Northern Ontario School of Medicine

Beyond Flexner Site Visit Report
Site Visit: October 5-7, 2011

Site Visit Team

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Introduction

Beyond Flexner, a W.K Kellogg Foundation-funded study at the Department of Health Policy of the George Washington University School of Public Health and Health Services, explored unintended consequences of the Flexner Report with a focus on innovative models of medical education that address social mission. The Beyond Flexner Study began with the development of an Advisory Committee consisting of sixteen leaders in medical education and health policy. The research team and Advisory Committee identified eight core modalities that stand out as essential elements in the social mission of education, and selected six medical schools which have demonstrated a commitment to strengthen their contribution to health equity.

Northern Ontario School of Medicine was chosen to participate in this study because of their unique approach to extended rural exposure in the third year, commitment to recruitment of the Aboriginal and Francophone population, and community partnership to improve the health of Northern Ontario. A team of three individuals, Drs. Hershey Bell, Donald Barr, and Malika Fair traveled to Sudbury and Thunder Bay for a three day visit in October 2011. This visit consisted of multiple group and individual interviews based on a standard Beyond Flexner site visit template including site visits to Sudbury Regional Hospital, Thunder Bay Regional Health Sciences Centre and Sensenbrenner Hospital in Kapuskasing.

We would like to express our appreciation to the Northern Ontario School of Medicine leadership, faculty and students for their cooperation and help towards achieving the goals of the site visit. Special thanks to Dr. Roger Strasser for arranging a highly successful visit and for his support of the Beyond Flexner Study.

Key Findings

1. Mandate

In 2001 the government of Northern Ontario established a mandate to build a medical school that would contribute to improving the health of the people and communities of Northern Ontario. This social accountability mandate is a unique example of a government initiated social mission endeavor.

2. Community Engagement

To ensure success of the social accountability mandate, NOSM leadership have actively engaged the surrounding community for partnership and input in the direction of the institution. In 2003, The Northern Ontario School of Medicine's Francophone Reference Group (FRG) and Aboriginal Reference Group (ARG) were established to serve as a resource for the school and provide guidance to NOSM on the strategies necessary to successfully address the specific health care needs of the Aboriginal and Francophone communities. Community input was also bolstered with a formal addition of Local Community Coordinators (LCC's) which are healthcare providers from the region where the students will obtain a variety of clinical

placements during the four years. These facilitators provide feedback to the school on the success of the distributed learning model and important health needs of the surrounding community. There is a sense of community ownership of NOSM within the various Northern Ontario communities.

3. Admissions

NOSM admissions process is aligned with the mission of the school and they seek to reflect the demographics of Northern Ontario in the medical school class profile. They have successfully recruited students from the Northern areas of Ontario and particularly from rural areas. 91% of students admitted to NOSM are from Northern Ontario, and 30-40% of admitted students come from remote rural areas. 7% of the students are from Aboriginal descent and 22% are Francophone which represents an institutional commitment to diversity. NOSM utilizes the Multiple-Mini Interview in the admissions process which places greater emphasis on non-cognitive characteristics such as leadership, social accountability and interpersonal skills. This helps NOSM to recruit students who are committed to practicing within the region and maintain the social accountability purpose of the school.

4. Integrated curriculum

The curriculum is specifically tailored to preparing students for practice in Northern Ontario. The case-based modules, community experiences, clerkships and assessments all maintain a relevance to the mission of the school. The innovative approach to integrating traditional medical and public health curriculum as themes throughout the curriculum is transportable to other schools.

5. Comprehensive Community Clerkship

The third year Comprehensive Community Clerkship is the centerpiece of the curriculum. This is an eight month community immersion experience where students are able to develop close ties with local family practice physicians to obtain a solid foundation in family medicine. Students also gain a solid understanding of rural healthcare access and systems of care.

6. Training Generalist

NOSM promotes a generalist view of medicine while not discouraging students from pursuing specialty fields if they desire. Sixty three percent of the student body choose a career in rural family medicine and 33% in general specialties. Forty percent of students choose to continue their residency education at NOSM and over 65% of the NOSM residents will stay in Northern Ontario to practice.

