NORTHERN ONTARIO SCHOOL OF MEDICINE

NOVEMBER 2014

NORTHERN HEALTH RESEARCH

THE SCOPE

INAUGURAL EDITION

Northern Ontario School of Medicine
École de médecine du Nord de l'Ontario
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Knee Surgery Rehabilitation

Research Support Group

Dementia Care Research in Northern Ontario

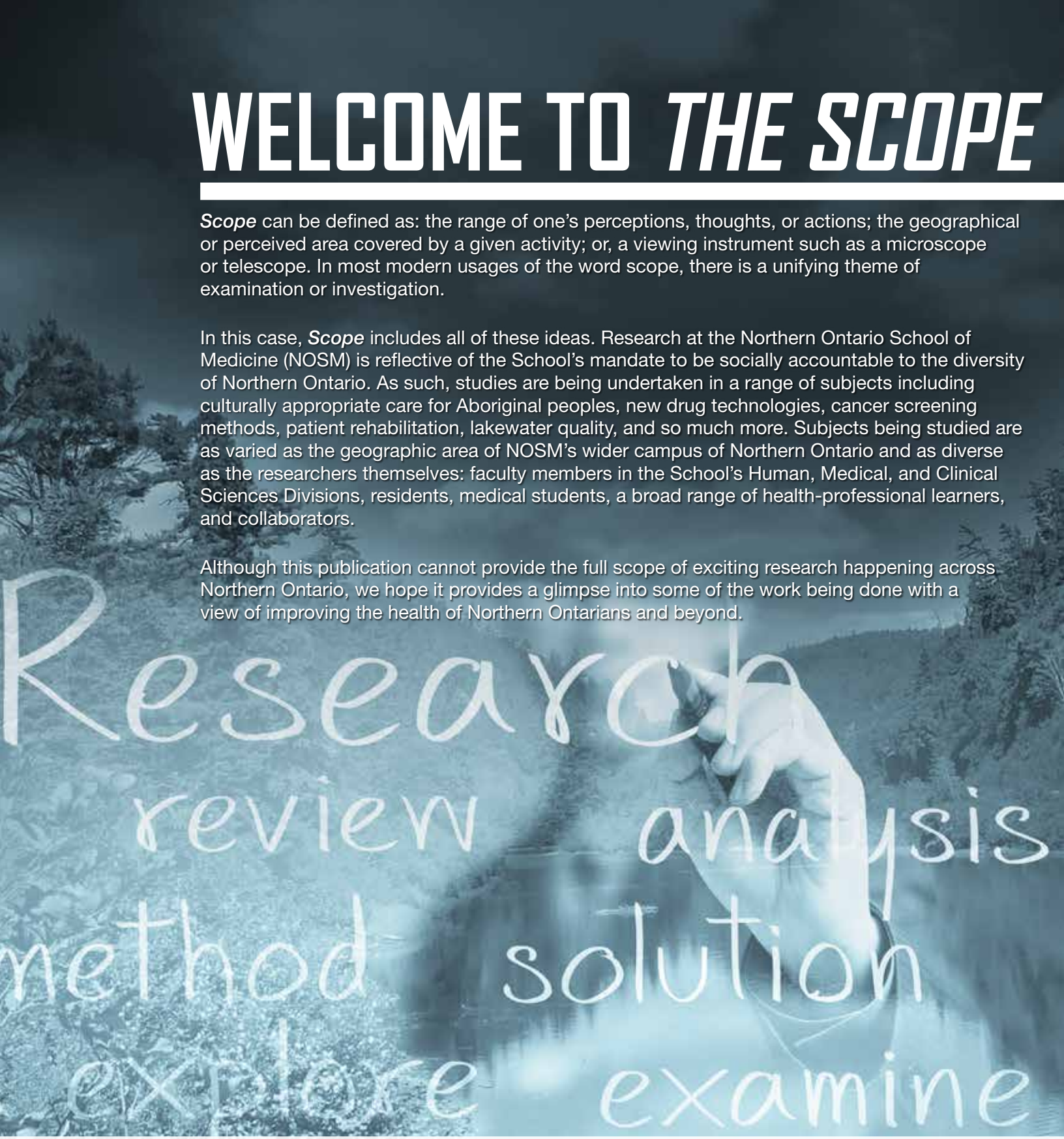
Taking a Closer Look at Medical Education

WELCOME TO *THE SCOPE*

Scope can be defined as: the range of one's perceptions, thoughts, or actions; the geographical or perceived area covered by a given activity; or, a viewing instrument such as a microscope or telescope. In most modern usages of the word scope, there is a unifying theme of examination or investigation.

In this case, ***Scope*** includes all of these ideas. Research at the Northern Ontario School of Medicine (NOSM) is reflective of the School's mandate to be socially accountable to the diversity of Northern Ontario. As such, studies are being undertaken in a range of subjects including culturally appropriate care for Aboriginal peoples, new drug technologies, cancer screening methods, patient rehabilitation, lakewater quality, and so much more. Subjects being studied are as varied as the geographic area of NOSM's wider campus of Northern Ontario and as diverse as the researchers themselves: faculty members in the School's Human, Medical, and Clinical Sciences Divisions, residents, medical students, a broad range of health-professional learners, and collaborators.

Although this publication cannot provide the full scope of exciting research happening across Northern Ontario, we hope it provides a glimpse into some of the work being done with a view of improving the health of Northern Ontarians and beyond.



The Scope Research Newsletter of the Northern Ontario School of Medicine

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Feedback

We welcome feedback and suggestions about *The Scope*. NOSM is a school for all individuals and communities of Northern Ontario. What stories would you like to read about? Send ideas to **communications@nosm.ca**.

