

# Conference Program and Abstracts



## NORTHERN HEALTH RESEARCH CONFERENCE

The Northern Ontario School of Medicine  
and Nipissing University welcome you to the third  
annual Northern Health Research Conference

May 30 - 31, 2008



Northern Ontario  
School of Medicine



# NORTHERN HEALTH RESEARCH CONFERENCE

May 30 - 31, 2008

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For information on the Northern Ontario School of Medicine's Research programs, please contact us at [research@normed.ca](mailto:research@normed.ca) or through NOSM's website at [www.nosm.ca](http://www.nosm.ca).



# MESSAGE FROM THE NORTHERN ONTARIO SCHOOL OF MEDICINE



## WELCOME TO THE THIRD ANNUAL NORTHERN HEALTH RESEARCH CONFERENCE

On behalf of the Northern Ontario School of Medicine (NOSM), we welcome you to the 2008 Northern Health Research Conference (NHRC).

There are a number of things that make this year's event special. First, we are pleased to partner with Nipissing University for this third annual event, and extend to the University and the City of North Bay our sincerest thanks for their support and hospitality. Second, we are thrilled to welcome our Keynote Speaker, Dr. Joshua Tepper, Assistant Deputy Minister with the Ministry of Health and Long-Term Care, Health Human Resources Strategy Division, to the conference. Third, we have received a record number of submissions – over 80 – for this conference. As you will hear over the next couple of days, many of the posters and oral presentations focus on research specific to the people and communities in Northern Ontario.

Research at NOSM is reflective of the School's mandate to be socially accountable to the diverse cultures of Northern Ontario. The School's unique research program targets areas that have a direct relevance to Northern populations. The key theme of NOSM research is tackling the questions of importance to improving the health of the people and communities of the North, and the NHRC is one of many initiatives that allows NOSM to facilitate this objective.

We would like to sincerely thank all who are participating in the Northern Health Research Conference and those on the organizing committee that have dedicated many hours to ensure that each of us enjoys an exceptional conference over the next two days.

Please enjoy the conference and the networking opportunities that it has to offer!

Sincerely,

Dr. ROGER STRASSER  
*NOSM Founding Dean*

Dr. GREG ROSS  
*NOSM Associate Dean, Research*



Northern Ontario  
School of Medicine



## MESSAGE FROM NIPISSING UNIVERSITY



### DEAR CONFERENCE PARTICIPANTS

It is my pleasure to extend a warm welcome to each of you on behalf of Nipissing University. We are extremely proud to be hosting the third annual Northern Health Research Conference.

Nipissing University is now known as one of the hottest small universities in the country! We are a progressive, innovative undergraduate university with a reputation for excellence and we pride ourselves on providing a welcoming, respectful and personalized experience for our students in a safe environment.

Nipissing fully supports the Northern Health Research Conference objectives and those of the Northern Ontario School of Medicine (NOSM). Each provides a wonderful opportunity for research and health care to survive and thrive in the North.

At Nipissing, we have created an ideal balance between teaching and research which has resulted in a substantial increase in research grants and graduate scholarships being awarded to our faculty and graduates. Many of our undergraduate students conduct research with the direct supervision of faculty -- a concept almost unheard of at larger institutions.

Nipissing University's innovative Biidaaban Community Service-Learning program provides students with the opportunity to link classroom theory with real-world experience while, at the same time, providing a valuable service to our community.

It is an exciting time for Nipissing University as we continually grow and expand in all areas, particularly in research. On March 28 – 29, 2008, we delivered our first annual Undergraduate Research Conference.

I trust you will thoroughly enjoy the Northern Health Research Conference, special guest speakers and the opportunities available for collaboration and community networking.

A handwritten signature in black ink that reads "Dennis Mock". The signature is fluid and cursive.

Dr. DENNIS MOCK  
*Nipissing University President*







## MESSAGE FROM THE CITY OF NORTH BAY



### WELCOME TO OUR COMMUNITY

On behalf of City Council and the citizens of North Bay, I am delighted to extend a warm welcome to those attending the third annual Northern Health Research Conference on May 30-31, 2008.

This conference demonstrates the Northern Ontario School of Medicine's (NOSM) commitment to health care and education to the people of Northern Ontario and beyond. More than 150 delegates from across Northern Ontario and other provinces in Canada will be in attendance at this conference, with many health professionals and researchers from our area.

We recognize the hard work that is involved in organizing this event and fully support the staff of the Northern Ontario School of Medicine that are hosting this event in North Bay.

For those of you from out of town, we hope that you will take some time to enjoy our city's sights and

hospitality. Here in the City of North Bay, we feel very fortunate to have the best of culture, entertainment, shopping, dining and accommodation that make this city – a great city! We hope that your stay with us will be an enjoyable and memorable one.

Best wishes for a successful conference.

Sincerely,

VICTOR A. FEDELI  
Mayor of North bay





## KEYNOTE SPEAKER DR. JOSHUA TEPPER



### BIOGRAPHY

Dr. Joshua Tepper is a family physician and an Assistant Deputy Minister at Ministry of Health and Long-Term Care, Health Human Resources Strategy Division.

With a degree in Public Policy from Duke University he has been involved in health policy and research relating to health human resources at both the provincial and national level. He completed his Masters of Public Health at Harvard University in 2005.

He was a senior medical officer for Health Canada, an adjunct scientist at the Institute for Clinical Evaluative Sciences (ICES) and a research consultant for the Canadian Institute of Health Information

(CIHI). Joshua was president of both the Canadian Federation of Medical Students and the Provincial Association of Interns and Residents of Ontario. He has sat on the board of both the Canadian Medical Association and the Ontario Medical Association.

Joshua is happily married to Andrea Berntson and the proud father of baby boy Ishai.

# ACCREDITATION

This program meets the accreditation criteria of the College of Family Physicians of Canada and has been accredited for 13 MAINPRO-M1 credits. This event is an Accredited Group Learning Activity (Section1) as defined by the Maintenance of Certification program of the Royal College of Physicians and Surgeons of Canada, approved by University of Toronto for 13 hours.

## ACKNOWLEDGEMENTS

### ORGANIZING COMMITTEE

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Coordinator

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A SPECIAL THANK YOU TO BARBARA PELTIER, NOSM  
ABORIGINAL ELDER AND KIAN KAYLER, NIPISSING  
UNIVERSITY STUDENT.



# AGENDA

## THURSDAY, MAY 29, 2008

5:00 - 9:00

"Meet and Greet" BBQ at Nipissing University

## FRIDAY, MAY 30, 2008

8:00 - 8:45

Registration / Continental Breakfast / Poster Set-Up

8:45 - 8:50

Welcome and Opening Remarks

Dr. Roger Strasser

NOSM Founding Dean

8:50 - 9:15

Welcome Messages from Dignitaries and Special Guests

9:15 - 10:15

KEYNOTE SPEAKER

Dr. Joshua Tepper

Assistant Deputy Minister, Health Human Resources Strategy Division, Ministry of Health and Long-Term Care

10:15 - 10:45

Nutrition Break / Poster Viewing

SESSION CHAIR: DR. CARITA LANNÉR, NOSM  
ASSOCIATE PROFESSOR, DIVISION OF MEDICAL SCIENCES

10:45 - 11:00

Erinma Abara

Patterns of Computer and Internet Use Among Urology Patients in Northern Ontario

11:00 - 11:15

Dr. Jacques Abourbih and Richard Witham

Effective Use of Formative Assessment to Strengthen the Learning Environment

11:15 - 11:30

Philippe Babady-Bila

Antioxidant and Antibacterial Activities of the Extracts from the Leaves of Sweet Fern (*Comptonia peregrina*)

11:30 - 11:45

Pauline Bodnar

HEARTBEAT of the Anishnawbe Nation



11:45 - 12:00

Dianne Cameron

Stereological Assessment of Tumor Burden in Mouse Lung

12:00 - 1:15

Lunch / Poster Viewing

SESSION CHAIR: DR. RICK VANDERLEE, NIPISSING  
UNIVERSITY DIRECTOR, SCHOOL OF NURSING

1:15 - 1:30

Dr. Mike Cotterill

Screening for Colorectal Cancer by Colonoscopy in a Rural Community

1:30 - 1:45

James Crispo

Effect of Polyphenolic Compounds on Apoptosis in an In-Vitro Model of Oxidative Stress

1:45 - 2:00

Sheila Damore-Petingola

The Supportive Care Regional Provider Network: Building Supportive Care Oncology Capacity in a Diverse Region

2:00 - 2:15

Joseph Eibl

Zinc Induces Motor Neuron Death Via a Selective Inhibition of Brain-Derived Neurotrophic Factor Activity

2:15 - 2:30

Mark Fraser

Bridging Clinical Work with Research: A Scientist/  
Practitioner Approach with Children-in-Care

2:30 - 3:00

Nutrition Break / Poster Viewing

SESSION CHAIR: DR. PATRICIA SMITH, NOSM  
ASSOCIATE PROFESSOR, DIVISION OF HUMAN  
SCIENCES

3:00 - 3:15

Alain P. Gauthier

Understanding the Impact of a Unique Socio-Cultural  
and Geographical Context on Physical Activity

3:15 - 3:30

Sean K. Gravelle

The Role of Spleen Tyrosine Kinase in Epithelial Cell  
Responses to *Pseudomonas aeruginosa*

3:30 - 3:45

Mary Ellen Hill

Ontario's Aboriginal Mental Health Challenges: Health  
Human Resource Implications

3:45 - 4:00

Carol Kauppi

Northern Homelessness: Exploring Areas for Public  
Health Interventions

4:00 - 4:15

Grace King

Brain Injury from an Aboriginal Perspective: Traditional  
Teachings from Elders

4:15 - 5:00

Poster Viewing

7:00 - 10:30

Dinner and Social Evening

Churchill's

631 Lakeshore Drive

## SATURDAY, MAY 31, 2008

8:00 - 9:00

Continental Breakfast / Poster Viewing

SESSION CHAIR: DR. DAVID TOPPS, NOSM DIRECTOR,  
ELEARNING

9:00 - 9:15

Nadia La Russa

Metabolic Syndrome in First Nations: Gene vs.  
Environment

9:15 - 9:30

Danusia Gzik

The Manitoulin Regional Aboriginal Diabetes Care and  
Management Research Project

9:30 - 9:45

Marion Maar

Innovation in Collaborative Mental Health Care: The  
Aboriginal Community-Based Model at Mnaamodzawin  
Noojmowin Teg on Manitoulin Island

9:45 - 10:00

Dr. Bobby M. Chaudhuri

The Dynamics of Medical Trainees with Physical  
Disabilities

10:00 - 10:15

Lorrilee McGregor

Conducting Ethical Research Among Aboriginal People

10:15 - 10:45

Nutrition Break / Poster Viewing

SESSION CHAIR: DR. RACHEL ELLAWAY, NOSM  
ASSISTANT DEAN, EDUCATION INFORMATICS

10:45 - 11:00

Phyllis Montgomery, Rheanon Funnell, and Ivan Evers  
Evaluation of Northern Support and Housing Services  
for Persons with Serious Mental Illness

11:00 - 11:15

S. Kathleen Bailey

Possible Link Between Higher Admitting Threshold and  
Low Bounce Back Rates

11:15 - 11:30

Dr. Ian Newhouse

Development of the Northern Interprofessional Centre for Health Education

11:30 - 11:45

Joanne Y. Pelletier

Children-in-Care Perceptions of a Participatory Action Research Project Between The Children's Aid Society of the Districts of Sudbury and Manitoulin and Laurentian University's English School of Education



11:45 - 12:00

Karen L. Rebeiro Gruhl

Supported Employment and Work for Pay: Issues of Justice and Equity for Persons with Serious Mental Illness in Northeastern Ontario

12:00 - 1:00

Lunch / Poster Viewing

SESSION CHAIR: DR. T.C. TAI, NOSM ASSOCIATE PROFESSOR, DIVISION OF MEDICAL SCIENCES

1:00 - 1:15

Patricia M. Smith

Healthier First Nations Communities Through Community-Based Tobacco Cessation and Intervention

1:15 - 1:30

Laena Maunula

Citizens Can Offer Valuable Input for Influenza Pandemic Planning

1:30 - 1:45

Dr. Marina Ulanova

Role of Integrin Receptors in Recognition of Pathogen-Associated Molecules and Innate Immunity

1:45 - 2:00

Bruce Weaver

The Importance of Graphing the Data: Anscombe's Regression Examples

2:00 - 2:15

Elizabeth Wenghofer

Do Organizational and System Factors Affect Family Physician Performance?

2:15 - 2:30

Poster Viewing / Nutrition Break

SESSION CHAIR: GREG ROSS, NOSM ASSOCIATE DEAN, RESEARCH

2:30 - 2:45

Stephanie Cull

Aldoketoreductase 1C2-mediated Conversion of Doxorubicin to Doxorubicinol in Anthracycline-Resistant Breast Tumour Cells

2:45 - 3:00

Jennifer M. Kelly and Dr. John M. Haggarty

Agree or Disagree in Primary Care Mental Health? An Analysis of Interprofessional Agreement of Providers

3:00 - 3:15

Janelle Jarva

Six Years and Counting: Utilization of Shared Mental Health Care Services at the Fort William Clinic

3:15 - 3:30

Ryan Mailloux

Development of a Diagnostic Kit for Homocysteine, a Biomarker for Cardiovascular Diseases.

3:30 - 3:45

Dr. David Topps

Canadian Healthcare Education Commons (CHEC): A New Collaborative Approach for Educators and Researchers

3:45-4:00

Closing Remarks

# POSTER PRESENTATIONS

## FRIDAY, MAY 30, 2008

8:00 - 9:00

Poster Setup / Open Viewing

10:15 - 10:45

GROUP #1 VIEWING

Poster Station #1: Recurrent Renal Cell Cancer: 10 Years or Longer After Nephrectomy

Poster Station #4: Human Septic Sera Induces Apoptosis and DNA Fragmentation Factor 40 Activation in Human Fibroblasts

Poster Station #7: Canadian Indicators of Health for Children in Rural and Northern Regions

Poster Station #10: Virtual Patients for Objective Performance Assessment

Poster Station #13: A Randomized Control Trial of the 'Transition into Primary Care Psychiatry' Model of Shared Care

Poster Station #16: Smoking and Pregnancy

Poster Station #22: An Isoform of Actin is Associated with the Cancer Status of Ovarian and Breast Epithelial Cells

Poster Station #25: Primary Health Care and Severe Mental Illness: Model of Care in Sudbury Ontario in the Hospital Setting [PHCSMI]

Poster Station #28: The Expanded Indigenous Health Research Development Program

Poster Station #31: The Radiation Therapy Program at Laurentian

Poster Station #34: Patient Tobacco Use and Provider Tobacco Cessation Interventions in NW LHIN Hospitals

Poster Station #37: Aboriginal Palliative Care - A Qualitative Study of Aboriginal Family Members

Poster Station #40: PocketSnipped - Cutting Comments from the Field

Poster Station #43: A Common Misuse of Confidence Intervals

12:45 - 1:15

GROUP #2 VIEWING

Poster Station #2: Regulation of Catecholamine Biosynthetic Enzymes by Nitric Oxide

Poster Station #5: Identifying the Incidence of Invasive Haemophilus Influenzae Disease in Northwestern Ontario

Poster Station #8: Applying Molecular Epidemiology Approach to study Perinatal Health Hazards Among Female Tobacco Workers in Gujarat, India

Poster Station #11: The Influence of Hypertension and Fiber Type on Basal Nitric Oxide Concentrations in Rat Skeletal Muscle

Poster Station #14: Reducing Pain and Enhancing Effect of Local Anaesthetics in Plastic Surgery

Poster Station #17: Enzyme-Based Detection of E coli and Total Coliforms in Drinking Water Using Fiberoptics and Fluorescence

Poster Station #20: Epileptogenic Cortical Dysplasias: Neurophysiology and Neuropathology

Poster Station #23: Lactate as a Source of Oxidative Energy in the Brain: a Rethinking of the Brain Energy Budget

Poster Station #26: Role of antioxidants in paraquat-induced cytotoxicity

Poster Station #29: The Making of an Epidemic. " A Review of Aboriginal Youth and Type 2 Diabetes"

Poster Station #32: Repeated distress assessment using a shortened HADS

Poster Station #35: Smoke-Free Legislation and Long-Term Care Homes in Northwestern Ontario: Identifying the Benefits, Challenges, and Safety Concerns

Poster Station #38: Effectiveness of p-Diethylphenyldiamine in the Determination of Odor-Causing Sulfur Compounds in Water

Poster Station #41: Team Sites for Collaboration

Poster Station #44: "ICEPHC - Initiative for Clinical Evaluations in Primary Health Care" - Unlocking the Potential for Collaborative Research in Northern Ontario

2:30 - 3:00  
GROUP #3 VIEWING

Poster Station #3: Do Integrin Receptors Mediate Pseudomonas aeruginosa Infection of Lung Epithelial Cells?