Background

State Demographics

The population of Northern Ontario is only 805,250, which represents 6% of Ontario's total population.[1] Northern Ontario's population is expected to remain relatively stable until 2036, with only a slight increase of 5,900 (0.7%).[2] The population density in the region is about one person per square kilometer, compared to 115 people per square kilometer in southern Ontario.[1] About 24% of Ontario's Francophone population (139,000) resides in Northern Ontario, which represents 18% of the region's total population.[1] Additionally, Northern Ontario is home to 49% of the province's Aboriginal population (98,000), which accounts for approximately 13% of the region's total population.[1] Over one-third of Northern Ontario's population lives in rural areas, compared to 11% in Southern Ontario.[1]

In contrast to its relatively small population, Northern Ontario covers 90% of the province's total territory, a land area of about 800,000 square kilometers (308,880 square miles).[1] This includes 10 territorial districts, 144 municipalities, 106 First Nations (out of 134 total in the province), over 150 unincorporated communities, and 44 Local Services Boards.[1] The five biggest cities are Thunder Bay, Sault Ste. Marie, Timmins, Greater Sudbury, and North Bay, and more than 50% of Northern Ontario's population live in these areas.[1]

Economy

Northern Ontario's economy is reliant on primary industry sectors such as mining and forestry, and on public sector employment such as public administration, education and health care.[1] In 2010, primary industry sectors accounted for about 6.6% of Northern Ontario's total employment, compared to 0.6% for the entire province.[1] Similarly, educational services, public administration, health care, and social assistance sectors supplied 31.8% of Northern Ontario's total 2010 employment, compared to 23.9% for the province.[1]

In terms of income, Northern Ontario is significantly more dependent on government transfer payments—in the province, transfer payments represent 9.6% of total income, while in Northern Ontario this figure rises to 14.4%.[3] In 2005, only 14.4% of individuals in Northern Ontario earned over $60,000, whereas the average for the province was 17.3%.[3] Northern Ontario also has a higher percentage of low income earners, with 25.2% earning less than $12,000 in 2005 compared to 24.5% overall.[3] This discrepancy is reflected in a regional average income that is 13% less than the Ontario average.[3]

Health Indicators

In general, Canadians living in rural areas including Northern Ontario experience a lower life expectancy at birth, increased all-cause mortality rates, and a have greater prevalence of overweight adults.[4] Fewer residents of Northern Ontario report very good or excellent health status, compared to Southern Ontario.[4] The region experiences higher rates of hospitalization due to injury, and for conditions that could be prevented or managed by outpatient care.[4] Also, in

Northern Ontario 8.9% of households are food insecure, compared to 7.7% overall in the province.[5]

Among children ages 12 to 19 in Northern Ontario, 78.2% engage in regular physical activity (compared to 64.6% overall). However, 28.4% of males and 21.2% of females in the same age group are obese, compared to 24.6% and 15.4%, respectively. Also, more children in Northern Ontario are exposed to second-hand smoke, and 59.2% of children aged 12-18 reported binge drinking alcohol in the past year, compared to 45.1% in Ontario. Youth pregnancy rates among ages 15-19 are also higher, at 506.4 per 10,000 compared to 429.1 per 10,000 in Ontario.[5]

Health care system

All residents of the province are eligible to join the government funded Ontario Health Insurance Plan, which pays for most basic and emergency medical services.[6]

Healthcare Workforce

Recent research shows that 94% of Ontario's physicians practice in the southern region, and 6% practice in the north.[7] While the percentage of physicians in the north is proportionate to the percentage of population living in this region overall, the rural-urban distribution is not representative of population needs. Seventy-one percent of Northern Ontario physicians practice in urban areas, while only 59% of the population lives in urban areas.[7] In Canada overall, only 16% of family physicians and 2.4% of specialists were rurally located in 2004, whereas 21% of the population lived in these areas.[8]

History

Northern Ontario has participated in medical education since the early 1970s as evidenced by the region's involvement in McMaster University's Northwestern Ontario Medical Program and the University of Ottawa's elective and core rotations in Northeastern Ontario.[9] In the early 1990s, McMaster University established family medicine residency programs in Northwestern Ontario, and the Northeastern Ontario Medical Education Corporation followed suit in collaboration with the University of Ottawa.[9]