The Scope is published bi-annually.

WELCOME TO *THE SCOPE*


Dr. Penny Moody-Corbett

I am delighted, as the new Associate Dean of Research at the Northern Ontario School of Medicine, to welcome you to the first edition of *The Scope*. A bi-annual publication, *The Scope* aims to highlight the varied research being undertaken at the School.

Research is near and dear to my heart. I have been impressed by the interest and engagement of the NOSM's Human, Medical, and Clinical Sciences divisions in research, particularly research supporting the social accountability mandate of the School. I have also been impressed with the number of collaborative research activities that exist at NOSM with colleagues within the School, the community, and at both a national and international level. I believe research is critically important in our world, and it is essential to ask questions and seek answers to challenging problems from many perspectives, and at many different levels. It is a pleasure for me to see that my NOSM colleagues also support collaboration.

My own background in research combines several areas. In my early career, I pursued research in neuroscience looking at developmental expression of electrical excitability using a number of approaches from electrophysiology to molecular biology. I also have a strong interest in the relationship between exercise and health and, more recently, have been involved in studies looking at the relationship between healthy lifestyles and dementia. As the past Associate Dean of Research and Graduate Studies at Memorial University of Newfoundland, I was responsible for research ethics oversight. Over the years, I have participated in local, national, and international activities related to the research ethics review process.

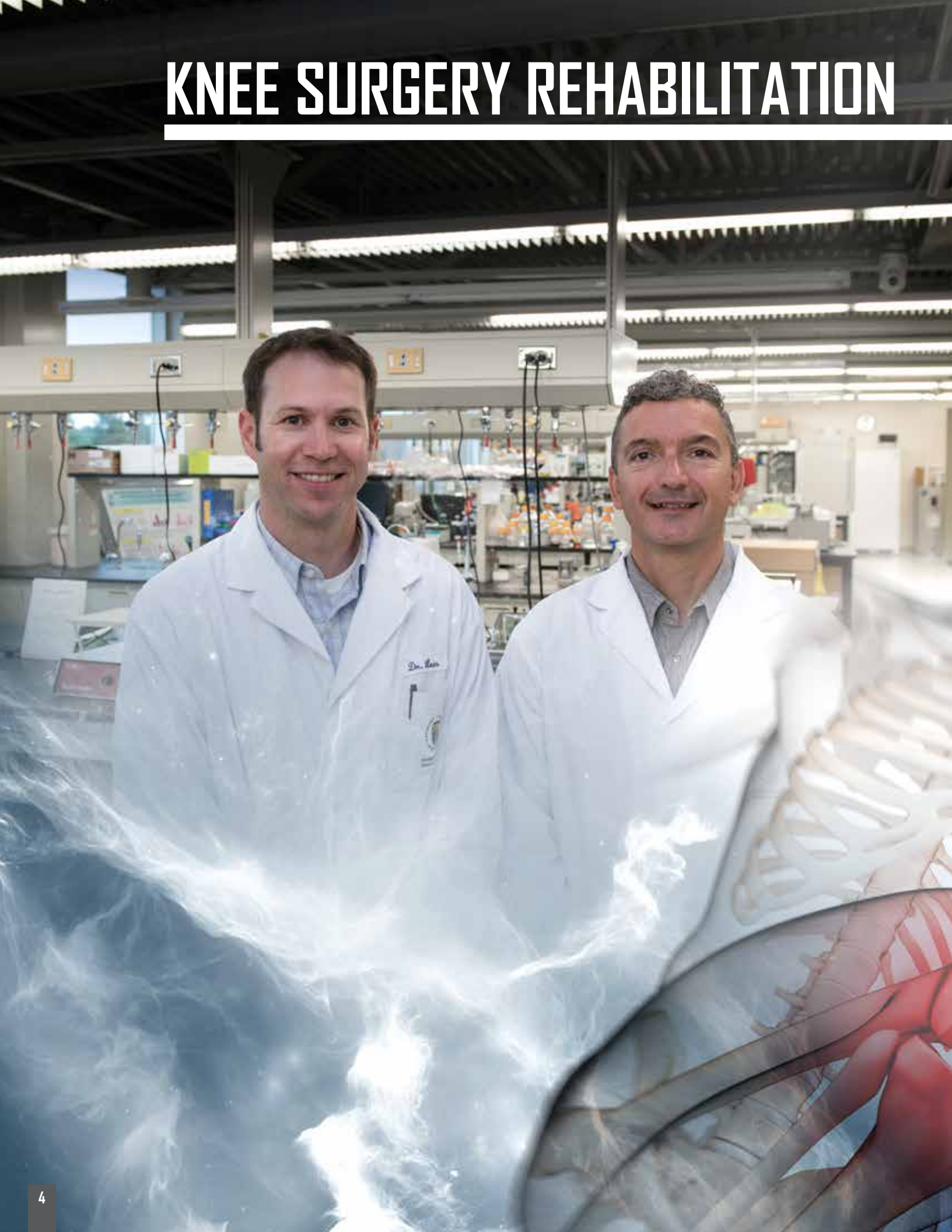
As a faculty member at NOSM, I look forward to working with all of you. As NOSM's Associate Dean of Research, I hope that I am able to facilitate research in our School. As I do, I hope you look forward to reading about the important research activities of our faculty, staff, and learners in this and future issues of *The Scope*.

