deployment of the technological infrastructure is in itself not enough. It is the ability to transform information into knowledge that is critical to the success of this partnership. We seek to explore ways in which the partnership can grow into a knowledge partnership.

In order to achieve this goal, every individual must be given the opportunity to participate and contribute to its development. NHIP provides the means to make this possible. By developing online processing, representation, and interpretation of health data and sponsoring discussion groups, meetings, workshops, etc. we will encourage and expand the capacity and opportunity for collaboration between the staff of the partner agencies.

In developing such a partnership, NHIP provides the interaction, the infrastructure and technology to aid the partners in developing more efficient and effective programs and policies.

NHIP Partners:

- Algoma, Cochrane, Manitoulin & Sudbury District Health Council
 - Algoma Health Unit
 - Lakehead University
 - Laurentian University
 - Nipissing University
 - North Bay & District Health Unit
 - Northern Shores District Health Council
 - Northwestern Health Unit
 - Northwestern Ontario District Health Council
 - Porcupine Health Unit
 - Sudbury & District Health Unit
 - Thunder Bay District Health Unit
 - Timiskaming Health Unit
-

CONTACT NORTH AND ADCOM VIDEOCONFERENCING

This Centre is at the forefront of videoconferencing technologies and their applications for education, health, government and business. The Centre combines the existing technical expertise, network support and client services capabilities to:

- showcase emerging videoconferencing technologies, innovations and exemplary practices,
- provide training expertise for successful videoconferencing applications in education, health, government and business,
- help design, develop and introduce advanced videoconferencing systems, and
- initiate and co-ordinate research and evaluation in the effective use of videoconferencing technologies.

The public private alliance will provide Videoconferencing excellence in the following.

- Distance Education
- Telehealth
- Workplace Training
- Business Communications

Contact North's high quality videoconferencing network offers comprehensive on-site support services throughout Northern Ontario and additional facilities are available through our partners. Conference rooms are available with a full range of videoconference facilities in 23 locations providing a comfortable private meeting space to work with others in distant locations.

The teleconference services are even more widely available, Contact North has meeting facilities in over 100 communities throughout Northern Ontario, and if there are only one or two participants at a given location, they can join a teleconference from any phone located any place.

Contact North/Contact Nord Access Centres span 880,000 square kilometers in over 100 communities in Northern Ontario. (Attawapiskat, Bear Island, Beardmore, Bearskin Lake, Blind River, Burk's Falls, Caramat, Cat Lake, Collins, Constance Lake, Desbarats, Dokis, Dubreuilville, Ear Falls, Englehart, Fort Albany, Fort Severn, Gogama, Hanmer, Kashechewan, Kasibonika Lake, Killarney, Kingfisher Lake, Lac La Croix, Lac Seul, Landsdowne House, Levack, Matachewan, Mattagami., Mississauga, Moose Factory., Muskrat Dam, New Liskeard, New Slate Falls, Ogoki Post, Osnaburgh., Pic Mobert, Pickle Lake, Pikangikum, Powassan, Rainy River, Red Rock, Rocky Bay, Sachigo Lake, Sagamok Anishinawbek, Savant Lake, Shining Tree, Shoal Lake #39, Smooth Rock Falls, South River, Summer Beaver, Temagami, Thessalon, Thorne, Timmins, Upsala, Weagamow, Webequia, Whitedog, Whitesand, Wunnumin Lake)

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