In 1999, the government of Ontario commissioned a "fact finder report" to examine a growing shortage of doctors in the province.[9] The final report recommended the establishment of a medical school in Northern Ontario based at Lakehead University in Thunder Bay and Laurentian University in Sudbury. The government adhered to this recommendation, and in 2001 announced the decision to establish a medical school in Northern Ontario for the purpose of improving the health of the region—the first school in Canada to be established with such a mandate.[9] Northern Ontario School of Medicine was incorporated in 2002, and graduated its first class in June 2009.[9,10]

NOSM is a not-for-profit corporation, and does not have degree-granting authority nor is it an academic body. Rather, NOSM functions as the faculty of medicine at Lakehead University in Thunder Bay and Laurentian University in Sudbury.[9]

Social Mission Modalities

The remainder of this site visit report will focus primarily on the education of medical students at NOSM and the ability of the institution to meet its stated social mission. The information gleaned from this visit provides perspective for new and expanding medical schools and suggests ways in which traditional medical schools can improve their contribution to health equity. NOSM's strategy for meeting its social mission is described using the following modalities:

Mission

The vision of the Northern Ontario School of Medicine (NOSM) is "innovative education and research for a healthier north." The mission states that NOSM is committed to the education of high-quality physicians and health professionals, and to international recognition as a leader in distributed, learning centered, community engaged education and research. NOSM will accomplish this by:

- being socially accountable to the needs and the diversity of the populations of northern Ontario
- actively involving Aboriginal, Francophone, remote, rural and underserviced communities
- leading and conducting research activities that positively impact the health of those living in northern communities
- fostering a positive learning environment for learners, faculty and staff
- achieving an integrated, collaborative approach to education, learning, and programming
- increasing the number of physicians and health professionals with the leadership, knowledge and skills to practice in northern Ontario

The values that NOSM will utilize are innovation, social accountability, collaboration, inclusiveness, and respect.

Several key elements came together to allow the effort to be effective. First, as early as the mid-1960s, there were efforts at lobbying the Ontario provincial government to develop a medical school, or schools, in Northern Ontario. While two of southern Ontario's five schools established efforts for their students and residents in northern communities, it was not until 1999 when the Ontario Ministry of Health and Long-term Care was faced with growing concerns about physician shortages that an effort that would eventually lead to NOSM was undertaken. In May 2003 Premier Ernie Eves committed $95.3 million to NOSM over three years.

Second, the recruitment of Dr. Roger Strasser, the former head of the school of rural health at Monash University, Melbourne, Australia and a widely recognized leading international authority on rural medical education, as founding Dean was critical to the success of the institution. Dr. Strasser was able to create and articulate a clear vision that connected the provincial mandate to the academic and practice communities in Northern Ontario.

Third, the people of Northern Ontario immediately viewed this endeavor as "their medical school" and embraced the distributive curriculum willingly and fully. Many students in Northern Ontario schools now saw an opportunity to become physicians, particularly in Aboriginal communities, where they had not seen this opportunity earlier.

It was also quite fortuitous that the new Chief Executive Officer of Thunder Bay Regional Health Sciences Centre (TBRHSC) is Andree Robichaud, a former deputy minister of health in New Brunswick, who is expert in chronic disease and aboriginal health issues. She herself brought an agenda of social accountability to the TBRHSC which is absolutely consistent with the mission of the school. Together with the Vice President of Medical and Academic Affairs, Gordon Porter, she and Dr. Strasser are "three peas in a pod" in terms of forwarding the mission of social accountability.

Leaders of the school see the mission and vision as "being incorporated into everything." The school's genuine desire to work with Aboriginal and Francophone populations is critical to furthering their mission. This is effectively conveyed though the curriculum which emphasizes generalism, a foundation in the understanding of northern and rural cultural issues, and a focus on social and population health.

Pipeline

A commitment to diversity plays an important part in the history of the founding of NOSM. In order to fulfill its mission of training physicians who were likely to practice in Northern Ontario, the leadership of NOSM appreciated the importance of establishing and supporting a "pipeline" of high school and college students who live in Northern Ontario. Previous research in both Canada and the U.S. has documented the value of recruiting students to medical school who live or have lived in a rural area, as these students are most likely to want to practice in a rural area upon completion of training.