ABOUT DR. PENNY MOODY-CORBETT

Dr. Penny Moody-Corbett gained extensive experience in health and health research during her 11-year post as Associate Dean of Research and Graduate Studies for the Faculty of Medicine at Memorial University of Newfoundland, as well as during her time as a senior member of the Canadian Institutes of Health Research (CIHR). While at Memorial, she also served as a member of the senior executive team providing advice and guidance to the Dean and faculty on research opportunities, as well as graduate training. She was a member and chair of numerous committees and was involved in a number of large grant opportunities, including successful Canadian Foundation for Innovation (CFI) and Genome Canada grants, which led to a new multimillion-dollar genetics research and teaching facility at Memorial.

As an independent investigator, Moody-Corbett studied electrical properties in nerve and muscle. She continues neuroscience research through collaborative work, studying the influence of diet and exercise on cognitive function during aging, and has expanded her scholarly interests in the fields of ethics, health policy, and patient-oriented research. Moody-Corbett has a number of publications in biomedical science, ethics, education, and health research programming. She has taught at the undergraduate and graduate level in physiology, neuroscience, research integrity, and grantsmanship.

KNEE SURGERY REHABILITATION



Dr. Simon Lees

Dr. Paolo Sanzo

The combination of an increasing aging population, a higher rate of osteoarthritis, and higher rates of obesity has resulted in an increased incidence of total knee arthroplasty (TKA), known commonly as total knee replacements.

Drs. Kurt Droll, David Puskas, Paolo Sanzo, and Simon Lees are collaborating on a study following rehabilitation programs of patients coming from Big Thunder Orthopedics and the Thunder Bay Regional Health Sciences Centre following TKA surgery.

In the United States, TKA rates have nearly doubled since 2000. The goals of TKA surgery are to provide pain relief, improve range of motion, and increase functional abilities. However, following this surgery, there is a possibility of negative and adverse events; therefore, post-operative rehabilitation must be maximized to reduce this risk. Rehabilitation often includes active and passive exercises and therapeutic modalities to reduce pain and improve joint function. Along with exercise, other factors that may affect the outcome of surgery include psychological variables, self-motivation and compliance, the presence of comorbidities, gender, and age. It is therefore imperative to find the optimal combination of treatments and exercise to restore functional abilities, minimize post-operative adverse events, increase self-motivation, assist with cost control, and ensure patient compliance and satisfaction.

This study will use an innovative and newly developed active-assisted cycle ergometer called the Viscus V1.5, developed by Andre Riopel, Physiotherapist and Clinic Director at Back in Motion Physiotherapy in Sault Ste. Marie. Though Riopel is not part of the research team, he has agreed to loan the research team several Viscus units for patient use.

The researchers believe the use of the Viscus will improve patient rehabilitation through decreasing the risk of adverse events and increasing self-motivation and compliance following surgery. Use of the Viscus will be integrated into the rehabilitation programs of patients following surgery. Multiple measures will then be collected, which will indicate patient compliance, motivation, and functional status of the knee, as well as blood samples to examine markers for rehabilitative success.

Funded by the Northern Ontario Academic Medicine Association (NOAMA) through the Clinical Innovation Opportunities Fund, the research team is currently in the process of completing research and ethics review. Recruitment to the study is set to begin in early 2015.

The research team consists of: Dr. Paolo Sanzo, NOSM Assistant Professor, Clinical Sciences, Assistant Professor, School of Kinesiology at Lakehead University, and Physiotherapist (opposite page, right); Dr. Simon Lees, NOSM Associate Professor, Medical Sciences (opposite page, left); Dr. Kurt Droll, NOSM Assistant Professor, Clinical Sciences and Big Thunder Orthopedics; and, Dr. David Puskas, NOSM Associate Professor, Clinical Sciences and Big Thunder Orthopedics.

RESEARCH SUPPORT GROUP

The Research Support Group at NOSM is available to assist all faculty, staff, students, and residents as they embark on new research endeavours, create new projects and teams, and aspire to conduct research from the North, and by the North. In keeping with NOSM's tradition of a distributed, community-engaged model of medical education and research, the Research Support Group is available to all faculty, wherever they live and work.

WHAT CAN THE RESEARCH SUPPORT GROUP DO FOR YOU?

Research Support

The Research Support Group can assist faculty, learners, residents, and staff as they embark on research endeavours. The Research Support Group is committed to ensuring that all researchers have access to the guidance they need to be successful.

Research Ethics Board

The Research Support Group can assist researchers with the ethics process, help select the appropriate Research Ethics Board (REB) to which to apply, troubleshoot major issues, and inform users about Lakehead University, Laurentian University, and hospital boards and forms. Faculty can receive guidance from the Research Support Group with respect to the newest Tri Council Policy Statement on research (TCPS) and implications for REBs, informed consent, research with Aboriginal peoples, conflict of interest assistance, and more.

Human Resources

Most research programs require the hiring of additional personnel. The Research Support Group can assist with this process by informing and providing researchers with the various internal and Lakehead University and Laurentian University forms. In addition, assistance can be provided with room bookings, interview questions, and policies for hiring at NOSM and at the School's host institutions.

Grant Procurement

The Research Support Group can assist in the general grant writing process, help write budgets, assist with literature searches, inform timelines, and identify appropriate granting agencies to which to apply. They can guide researchers through the internal process for applying for grants, and can also link faculty to Lakehead University and Laurentian University resources that can also help with finding grants and the process for applying at either host university.

End-of-Grant Reports

Most grants require mid-year and year-end reports. The Research Support Group can assist faculty by proofing written reports for compliance, ensuring that budget is accurate, and any other important information that may need to come from the institution.

Linking Researchers and Learners to Projects and other Researchers

As NOSM continues to grow, the Research Support Group is available to assist faculty, staff, residents, and learners who are interested in collaborating. The Research Support Group keeps accurate information on current projects, researchers, and their interests in order to match potential collaborations.