Poster Station #6: Bringing Nutrition Risk Screening to Canadian Preschoolers: Development and Validation of Nurtistept (Nutrition Screening Tool for Every Preschooler)

Poster Station #9: Delivering a School-Based Fruit and Vegetable Program in Northern Ontario: Key Facilitators and Notable Challenges

Poster Station #12: Literacy: A Fundamental Resource for Global Health

Poster Station #15: Interdisciplinary Clinical Mentor Survey Review and the Resulting Interactive WebCT Pilot Site

Poster Station #18: Characterization of Bacterial RNA Induced Signal Transduction Pathways that Cause Cellular Dysfunction

Poster Station # 21: Characterizing the Role of STAT, IRF & NF- $\kappa$ B Signalling During Sepsis

Poster Station # 24: Peritoneal Catheter Insertion Using the Mini-Laproscope - The 10 Year Experience of a Single Physician

Poster Station # 27: Molecular Mechanisms of Phenylethanolamine N-methyltransferase Gene Regulation Associated with Hypertension

Poster Station #30: The Role of Bacterial Virulence Factors in Pseudomonas Aeruginosa-Induced Apoptosis of Lung Epithelial Cells



Poster Station #33: Role of Integrin Receptors in Cardiomyocyte Response to Oxidative Stress

Poster Station #36: The Small Group "Tele-Learning" of NOSM's Distributed Education

Poster Station #39: Ionizing Radiation-Induced Oxidative Stress and DNA Damage in Lymphocytes of Varying BRCA1 Expression

Poster Station #42: The Effects of Oxidative Stress on Phenylethanolamine N-methyltransferase Gene Regulation

4:30 - 6:00  
OPEN VIEWING



## SATURDAY, MAY 31, 2008

8:00 - 9:00  
Open Viewing

10:15 - 10:45  
GROUP #2 VIEWING

Poster Station #2: Regulation of Catecholamine Biosynthetic Enzymes by Nitric Oxide

Poster Station #5: Identifying the Incidence of Invasive Haemophilus Influenzae Disease in Northwestern Ontario

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Poster Station #10: Virtual Patients for Objective Performance Assessment

Poster Station #13: A Randomized Control Trial of the ‘Transition into Primary Care Psychiatry’ Model of Shared Care

Poster Station #16: Smoking and Pregnancy

Poster Station #19: Responding to Community Needs and Valuing Local Knowledge: Diabetes Research in Wikwemikong, Ontario

Poster Station #22: An Isoform of Actin is Associated with the Cancer Status of Ovarian and Breast Epithelial Cells

Poster Station #25: Primary Health Care and Severe Mental Illness: Model of Care in Sudbury Ontario in the Hospital Setting [PHCSMI]

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2:15 - 2:30  
GROUP #3 VIEWING

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Poster Station #18: Characterization of Bacterial RNA Induced Signal Transduction Pathways that Cause Cellular Dysfunction

# ORAL ABSTRACTS

RESEARCH WORK IN THE FOLLOWING ABSTRACTS ARE ALL ORIGINAL AND INNOVATIVE. THE LENGTH OF EACH ORAL PRESENTATIONS IS EXPECTED TO BE 15 MINUTES IN DURATION, INCLUDING TIME FOR DISCUSSION. PLEASE CONSULT THE AGENDA FOR PRESENTATION ORDER.

ABSTRACTS HAVE BEEN PUBLISHED EXACTLY AS SUBMITTED, WITH THE EXCEPTION OF FORMATTING.



# PATTERNS OF COMPUTER AND INTERNET USE AMONG UROLOGY PATIENTS IN NORTHERN ONTARIO

PRINCIPAL PRESENTER

Erinma Abara, BA (Hons.) Brock University, University of Windsor (LLB candidate)

CO-AUTHOR

Miya Narushima, PhD, Assistant Professor, Department of Community Health Sciences, Brock University  
Emmanuel Abara, MB, FRSC(C), Kirkland Lake

## ABSTRACT

PURPOSE

We attempted to determine if the Internet can be used as a potential health promotion tool in Northern Ontario by identifying patient’s computer and Internet access and use patterns in two Northern Ontario communities: Kirkland Lake and Kapuskasing.

METHODS

This study was reviewed and approved by the review boards of the Kapuskasing and Kirkland Lake hospitals and Brock University, St. Catharines. Data was collected by paper and pen questionnaire in English and French. Qualitative information regarding computer and Internet use were also obtained. Quantitative and qualitative data were analyzed using the Statistical Analysis Software (SAS) and the conceptual matrix, respectively.

RESULTS

The response rate of the study sample was 90%; 137 questionnaires were distributed and collected, 7 were incomplete. There were 67 men (62%) and 63 women (48%) aged between 24 and 84 (average 56) years. Languages spoken by respondents were English (56.9%), French (37.5%) and others (5.1%). The sample was stratified into 3 groups: those with computer and Internet access; those with computer and no Internet; and those with neither computer nor Internet access. Those who were younger had higher education and higher paying jobs used the computer more often than older persons, less educated or with less paying jobs. Seeking health information for themselves, their families and friends was their main reason for use of the Internet in health related matters. There were mixed feelings about communicating with their physicians through the Internet.

CONCLUSION

A majority of the respondents used (53.5%) computer and Internet to access health information. Patient reactions toward online communication with their physician were mixed. The sample population is small and limits far-reaching conclusions. Further studies are recommended.

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# EFFECTIVE USE OF FORMATIVE ASSESSMENT TO STRENGTHEN THE LEARNING ENVIRONMENT

PRINCIPAL PRESENTER

Dr. Jacques Abourbih, RCSPC, Assistant Professor in Surgery, Northern Ontario School of Medicine, Affiliate Professor at Haifa University, Haifa Israel.

CO-AUTHOR

Richard Witham MEd(c), Continuing Professional Development Coordinator: Learning Technologies, Northern Ontario School of Medicine

ABSTRACT

The importance of formative assessment in the learning process is well documented in educational literature. Jason and Westburg (1993), highlight the underutilization of formative assessment in many medical school curricula and advocate for its increased adoption. This session will briefly document the relevant research on this topic, illustrate the use of web-based collaborative software to facilitate formative assessment in the learning environment, and discuss evaluative data obtained from learners using this approach. In addition, participants with computers and an Internet connection will be encouraged to use the software to provide formative assessment data during the session

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# ANTIOXIDANT AND ANTIBACTERIAL ACTIVITIES OF THE EXTRACTS FROM THE LEAVES OF SWEET FERN (COMPTONIA PEREGRINA)

PRINCIPAL PRESENTER  
Philippe Babady-Bila, Assistant Professor, Department of Biology, Nipissing University

CO-AUTHOR  
Ewa Cholewa, Assistant Professor, Department of Biology, Nipissing University  
Bill Dew, Lecturer, Department of Biology, Nipissing University  
Breanna Duquette, Student, Department of Biology, Nipissing University

## ABSTRACT

Sweet fern (*Comptonia peregrina*) grows abundantly in northern Ontario. Many Aboriginal tribes have used the sweet fern for its medicinal attributes as a general astringent and tonic, and made a tea to relieve cramps and cure flux. Until recently, no research reports supported Aboriginal claims about sweet fern medicinal properties. A recent study reported the cytotoxic activities of the sweet fern leaf essential oil against human lung carcinoma cell line A-549 and human colon adenocarcinoma cell line DLD-1 (Phytother. Res. 2007, 21:536). In present study, the antioxidant capacities of several sweet fern extracts were investigated using two methods: the oxygen radical absorbing capacity (ORAC) and 1,1-diphenyl-2-picrylhydrazyl (DDPH) assays. The first method deals with the measurement of the fluorescent decay of fluorescein using the hydrophilic free radical generator 2,2'-azobis(2-amidinopropane) dihydrochloride (AAPH). The rate of fluorescent decay was inhibited by either a known concentration of Trolox (used as a standard antioxidant), or a sample extract, which acts to protect the fluorescein molecules from free radical damage. The sweet fern extracts used in this study include a crude water extract, a butanol extract, an ethyl acetate extract, and sweet fern essential oil. The antioxidant capacity of the various extracts ranged from 25.097  $\pm$  0.104% to 53.952  $\pm$  0.856% ?M Trolox equivalents per 0.01 g/L of extract, with crude water extract having the lowest antioxidant activity and ethyl acetate extract having the highest. The DDPH scavenging activities of the sweet fern extracts confirmed ORAC results and showed the same trend. As for the antibacterial activities, the ethyl acetate and butanol extracts inhibit the growth of *Bacillus subtilis* (gram positive) and *Alcaligenes faecalis* (gram negative) indicating antibacterial properties of sweet fern. Furthermore, HPLC analysis of ethyl acetate revealed presence of 21 peaks indicating the presence of at least 21 different substances in this extract. The isolation of these substances is in progress and it could lead to the identification of specific compounds with potent antioxidant and antibacterial properties in *Comptonia peregrina*.

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# HEARTBEAT OF THE ANISHNAWBE NATION

PRINCIPAL PRESENTER

Pauline Bodnar, MHSA, HBSW, RSW, Community & Long-Term Care Specialist, Northwestern Ontario Regional Stroke Network

## ABSTRACT

Northwestern Ontario (NWO) covers approximately 526,355 square kilometers, which is approximately 60% of the provincial landmass. The percentage of the population of Aboriginal identity is substantially greater in NWO (13.9%) than the province (1.7%)

There is a growing incidence of risk factors for cerebrovascular disease in the Aboriginal population. High blood pressure is 2.8 times more prevalent in Aboriginal men and 2.5 times more prevalent in Aboriginal women than non Aboriginal Canadians.

The health status of Aboriginal people had been identified as an issue of concern by the NWO Regional Stroke Network (NWORSN) at the provincial level of the Ontario Stroke System (OSS). Heart and Stroke Foundation of Ontario, a partner of the OSS, proposed funding an educational resource tool to address the identified concerns.

A focus group (representatives from Nishnabwe-Aski, Grand Council Treaty #3, Union of Ontario Indians, Independent First Nation, and health care providers) directed a working group on how to deliver the key messages (blood pressure & stroke) in a culturally sensitive manner. This included: Elder teachings; Medicine Wheel, mother earth, story telling, community environment; non-intrusive, use of drums and water, visual aids, humour and holistic.

A tool was developed using DVD technology that addresses stroke and blood pressure management that is culturally consistent with Aboriginal traditions. Ojibwe had been identified as the language of choice. Oji-Cree and English would be dubbed. Promoting a healthy lifestyle both in a medical and traditional manner is the theme throughout the DVD.

The evaluation process included the distribution of 165 DVDs to First Nation communities accompanied by a survey with a response rate of 40% (n=66). The development and distribution of the survey was jointly conducted by NWORSN and a team of researchers from Lakehead University School of Nursing. The analysis of the survey was completed by the research team.

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# STEREOLOGICAL ASSESSMENT OF TUMOR BURDEN IN MOUSE LUNG

PRINCIPAL PRESENTER  
Dianne Cameron, PhD, Coordinator, Radiation Therapy Program, Dept. of Physics, Laurentian University

## ABSTRACT

Stereology is a spatial version of sampling theory which provides practical techniques for extracting quantitative information about 3-dimensional objects from 2-dimensional measures of planar sections of materials or tissues. It is widely applied in microscopy to ensure rigorous quantitative analysis of the size, shape, and number of objects such as cells or sub-cellular components, or mineral fractions in rock samples.

In this study, stereological methods were applied in a quantitative analysis of tumor burden in developing metastases in mouse lung up to 14 days after injection of murine melanoma cells. The tumor burden in lung, expressed as the volume fraction of tumor in the tissue  $V_V$ , was estimated using  $AA$ , the ratio of the area of profiles of tumors to the cross-sectional area of the entire lung section. The tumor burden at the surface of particular interior structures (veins, arteries, bronchioles) and the lung surface was estimated from  $LL$ , the ratio of the perimeter length of the surface covered in tumor to the entire perimeter length. The actual boundary lines representing the perimeter of the structures were used to determine the tumor burden adjacent to those surfaces. Preferential distribution of tumor was quantified by comparing the burden at specific surfaces to the overall burden for the whole lung volume at different time points.

A significant preferential distribution of tumors at the lung surface and around vessels was found to be due to rapid but transitory tumor cell proliferation which became limited by available space for further expansion as tumor burden increased.

This presentation will describe the techniques used to segment boundaries of major structures in images of lung sections and their subsequent stereological analysis. These methods have increasing application in the biomedical sciences, especially in microscopic analysis of lung, kidney and bone sections, in cancer and in neuroscience.

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# SCREENING FOR COLORECTAL CANCER BY COLONOSCOPY IN A RURAL COMMUNITY

PRINCIPAL PRESENTER  
Dr. Mike Cotterill, Family Physician, Wawa Medical Centre

## ABSTRACT

Physicians at the Wawa Medical Centre, in Wawa, Ontario, have been running a colorectal cancer screening program for the past seven years.

The program is unique in many respects. Patients are recruited from the general population, aged 50-75. They can be referred directly for colonoscopy by either family physicians or nurse practitioners. The goal of the program is to have screened all of the eligible population within 10 years, which is the recommended interval between screening colonoscopies for persons considered to be at average risk. Two family physicians perform all of the screening colonoscopies, as well as the subsequent follow-ups in patients who are found to have polyps, or who have colorectal cancers resected.

The presentation will deal with the efficacy of the program in recruiting patients in the target group, and the results, both in terms of cancers and polyps found. This will be compared to rates reported in the literature.