NOSM has established a range of outreach programs that focus on introducing young people to the potential of a health professions career. Examples of these outreach programs include:

- Youth Health Career Awareness Program – Targets students in grades 7 through 12; works with students, parents, teachers, and the community to introduce students to possible health professions careers, while encouraging students to return to Northern Ontario upon completion of training. This program provides funding necessary for a variety of youth initiatives;
- Youth Science and Technology Outreach Program – Encourages high school students to consider careers in science and technology by providing students with hands-on science and technology experience and face-to-face interaction with scientists. An example of their efforts is a Summer Science Camp which offers one-week residential science camps for approximately 12 students at the Thunder Bay and Sudbury campuses. This program which has been in existence since 2006, specifically targets students from remote rural areas and from Northern Ontario's Francophone and Aboriginal communities.

In addition to these programs, NOSM also has outreach programs that focus on 4-year undergraduate colleges and community colleges. As with the programs that target younger students, these programs emphasize encouraging current college students from remote rural areas, Francophone, and Aboriginal communities to consider applying to medical school.

For all of these pipeline programs, NOSM actively attempts to intervene in the educational experiences of young people in Northern Ontario to provide mentoring and support for those students considering a health professions career. An excellent example is the role medical students play when assigned to a remote rural area as part of their training, in reaching out to local high school students and establishing "buddy" systems to encourage those students to consider a medical career. NOSM also emphasizes the importance of identifying and supporting multiple and flexible paths to medical school or other types of health professions training. For example, they have established a program to allow a smooth transition from nursing practice to medical school.

Admissions

Reported plainly in the NOSM admission literature, "The mandate of the School's Admissions Committee is to reflect the demographics of Northern Ontario in the medical school class profile…[NOSM] is seeking applicants who have a genuine interest in helping to fulfill the school's mandate and values." Accordingly, the school's policy on admissions stresses diversity as an important criterion in evaluating and selecting students. While NOSM focuses particular attention on admitting students from the two principal ethnic minority groups in Ontario (Aboriginal and Francophone), they define "diversity" in substantially broader terms, also including geography, socioeconomic background, personality, and social perspectives as important considerations.

NOSM has established a formal admissions process to carry out its mandate of assuring diversity among the students admitted. To a substantial degree, the process is based on that developed by the DeGroote School of Medicine at McMaster University. The admissions process has two distinct phases. Applications are initially evaluated using three criteria, each of which is weighted as one-third of the initial evaluation: i) undergraduate grade point average, based on all classes taken, with no specific emphasis on grades in or completion of specific science classes; ii) an autobiographical statement submitted by the applicant; and iii) a scoring of the context (geographical, socioeconomic, etc.) from which the student comes. Of note, NOSM does not require students to report an MCAT score.

From the aggregation of scores based on these three factors, a sub-set of applicants is invited to campus for personal interviews, using the "Multiple Mini Interview" (MMI) format. MMI was developed and tested by McMaster, and has been shown to be a stronger predictor of clinical and professional quality than the traditional, one-on-one interview format. In the MMI format, applicants are introduced to a problem or an issue, often involving interpersonal interactions and communication, and are given 8-10 minutes to respond. Each applicant will undergo 10 of these scenarios and, based on the performance in each scenario, a composite score will be calculated. In selecting those students to be offered admission, the initial 3-phase evaluation is weighted as 50% of the overall evaluation, and the composite MMI score is weighted as 50%.

In addition to the students selected through this process, NOSM offers a separate admissions stream to Aboriginal students and designates two positions each year to be filled by Aboriginal students. Based on those students admitted though this separate stream and those admitted through the standard process, between 2005 and 2010, 7% of the 346 students admitted were Aboriginal. While Francophone students do not have a separate admissions stream, the school's emphasis on recruiting and supporting these students has resulted in 22% of the students admitted between 2005 and 2010 being Francophone. The separate admissions stream and deliberate effort to recruit from these two groups is a result of NOSM leadership identifying and reducing existing barriers for Aboriginal and Francophone students wishing to matriculate to medical school.

Given that NOSM does not require specific premedical science classes for applicants and does not give extra weight to grades in science classes, some of the students entering the school have relatively weak science backgrounds. The faculty with whom we spoke reported that some of these non-science students may struggle in the first year of medical school, and may have to work harder than their classmates to learn some of the preclinical science material. However, the faculty indicated that these non-science students eventually do as well as their classmates who have had a more rigorous undergraduate science experience. The faculty indicated that the non-science students were sometimes at somewhat of an advantage, as they approached their initial class work with more of an open mind, not having previously adopted narrow or rigid concepts or perceptions of science and scientific knowledge.