NOSM's Research Support Group is committed to growing research at the School. For more information, please contact **researchsupport@nosm.ca**.

Dr. Joe Eibl, NOSM Researcher, photographs waterways near St. Charles, Ontario to screen lakes for presence of blue-green algae.

PHOTOGRAPHY AND GENETIC SEQUENCING JOIN FORCES

One of the many allures of Northern Ontario is the abundant access to fresh water lakes, which often provide a source for recreation, exercise, leisure, and sometimes drinking water for camps and cottages. Sadly, many Northern Ontarians face the closure of their waterways during the summer months due to the presence of blue-green algae, a toxic bacteria which poses significant health risk to those who come in contact with it.

Currently, the Ministry of Health tests waterways in Northern Ontario to identify lakes affected by blue-green algae. The current process leaves a one- to two-week period between the time the water is sampled and the time the public is notified of a potential algae bloom in their area. NOSM researcher Dr. Joe Eibl and his colleague Gerry Dignard, CEO of Canadian Shield Consultants, are working on a new, faster method of identifying potentially harmful blue-green algae.

First, Eibl and Dignard are piloting a system that suggests that blue-green algae can be identified photographically. By repurposing technology from the resource industry, Eibl and his colleagues were able to take aerial photos of the lakes in Northern Ontario, and visualize pigments of chlorophyll in the blue-green algae to identify at-risk areas very quickly. In addition, Eibl and Dignard are using genetic sequencing to identify exact strains of algae present in a specific waterway.

"It's all about water security," says Eibl. "The goal of the project is to be able to identify the algae early to determine potential danger. We want to be able to say, 'Yes, this is blue-green algae. It's worth being cautious,' or 'No, this is green algae. It's not harmful in any capacity'."

With the advances in genetic sequencing, Eibl and Dignard are now able to detect which species are present in the water, identify the relative abundance of the species in the waterway, and integrate this information with the imaging data that they collect aerially. All of this data provides clarity about where the concentration of algae is the strongest, and will reduce the turn-around time for identifying waterways with blue-green algae down to a single day.

"The work still ahead of us is to come up with a technology or strategy to identify areas of concern at the early stage, when the nutrients are starting to grow–before the algae really blooms," explains Dignard. "Once we can identify potential areas of concern before they become a problem, then we can work towards solving the problem itself."

NOSM RESEARCHER PARTICIPATING IN $55.5M NATIONAL DEMENTIA INITIATIVE

On Wednesday, September 10, 2014, the Honourable Rona Ambrose, Federal Minister of Health, announced the launch of the Canadian Consortium on Neurodegeneration in Aging (CCNA), a national initiative aimed at tackling the growing onset of dementia and related illnesses and improving the lives of Canadians with these illnesses and their families and caregivers.

Led by Dr. Howard Chertkow, a cognitive neurologist and co-founder and director of the Jewish General Hospital / McGill Memory Clinic, the CCNA brings together 20 research teams and experts from across Canada to focus research on three themes: delaying the onset of dementia and related illnesses; preventing these illnesses from occurring; and, improving the quality of life of Canadians living with these illnesses and their caregivers.

The CCNA will receive $31.5 million over five years from the Government of Canada through the Canadian Institutes of Health Research (CIHR) and a group of 13 partners from the public and private sectors, including the Alzheimer Society of Canada and Fonds de recherche du Québec–Santé. The CCNA researchers will also benefit from an additional $24 million investment by a subset of the partners in Ontario and Quebec.

Dr. Kristen Jacklin, NOSM Associate Professor, Medical Anthropology

DEMENTIA CARE RESEARCH IN NORTHERN ONTARIO

Dr. Kristen Jacklin, NOSM Associate Professor, Medical Anthropology, is one of 47 principal investigators on the CCNA and the only principal investigator in Northern Ontario. Jacklin is co-leading a research team called *Team 20: Issues in dementia care for rural and Indigenous populations.* Dr. Debra Morgan (University of Saskatchewan) is leading the rural research projects while Jacklin and Dr. Carrie Bourassa (First Nations University) are leading the Indigenous research stream.

Jacklin's team will receive $1 million in funding over five years to conduct this research. The research will be carried out at NOSM, Laurentian University, and in Northern Ontario, and will focus on four areas:

- Examining pathways to dementia care for Indigenous people and identifying effective cultural approaches to care.
- The development of culturally appropriate cognitive assessment protocols for use in Aboriginal communities.
- Capacity building for age-related Indigenous dementia research.
- Regional epidemiological studies concerning dementia in rural and Indigenous populations (incidence and prevalence, patterns of care, and multi-morbidities).

"Our team is truly excited about the launch of the CCNA," says Jacklin. "I think it is highly significant that Indigenous issues will be a part of the Consortium's work and that there is a team headquartered here at NOSM and the Centre for Rural and Northern Health Research at Laurentian University leading this work."

Over the past four years, Jacklin's team has worked in partnership with rural First Nations communities and urban Aboriginal organizations in Northern Ontario to begin exploring experiences with dementia. The CCNA will enable Jacklin and her team to foster cross-fertilization of ideas between research disciplines to support their research program and to develop innovative projects with other CCNA investigators.

"Initially, we will be working closely with the First Nations health centres on Manitoulin Island who were the first to bring the issue of dementia in their communities to our attention back in 2007," explained Jacklin. "Our funding is structured in such a way that there will be opportunities to involve other communities and organizations as we move forward. Addressing dementia in Indigenous populations is crucial. Ten years ago, dementia was not a significant illness in most Aboriginal communities. Through our research, we now know that rates of dementia in Aboriginal populations are higher than those in the non-Indigenous population and communities are struggling to deal with this emerging health issue."