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# EFFECT OF POLYPHENOLIC COMPOUNDS ON APOPTOSIS IN AN IN-VITRO MODEL OF OXIDATIVE STRESS

PRINCIPAL PRESENTER

James Crispo, Division of Medical Sciences, Northern Ontario School of Medicine, and Department of Biochemistry, Laurentian University

CO-AUTHOR

Greg Ross, Division of Medical Sciences, Northern Ontario School of Medicine  
T.C. Tai, Division of Medical Sciences, Northern Ontario School of Medicine, and Department of Biochemistry, Laurentian University

## ABSTRACT

Oxidative stress arises from an imbalance in the production of reactive oxygen species (ROS) and a biological system’s ability to reduce harmful ROS effects or reverse the incurred damage. Oxidative stress resulting from the production of ROS is reported to occur as a result of trauma to the nervous system. Within mitochondria, oxidative damage may arise from increased ROS production from the electron transport chain (ETC) and/or an inability to scavenge released radicals. Damage may result in: loss of membrane potential resulting in ATP depletion, activation of various caspases, membrane swelling, and cytochrome c release, all of which may result in an apoptotic cell death.

Tea is one of the most popular beverages worldwide and many health benefits associated with tea consumption have been linked to the antioxidant properties of tea polyphenols. Furthermore, numerous polyphenols have been isolated from vegetation growing in the Boreal Forest. Some health benefits associated with polyphenols and antioxidant compounds include cancer chemoprevention, improving cardiovascular health, and enhancing weight loss.

Currently, our lab is investigating the effects of various polyphenolic compounds on cell viability in three separate models of oxidative stress in PC12 cells. These models of oxidative stress include treatment of PC12 cells with 6-hydroxydopamine (6-OHDA), cobalt chloride (CoCl<sub>2</sub>), and hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) to invoke elevated ROS production. The three models utilized have previously been shown to generate ROS via different mechanisms that mimic in-vivo occurrences. MTT assays and DNA fragmentation will be used to assess cell viability in oxidative stress models pre-treated with polyphenolic compounds of interest. Lastly, flow cytometry will aid in determining the level of apoptotic cell death within sample groups. Completion of these studies will aid in the identification of novel antioxidants that may have potential therapeutic properties.

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# THE SUPPORTIVE CARE REGIONAL PROVIDER NETWORK: BUILDING SUPPORTIVE CARE ONCOLOGY CAPACITY IN A DIVERSE REGION

PRINCIPAL PRESENTER

Sheila Damore-Petingola, MSW, RSW, Coordinator, Supportive Care Regional Provider Network, Regional Cancer Program, Hôpital régional de Sudbury Regional Hospital, Faculty Appointment, Northern Ontario School of Medicine

CO-AUTHOR

Carole Mayer, MSW, RSW, PhD (Candidate) Clinical Leader/Manager, Supportive Care Program, Supportive Care Oncology Research Unit and Sudbury Genetic Counseling Service, Regional Cancer Program, Hôpital régional de Sudbury Regional Hospital, Faculty Appointment, Northern Ontario School of Medicine

## ABSTRACT

The Supportive Care Regional Provider Network (SC RPN) was developed to ensure the provision of Supportive Care services for oncology patients and their families throughout Northeastern Ontario. Patients and their family members who attend the regional cancer centre in Sudbury have access to the outpatient services of dietitians, pediatric Interlink nurses, physiotherapists, psychologists, speech language pathologists and social workers whose expertise is oncology. Approximately 52% of the patients referred to the Supportive Care Program reside outside of the Sudbury District (2007 referral data). Nineteen Community Oncology Clinic Network sites, located in community hospitals in this region provide chemotherapy treatment for patients closer to home. In August 2007, allied health care professionals who provide Supportive Care services for oncology patients and families in Northeastern Ontario (Local Health Integration Network - LHIN 13) were surveyed in an effort to better understand and plan for their professional needs. Forty-seven surveys were completed by health care professionals from 17 communities. This data informs Regional Cancer Program administrators as to the current level of Supportive Care available in Northeastern Ontario; the interest in technological connection to reduce professional isolation; and specific areas of concern by discipline in meeting the needs of cancer patients and their families. This data is being used to build clinical capacity in Supportive Care and ensure access for cancer patients and their families in our region.

This presentation will: 1. review the results of the survey entitled: Building Allied Health Care Capacity in Oncology; 2. share the SC RPN strategic plan to build competence, confidence and capacity in ensuring access to Supportive Care for cancer patients and their families in rural Northeastern Ontario; and 3. provide outcomes of the action plan to date.

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# ZINC INDUCES MOTOR NEURON DEATH VIA A SELECTIVE INHIBITION OF BRAIN-DERIVED NEUROTROPHIC FACTOR ACTIVITY

PRINCIPAL PRESENTER  
Joseph Eibl, Research Laboratory Coordinator, Northern Ontario School of Medicine

CO-AUTHOR  
Joan I. Post, Queens Unive  
Greg Ross, Division of Medical Sciences, Northern Ontario School of Medicine

## ABSTRACT

Amyotrophic Lateral Sclerosis, also known as Lou Gehrig’s disease, is a debilitating disease that results from the deterioration and loss of motoneurons. The neurotoxic potential of Zn<sup>2+</sup>, both in vitro and in vivo, has been well established; however the mechanism(s) of zinc’s toxicity remain unclear. Our laboratory has demonstrated that Zn<sup>2+</sup>-mediated inhibition of neurotrophins can induce cell death. The present study investigates the neurotoxic mechanism(s) of this metal ion by assessing zinc’s selectivity in altering the neurotrophin BDNF, but not the neural cytokine CNTF, with respect to motoneuron survival. Embryonic day 15 rat spinal motoneuron cultures were maintained in either BDNF or CNTF. The apoptotic indicator terminal deoxynucleotidyl transferase-mediated dUTP-digoxigenin nick end-labelling (TUNEL) staining showed that exposure to 100 μM Zn<sup>2+</sup> significantly increased the number of pro-apoptotic neurons in cultures maintained with BDNF, while these conditions had no effect on cultures maintained with CNTF. We also demonstrate that BDNF protomer crosslinking efficiency and TrkB receptor crosslinking to BDNF are significantly inhibited by Zn<sup>2+</sup>, suggesting that a Zn<sup>2+</sup>-induced change in BDNF conformation inhibits receptor-binding activity. This study reveals a mechanism by which zinc toxicity is mediated via a selective loss in neurotrophin activity resulting in motoneuron death.

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# BRIDGING CLINICAL WORK WITH RESEARCH: A SCIENTIST/PRACTITIONER APPROACH WITH CHILDREN-IN-CARE

PRINCIPAL PRESENTER

Mark Fraser, A.Sc., B.Sc (Lib), H.B.A (PSYC), ECHO Program Coordinator/Program Developer/Researcher  
Clinically Managed Access Facilitator, Children’s Aid Society District of Sudbury and Manitoulin;  
Master’s Student, Applied Psychology, Laurentian University

CO-AUTHOR

Brenda Robinson, MSW, RSW, Supervisor, Specialized Support Services, Children’s Aid Society District of Sudbury and Manitoulin

## ABSTRACT

Recently, research and clinical efforts towards amalgamating the extant body of evidence in the field of stress neurobiology with the psychosocial effects of child maltreatment have been quite productive in narrowing the translational gap between biology and clinical practice. Despite these gains, many questions exist regarding how clinicians should integrate brain and developmental psychology research into existing and future therapeutic approaches. Still, other questions arise concerning the usefulness of neuroscience in enhancing a practice’s effectiveness and efficiency. The Children’s Aid Society (CAS) District of Sudbury and Manitoulin’s ECHO Program is an example of a therapeutic program that blends current stress neurobiology and developmental psychopathology research and statistics with current evidence-based psychosocial approaches with maltreated children. The poster will include a non-technical introduction to the neurodevelopmental and psychosocial effects/outcomes of childhood maltreatment; it will also tie this theory base to practical therapeutic approaches. Using the ECHO Program as a blueprint, the poster will describe how this program integrates neuroscientific and clinical research into its existing programming; uses data from the National Longitudinal Survey of Children and Youth (NLSCY) and the Assessment and Action Record-C2 (AAR-CS) to monitor child outcomes; and applies best-practice research. Using the scientist/practitioner model, the poster will also elaborate on how the children’s mental health and child welfare fields of Northern Ontario can benefit from statistical research as it may assist children’s mental health and child welfare agencies with better enabling resources to be allocated in an optimally effective manner, moving both fields towards a best-fit-for-services practice. Put another way, statistics could help agencies, clinicians, and case managers provide the right service, to the right clients at the right time. The ECHO Program’s partners are numerous and consist of the Child and Family Center, Laurentian University, and Cambrian College. General, multidisciplinary information and resource/reference packages will be provided.

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# UNDERSTANDING THE IMPACT OF A UNIQUE SOCIO-CULTURAL AND GEOGRAPHICAL CONTEXT ON PHYSICAL ACTIVITY

PRINCIPAL PRESENTER  
Alain P. Gauthier, B.E.P.S., M.A., PhD Student, Laurentian University (School of Rural and Northern Health)

CO-AUTHOR  
Michel Larivière, Laurentian University, School of Human Kinetics  
Raymond Pong, Laurentian University, School of Rural and Northern Health  
Susan Snelling, PHRED  
Nancy L. Young, Laurentian University, School of Rural and Northern Health

## ABSTRACT

Northern Ontario Francophones have a higher prevalence of cardiovascular disease (see table 1), as well as higher rates of overweight and obese (see table 2) persons than other socio-linguistic groups and geographical locations in Ontario, Canada (Picard & Allaire, 2005). Yet, Francophones in Northern Ontario have rates of activity similar to Anglophones and southern residents. This juxtaposition may be explained through a more detailed understanding of their activity patterns. For instance, Francophones actually have a significantly lower percentage of persons highly physically active than Anglophones. As well, environmental factors found within Northern Ontario may greatly influence preferences and interpretations related to physical activity. The current presentation will expand on this juxtaposition while identifying the importance of considering the combined impact of a unique socio-cultural and geographical context when studying physical activity.

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# THE ROLE OF SPLEEN TYROSINE KINASE IN EPITHELIAL CELL RESPONSES TO PSEUDOMONAS AERUGINOSA

PRINCIPAL PRESENTER

Sean K. Gravelle, HBS Sc Student, NOSM Research Laboratory, Lakehead University

CO-AUTHOR

Dr. Marina Ulanova, Associate Professor, Northern Ontario School of Medicine, Lakehead University

## ABSTRACT

Spleen Tyrosine Kinase (SYK) is a non-receptor protein tyrosine kinase that is known primarily for its role in immunoreceptor signaling in leukocytes, and is recently understood to regulate Lung Epithelial Cell (LEC) inflammatory responses. However, the role of SYK in host defense against bacterial infection has never been addressed. We have investigated the role of SYK in a variety of cellular responses to *Pseudomonas Aeruginosa* (PA) infection. H292 LEC were pretreated with piceatannol, a natural chemical inhibitor of SYK, and then stimulated with *P. aeruginosa* strain PAK. Using semi-quantitative RT-PCR we found that inhibition of SYK resulted in decreased expression of the inflammatory cytokine TNF- $\alpha$  after 20 h *P. aeruginosa* stimulation. Next, using a fluorescence-based system to measure internalization of GFP-labeled bacteria, we found that inhibition of SYK resulted in decreased *P. aeruginosa* internalization after 90 min stimulation. Finally, in order to determine the role of SYK in survival of infected cells, we measured cell viability following 8 h bacterial stimulation. We found that cells pretreated with piceatannol remained 98% viable, whereas the viability of non-pretreated cells decreased to 74%. These findings indicate that inhibition of SYK leads to decreased bacterial internalization and cellular inflammatory response, and that these effects may be protective to the infected cell. Future steps will be to investigate the role of SYK in production of an anti-bacterial peptide  $\alpha$ -defensin and in IL-1, IL-6, IL-8, GM-CSF cytokine release. Considering the role of SYK in regulation of lung epithelial responses to *P. aeruginosa*, this molecule may represent a promising therapeutic target in pulmonary infections.

This work was supported by a NSERC Discovery Grant and a Northern Ontario School of Medicine Faculty Association Research Development Award.

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# ONTARIO’S ABORIGINAL MENTAL HEALTH CHALLENGES: HEALTH HUMAN RESOURCE IMPLICATIONS

PRINCIPAL PRESENTER

Mary Ellen Hill, PhD., Senior Researcher, Centre for Rural and Northern Health Research, Lakehead University

CO-AUTHOR

Bruce Minore, PhD., Research Director, Centre for Rural and Northern Health Research, Lakehead University  
Margaret Boone, MScN, Affiliated Investigator, Centre for Rural and Northern Health Research, Lakehead University  
Mae Katt, MEd, Affiliated Investigator, Centre for Rural and Northern Health Research, Lakehead University  
Alexander Lyubechansky, MA, MLIS, Director, Northern Ontario Virtual Library

## ABSTRACT

There is compelling evidence that Aboriginal residents of Ontario carry a heavy mental health burden, made worse by a lack of appropriate services and culturally competent providers. This study, funded by the Ontario Ministry of Health and Long-Term Care and the Ontario Mental Health Foundation, examines the skills and knowledge required to deliver effective mental health care. Answers to these questions were found by synthesizing information from a systematic review of Canadian and international studies, reports and websites; community-based interviews with 55 mental health program administrators, supervisors and front-line personnel in Northern and Southern Ontario; interviews with 27 policy makers and implementers from all of the other provinces and territories; as well as the federal government; and a scan of relevant mental health training programs offered by post-secondary institutions in Ontario.

Results documented the gaps in services, difficulties in clients being transferred from one level of care to another, and restrictions accessing various programs. A major cause of concern was the lack of mental health workers with the requisite preparation to look after Aboriginal client’s mental health needs. While crisis care is usual managed appropriately, the lack of preventive or follow-up care means that clients experience continuing crises, with no resolution of their situation, and, over time, frequently become discouraged and avoid seeking care altogether. The latter is especially likely to occur if they have encountered providers who lack cultural sensitivity.

This presentation outlines the challenges of preparing mental health professionals, clinically and culturally, to care for their Aboriginal clients. These include various barriers that Aboriginal students face in pursuing mental health careers; the difficulty of including culturally-appropriate clinical content in professional programs, open to Aboriginal and non-Aboriginal learners alike; and ongoing issues around developing and sustaining cultural competence in the workplace.

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# NORTHERN HOMELESSNESS: EXPLORING AREAS FOR PUBLIC HEALTH INTERVENTIONS

PRINCIPAL PRESENTER  
Carol Kauppi, Ph.D., Associate Professor and MSW Program Coordinator, School of Social Work, Laurentian University

## ABSTRACT

Housing is an important determinant of health. In Northern communities, relatively little research has been conducted to examine the impact of circumstances such as chronic health challenges, poverty, and lack of affordable housing on vulnerability to homelessness. What remains unclear is how public health can intervene to ensure safe, affordable housing for homeless persons and those who are at risk for homelessness. The aim of the present participatory action study was to describe clients' experiences of the lack of decent, stable, affordable housing on their health. Twenty-seven precariously housed or homeless persons likely to utilize the services of a Sudbury and District Health Unit clinic participated in a multi-methods study which included photo documentation of housing conditions. Participation in individual interviews and/or focus groups enabled participants to tell their stories of the impact of substandard housing on health and to assist by making recommendations for action. The results, obtained using thematic analysis, describe several steps that can be taken to effect positive change, which were supported by an Advisory Group of service providers. The findings outline areas for public health intervention and emphasize the need for public health organizations to make a difference at a societal level for the benefit of vulnerable citizens.