As a sign of the success of the alignment of the admissions process with the mission of the school, the leaders of NOSM with whom we spoke indicated that 90% of students admitted to NOSM are from Northern Ontario, and 30-40% of admitted students come from remote rural areas.

Curriculum

The NOSM curriculum is based on five themes that are the bedrock of the structure and are mapped within the three phases of the curriculum: Northern and Rural Health, Personal and Professional Aspects of Medical Practice, Social and Population Health, Foundations of Medicine, and Clinical Skills in Health Care. Each theme is represented in the varied pre-clinical and clinical courses within the objectives and assessments. Students pass at the theme level and not at the course level to help ensure that each theme is equally valued and integrated throughout the curricula.

Unlike traditional medical schools that divide pre-clinical and clinical into the two halves of a traditional Flexnerian model, NOSM divides phase 1: first two years of medical school with eleven case-based modules and incorporated community integrated learning, phase 2: third year consisting of an eight month community-based longitudinal clerkship, and fourth year : specialty exposure in various traditional rotations.

Similar to traditional medical schools, the basic sciences are primarily taught in the first two years. NOSM uses case-based modules which focus on eleven major body systems. Each

module has a remote, regional or Aboriginal setting so that students are prepared for life and practice within Northern Ontario.

NOSM students are also given significant exposure to population and community health through a set of unique clinical experiences in Phase 1. The flagship experience is a course numbered 106 which takes each student into the Aboriginal community for four weeks. During this experience they learn about the culture, shadow traditional healers, and become familiar with a rural Aboriginal lifestyle. During their second year they have two more clinical experiences in similar rural areas where the focus is on medical care in small communities.

Approximately half of the class completes Phase 1 at the Thunder Bay campus and the other half in Sudbury. The curriculum is identical and several classes are shared with video conferencing technology. Because of the small class size (64 students per class) NOSM is able to structure a unique and innovative curriculum across two campuses.

One of the most notable aspects of the curriculum is the Comprehensive Community Clerkship in Phase 2 or the 3rd year of the NOSM medical school training. This year is spent immersed in a rural community setting with primary exposure to family medicine and opportunities to explore other specialties. Students are placed in communities of Northern Ontario for an in-depth clinical experience. Concurrently, each student engages in group teaching sessions, virtual academic rounds (VARs) and distributed topic sessions (DTS). Students are also required to complete a reflective community based research project based during Phase 2.

Although the NOSM leadership seem pleased with the current structure of the curriculum they admit that curricula development for them is still dynamic and they are currently looking into ways to modify, adapt, and improve each phase.

Location of Clinical Experience

NOSM utilizes the resources in the northern areas of the province to provide a distributed learning environment for the students. During the first year, students spend three hours per week with interprofessional providers. NOSM works with over 200 organizations to expose their student to allied health professionals in various facilities including long term care, mental health organizations, and rehabilitation facilities. Faculty commented that career decisions have been made simply from these three hour weekly experiences.

At the end of the year one they spend four weeks in an Aboriginal community as described above. During this module students observe the traditional and western medical care available to the local population. The communities have a population of 200-2,000 on average. The western medical care is limited to a nursing station and occasionally a physician. The focus of the rotation is on cultural learning and not necessarily medical training. A student commented that this was a "phenomenal experience," they felt welcomed by the community, and their preconceived notions about Aboriginal communities were dispelled and replaced with a real-life context for the patient population. "For me, when I have a patient that comes in, I at least have an idea of where they are coming from" said a pre-clinical student.

During the second year the students participate in two modules of four week duration each in rural communities. These communities have a population of approximately 5,000 people and mostly have a family physician residing with the community. The medical care available is primarily outpatient. This provides the students with two in-depth clinical experiences much earlier than other medical schools.

The third year community placements are in slightly larger communities with available secondary and tertiary facilities. However, the students are mainly in an outpatient family medicine setting with 'bursts' of specialty exposure typically related to their outpatient experiences. Approximately 50% of their time is spent in the family practice setting and 50% is inpatient or with a specialist. This unique structure allows to students to have a solid understanding of the health care system in the region and the barriers to accessing care.