MEDICAL STUDENTS RECEIVE RESEARCH AWARDS TOTALING $78,000

This past summer, the Northern Ontario School of Medicine awarded 11 medical students with NOSM Dean's Summer Medical Student Research Awards, valued at $6,000 each. This is the ninth year that NOSM has awarded this grant to qualifying MD students. In addition, the Heart and Stroke Foundation (HSF) and the Toronto-Dominion Bank (TD) provided an award of $12,000 to one second-year NOSM medical student.

Heart and Stroke Foundation Award

TD has committed to supporting HSF's established partnership with NOSM by funding a research award for eight four-month summer studentships over the next three years. Second-year NOSM medical students who participated in the School's Integrated Community Experience in their first year of the MD program can apply for this award.

To be eligible to receive the award, applicants must be working on a research project under the supervision of a NOSM faculty member and have the support of the community leadership in the rural and/or Aboriginal community within which the applicant's placement will be situated. Additionally, the potential to address factors related to cardiovascular or cerebrovascular health will determine award recipients.

Second-year NOSM medical student Zsolt Toth has received an award of $12,000 for his project entitled *Childhood obesity and overweight rates in M'Chigeeng First Nation: Five-year trend comparison to ICES or CIHI data*. Toth will be supervised by Dr. Sheldon Tobe, Heart & Stroke Foundation Chair in Aboriginal and Rural Health.

Ryan Weist
Second-year NOSM
Medical Student

Jazmyn Balfour-Boehm
Second-year NOSM
Medical Student

NOSM Dean's Summer Medical Student Research Awards

The following projects, carried out with NOSM researchers across Northern Ontario, allow the School's medical students to conduct hands-on research on a broad range of topics:

- Award recipient Jazmyn Balfour-Boehm is investigating *Narcotic Use in Pregnancy* under the supervision of Dr. Len Kelly.
- The project *Pseudoexfoliation Glaucoma Risk Assessment in Northern Ontario Through 'Clinical-Genetic' Screening* is being undertaken by Daenis Camire and supervised by Dr. Sanjoy Gupta.
- Pamela Chenard is undertaking a project titled *A comparison of Doxorubicin and Doxorubicinol in rat heart and liver tissue following anthracycline administration* under the guidance of Dr. David MacLean.
- *Biological and Systemic Effects of Iron Overload* is being studied by John Coccimiglio and supervised by Dr. Zacharias Suntres.
- Award recipient Daniel Dalcin is undertaking a project supervised by Dr. S. Zaki Ahmed titled *Investigation of blastomycosis septic shock in Northwestern Ontario*.
- *Evaluating Student-Led Interprofessional Education* will be undertaken by Daphne Haggarty and supervised by Dr. Ian Newhouse.
- Kelly Lewis is researching *The Incidence and Implications of Mental Illness in University Students* under the guidance of Dr. Elizabeth Levin.
- A project titled *Autophagy signaling in doxorubicin induced cardiotoxicity* is being studied by George McKay with Dr. Neelam Khaper as a supervisor.
- Award recipient Meagan Roy is studying *The Three Ds: Understanding the Concurrence of Diabetes, Dementia, and Depression in an Aboriginal Patient Population* with the support of supervisor Dr. Kristen Jacklin.
- *Providing sensitive and competent health care for LGBTQ patients in Northern Ontario* is the subject of Joelle Thorgrimson's research under the supervision of Dr. Stacey Ritz.
- Ryan Weist is undertaking a project titled *A prospective chart review study of patients with back pain receiving "Endoskopia" a conservative spinal therapy treatment at the Alfen Spinal Clinic in Wurzburg, Germany* with the supervision of Dr. Marion Maar.

TAKING A CLOSER LOOK AT MEDICAL EDUCATION

Dr. Rachel Ellaway, NOSM Assistant Dean Curriculum and Planning and Associate Professor, considers herself to be a generalist in her approach to researching medical education. “There are many challenges understanding what we do at the Northern Ontario School of Medicine and with medical education across Northern Ontario. I am actively involved in medical education research locally and around the globe,” explains Ellaway.

One of Ellaway’s projects explored the learning experience of medical students with and without a background in biomedical sciences. Traditionally, medical schools admit students with strong backgrounds in sciences. Research has shown that students with backgrounds in the social sciences can be as successful in medical school as those with backgrounds in biomedical sciences, yet the experience of being a ‘non-science’ student had not been studied.

Initiated by, and working with, a group of NOSM learners, Ellaway’s team concluded that there were clear differences between the experiences and performance of science and non-science students. Students’ self-reported sense of preparedness and stress levels, and marked differences in their examination performance, diminished over time. By the third year of study, the differences in exam performance fell below statistical significance and the non-science learners did not appear to be disadvantaged. These findings have implications for how each group of students should be supported, and how curricula can be configured to afford quality learning for all medical students.

How medical students at NOSM use mobile devices has been another area of interest for Ellaway. Although many medical students and teachers around the world are using mobile technologies within medical education, there has been little evidence presented describing how they use them across a program of study. Using a combination of quantitative and qualitative methods, Ellaway’s team identified a series of themes that synthesized student behaviors, perceptions, and attitudes. The expectation that school-issued devices would be regularly and enthusiastically used to replace more traditional study media was not reflected in practice.