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# BRAIN INJURY FROM AN ABORIGINAL PERSPECTIVE: TRADITIONAL TEACHINGS FROM ELDERS

## PRINCIPAL PRESENTER

Grace King, MScOT (candidate), Department of Occupational Science & Occupational Therapy, University of Toronto

## CO-AUTHOR

Michelle Keightley, Ph.D., C.Psych., Assistant Professor, Departments of Occupational Science & Occupational Therapy and Rehabilitation Sciences, University of Toronto

Ruwan Ratnayake, Department of Occupational Science & Occupational Therapy, University of Toronto

Angela Colantonio, Ph.D., Associate Professor, Departments of Occupational Science & Occupational Therapy, Rehabilitation Sciences and Public Health Sciences, University of Toronto

Bruce Minore, Ph.D., Research Director, Centre for Rural and Northern Health Research, Associate Professor, Department of Sociology, Lakehead University

Mae Katt, M.Ed., RN (EC)

Anita Cameron, Executive Director, WASSAY-GEZHIG-NA-NAHN-DAH-WE-IGAMIG (KAHAC)

Randy White, Mental Health Counselor, WASSAY-GEZHIG-NA-NAHN-DAH-WE-IGAMIG (KAHAC)

Alice Bellavance, Executive Director, Brain Injury Services of Northern Ontario (BISNO);

Claudine Longboat-White, FASD Child and Family Support, WASSAY-GEZHIG-NA-NAHN-DAH-WE-IGAMIG (KAHAC)

## ABSTRACT

### INTRODUCTION

Aboriginal Canadians experience higher rates of brain injury, including fetal alcohol spectrum disorder (FASD), than the general Canadian population. Cultural ideas about disability impact the perception of rehabilitation needs and the ability to access rehabilitation services. In order to provide culturally competent rehabilitation services, it is necessary to have an understanding of the cultural beliefs about brain injury, including FASD, and any traditional healing methods used in its treatment.

### OBJECTIVES

This participatory action research study aims to gain an understanding from Aboriginal Elders in Northwestern Ontario of traditional teachings about the healing of brain injury, including FASD, and how these can inform culturally-relevant rehabilitation practices.

### METHOD

A qualitative focus group was held with Aboriginal Elders to discuss traditional teachings and healing methods for brain injury, and how these can be incorporated into or offered in combination with Western rehabilitation practices in order to offer culturally competent care. Data was analyzed using a thematic analysis method, and findings went through a process of member-checking prior to dissemination.

### PRACTICE IMPLICATIONS

Findings will inform more culturally relevant rehabilitation services for Aboriginal individuals with brain injury, including FASD.

### CONCLUSIONS

New knowledge on traditional Aboriginal teachings and healing approaches for brain injury, including FASD, were gained through sharing by Elders. This process of obtaining traditional knowledge to complement Western medical practices for Aboriginal clients with brain injury is unique and future studies should further explore traditional Aboriginal teachings and healing methods for physical medicine and mental health more broadly.

# METABOLIC SYNDROME IN FIRST NATIONS: GENE VS. ENVIRONMENT

PRINCIPAL PRESENTER

Nadia La Russa, Research Assistant, Northern Ontario School of Medicine

CO-AUTHOR

Dr. Christopher Lai, M.D., F.R.C.P. (C), Associate Professor, Northern Ontario School of Medicine

## ABSTRACT

The purpose of this study is to determine if a trend exists in First Nation that shows a lower prevalence of Coronary Artery Disease despite the presence of Metabolic Syndrome. The First Nation demographic in the initial study showed the highest percentage of Metabolic Syndrome, yet the same group showed the lowest instance of Coronary Artery Disease compared to the non-first nations group. With angiographic data and physicians’ report a total of 1355 cases from the Cardiac Catherization, were used the data collection. These cases were categorized into three areas of study; First Nation, Rural (outside Thunder Bay) and In Town (within the city of Thunder Bay). Using the World Health Organizations’ definition of Metabolic Syndrome, it was determined that 17% of the First Nation group had Metabolic Syndrome, compared to the Rural and In Town group who showed a 5% and 6% instance of Metabolic Syndrome respectively. Of the First Nations patients with Metabolic Syndrome, 69% of them maintained a normal Cardiac Catherization outcome. The Rural and In Town groups show a much lower instance of a normal Cardiac Catherization outcome at 37% and 19% respectively. In conclusion, it was determined that despite having the highest instance of Metabolic Syndrome, the First Nations group showed the lowest instance of Coronary Artery Disease as identified on the Coronary Angiogram. This study is a preliminary retrospective study; we recommend a prospective multicentre study be performed to confirm the initial results.

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# THE MANITOULIN REGIONAL ABORIGINAL DIABETES CARE AND MANAGEMENT RESEARCH PROJECT

PRINCIPAL PRESENTER  
Danusia Gzik, M.D., Family Physician, Manitoulin Island Medical

CO-AUTHOR  
Marion Maar, Ph.D., Medical Anthropologist, Division of Human Sciences, Northern Ontario School of Medicine  
Tim Zmijowskyj, M.D. Division Head, Clinical Sciences, Scientific Director ICEPHC, Northern Ontario School of Medicine  
Tricia Larose, B.Sc., B.A., Research Assistant, Division of Clinical Sciences, Northern Ontario School of Medicine  
Douglas Graham, Mnaamodzawin Health Services  
Pamela Williamson, Noojmowin Teg Health Centre  
Roger Beaudin, M’Chigeeng Health Services

## ABSTRACT

As part of a larger initiative, the UCCM Aboriginal Diabetes Care and Prevention Project, involving Aboriginal health organizations and the First Nations of the United Chiefs and Councils of Manitoulin (UCCM), this regional study examines the management and control of type 2 Diabetes of Aboriginal/non-Aboriginal patients in four medical offices in the Manitoulin Island District of North Central Ontario. In this presentation, we describe the recruitment process of rural physicians into an existing collaborative research partnership between Aboriginal communities and university based researchers. We focus on two areas: (1) the special challenges involved in engaging rural physicians, and (2) the methodological challenges, such as site specific variations of charts, in collecting medical chart information at multiple sites in rural medical clinics, and statistical implications. Specifically, we discuss the impact that factors such as isolation, practice patterns, and the physicians’ interest to engage in research has on rural medical practice, as well as physicians’ expectations of the researchers, concerns related to patient privacy and anonymity of the local clinics, and strategies for successful collaborations. We discuss how these concerns are compounded in small rural communities and how our team has resolved these issues. Overall we found that physicians are very interested in engaging in research that is confidential, ethical, relevant and beneficial to patients. However, it is important to approach physicians with insight into their individual professional situation and allow them to choose their level of involvement into the study. This approach improves the physicians’ readiness to participate in the research and also contributes to the quality of the research by incorporating physicians’ knowledge and skills into the study design. This project received funding and support from the Initiative for Clinical Evaluations of Primary Health Care (ICEPHC), Northern Ontario School of Medicine, under the Scientific Direction of Tim Zmijowskyj, M.D.

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# INNOVATION IN COLLABORATIVE MENTAL HEALTH CARE: THE ABORIGINAL COMMUNITY-BASED MODEL AT MNAAMODZAWIN NOOJMOWIN TEG ON MANITOULIN ISLAND

PRINCIPAL PRESENTER

Marion Maar, PhD, Assistant Professor, Medical Anthropology, Human Sciences Division, Northern Ontario School of Medicine

CO-AUTHOR

Barbara Erskine, PhD, CPsych, Psychologist, Noojmowin Teg Health Centre  
Douglas Graham, RN, Executive Director, Mnaamodzawin Health Services

## ABSTRACT

Many First Nations communities are dealing with complex community mental health issues compounded by cross-jurisdictional and cultural barriers to care, in addition to serious lack of financial and health human resources. Despite these barriers to the provision of mental health services, the mental health professionals at Mnaamodzawin Health Services Inc. and Noojmowin Teg Aboriginal Health Access Centre on Manitoulin Island have developed an innovative model of Aboriginal community-based shared mental health care. Prior to our research, program data and anecdotal evidence suggested that the model maximized mental health resources and successfully integrated clinical services such as counselling, psychology, psychiatry and long-term care, with traditional Aboriginal healing approaches. We conducted a case study of this model, focusing on three main lines of evidence: (1) a program and document review; (2) semi-unstructured interviews and focus groups with a total of 31 providers; and (3) pilot interviews with 23 program clients to examine the impact on their health and well-being. We found that the service model is supported by very high levels of client and provider satisfaction. Interdisciplinary integration of clinical and traditional Aboriginal approaches is well established. The level of cultural competence of the services is perceived as very high by clients. Qualitative data shows that there are significant positive client and family, as well as, service outcomes. Some of the ongoing challenges include a chronic lack of core funding for clinical counseling which acts as a threat to continuity of care and consistent collection of client outcome data.

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# THE DYNAMICS OF MEDICAL TRAINEES WITH PHYSICAL DISABILITIES

PRINCIPAL PRESENTER  
Dr. Bobby M. Chaudhuri, MD, Faculty, Division of Clinical Sciences, Northern Ontario School of Medicine

## ABSTRACT

Physicians struck with illness and residents with physical disabilities find each other at cross-purposes. The disabled doctor and disabled residents want recognition and adaptations. Resident training, however, deals with normative paradigms in teaching different fields of specialty in medicine. Manifest disability is a provocative stimulus for projection, both for patients and one’s own colleagues. The medical profession has little experience in dealing with physicians or trainees with physically disabled medical students, such as pregnant, wheelchair bound, blind, or deaf, as examples of overt problems or epilepsy, post-stroke injury, Crohn’s disease multiple sclerosis, cancer as examples of more covert problems. Issues involving transference, professionalism and the history of bias within the medical profession towards the disabled will be examined within this paper.

The presentation will first briefly explore the historical context in which the medical community has perceived disability. Secondly, the paper will comment on the production of stigma, and examine the nature of public health and prevention and how it affects the disabled and the non-disabled. Third, the expectations by differing College of Physicians and Surgeons (herein for example, Ontario) regarding supervision of these students in both the under-graduate and the post-graduate training program will be discussed. Finally, suggestions for how one might alter the educational structure in order to assist a medical student or resident with disability will be provided

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# CONDUCTING ETHICAL RESEARCH AMONG ABORIGINAL PEOPLE

PRINCIPAL PRESENTER  
Lorrilee McGregor, Chairperson, Manitoulin Anishinabek Research Review Committee

## ABSTRACT

Research fatigue continues to plague Aboriginal communities as Aboriginal people remain a “hot” research topic. This presentation will begin with an overview on the resilience of Aboriginal people in the face of overwhelming pressures to assimilate. Next, an Aboriginal perspective on research and researchers will be provided. Finally, based on the Guidelines for Ethical Aboriginal Research developed for Manitoulin First Nation communities, research considerations will be presented. For example in addition to the Tri-council Policy Statement, there are local values that need to be respected and traditional knowledge that needs to be protected. Other considerations are local protocols, community and individual consent, collaborative research, OCAP (ownership, control, access, and possession), and capacity building.

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# EVALUATION OF NORTHERN SUPPORT AND HOUSING SERVICES FOR PERSONS WITH SERIOUS MENTAL ILLNESS

PRINCIPAL PRESENTER  
Phyllis Montgomery, Associate Professor, School of Nursing, Laurentian University

CO-AUTHOR  
Rheanon Funnell, Program Manager, Canadian Mental Health Association, Nipissing Regional Branch  
Ivan Evers, Support Program Manager, Nipissing Mental Health Housing and Support Services

## ABSTRACT

BACKGROUND  
The incidence of homelessness is greater in the population of persons with Serious Mental Illness (SMI) than in the general Canadian population. Consumers, providers, and policy makers recognize support and housing programs as effective in enabling persons with SMI to live successfully in the community. The effectiveness of such programs, however, is influenced by the community’s characteristics and resources. For example, northern communities’ support and housing programs for persons with SMI must contend with challenges such as lack of a continuum of mental health services, and/or small or non-existing housing markets. Few studies have been done to qualitatively evaluate the effectiveness of such programs, especially in northern settings.

PURPOSE  
The purpose of this research was to evaluate the processes as well as outcomes of support and housing programs for clients with SMI in two northern communities.

DESIGN  
This participation action research was guided by a conceptualization of getting, losing and keeping housing (Forchuk et al., 2006); a view grounded in the housing experiences of 90 psychiatric consumers living in urban and rural communities in southwestern Ontario. The prime method of data collection was Photovoice, the distribution of cameras to clients with SMI and community mental health workers to allow them to illustrate and discuss their realities.

FINDINGS:  
Overall, the programs were evaluated positively when they facilitated psychosocial belonging. From the clients’ perspective, sense of belonging contributed to their health maintenance as well as their abilities to cope day-to-day. From the workers’ perspective, time with and getting to know the person assisted them in co-creating an environment that “fit” with the person’s needs.

CONCLUSIONS  
Implications for practice and policy will be discussed.

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# POSSIBLE LINK BETWEEN HIGHER ADMITTING THRESHOLD AND LOW BOUNCE BACK RATES

## PRINCIPAL PRESENTER

David E. Mutrie, MD, Emergency Physician, Thunder Bay Regional Health Sciences Centre, Assistant Professor, Northern Ontario School of Medicine

## CO-AUTHOR

S. Kathleen Bailey, Research Intern, Northern Ontario School of Medicine  
Saleem Malik, MD, PhD, Thunder Bay Regional Health Sciences Centre,  
Section Leader for Internal Medicine, Northern Ontario School of Medicine

## ABSTRACT

### OBJECTIVES

Examine the relationship, if any, between patient “bounce back” rates and physicians’ admission rates along the Canadian Emergency Department Triage and Acuity Scale (CTAS) continuum.

### METHODS

Emergency physicians (N=29) at a large regional hospital (annual ED census ~90 000) were divided into 3 groups (Lower, Average, Higher) based on their rates of admission (Nadmitted/Npatients) within each CTAS category and overall. We then drew out patients who had “bounced back” at 24 hours, 7 days, and 30 days and performed a Chi Square test of Independence to test whether physician’s admitting group showed a relationship to patient bounce back. We looked at up to four visits per patient, which accounted for 89.5% of patient visits. There were a total of 45 CTAS and Bounce Back combinations investigated.

### RESULTS

In all but five cases (see Table 1), the relationship between physicians’ admitting threshold and bounce back rate was not significant. None of the analyses were significant in the “overall” or “30 day Bounce Back” categories.