In order to maintain limited variation between sites, the school leadership has set core encounters and experiences that each student must complete during Phase 2. Each student has to log these experiences and they are tracked by the faculty. If a deficiency is seen, the curriculum has the flexibility built in to supplement with simulation time. In addition, all students are participating in on-line case-based modules and have access to an extensive digital library. The e-Learning component of the curriculum allows each student access to the same core materials and adequately prepares students for their examinations. Students pay a technology fee yearly that supports electronic devices used in their distributed clinical sites.

Tuition management

NOSM has established an innovative series of financing arrangements that help most medical students to complete their training without carrying a substantial debt burden. It is felt that a greater debt burden might discourage students from electing to practice in Northern Ontario after completion of their training.

Yearly tuition is approximately $18,000 per year. (All figures are in Canadian dollars.) In addition students have approximately $2,000 in books and fees. Thus the aggregate cost of four years of medical school will be approximately $80,000. While these figures seem low compared to many U.S. medical schools, they are actually somewhat higher than many Canadian medical schools.

In order to reduce the immediate financial burden of medical students, NOSM has established a "bursary" fund to provide aid to students. The bursary is supported by private donations which are matched by provincial funding for the purpose of supporting medical student education. There is a greater financial need for the NOSM students because of an average lower family income than other Canadian medical schools which is what drives the bursary program. In addition, the Province of Ontario provides some funding to support students on need-based criteria. The combination of these funding sources provides partial or complete aid to approximately 200 students per year, out of the approximately 250 students enrolled across the four years of school. In addition to these sources of direct financial aid during school, students have access to student loans that accrue interest at the established prime rate.

Once students have completed their training, those who select a rural area for their practice are eligible for additional funding from a "Rural Recruitment and Retention Initiative" established by the provincial government. This funding appears to be quite similar to the loan-repayment provided to U.S. primary care practitioners through the National Health Service Corps.

The end result of these financial aid programs appears to be the opportunity for most NOSM students to complete their medical training with little or no indebtedness. This is especially true for those electing to practice in remote rural areas and those practicing in Aboriginal communities. The aid programs appear to be quite successful in helping the school to fulfill its mandate of training students from Northern Ontario for practice in Northern Ontario.

Mentoring/role modeling

Mentoring at NOSM is facilitated through exposure to many physicians dedicated to improving the health of Northern Ontario. Almost all physicians practicing in Thunder Bay and Sudbury, as well as many northern communities are graduates of urban Canadian and primarily southern Ontario schools. These regions have more traditional schools in academic settings. Many chose to leave the urban/southern environment because they did not want to practice in a traditional setting and preferred rural community medicine. They therefore embrace many of the values that NOSM is hoping to impart to its students with regard to training generalist to serve the Northern Ontario population.

A majority of the preceptors of NOSM students are rural practitioners who truly enjoy rural practice. Eighty per cent of faculty are physicians and sixty percent of these are family physicians, again reinforcing the mission of the school. Faculty speak of "expanded" family medicine where students are shown the full spectrum of what family medicine can offer. They believe that they have reversed the attitude that is seen in many universities that family physicians do not know what they are doing. Although NOSM does not expect all students to enter family medicine or generalist specialties, they stress that the specialists who graduate from NOSM will be more socially accountable and more aware of the unique struggles of Aboriginal and northern populations.

NOSM has a faculty mentoring program where students are assigned to a specific advisor from the start of their education. In addition, each first year student is paired with a 2nd year "buddy" for peer mentoring. During every clinical rotation students go out in pairs and function as a team of learners allowing them to share their experiences and deepen their understanding of northern and community issues. Students are also encouraged to find mentors through their various practice and immersion experiences. Residents also serve as mentors to the students.

One of the most striking aspects of the NOSM model is how the mentoring goes beyond the faculty of the school and extends out to allied health care professionals and the patients themselves. While not said overtly, there appears to be a feeling that northern, Aboriginal and francophone health care was largely neglected or given only partial attention by the southern medical schools in Ontario. The pride of everyone involved in the NOSM effort is evident

throughout the system, particularly in the northwest, and serves to mentor the students in ways that other schools without such an overt message of social accountability can achieve.