Ellaway’s commitment to generalism in medical education research is reflected in her ongoing work in exploring medical education informatics, technology-enabled learning, instructional and learning design, sociology and cultures of medical education, hidden curriculum, simulation, virtual and augmented reality, quality improvement, and educational scholarship. The large-scale systematic review she has led CEMESTR, which stands for Community Engaged Medical Education: Systematic Thematic Reviews) is of particular interest to the NOSM community as it explored how the relationships between communities and medical education programs has been explored and represented in the literature. Ellaway will be presenting the findings from this review in a keynote address at Muster 2014: The Global, Community-Engaged Medical Education Conference in October 2014.

Dr. Rachel Ellaway, NOSM Assistant Dean of Curriculum and Planning, and Associate Professor

JUST LIKE HEATWAVES

Inaugural Visiting Scholar Discusses Cognitive Illusions in Medicine

Dr. Donald Redelmeier

This June, NOSM celebrated the inaugural PSI Foundation Visiting Clinical Scholar Award. The recipient of the award, Dr. Donald Redelmeier, visited NOSM to share his research with NOSM faculty and learners across the North. One of the foci of his presence in the North was to discuss his research in medical decision-making.

During educational sessions videoconferenced across the North via NOSM's Continuing Education and Professional Development office, Redelmeier spoke with NOSM faculty and learners about the field of cognitive psychology, which is a science that can provide insight into why physicians misdiagnose. Using a misdiagnosed case of his own as an example, Redelmeier discussed five pitfalls in reasoning—such as the availability heuristic, and the anchoring heuristic—that can lead physicians astray when assessing a patient.

"Our minds, like our eyes, are not perfect," Redelmeier said. "It's the same with visual illusions. You know when you're driving on a highway on a hot summer's day, it looks like there's water on the pavement. No matter how many times you drive up and down that highway, you can't help but see the water. But if you react in accordance with that and slam on your brakes, you'll get yourself in a whole host of problems. That is the issue of cognitive illusions. In medicine, we can look at similar insight about how our own mind can be fooled."

"We are so very happy to welcome Dr. Redelmeier to the North, our very first visiting clinical scientist," said Dr. David MacLean, NOSM Assistant Dean of Research. "We are so pleased to have such a high-profile guest join us in Northern Ontario, who can share his expertise in medical decision science."

The first of many visiting scholars to come, Redelmeier also gave a keynote address at the Northern Health Research Conference (NHRC) in Sioux Lookout on June 7, 2014. Redelmeier's address, titled *Pregnancy and the Risk of a Traffic Crash*, provided a lively debate about the physician's role in road safety, informed by new scientific data on the topic.

Dr. Len Kelly, Family Physician and NOSM Professor of Family Medicine

"Whatever is of clinical importance to our communities, patients, and clinicians ends up coming to the foreground, and that's what we investigate."

PUTTING RESEARCH INTO HIS PRACTICE

Research at the Northern Ontario School of Medicine is guided by the School's social accountability mandate to influence the health of the people and communities of Northern Ontario. Dr. Len Kelly, NOSM Professor of Family Medicine, is quite literally putting this into his practice. He has spent over twenty years conducting community-based research by investigating topics that are relevant to the people of Sioux Lookout, and the 31 Northern communities to which Sioux Lookout provides health services.

"Being a generalist, the topics change as the years do," explains Kelly. "Whatever is of clinical importance to our communities, patients, and clinicians ends up coming to the foreground, and that's what we investigate."

Over the past six years, Kelly has been working with some of his colleagues in the Sioux Lookout Obstetrics Program, Drs. Joseph Dooley, Irwin Antone, and Lianne Gerber Finn to investigate narcotic use and treatment in pregnancy, including substitution opioid therapy. Their research has benefitted from funding from the Northern Ontario Academic Medical Association's (NOAMA) Clinical Innovation Opportunities Fund.

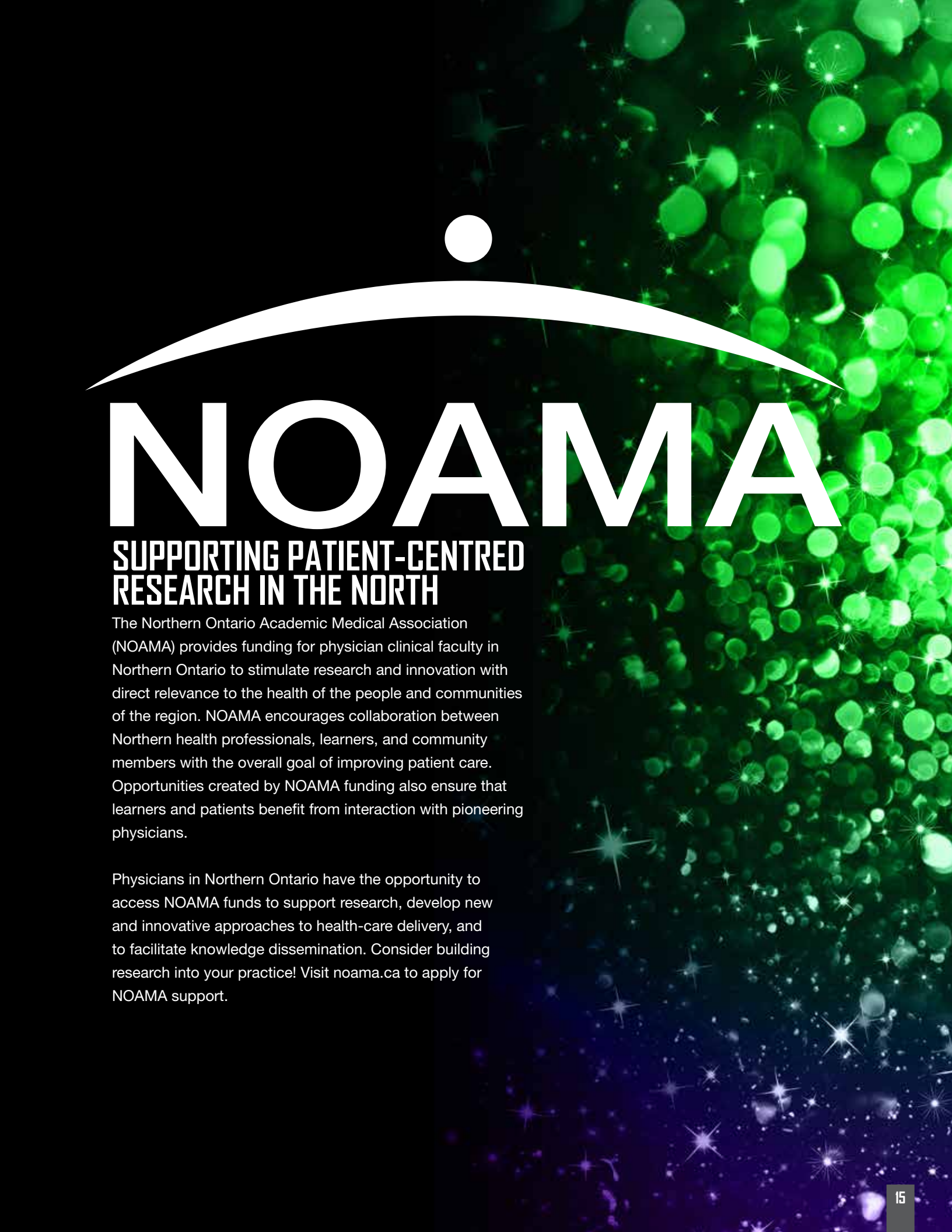
"Sioux Lookout is one of the leading research communities on narcotic use in pregnancy in Canada," says Kelly. "We've seen quite a surge of narcotic use in our region, so we have an ongoing series of studies on narcotic use in pregnancy, which looks at treatment in the hospital setting, the pre-natal program, and subsequent return to their home community."