### CONCLUSION

There appeared to be a weak trend of lower admission rates pairing with lower bounce back rates, but further analysis on a larger sample of physicians will be required

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# DEVELOPMENT OF THE NORTHERN INTERPROFESSIONAL CENTRE FOR HEALTH EDUCATION

PRINCIPAL PRESENTER

Dr. Ian Newhouse, Dean, Faculty of Professional Schools, Lakehead University

CO-AUTHOR

Dr. Wayne Bruce, Associate Dean, Continuing Health Professional Education, Northern Ontario School of Medicine  
Kelly Reilly, Interprofessional Education Program Lead, Northern Ontario School of Medicine

ABSTRACT

An update will be provided on a recently awarded (Dec, 2007) grant from the HealthForce Ontario Interprofessional Care/Education Fund. The primary objective of this proposal is to develop the Northern Interprofessional Centre for Health Education (NICHE). Building upon the current initiatives in interprofessional education (IPE) and the infrastructure of NOSM and Lakehead University and partners such as Laurentian University, Thunder Bay Regional Health Science Centre (TBRHSC), Sudbury Regional Hospital, Community Colleges across the North, and both the NE and NW LHINS, NICHE will act as a unifying entity to further IP education and care development. The niche of NICHE will be to support northern, rural, remote and aboriginal health needs. A “one-stop shopping” analogy is fitting as NICHE will offer a comprehensive IPE curriculum with course work and practice components that are integrated and sequenced to provide synergies between the research, teaching and service arms. It will also house and coordinate resources, both existing and newly developed, that will advance the understanding and practice of team based, collaborative, patient centered care. These resources will include:

- Courses
- Research initiatives
- Certificate, diploma, undergraduate and graduate degree programs
- Workshops, speaker series, CME credits, forums,
- Capacity building activities to nurture IPE (writing clubs, student associations, team building events)
- Websites and other media that provide IPE information
- Practicum opportunities

NICHE shoppers will be students, patients, faculty, health service organizations and researchers. Students will be defined broadly to include:

- Individuals in any health related profession at both pre- and post-licensure levels
- Individuals in health related disciplines
- Paraprofessionals (particularly important to the Northern, Rural, Remote, Aboriginal context)

There are three cornerstones needed to develop NICHE: 1) Filling the primary Human Resource needs; 2) Creation of a Pan Northern Advisory Committee; and 3) supporting proposed and/or ongoing ICE projects.

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# CHILDREN-IN-CARE PERCEPTIONS OF A PARTICIPATORY ACTION RESEARCH PROJECT BETWEEN THE CHILDREN'S AID SOCIETY DISTRICT OF SUDBURY AND MANITOULIN AND LAURENTIAN UNIVERSITIES ENGLISH SCHOOL OF EDUCATION

## PRINCIPAL PRESENTER

Joanne Y. Pelletier Ph.D. Assistant Professor, Physical Education/Health, School of Education (English), Laurentian University

## CO-AUTHOR

Mark Fraser A.Sc., B.A.Sc., H.B.A, ECHO Program Coordinator - Children's Aid Society District of Sudbury and Manitoulin  
Micheal Asumnaa, B.P.H.E., STRIPE, School of Education, Laurentian University  
Courtney Gordon, B.P.H.E., STRIPE, School of Education, Laurentian University  
Crystal MacFarlane, B.P.H.E., STRIPE, School of Education, Laurentian University  
Katharine McNamara, B.P.H.E., STRIPE, School of Education, Laurentian University  
Sally Parent, B.P.H.E., STRIPE, School of Education, Laurentian University  
Lisa Roberts, B.P.H.E., STRIPE, School of Education, Laurentian University  
Iain Robson, B.P.H.E., STRIPE, School of Education, Laurentian University  
Julia Sporer, B.P.H.E., STRIPE, School of Education, Laurentian University  
Scott Thomas, B.P.H.E., STRIPE, School of Education, Laurentian University

## ABSTRACT

Recent work in the developmental psychology and educational fields have done much to reduce the translational gap between research outcomes/findings and application; however, many questions exist regarding how educators should integrate this research into existing teaching approaches. The Children's Aid Society (CAS) District of Sudbury and Manitoulin's ECHO Program is a therapeutic program that blends current stress neurobiology and developmental psychopathology with current evidence-based psychosocial approaches with maltreated children. The ECHO Program partners with numerous agencies including Laurentian University. Current literature in the area of physical and health education attributes much credence to teachers facilitating learning in ways that provide equal opportunities for students. This suggests a variety of instructional approaches be used by teachers to ensure that all students are learning and benefiting from an opportunity to learn to their full potential. Laurentian University's English School of Education STRIPE (Student Teachers Researching in Inclusive Physical Education) is a group of bachelor of physical and health education students studying to become reflective practitioner teachers. By using working community-based action research principles, the Children's Aid Society (CAS) District of Sudbury and Manitoulin's ECHO Program and the English School of Education STRIPE group, student teachers focused on exploring, developing, incorporating, refining, evaluating and articulating set lessons plans that reflect/build upon/reinforce/exercise ECHO program core concepts. This poster demonstrates how children-in-care perceptions of the approaches built based on ECHO core concepts are impacting on children's performance within this program. The qualitative data brought forth by the STRIPE group coupled with the quantitative data collected by the ECHO program can be especially helpful in developing measurable curriculum focusing on enhancing student academic and social functionality, and learning experiences.

# SUPPORTED EMPLOYMENT AND WORK FOR PAY: ISSUES OF JUSTICE AND EQUITY FOR PERSONS WITH SERIOUS MENTAL ILLNESS IN NORTHEASTERN ONTARIO

PRINCIPAL PRESENTER  
Karen L. Rebeiro Gruhl, MSc.O.T., O.T. Reg (ON), PhD Student, School of Rural and Northern Health, Laurentian University

## ABSTRACT

Employment has long been understood as a key determinant of health at the global, national and provincial levels. People who are working experience better physical and mental health and avoid the ill effects of poverty. People with mental illness also desire work, yet, are often denied just access to employment opportunities. Recent advances in how to best foster competitive employment for persons with serious mental illness (SMI) have unfortunately not materialized into better employment outcomes in Ontario. Persons with SMI continue to experience unacceptably high levels of unemployment, estimated to be between 75 and 89%. In a multi-site, Pan-Ontario study, Koegl et al., identified continued high rates of unemployment for persons with SMI and a relative scarcity of vocational services within funded community mental health programs. Employment is a particularly pressing issue for persons with SMI in Northeastern Ontario which is characterized by the highest unemployment rates in the Province, 4,5. Many challenges to implementing supported employment programs exist in northern and rural places, the least of which are vast geography, distances, and inclement weather. Successful employment programs additionally have been shown to be less successful in regions which have not integrated mental health and vocational services; in areas which routinely struggle with adequate human health resources; and within regions with high unemployment rates and lower educational attainment 6,7. These factors characterize northern and rural places, and collectively, begin to paint a grim picture for the employment prospects of persons with SMI in this region of the province. This paper will explore the role of place in the implementation of employment policy and services for persons with SMI in Northeastern Ontario.

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# HEALTHIER FIRST NATIONS COMMUNITIES THROUGH COMMUNITY-BASED TOBACCO CESSATION AND INTERVENTION

PRINCIPAL PRESENTER

Patricia M. Smith, PhD, Associate Professor, Northern Ontario School of Medicine

CO-AUTHOR

Robert Thomas, Health Director, Keewaytinook Okimakanak  
Franz Seibel, Researcher, Keewaytinook Okimakanak  
Brian Walmark, Research Director, Keewaytinook Okimakanak

## ABSTRACT

This presentation will report on a pilot study of a comprehensive smoking cessation program implemented in six First Nations communities in Northwestern Ontario - Deer Lake, MacDowell Lake, North Spirit Lake, Keewaywin, Fort Severn, and Poplar Hill. The study is a joint collaboration among the Keewaytinook Okimakanak (KO) Health Advisory Committee, the KO Community Health Directors and Executive Director, and a researcher from the Northern Ontario School of Medicine. The rationale for the study stems from the high smoking rates within First Nations communities in Northwestern Ontario, which are approximately three times the Canadian national average.

The study ran from January to March, 2008 and included three general strategies. The “Orientation and Training” strategy involved hiring and training smoking cessation coordinators in each community, the development of reporting templates and processes, and the recruitment of tobacco cessation experts for bi-weekly telehealth education sessions. The “Community-based Tobacco Cessation Activities” strategy included the development of a series of tobacco cessation activities including local support groups, an online tobacco cessation program, a quit smoking contest, KO Telehealth Network education sessions, raised awareness for smoke-free homes and cessation, and a communications campaign to inform the communities about the various activities. The third strategy involved a nursing station-initiated smoking cessation brief intervention that used return from hospital to community as a window of opportunity for continued smoking cessation support, which built on a current smoking cessation study underway in all hospitals in NW Ontario. Process, impact, and outcome evaluations were completed for each of the three strategies. This presentation will present the results of these evaluations, along with recommendations for ongoing programs based on the successes.

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# CITIZENS CAN OFFER VALUABLE INPUT FOR INFLUENZA PANDEMIC PLANNING

PRINCIPAL PRESENTER

Laena Maunula, HBSc, MPH, Centre for Health Care Ethics Lakehead University

CO-AUTHOR

Jaro Kotalik, MD, MA, FRCPC, Northern Ontario School of Medicine and Centre for Health Care Ethics, Lakehead University

ABSTRACT

Anticipation of another influenza pandemic has prompted governments, pubic health authorities and experts to develop elaborate plans for this situation. These national, provincial and regional plans represent the most far reaching public health policies ever constructed and will affect every member of society.

Involving people in the decisions which will affect them is a basic ethics requirement. Recent literature suggests their involvement will vitally enhance the probability the public will accept and participate in the execution of these plans. The issue is whether all decisions must be made by experts and officials or whether non-expert, ordinary Canadians are sufficiently interested in these issues to become directly engaged. If so, is wide-spread participation of the public in decision making feasible?

We will review the outcome of two large -scale public involvement projects: Public Engagement Pilot Project for Influenza Pandemic (PEPPPI) carried out in the US in 2005 and The Use of Antivirals for Prophylaxis: Deliberative Dialogue Process, commissioned by Health Canada (PHAC, 2007). Finally, we will present results of a 2007 survey conducted by the authors in Thunder Bay, Ontario involving 161 subjects.

These studies suggest that while non-expert groups of citizens initially underestimate the impact of pandemic and start with low levels of knowledge of official plans, they: 1) expressed strong interest to become better informed 2) seek to participate in some aspects of pandemic planning, and 3) with expert assistance, can provide sensible and practical recommendation on such critical issues as prioritization of scarce resources. We need to seek ways in which to better inform, communicate with and engage our citizens in planning for the next influenza pandemic.

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# ROLE OF INTEGRIN RECEPTORS IN RECOGNITION OF PATHOGEN-ASSOCIATED MOLECULES AND INNATE IMMUNITY

## PRINCIPAL PRESENTER

Marina Ulanova, MD, PhD, Associate Professor, Division of Medical Sciences, Northern Ontario School of Medicine

## CO-AUTHOR

Sean K. Gravelle, B.Sc. (Hon.) Student, Lakehead University

Rebecca Barnes, MSc Candidate, Lakehead University

Joseph Eibl, MSc, Research Lab Coordinator, Northern Ontario School of Medicine

## ABSTRACT

Recognition of pathogen-associated molecules is essential for the innate immunity. The Toll-like receptors are key molecules that sense the invasion of pathogens and induce signal transduction leading to inflammatory responses and eventually to elimination of the invader. However, microorganisms can bind various receptors of host cells that results in complex cellular responses. Integrin receptors and their ligands are involved in adhesion and internalization of several pathogens. Upon their engagement, integrins are able to provide signaling that regulates cellular responses. The aim of this study is to test the hypothesis that lung epithelial cell (LEC) integrins serve as receptors to recognize pathogen-associated molecules and mediate the innate immune response to the opportunistic pathogen *Pseudomonas aeruginosa*.

To determine the mechanisms of integrin involvement in LEC responses, we used an in vitro model of infection of A549 cells with *P. aeruginosa* strain PAK chromosomally labeled with a green fluorescent protein gene. Integrin expression in A549 cells was studied by flow cytometry, Western blot, and real time RT-PCR.

The natural  $\alpha 5 \beta 1$  integrin ligand fibronectin enhanced adhesion of *P. aeruginosa* to LEC. *P. aeruginosa* infection caused rapid transcriptional up-regulation of integrins  $\alpha 5$ ,  $\alpha v$ ,  $\beta 1$ ,  $\beta 4$  followed by an increased surface protein expression. Heat-killed, pili-deficient, or core oligosaccharide-deficient PAK did not alter integrin expression, although a flagellin-deficient mutant had the same effect as the wild-type strain suggesting the importance of live bacteria-cell interactions involving intact LPS and pili. The data indicate that *P. aeruginosa* are capable to modulate integrin expression in LEC, potentially using fibronectin to mediate bacterial binding to  $\alpha 5 \beta 1$  integrins. Upon their engagement, integrins can initiate intracellular signaling involved in innate immune and inflammatory responses to the pathogen. Integrin-dependent responses of LEC may play important role in the pathogenesis of pulmonary infection caused by *P. aeruginosa*.

Funding support: NSERC and NOSM

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# THE IMPORTANCE OF GRAPHING THE DATA: ANSCOMBE’S REGRESSION EXAMPLES

PRINCIPAL PRESENTER

Bruce Weaver, Assistant Professor, Human Sciences Division, Northern Ontario School of Medicine

## ABSTRACT

It is well known that good graphs are an important component of data analysis (e.g., Tukey, 1971; Tufte, 1997). Nevertheless, in their haste to look at the numbers, data analysts and researchers often fail to adequately examine the data graphically. Frank Anscombe (1973) used the context of linear regression to illustrate some possible consequences of failing to look at the data graphically. He generated four sets of data that all produce exactly the same equation and summary statistics for a simple regression model:  $Y' = 0.5X + 3$ , regression sum of squares = 27.5, residual sum of squares = 13.75,  $F(1,9) = 18.0$ ,  $R\text{-squared} = 0.667$ . However, when scatter-plots are examined, it immediately becomes clear that only one of the four data sets produces a good regression model. Plots for the three poor models show: 1) a perfect curvilinear relationship; 2) a perfect linear relationship for 10 of the 11 points, with the 11th point being an outlier; and 3) 10 points at one value of X (with considerable variability on the Y axis) and one point at a higher value of X. The lesson to all of us is clear: We must always examine our data graphically.

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# DO ORGANIZATIONAL AND SYSTEM FACTORS AFFECT FAMILY PHYSICIAN PERFORMANCE?

PRINCIPAL PRESENTER  
Elizabeth Wenghofer, PhD, Assistant Professor, School of Rural and Northern Health, Laurentian Univeristy

## ABSTRACT

A growing literature suggests that a physician’s ability to provide good patient care and avoid medical errors is dependent on individual, organization and, system-level factors. A nuanced understanding of how such factors individually and jointly impact on physician performance is required to design and implement effective strategies for measuring and improving performance. The objective of this study was to assess how individual, organizational and system level factors impact on family physician performance across Ontario.

We conduct a cohort study of 532 family practitioners randomly for peer assessment by the College of Physicians and Surgeons of Ontario between 1997 and 2000. A series of multivariate regression analyses examined the impact of individual level factors on family physician performance indicators in six areas: acute care, chronic conditions, continuity care, well care, psychosocial care, and records. A second series of regressions examined the simultaneous impact of individual, organizational, and system level factors.