Post-graduate engagement

The students are shown, and participate in a strong focus on quality of care as delivered through interprofessional teams. This focus serves as one of many influences that shape student career choice –both for generalism and for practice in smaller communities where interprofessional care is essential to the delivery of quality care. Exposure to telemedicine demonstrates to the students that they can practice high quality care even in the most remote communities.

Students are aware that the residency programs offered through NOSM are interested in recruiting students from Northern Ontario or those who want to stay in Northern Ontario. The education at NOSM, both in the undergraduate and graduate setting sends the strong message that the care that is provided by practitioners in these settings is the same as anywhere but of added value in that it takes into account social and geographic factors.

There is no "pecking order" of learners, and no sense of primary care residents being "lesser than" other residents in the system. Residents report that there is no hidden agenda and that the learning environment is relaxed and fosters excellent relationships between specialists and generalists.

The school has by and large avoided the dehumanizing effects of medical education because of who the faculty are and why they chose to be in this environment, the nature of the curriculum, and the distributed experiential model. In fact, the faculty postulate that they may have developed a model where empathy for the population increases because of the curriculum.

There is an opportunity for continuity of the educational milieu in that all residencies are offered by the schools so that students can continue to experience the special attention given to northern populations through their post-graduate experience. Generalism and community orientation are imbedded academic principles in both the undergraduate and graduate curriculum that provides a framework for the development, delivery, and evaluation of their programs. There is also an effort to recreate the comprehensive community clerkship model in the residency programs.

One of the most critical elements countering the "hidden curriculum" is the inherent belief that the people of Northern Ontario "own their medical school." Community involvement is a fundamental key to success. From Dr. Strasser's view, there is complete alignment between the overt and hidden curriculum. That is, the hidden curriculum influences the values that the school hopes are being imparted to the students around social accountability to northern and Aboriginal populations.

Challenges

NOSM's curriculum is heavily built on a distributed teaching model which requires a significant number of physician preceptors. Unfortunately, there is a lack of sufficient preceptors for the students. As mentioned above, many of the Northern Ontario community physicians decided to practice in the region to escape the large academic medical center tradition and style of practice. While a majority of physicians have embraced the mission of NOSM there are still several physicians who are not interested in an academic model. All new physician hires for the participating hospitals are required to accept a faculty positions. The leadership are committed to reducing barriers for community physicians to commit to teaching. Through NOSM's concerted efforts to engage the community they are slowly developing a culture of community teaching. Apart from a culture change there is also a general shortage of primary care physicians in the area. The current goal is to recruit their own graduates as practitioners and preceptors for the NOSM undergraduates. They estimate a need for 15-20 more family practice doctors in the surrounding area.

There does appear to be a stronger sense of alignment between mission, vision, NOSM and TBRHSC than there is with Health Sciences North (the new name for Sudbury Regional Hospital). While there is a stated message of support for NOSM and its curriculum, there are more questions about the model in Sudbury. For example, there were questions as to whether NOSM can produce the specialists that Health Sciences North wants to add to its staff. While the feeling in Thunder Bay was one of strong alignment and gratitude for NOSM being there, in Sudbury, the conversation was more about the nature of the fit between the aims of NOSM and the aims of Health Sciences North. However, even though more questions surfaced in Sudbury, the overall message was one of looking forward to a successful partnership.

There are opportunities for development within NOSM's pipeline programs. Many of the small rural communities have low graduation rates from high school and several barriers to achieving high academic success. During the site visit to Kapuskasing, only three local students attended college within the previous year. As NOSM develops its community outreach it may have a significant impact on the mentorship of these students to improve the graduation rates and encourage higher education. The site visit team encouraged NOSM leadership to consider the socioeconomic component of diversity and structure pipeline programs to indentify students that have a socioeconomic disadvantage. Suggestions for admissions of students with these educational barriers included accepting a graduated GPA evaluation throughout college, conditional admissions programs, and preference for students who are the first in their family to attend college.

Conclusion

Northern Ontario School of Medicine is fulfilling the social accountability mandate by actively engaging their community partners, accepting students that reflect the local population, and providing curriculum and clinical experiences to encourage careers within Northern Ontario. The coordination of their efforts both within the institution and the community is remarkable and a transferable model to other communities. They have demonstrated a novel approach to the social mission of medical education.

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