Communities and physicians across the far North are developing treatment programs to address the high rates of narcotic abuse. Kelly and his colleagues are working with these groups to ensure that new mothers receive the care that they need when they return home after delivering their babies in Sioux Lookout. These researchers are putting the final touches on this research for submission to peer-reviewed journals in the near future.

Although all of his studies are developed with the patients in mind, Kelly finds that they are not the only group in his community who find value in community-based research. "Sioux Lookout has a tradition now of employing university students in the summer for data collection and research work," Kelly explains. "The local community has benefitted from the research here. Over the past decade, we've had many of our research interns go on to careers in pharmacy, medicine, and law."

Even with the extra support of students during the summer, Kelly admits that it can still be challenging to find time for scholarly pursuits in addition to his busy clinical schedule. Fortunately, he finds that the outcome is well worth the effort.

"Most rural physicians are curious by nature, so research is a natural avenue to explore the interplay of people's families, communities, and their health in our region," says Kelly. "It's interesting work, but most importantly, very rewarding."



SUPPORTING PATIENT-CENTRED RESEARCH IN THE NORTH

The Northern Ontario Academic Medical Association (NOAMA) provides funding for physician clinical faculty in Northern Ontario to stimulate research and innovation with direct relevance to the health of the people and communities of the region. NOAMA encourages collaboration between Northern health professionals, learners, and community members with the overall goal of improving patient care. Opportunities created by NOAMA funding also ensure that learners and patients benefit from interaction with pioneering physicians.

Physicians in Northern Ontario have the opportunity to access NOAMA funds to support research, develop new and innovative approaches to health-care delivery, and to facilitate knowledge dissemination. Consider building research into your practice! Visit noama.ca to apply for NOAMA support.

IN FOCUS

NOSM'S NEW ASSOCIATE DEAN OF UME

This summer, the Northern Ontario School of Medicine welcomed Dr. David Musson as the new Associate Dean of Undergraduate Medical Education. Originally from Onaping, Ontario, Musson has much to offer his role of Associate Dean of Undergraduate Medical Education as a result of his experiences as a physician, a flight surgeon with the Canadian Armed Forces, and PhD studies in Psychology.

In this edition of ***The Scope***, we put Dr. David Musson 'in focus' to learn more about his experience as a researcher, and to hear about how this training might impact his role as Associate Dean at NOSM.

In addition to being a clinician, you have quite a history with research. Tell us about your areas of research focus.

I would describe myself in part as an organizational psychologist, with a focus on teams and human factors. My PhD is in social psychology, which I received quite some time after my MD.

In graduate school, I focused on personality assessment with a focus on high-performance teams, including pilots, physicians, and astronauts. My thesis looked at the NASA selection process and how it whittles down the pool of candidates–in a way that you may or may not want. We looked at some of the realities that occur when you apply an administrative process to candidate selection.

In addition, my thesis investigated team-based elements, to discover how people work together, and how this should influence the admission process. We did a number of observational studies in cockpits, looking at crew behavior. We also surveyed hospitals on physician attitude, and attitudes towards patient safety, team dynamics, and leadership to assess how these elements affect the way people work together.

Teams and team work seem to be a common theme in your areas of research interests. What is compelling to you about teamwork?

In general, I'm interested in human performance. Having spent time working in medicine, in the Air Force, and working with NASA, you see people make mistakes, you see teams go poorly, and as a result, you sometimes see people die. My interest in teams is not for a pure love of teams, but rather, because teams are an operationally relevant construct.

We understand you've also done a fair bit of work with simulation in medical education. Tell us about some of these projects.