Multiple regression models were significant for all performance indicators. The effects of physician, organizational and system varied depending on the indicator examined. Acute care, well care and records management were primarily effected by physician and organizational factors, psychosocial care by organizational factors and chronic conditions and continuity care by organizational and system factors. Of particular interest, the system level variables related to availability of diagnostic tests and physician to population ratio were predictive of performance, both of which are of particular relevance in Northern Ontario.

Individual, organizational and system level factors all significantly impact physician performance to varying degrees dependent upon which dimension of performance is examined. Thus, interventions and policy aimed at improving performance must both consider the specific dimension of performance where improvement is required and, the broader organizational and system context of medical practice.

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# ALDOKETOREDUCTASE 1C2-MEDIATED CONVERSION OF DOXORUBICIN TO DOXORUBICINOL IN ANTHRACYCLINE-RESISTANT BREAST TUMOUR CELLS

PRINCIPAL PRESENTER  
Stephanie Cull

CO-AUTHOR  
David MacLean  
Zachary Veitch  
Amadeo Parissenti

## ABSTRACT

Anthracyclines are highly effective drugs used in the treatment of breast and other cancers. However, innate or acquired resistance to these agents results in treatment failure for over 90% of patients with metastatic breast cancer. Sadly, clinically relevant mechanisms for anthracycline resistance in these patients have yet to be identified. Recently, we have created derivatives of the MCF-7 breast tumour cell line resistant to the anthracyclines doxorubicin (MCF-7DOX) or epirubicin (MCF-7EPI). Interestingly, these cells express higher levels of aldoketoreductase 1C2 (AKR1C2) than wildtype cells. Since these enzymes convert doxorubicin to a 10-fold less toxic metabolite of doxorubicin (doxorubicinol), their elevated expression in breast tumour cells may play an important role in clinical resistance to anthracyclines. To test this hypothesis, 8 million MCF-7, MCF-7DOX, and MCF-7EPI cells were incubated for 24 hours in the presence of 0.1  $\mu$ M doxorubicin and, after washing, the cells were extracted for the quantitation of intracellular doxorubicin and doxorubicinol levels by high performance liquid chromatography. Compared to MCF-7 cells, the intracellular concentrations of doxorubicin and doxorubicinol were reduced ( $P<0.05$ ) 58 $\pm$ 7% and 11 $\pm$ 4%, respectively, for MCF-7DOX cells and 89 $\pm$ 2 and 30 $\pm$ 2%, respectively for MCF-7EPI cells, suggesting less accumulation of both doxorubicin and its metabolite in drug-resistant cells. The doxorubicinol/doxorubicin concentration ratios within MCF-7, MCF-7DOX, and MCF-7EPI cell lines were observed to be 14 $\pm$ 2, 33 $\pm$ 3%, and 84 $\pm$ 1%, respectively. Taken together, these findings suggest that selection of breast tumour cells for resistance to anthracyclines results in increased cellular levels of hydroxylated metabolites, likely through the increased expression of AKR1C2. Consistent with this view, an AKR1C2-inhibitor ( $\alpha$ -cholanic acid) almost completely restored sensitivity to doxorubicin in MCF-7DOX cells. Interestingly, drug sensitivity was not restored by  $\alpha$ -cholanic acid in MCF-7EPI cells, suggesting insufficient drug accumulation and/or the presence of additional mechanisms of drug resistance.

Supported by The Ontario Institute for Cancer Research and NSERC

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# AGREE OR DISAGREE IN PRIMARY CARE MENTAL HEALTH? AN ANALYSIS OF INTERPROFESSIONAL AGREEMENT OF PROVIDERS

PRINCIPAL PRESENTER  
Jennifer M. Kelly, BSc, Lakehead University

CO-AUTHOR  
John M. Haggarty, MD, St. Joseph’s Care Group  
Janelle A. Jarva, MA, St. Joseph’s Care Group

## ABSTRACT

### BACKGROUND/OBJECTIVES

Shared Care is a shared responsibility between different disciplines that strive to provide the best care for patients by means of a cooperative interface in diagnoses and treatment planning. The purpose of the study is to determine the degree of agreeability of clinical priorities and diagnoses based on clinicians within the shared care team.

### METHOD

Reasons for referral based on both psychiatric symptoms and psychosocial issues over 6 years (N= 2220) were collected from those selected by the family physician, counselor and psychiatrist at the Fort William Clinic in Thunder Bay. Agreement of priority clinical issues for each clinician will be compared to assess ‘agreement’ between each, change of agreement over time, and clinical areas most likely to show high agreement. The data will be analyzed using Cohen’s Kappa statistical measure of analysis in order to determine the levels of agreeability.

### RESULTS

Findings pending at time of submission.

### CONCLUSIONS

When completed, the data will contribute further to the concept of Shared Care and the interprofessional relationship implied. The implications of our findings may help to further understand interdisciplinary perspectives in Shared Care.

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# SIX YEARS AND COUNTING: UTILIZATION OF SHARED MENTAL HEALTH CARE SERVICES AT THE FORT WILLIAM CLINIC

PRINCIPAL PRESENTER  
Janelle Jarva M.Sc., Research Intern, Northern Ontario School of Medicine

CO-AUTHOR  
John Haggarty, Northern Ontario School of Medicine, St. Joesph’s Care Group  
S. Robbillard, PhD, Clinical Psychology

## ABSTRACT

**BACKGROUND/OBJECTIVES:**  
Located in a primary care clinic, the Shared Mental Health Care Service (SMHCS) provides psychiatric consultation and brief counselling to mentally ill individuals. The purpose of this study is to examine and describe the characteristics of users of this service.

**METHOD**  
The primary care physicians referred 2220 individuals to the service from July 2001 to May 2007. Analyses included an examination of demographic characteristics among the full group of referred individuals and trends in service use in a subgroup of service users.

**RESULTS**  
Of the total sample of individuals referred to the service, approximately 2/3 were female (70.5%), and the mean age was 37.97 (SD = 14.90). As reported by their primary care physician, the majority (62.4%) were suffering from depressed mood. The most frequently selected psychosocial symptom was marital, common-law, or partner problems (20.2%). Of the 2105 inactive cases, 1655 (78.6%) were seen for at least one appointment, and of those, 19.5% were seen for psychiatric consultation. Females were more likely than males to report being disturbed by depressed mood, bereavement, parent/child issues, illness in a family member, alcohol abuse in a family member, being a victim of past physical abuse, and being a victim of current non-sexual or physical abuse. Males were more likely than females to report problems with anger/temper control, work problems, unemployment, financial issues, legal issues, and WSIB issues.

**CONCLUSIONS**  
This is the first study to describe the characteristics of users of the SMHCS service. The majority of the service users were adult women, who were suffering from depressed mood. Implications of these findings in terms of broader

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# DEVELOPMENT OF A DIAGNOSTIC KIT FOR HOMOCYSTEINE, A BIOMARKER FOR CARDIOVASCULAR DISEASES

PRINCIPAL PRESENTER  
Ryan Mailloux, Ph.D, Laurentian University

CO-AUTHOR  
Dr. Vasu Appanna, Project Coordinator and Supervisor, Laurentian University

## ABSTRACT

Although a variety of factors have been found to contribute to different vascular disorders, high circulating levels of homocysteine has garnered considerable attention. Indeed, increased plasma levels of homocysteine, a metabolic intermediate, has often been considered a critical biomarker for cardiovascular diseases. However, the clinical measurement of homocysteine in the blood stream is limited as current analytical methods are both costly and time-consuming. Thus, it is imperative to develop an efficient and cost-effective method for the detection of homocysteine in the blood stream. We have utilized a microbial system to generate a homocysteine-metabolizing enzyme. This enzyme specifically degrades this metabolite in the presence of NAD with the concomitant formation of NADH. The latter can be easily detected and quantified. This enzymatic system is capable of detecting homocysteine in several serum samples from patients undergoing screening for cardiovascular disorders. The efficacy of this diagnostic kit is presently being optimized. Its utilization will render the detection of homocysteine a routine clinical procedure and will be an immense help in the management of cardiovascular abnormalities.

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# CANADIAN HEALTHCARE EDUCATION COMMONS (CHEC) - A NEW COLLABORATIVE APPROACH FOR EDUCATORS AND RESEARCHERS

PRINCIPAL PRESENTER  
Dr. David Topps, Director, eLearning, Northern Ontario School of Medicine

CO-AUTHOR  
Dr. Rachel Ellaway, Assistant Dean, Education Informatics, Northern Ontario School of Medicine

## ABSTRACT

Research and development of new education approaches is not sustainable in a single institution approach. Costs are too great and there remains a large amount of duplication across educational organizations. The will to collaborate in many areas has been present for many years now but effective mechanisms that can truly facilitate collaborative activity have been lacking.

Building on the SharePoint Team Sites approach that is presented elsewhere, collaborative tools and approaches are being explored in a new group supported by the Association of Faculties of Medicine of Canada (AFMC). Team Sites are fine for small collaborative groups but a much more robust mechanism is required for national level collaboration. NOSM's eLearning Unit has been at the forefront of the development of the Canadian Healthcare Education Commons (CHEC).

Using a Commons approach to promote and coordinate collaborative activities is a much more flexible and sustainable paradigm. Examples of the successes arising from CHEC will be presented, along with some parallel examples of challenges faced. Comparisons will be made with other web oriented mechanisms such as portals and object repositories, highlighting the strengths and weaknesses of each.

Using a Web 2.0 approach, web services, and social networking tools, in a manner similar to FaceBook, CHEC will provide a more flexible and participatory venue in which researchers and educators will be able to work with their colleagues across the country.

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# POSTER ABSTRACTS

THE RESEARCH WORK IN THE FOLLOWING ABSTRACTS ARE ALL ORIGINAL AND INNOVATIVE. THE POSTER PRESENTATIONS ARE AVAILABLE FOR VIEWING THROUGHOUT THE CONFERENCE.

ABSTRACTS HAVE BEEN PUBLISHED EXACTLY AS SUBMITTED, WITH THE EXCEPTION OF FORMATTING.



# THE EFFECTS OF OXIDATIVE STRESS ON PHENYLETHANOLAMINE N-METHYLTRANSFERASE GENE REGULATION

PRINCIPAL PRESENTER

Gino Ubriaco, Graduate Student, Northern Ontario School of Medicine, Laurentian University

CO-AUTHOR

T.C. Tai, Assistant Professor, Northern Ontario School of Medicine, Laurentian University

## ABSTRACT

Cells are able to sense and respond to extracellular and intracellular stimuli by regulating the expression of a number of genes. One of the most common physiological stimuli is oxidative stress imposed to cells via hypoxia (reduced oxygen tension) or reactive oxygen species (ROS). Both hypoxia and ROS are known to regulate catecholamine enzyme genes which serve vital functions in relation with cardiovascular regulation. Additionally, a stressor such as oxidative stress has been linked with the pathophysiology of hypertension. Consequently, alterations in the levels of epinephrine and the epinephrine-synthesizing enzyme, phenylethanolamine N-methyltransferase (PNMT), may further contribute to the development of hypertension. Considering that hypertension has been identified as the number one risk factor for stroke and a major risk factor for heart disease, it becomes evident as to the importance of elucidating the cellular and molecular mechanisms involved in regulation of the PNMT gene. Currently, an in vitro cell culture model employing the oxygen-sensitive rat pheochromocytoma (PC12) clonal cell line, derived from adrenal medullary tumour cells is used to examine how both reactive oxygen species (ROS) and hypoxia (5% oxygen) regulate PNMT gene expression. PC12 cells treated with either the hypoxic mimetic agent, cobalt chloride (CoCl<sub>2</sub>), or exposed to 5% oxygen; increased expression of PNMT mRNA levels maximally at 24h. Furthermore, exposure to 5% oxygen or CoCl<sub>2</sub> also increased nuclear protein levels of the hypoxia-inducible factor 1 $\alpha$  (HIF-1 $\alpha$ ); an immediate early gene transcription factor stabilized by hypoxic conditions. Analysis of the PNMT promoter-driven luciferase activity revealed augmented activity for both CoCl<sub>2</sub> and 5% oxygen treatments. These findings provide evidence that oxidative stress can regulate PNMT gene expression.

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# REGULATION OF CATECHOLAMINE BIOSYNTHETIC ENZYMES BY NITRIC OXIDE

PRINCIPAL PRESENTER

Dominique Ansell, Graduate Student, Northern Ontario School of Medicine, Laurentian University

CO-AUTHOR

T.C Tai, Assistant Professor, Northern Ontario School of Medicine, Laurentian University  
David MacLean, Associate Professor, Northern Ontario School of Medicine, Laurentian University

## ABSTRACT

Catecholamines (CA) are neurotransmitters/neurohormones that are involved in a wide range of physiological processes, including the sympathetic control of arterial blood pressure and cardiac function. Nitric oxide (NO) is a signalling molecule that is a potent vasodilator. Studies suggest that NO may modulate the sympatho-adrenal system via regulation of the release of CA from the adrenal medulla. Studies suggest that an increase in CA levels along with other genetic, molecular and environmental factors may regulate essential hypertension. The focus of this research is to determine the molecular mechanisms which regulate CA biosynthesis. NO can be formed in an enzyme-catalyzed reaction between molecular oxygen and L-arginine and its effect is mediated by the elevation of intracellular cyclic GMP (cGMP) through the activation of soluble guanylate cyclase (sGC). The in vitro rat adrenal medullary pheochromocytoma cell line (PC12 cell culture model), and NO donors are being used to examine the effect of NO on the regulation of the CA biosynthetic enzymes which include tyrosine hydroxylase (TH), dopamine- $\beta$ -hydroxylase (DBH) and phenylethanolamine N-methyltransferase (PNMT). Preliminary RT-PCR revealed altered expression of the epinephrine synthesizing enzyme PNMT after a 6 hour treatment with the NO donor, sodium nitroprusside. Currently, the expression of immediate early gene transcription factors involved in the regulation of PNMT are being investigated through RT-PCR and immunoblot analyses. Further studies on the cellular and molecular mechanisms by which NO regulates PNMT gene expression is currently being investigated. The study of NO and its interaction with the CA pathway could bring forth causal evidence and contribute to the understanding of CA regulation as well as its possible role in the pathogenesis of essential hypertension.

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# THE SMALL GROUP “TELE-LEARNING” OF NOSM’S DISTRIBUTED EDUCATION

PRINCIPAL PRESENTER  
Dr. Bobby M Chaudhuri, MD, Faculty, Northern Ontario School of Medicine, Division of Clinical Sciences

## ABSTRACT

The traditional definition of teleconferencing involves the interaction of any clinician, usually in a consultative role, with a patient in need of an assessment in a site non-accessible to the clinician. Using an audio/video link-up, involving an ISDN line for the consultation to occur, facilitates this process. This concept implies the primary care physician and the distant clinician will communicate about how the patient should be treated after the consult, usually by letter.