While working at McMaster University as the Director of the Centre for Simulation-Based Learning, we ran a series of studies looking at our ability to use simulation in remote, extreme, and unusual environments. This work was largely funded by the Canadian Space Agency. The CSA wanted to know how to keep people safe when they go into space, and how to provide medical care during space flight. But at the same time, they knew that there are environments on Earth that mimic conditions in space, in that they are remote, extreme, or unusual

environments. We sometimes refer to these as space analog environments. The space agency knew that our findings for safe space flight could also help identify best practices for providing medical care to similar environments on Earth.

To explore these concepts, we went to the arctic on two occasions, and also travelled to Hawaii to conduct work at high altitude research station. We looked at the ways simulation can serve as a training tool in remote, extreme, or isolated environments, as well as how simulation can serve as a way to assess medical response capabilities in these areas.

Your research projects have benefitted from fairly substantial funding, including from the space agency. What sort of advice would you give to faculty who are interested in applying for grants?

In my experience, it is easier to obtain funding for a research project that seeks to find a solution to a known or stated problem. Letters of support come much more naturally, and research dollars free up a little bit easier. This is where NOSM's social accountability model is such a great fit, especially in the research world. NOSM was built to help solve health problems that people are facing in the North. Our faculty are very well positioned to conduct research that answers questions of importance to Northern Ontarians.

Do you feel that your experience as a researcher and the knowledge you have gained through your research will influence your role as Associate Dean at NOSM?

I think one of the ways this will happen is as a result of the research that I've been involved with that investigated distributed simulation as a tool to assess isolated and remote health-care delivery, and a tool to train providers in isolated areas. I suspect this research will probably have a major, informing role on how we at NOSM develop our educational capacity moving forward.

Second, the research work that I did with teams has a direct impact on patient safety, which is also going to impact how we develop curriculum at NOSM. NOSM-trained physicians need to know how to work in systems, and work well in teams. I'd like our doctors to land in an emergency room somewhere and immediately become an asset to that hospital. Lots of things go into making a good doctor or providing good treatment, and being able to function in a team is one of those things. That background and familiarity with the field of high performance teams will hopefully down percolate into how we teach medical students to function in complex clinical settings.

Lastly, I think it is helpful that I come to this role with both a clinical and a research background. As a result, I embrace research in general and medical education research specifically, and I want to see evaluation numbers for any new program. I want to see an evaluation strategy everywhere. And I believe that this is a researcher's perspective, perhaps more than a practitioner's perspective. I think I bring a bit of a research philosophy to the role, and I look forward to doing research as part of our day-to-day business.

MUSING ABOUT MEWS

NOSM-Trained General Surgeon Investigates Hospital Mortality Rates

Early detection of illness has been increasingly linked with patient outcomes. According to predominant international research, there is also a suggestion that transferring patients to ICU wards sooner can improve patient outcomes. This topic certainly piqued the interest of Dr. Alisha Tessier, alumnae of NOSM's general surgery residency program.

"Currently, patients are transferred into the ICU when any member of the allied health team notices that a patient is deteriorating, or requiring further supervision, which we think has been very positive so far," says Tessier. "But one of the theories about how to reduce ICU mortality rates is by identifying patients earlier in the course of their illness. The second theorized way to improve the odds is by adding something automatic to the system, an indicator that can identify a patient's need for the ICU just by identifying a changing number."

Tessier and her colleagues—Dr. S. Zaki Ahmed (NOSM Associate Professor), Dr. Michael Niebergall (NOSM Co-Chief Resident), and Dr. Ben Wykes (NOSM General Surgery Resident), along with medical students Rosie Bava and Julie Mongeau—conducted a retrospective chart review at Thunder Bay Regional Health Sciences Centre (TBRHSC) to see what they could do to improve hospital mortality rates using the Medical Emergency Team (MET) at the TBRHSC. Their hope was that by identifying trends, they could implement preventative measures that would lead to better patient outcomes.

"While doing our retrospective chart review, we applied what's called the Modified Early Warning Score, abbreviated to MEWS, which was developed in the United Kingdom," explains Tessier. "In the UK, they found that implementing the MEWS algorithm lead to much earlier rates of identification of patients who needed to be transferred to the ICU. After applying the scoring system

Dr. Alisha Tessier, Dr. Michael Niebergall, and Dr. S. Zaki Ahmed at Thunder Bay Regional Health Sciences Centre

to the retroactive charts that we were reviewing at TBRHSC, we saw that if we had been using the MEWS scoring system, some patients would have been transferred to the ICU up to two days earlier."

Tessier and her colleagues felt that this information suggested that there may be benefit to implementing MEWS at TBRHSC. They then implemented a prospective trial, wherein MEWS was added to the electronic medical record (EMR) systems already utilized at the hospital. Tessier and her colleagues worked with the IT department to implement the MEWS algorithm into all patient charts across the hospital. The EMR then pulls chart data to report the MEWS score to the allied health-care team in real-time.

"Any time you can visually see changes in numbers, it's helpful," says Tessier. "You're not looking for small changes–say from 126 to 128. You're looking for sweeping change, say down to single digits. Providing a numbered system makes it much easier to spot a trend, and allows hospital staff to say 'Okay, the MEWS is changing or has worsened. It's time to call the ICU.'"

Tessier and her colleagues are currently working to analyze the data as a result of the prospective trial to assess the impact of the study. Although it's difficult to say at this point, Tessier is hopeful that patient outcomes will improve as a result of the MEWS and earlier connection with the ICU.

"Although we are not yet sure of the outcome of the study, I'm proud that we did something remarkable within the facility, and unique to a variety of academic centres," says Tessier. "I don't know anywhere else where a resident-led research project has resulted in a hospital-wide practice change. It has been a very exciting and rewarding experience."

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