Teleconferencing can also involve community services, education for primary care physicians, nurses, social workers, occupational therapists, physiotherapists, psychologists, as well as other specialists. This community interaction and linkage has been recommended in multiple federal position papers, as the technology is just emerging. Practical hazards to physicians are relevant for clinicians to consider, including issues such as informed consent, duty to care, and beneficence. As well, medico-legal considerations around an electronic health record, privacy, and confidentiality also become elements in this complicated telecommunications network.

The use of communications technology, in particular videoconferencing, to provide medical service at a distance; applications of this are wide ranging, including consultation, follow-up, continuing medical education, and other possibilities such as the Northern Ontario School of Medicine [NOSM] distance medical small group learning using teleconferencing.

NOSM’s technique is innovative and will most likely revolutionize medical education in terms of teaching medical students how-to effectively communicate using teleconferencing and learn in this environment. Access for remote, rural, urban, national and international conferences can be made available using this model, which is already being used globally. The question only becomes the quality of education using this distributed learning process versus the “face-to-face” small group learning.

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# DO INTEGRIN RECEPTORS MEDIATE PSEUDOMONAS AERUGINOSA INFECTION OF LUNG EPITHELIAL CELLS?

PRINCIPAL PRESENTER  
Rebecca J Barnes, MSc Student, Biology Department, Lakehead University and Northern Ontario School of Medicine

CO-AUTHORS  
Kam T Leung, PhD, Associate Professor, Biology Department, Lakehead University  
Heidi Schraft, DVM, Associate Professor and Canada Research Chair, Biology Department, Lakehead University  
Marina Ulanova, MD, PhD, Associate Professor, Division of Medical Sciences, Northern Ontario School of Medicine

## ABSTRACT

*Pseudomonas aeruginosa* (Pa) is an important opportunistic pathogen with multiple virulence strategies. Mechanisms mediating interactions between bacteria and lung epithelial cells (LEC) are poorly understood. Previous studies suggested that integrin receptors are involved in the interactions of Pa and LEC during pulmonary infection. Our goal is to test the hypothesis that integrins are important for Pa adhesion to LEC, invasion of LEC, and activation of LEC responses. We have labeled a strain of Pa PAK with a green fluorescent protein (gfp) gene and used various fluorescence based detection methods to measure bacterial adhesion to and invasion of A549 human alveolar Type II pneumocytes. Using this methodology, we found that Pa strongly adheres to fibronectin (Fn) and vitronectin (Vn), the natural ligands for  $\alpha_5\beta_1$  and  $\alpha_v\beta_5$  integrins respectively. In addition, exogenous Fn increases PAKgfp adhesion to LEC but does not affect invasion, while Vn has no effect on either adhesion or invasion. The effects of integrin blocking RGD peptides and anti-integrin antibodies on adhesion and invasion were non-specific, though we observed strong IgG binding abilities of PAKgfp which may interfere with antibody based assays. Using siRNA gene silencing of integrins or the cytoplasmic signaling protein integrin linked kinase, we will investigate whether integrins mediate Pa internalization and cellular responses to Pa in terms of NF- $\kappa$ B activation and pro-inflammatory cytokine production. We hypothesize that Pa interactions with integrins regulate LEC responses during infection, and that this is important for pulmonary disease pathogenesis.

(Funded by NSERC Discovery Grants, OGS, and NOSM Graduate Student Funding)

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# PRIMARY HEALTH CARE AND SEVERE MENTAL ILLNESS: MODEL OF CARE IN SUDBURY ONTARIO IN THE HOSPITAL SETTING [PHCSMI]

## PRINCIPAL PRESENTER

Sarena L. McLean, MSc Epidemiology and Biostatistics, Biostatistician, Northern Ontario Initiative for Primary Health Care Research and Evaluation, Northern Ontario School of Medicine

## CO-AUTHORS

Dr. Tim Zmijowskyj, Scientific Director, Northern Ontario Initiative for Primary Health Care Research and Evaluation, Northern Ontario School of Medicine

## ABSTRACT

### CONTEXT

Primary health care [PHC] for individuals with severe mental illness [SMI] is an on-going challenge including access and receiving quality of care. In addition, barriers to care associated with primary care reform and the loss of in-patient psychiatric facilities has left the community responsible for providing services.

### OBJECTIVES

This study consists of two phases, an informational research report documenting the model of care at the Mental Health Primary Care Clinic [MHPCC]. Phase II is a mix-method descriptive study using chart audit data and key informant interviews investigating patient outcomes and experiences. Additionally, primary health care professionals' experiences' delivering PHC to this particular population.

### SETTING

The MHPCC in Sudbury Ontario.

### PARTICIPANTS

Patients attending the MHPCC and health care professionals from the MHPCC and the Crisis Intervention Program. Outcome Measures: The outcomes are both a documented model of shared care for the MHPCC along clinical patient outcome variables and interviews capturing their experiences of attending the MHPCC. Finally, study outcomes will illuminate primary health care professionals' experiences delivering health care services to this population using a shared care delivery model.

### RESULTS

The PHCSMI study is underway and there are no results to report at this time; however, preliminary results will be available in May 2008.

### CONCLUSIONS

The PHCSMI is focused on individuals with SMI and their PHC. The burden of disease for individuals includes both physical and mental health illness issues. Individuals face many challenges in securing regular PHC. Subsequently, primary health care professionals face challenges in providing PHC services and the continuity required for quality PHC to those suffering from SMI. Understanding how the MHPCC functions and experiences of individuals who both use and provide primary health care services will aid in other locations implementing and providing crucial PHC services to this vulnerable population.

# PATIENT TOBACCO USE AND PROVIDER TOBACCO CESSATION INTERVENTIONS IN NW LHIN HOSPITALS

## PRINCIPAL PRESENTER

Patricia M. Smith, PhD, Associate Professor, Northern Ontario School of Medicine

## CO-AUTHORS

Scott M. Sellick, PhD

Peter Brink, MA

Alan Edwardson, HBA, Thunder Bay Regional Health Sciences Centre.

## ABSTRACT

### INTRODUCTION

This study was designed to assess the extent to which the Tobacco Use and Dependence Clinical Practice Guidelines have been implemented in hospitals in NW Ontario, Canada.

### METHODS:

Tobacco use questions were added to the inpatient and ER electronic admitting forms in every hospital to determine the magnitude of tobacco use. Structured interviews with hospital management were used to identify the extent of systems-level tobacco guidelines in place. Surveys were distributed to all hospital-based clinicians (physicians, nurses, and others with direct patient care) to determine clinicians' adherence to the 5A's (ask, advise, assess, assist, arrange). Following data collection, detailed recommendations were made to each hospital based on systems-level and clinician-level results. Recommendations were mapped onto Canadian Council of Health Services Accreditation quality care indicators.

### RESULTS

Of the 170,000 admissions tracked in the first 6 months of the study, 33% indicated tobacco use in the last month. Tobacco use among adults 18-45 yr of age was 46%. None of the hospitals had implemented systems-level tobacco guidelines. The response rate from clinicians was low (n=371), but the results were promising-71% ask patients if they smoke, 64% advise patients to quit, 55% assess motivation to quit, 46% provide assistance, and 27% arrange follow-up.

### CONCLUSION

Tobacco use among hospital patients in NW Ontario is high (33% vs. 26% among the general population in NW Ontario and 19% in Ontario overall), highlighting the urgency of implementing tobacco guidelines to enable expansion of tobacco intervention services during hospitalization. Although none of the hospitals had implemented systems-level guidelines, most clinicians at least ask and advise patients to quit during hospitalization and hospitals were receptive to recommendations. The study will continue over the next year, helping hospitals expand tobacco cessation services tailored to their baseline data and tobacco guideline recommendations.

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# SMOKE-FREE LEGISLATION AND LONG-TERM CARE HOMES IN NORTHWESTERN ONTARIO: IDENTIFYING THE BENEFITS, CHALLENGES, AND SAFETY CONCERNS

PRINCIPAL PRESENTER  
Patricia M. Smith, PhD, Associate Professor, Northern Ontario School of Medicine

CO-AUTHORS  
Heather Woodbeck, MHSA, St. Joseph’s Care Group/MOHLTC  
Simon Hoad, HBA, Thunder Bay District Health Unit

## ABSTRACT

**BACKGROUND**  
This study was designed to measure outcomes related to the 2005 Smoke Free Ontario Act in long-term care (LTC) homes in NW Ontario. The study grew out of concerns resulting from the Act, such as the safety of long-term care residents being compromised by smoke-free regulations that were designed to protect the health of residents and staff. The Act includes no smoking in enclosed public places, no smoking within 9 metres of the door, and strict building/ maintenance rules for a smoking room.

**METHODS**  
20 of 21 long-term care facilities in NW Ontario participated in a structured telephone interview. Participants were asked about tobacco use prevalence among residents, changes made by each LTC home to comply with the Smoke Free Ontario Act, and the benefits, challenges, and incidents that have resulted from it.

**RESULTS**  
Results showed an average of 4 smokers per LTC home. Most homes (90%) have a 9 metre from the door rule (vs. smoke-free grounds) and none of the homes have an indoor smoking room. Challenges include safety (residents and staff), liability, surveillance/policing, compliance, dangerous “hidden” smoking, staff withholding cigarettes or limiting access to outside, assessment of fitness to smoke outside, resources (grounds clean-up), and bed-blocking in acute care facilities when LTC homes do not want to accept smokers and smokers who do not want to live where they cannot smoke.

**CONCLUSIONS**  
Issues of liability, responsibility, resources, and appropriate, safe, resident care require urgent solutions. These challenges will not disappear without active problem-solving and additional resources.

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# THE RADIATION THERAPY PROGRAM AT LAURENTIAN

PRINCIPAL PRESENTER

Dianne Cameron, Ph.D., Coordinator, Radiation Therapy Program, Laurentian University

## ABSTRACT

Radiation Therapy is one of three specialties in Medical Radiation Technology (MRT), a regulated profession under Ontario’s Regulated Health Professions Act. The Bachelor of Science program in Radiation Therapy at Laurentian is a collaborative program between The Michener Institute for Applied Health Sciences in Toronto and Laurentian University, with clinical placement at the Regional Cancer Program of the Hôpital régional de Sudbury Regional Hospital and other participating regional cancer centres. The joint program, which accepted its first students in Sept. 2003, offers a combined BSc / Diploma in Radiation Therapy, and is one of only two training programs currently accredited in the province of Ontario, the other being provided through a similar collaboration between The Michener Institute and University of Toronto.

This highly innovative program incorporates a foundation in the undergraduate science curriculum delivered at Laurentian with distributed on-line delivery for much of the discipline-specific content by faculty located at the Michener Institute, coupled with videoconferenced tutorials and laboratories on campus at Laurentian or at facilities of the Hôpital régional de Sudbury Regional Hospital. During clinical placement at participating regional cancer centres in the final program year students complete a clinical research project. Close collaboration among Laurentian, Michener and clinical faculty is essential for the day-to-day delivery of the program and support of its students.

This presentation outlines the evolution of the program, highlighting some obstacles and successes along the way. It will also review the program’s success in achieving two of its primary goals: making training in this professional discipline more accessible to students in the north; and retaining health care professionals in the north.

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# CANADIAN INDICATORS OF HEALTH FOR CHILDREN IN RURAL AND NORTHERN REGIONS

PRINCIPAL PRESENTER

Susan J. Snelling, PhD, Manager, Research & Evaluation, Sudbury & District Health Unit

CO-AUTHORS

Nancy L. Young, PhD, Canada Research Chair, Rural and Northern Children’s Health, Laurentian University  
Ellen Sears, BSC, NOHFC Research Intern, Laurentian University

## ABSTRACT

Indicators of health are often used to describe the health of a population. But which indicators are the most appropriate to measure the health of children living in rural and northern regions? The objective of this project is to identify the most relevant health indicators for these children.

We completed a formal review of the literature to identify indicators of child health used previously. These were organized according to a conceptual framework that incorporated health status, determinants of health, health care quality indices and community status and to identify indicators to fill gaps in the framework. An Expert Panel used a card sort and a Delphi process to reduce the number of indicators to those most relevant to rural children’s health and well-being. The experts also identified additional indicators that were relevant to understanding the health of rural and northern children.

The researchers assessed the capacity of existing national and provincial data sources to provide data on the resulting list of indicators. Health estimates were generated on the most relevant indicators, when data existed, to begin to describe the health and well-being of children in rural and northern regions. The results of this work will be used by local service providers to expand their understanding of the health status of the rural and northern children that they serve. The findings will also be used to advocate for improved health data on rural children, both with respect to the types of indicators measured and also with respect to the ability of large datasets to identify rural and northern children for sub-analyses tailored to their baseline data and tobacco guideline recommendations.

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# VIRTUAL PATIENTS FOR OBJECTIVE PERFORMANCE ASSESSMENT

PRINCIPAL PRESENTER

Dr. Rachel Ellaway, Assistant Dean, Education Informatics, Northern Ontario School of Medicine

CO-AUTHORS

Dr. David Topps, Director, eLearning, Northern Ontario School of Medicine

## ABSTRACT

Virtual Patients are a promising new approach to interactive medical education and assessment that was introduced to NOSM from Edinburgh by Dr Ellaway this year. Based on powerful gaming logic engines, this versatile educational tool provides a very easy method to create simple or complex cases, scenarios and narratives that explore the knowledge base and decision making processes of learners.

The code is Open Source and is light on technological requirements. The interface is very simple for both case authors and learners, requiring minimal instruction time for either. But this simplicity hides a very powerful approach that enables the logic engine to deal with complex variables, multiple path solutions and integration of external data sources. All data is XML based allowing much easier integration of web services in a Web 2.0 approach. This facilitates data and case sharing, collaboration on case authoring and analysis and reusability of virtual patient nodes, schema and objects.

All learner activity is tracked in real time, with flexible scoring and feedback mechanisms. Data will be presented that shows how a more objective approach can be taken in assessing learner capabilities when dealing with complex scenarios, rather than just using best of 5 simple MCQ formats. Collaboration with other web services and public data resources enables case presentations that are supported by dynamic data and up to the minute results from rapidly changing health data.

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# SMOKING AND PREGNANCY

PRINCIPAL PRESENTER

Roberta Heale, Assistant Professor, School of Nursing, Laurentian University

CO-AUTHORS

Irene Koren, Assistant Professor, School of Nursing, Laurentian University  
Rachelle Arbour Gagnon, Health Promoter, Environmental Health Division, Sudbury & District Health Unit  
Annie Berthiaume, Public Health Nurse, Sudbury & District Health Unit

## ABSTRACT

Women who smoke during pregnancy are faced with many complex issues relating to quitting. In 2007 a team from Sudbury & District Health Unit and Laurentian University School of Nursing implemented a telephone survey to describe smoking and cessation patterns among a group of 193 women living in the City of Greater Sudbury prior to, during and after pregnancy. Tobacco cessation intervention by health care providers and participant perception of readiness to quit or remain smoke-free were explored.

Results indicate that tobacco use in pregnancy and the postpartum period remains a substantial concern. While the prevalence of daily smokers decreased during pregnancy, it increased one to two months postpartum. Of the 56 participants who reported smoking cigarettes at the time they found out they were pregnant, 10.7% quit tobacco use during their pregnancy and remained tobacco-free at the time of the survey. Just over half (54%) of the remaining smokers made at least one quit attempt during their pregnancy. Quitting ‘cold turkey’ and reducing the amount of cigarettes consumed were the most popular methods used to quit tobacco use. Almost half (46%) of the smokers planned to quit smoking in the next 6 months, and 20% planned to quit in the next 30 days.

Obstetricians, family doctors, public health nurses with the Healthy Babies Healthy Children program, midwives and nurse practitioners were identified as health care providers for this sample. The most common health care interventions for tobacco cessation were asking clients about their intention to quit smoking followed by advising them to quit tobacco use. Providing assistance for quitting and referral to community tobacco cessation services for follow-up were less common interventions.

The supports and barriers to smoking cessation identified in this study provide baseline information for the planning and coordination of interventions to support this vulnerable population.

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# TEAM SITES FOR COLLABORATION

PRINCIPAL PRESENTER

Dr. David Topps, Director, eLearning, Northern Ontario School of Medicine

CO-AUTHORS

Mike Korolenko, eLearning Research and Development Specialist, Northern Ontario School of Medicine

Joel Seguin, Web Services Administrator, North East Local Health Integration Network

Dr. Rachel Ellaway, Assistant Dean, Education Informatics, Northern Ontario School of Medicine

## ABSTRACT

Research is no longer the preserve of the brilliant but isolated boffin, toiling over a beloved set of instruments. Research is now essentially a social activity, relying on collaboration and communication, often between widely dispersed individuals. Electronic media have certainly improved our ability to communicate but new approaches and collaboration software provide some clearly superior mechanisms.

Lightweight, nimble flexible team sites have been established at NOSM for several research groups using Microsoft Windows SharePoint Services 3.0 ®. This free tool provides a simple user interface that is well tuned for easy access and low site maintenance. Data and examples of how best to use these team sites will be provided, based on observations of the participating research teams. Tools such as wikis, forums, document libraries and version control mechanisms will be illustrated.

However, as with many things Microsoft, some of the underlying data objects are not as compatible with other platforms as they could be. Examples will also be given regarding the traps and pitfalls of such a proprietary approach. Extending on this, new approaches will be shown, based on the new Ektron Content Management System that will be the common presentation layer for NOSM data and services.

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# POCKETSNIIPPED - CUTTING COMMENTS FROM THE FIELD

## PRINCIPAL PRESENTER

Dr. David Topps, Director, eLearning, Northern Ontario School of Medicine

## CO-AUTHORS

Joyce Helmer, Chair of the Wabnode Institute, Cambrian College, Section Leader for Clinical Education, NOSM

Christina McMillan Boyles

Richard Witham, Coordinator, Continuing Professional Development Learning Technologies, Northern Ontario School of Medicine

Andrea Smith, Education Resource Consultant, Northern Ontario School of Medicine

## ABSTRACT

The NOSM eLearning Unit has been collaborating with HRSRH, Laurentian University AV Media, Cambrian College and Laurentian School of Nursing on the PocketSnips video library, as was presented last year. Strong collaborative activity has produced a high quality set of micro-videos for healthcare education.

Production costs and time have been reduced significantly through the use of a highly collaborative approach, building on the strengths of each participating organisation. Data will be presented on the cost containment strategies and dissemination methods. Survey and focus group data from undergraduate and postgraduate learners will be presented. Web site activity data and client feedback gained via the web site consultation process has produced some interesting improvements in our process.

Integration with other curricular activities and learning opportunities has been investigated through a number of avenues, the most promising of which are Virtual Patients. Examples of how PocketSnips can be integrated easily into this environment will be presented.

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# ROLE OF ANTIOXIDANTS IN PARAQUAT-INDUCED CYTOTOXICITY

## PRINCIPAL PRESENTER

Panagiotis Mitsopoulos, MSc Student, Northern Ontario School of Medicine, Lakehead University

## CO-AUTHORS

Bruce Cook, MD Candidate, Northern Ontario School of Medicine

Zacharias Suntres, Associate Professor, Northern Ontario School of Medicine

## ABSTRACT

Paraquat, a widely used quaternary nitrogen herbicide, is highly toxic in humans and animals. The primary injury occurs in the lung, which is morphologically characterized by an early destructive phase, where alveolar type I and type II epithelial cells are damaged, followed by a proliferative phase defined by alveolitis, pulmonary edema, and infiltration of inflammatory cells. The cytotoxicity of paraquat has been attributed to its ability to undergo redox cycling resulting in: the generation of superoxide anion, leading to the formation of more toxic reactive oxygen species; the oxidation of cellular NADPH, the primary source of reducing equivalents for the intracellular reduction of paraquat, which results in the disruption of critical NADPH-requiring biochemical processes; and lipid peroxidation which results in the oxidative degeneration of cellular polyunsaturated fatty acids. Recognizing that paraquat induces its toxic effects through oxidative stress-mediated mechanisms, modulating the levels of cellular antioxidants seems to serve as a potential treatment strategy. In the present study, we investigated the in vitro effects of the thiol-containing antioxidant N-acetylcysteine (NAC) delivered to human alveolar epithelial A549 cells, either in its free or liposomal form (L-NAC). Liposomes are phospholipid microscopic vesicles used to encapsulate active drugs to improve their delivery. Incubation of control A549 cells with PQ resulted in time- and concentration-dependent increases in intracellular PQ levels, with a concomitant decrease in cell viability and total thiol levels. Pre-incubation of cells with NAC or L-NAC protected against PQ-induced cytotoxicity (ie. cell viability, levels of thiol content), which was more evident in A549 cells pre-treated with L-NAC. These data suggest that the improved protection conferred by L-NAC appears to be attributed to the higher intracellular NAC levels achieved following its delivery via the liposomal drug delivery system.

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# INTERDISCIPLINARY CLINICAL MENTOR SURVEY REVIEW AND THE RESULTING INTERACTIVE WEBCT PILOT SITE

PRINCIPAL PRESENTER

Roberta Heale, Assistant Professor, Laurentian University School of Nursing

CO-AUTHORS

Sharolyn Mossey, Assistant Professor, Laurentian University School of Nursing

Bev Lafoley, PT, Assistant Professor, Clinical Sciences, Northern Ontario School of Medicine

## ABSTRACT

Clinical mentors are an integral part of all university health care education programs. They can include preceptors, clinical educators and faculty advisors. Although there are variations with clinical mentorship related to practice settings and health care disciplines, there is a well documented need for preparation and support for all practitioners who serve in these roles. To further explore this issue, an online survey was delivered to clinical mentors from a variety of health disciplines. Part of the survey is based on Bandura’s theory of self-efficacy which supports the link between confidence in one’s ability or self-efficacy, and the actual performance of role responsibilities. Participants also reported on supports and barriers to their role as clinical mentors and provided demographic data. In spite of the differences in the scope of practice of the various disciplines, clinical mentors are alike in their low levels of confidence in delivery of clinical education in a number of key areas. In addition, common themes related to the barriers and facilitators to clinical education were observed. Some of these include issues of time, need for increased communication with academic faculty for clarification of course material and university policies, the need for more formal preparation in the role of clinical mentor and the need to increase opportunities for collegial interaction. The data was applied to a WebCT site specific to nursing clinical mentors addressing the support needs of this group. Findings from this pilot demonstrate opportunities for an interdisciplinary interactive communication system regarding clinical mentorship and clinical education in general.

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# THE EXPANDED INDIGENOUS HEALTH RESEARCH DEVELOPMENT PROGRAM

PRINCIPAL PRESENTER  
Valerie O'Brien, Research/Training Coordinator, Indigenous Health Research Development Program

## ABSTRACT

The Indigenous Health Research Development Program is a program dedicated to increasing capacity in Aboriginal health research in Ontario. The IHRDP has recently received funding from the Institute of Aboriginal Peoples' Health as a Network Environment for Aboriginal Health Research. The new IHRDP aims to better address the needs of Aboriginal communities in all parts of the province. The program initially included co-investigators from the University of Toronto and McMaster University. The new program expands to include co-investigators from Trent University, Lakehead University and the Northern Ontario School of Medicine. We currently have offices at the University of Toronto, McMaster University and at Six Nations Polytechnic in Ohsweken, Ontario. Oshki-Pimache-O-Win Education and Training Institute will be the site of a new office in Thunder Bay in 2008. IHRDP's investigators, and new funding opportunities for health research in Aboriginal communities will be highlighted in this poster presentation.

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# HUMAN SEPTIC SERA INDUCES APOPTOSIS AND DNA FRAGMENTATION FACTOR 40 ACTIVATION IN HUMAN FIBROBLASTS

## PRINCIPAL PRESENTER

Danielle Brabant, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University

## CO-AUTHORS

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Shuhung Kung, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University  
Tyler Kirwan, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University  
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Shaimaa Hussein, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University  
Johanna Delongchamp, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University

Abdelwahab Omri, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University

Aseem Kumar, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University

Chilakamarti V. Ramana, Department of Medicine, Yale University, New Haven, CT

Joseph E. Parrillo, Division of Cardiovascular Disease and Critical Care Medicine, Cooper University Hospital

Robert Wood Johnson Medical School, Camden, New Jersey

Anand Kumar, Division of Cardiovascular Disease and Critical Care Medicine, Cooper University Hospital, Robert Wood Johnson Medical School, Camden, New Jersey, and Section of Critical Care Medicine, University of Manitoba.

## ABSTRACT

Sepsis and septic shock represent the systemic immunologic and pathophysiologic response to overwhelming infection. Approximately 800 000 cases of sepsis are reported every year in the USA and 215 000 will succumb to the disease despite aggressive antibiotics and supportive care. Septic patients can succumb through the development of early refractory hypotension or late multiple organ dysfunction. The host response to sepsis includes regulation of the pro-inflammatory response, cell-adhesion molecule regulation, inducible nitric oxide synthase (iNOS) induction and apoptosis. Misregulation of apoptosis during sepsis may contribute to cellular dysfunction and multiple organ dysfunction.

We observed elevated levels of TNF- $\alpha$ , IL-1 $\beta$  and IFN- $\gamma$  in sera obtained from patients undergoing sepsis (septic sera) when compared to sera obtained from healthy volunteers (normal sera). Utilizing a tissue culture model which mimics the human disease we demonstrate that septic sera treatment of fibroblasts (2fTGH) activates a caspase cascade involving the initiator caspase 8 and caspase 3. We also demonstrated that the DFF 40 inhibitor, DFF 45, is cleaved and rendered inactive in 2fTGH cells treated with septic sera. To further elucidate the mechanism of apoptosis, we extended our observations to a mutant human fibroblast cell line that lacks the signal transducers and activators of transcription 1 (STAT1). These STAT1 null cells (U3A) have previously been shown to be resistant to TNF- $\alpha$  induced apoptosis. We have shown that U3A cells are resistant to septic sera induced apoptosis utilizing light microscopy, trypan blue exclusion assay and genomic DNA laddering. In addition, septic sera treated U3A cells did not activate DFF 40. Taken together, these data suggest that septic sera treatment of 2fTGH induces apoptosis which is partly dependent on caspase and DFF 40 activation. Apoptosis mediated by caspases and DFF 40 may play a significant role in mediating sepsis induced cellular dysfunction.

# CHARACTERIZATION OF BACTERIAL RNA INDUCED SIGNAL TRANSDUCTION PATHWAYS THAT CAUSE CELLULAR DYSFUNCTION

## PRINCIPAL PRESENTER

Shaimaa Hussein, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University

## CO-AUTHORS

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Danielle Brabant, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University  
Tyler Kirwan, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University  
Abdelwahab Omri, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University  
Aseem Kumar, Department of Chemistry and Biochemistry, Biomolecular Sciences Program, Laurentian University  
Chilakamarti V. Ramana, Department of Medicine, Yale University, New Haven, CT  
Joseph E. Parrillo, Division of Cardiovascular Disease and Critical Care Medicine, Cooper University Hospital, Robert Wood Johnson Medical School, Camden, New Jersey;  
Anand Kumar, Division of Cardiovascular Disease and Critical Care Medicine, Cooper University Hospital  
Robert Wood Johnson Medical School, Camden, New Jersey and Section of Critical Care Medicine, University of Manitoba

## ABSTRACT

Septic shock (shock due to infection) and sepsis associated multiple organ failure are the number one cause of death in North American intensive care units with an incidence which continues to increase. Approximately 800,000 cases of sepsis are admitted every year to American hospitals with half of those developing septic shock and half of those succumbing (215,000 deaths/year). The typical human cardiovascular response to septic shock is characterized by hypotension, decreased systemic vascular resistance and elevated cardiac index. Septic deaths are typically due to early refractory cardiovascular failure (hypotension or shock) or later multiple organ failure. Bacteria known to cause septic shock and induce myocyte contraction depression include, *E. coli* and *S. aureus*. Classically, cellular dysfunction was thought to be dependent on bacterial exotoxins such as Toxic Shock Syndrome Toxin-1 and/or bacterial endotoxin (lipopolysaccharide). In this research proposal we hypothesize that myocyte cellular dysfunction is partially mediated by bacterial RNA. Our data indicate that bacterial RNA activates protein kinase RNA-dependent (PKR) to induce cardiac myocyte dysfunction. In addition we demonstrated that bacterial RNA induces caspase 1 and 3 cleavage. We have also shown that myocytes produce IL-1 $\beta$  in response to bacterial RNA treatment. Using in vitro cellular and molecular biology strategies, our research will delineate the bacterial RNA induced signal transduction pathways that lead to cellular dysfunction.

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# CHARACTERIZING THE ROLE OF STAT, IRF & NF- $\kappa$ B SIGNALLING DURING SEPSIS

## PRINCIPAL PRESENTER

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## ABSTRACT

Sepsis is a multi-factorial disease induced by an overwhelming inflammatory response to microbial infection. Sepsis and septic shock are the leading causes of death in intensive care units in the developed world. Approximately 800,000 cases of sepsis are reported annually in the United States and one quarter of patients will succumb to the disease. Largely due to an increase in invasive procedures and an aging population, annual cases of sepsis continue to rise and are projected to double by 2050. Sepsis is initiated by the presence of microbes or their components which elicit a complex signalling cascade and can lead to myocardial dysfunction, vasculatory collapse, multiple organ failure and death. The key pathways involved in mediating septic organ dysfunction are known to be regulated by transcription factor family members: nuclear factor- $\kappa$ B (NF- $\kappa$ B), signal transducers and activators of transcription (STAT) and interferon regulatory factor (IRF). These transcription factors induce the inflammatory response through the expression of inflammatory mediators including cytokines, chemokines, cell-adhesion molecules and inducible nitric oxide synthase (iNOS). Although NF- $\kappa$ B, STAT and IRF transcription factor families broadly regulate the inflammatory response, sub-family members have distinct regulatory roles within this response. Previously, we have shown activation of STAT, IRF and NF- $\kappa$ B in response to septic serum. This study aims to elucidate the specific transcription factor sub-family members being activated using a tissue culture model mimicking sepsis. Transcription factors STAT, IRF and NF- $\kappa$ B mediate pathways that modulate the expression of hundreds of genes which are involved in sepsis. Modulation of these pathways may lead to regulation of the immune system in an attempt to return the body to homeostasis. Consequently, targeting these transcription factors may be a novel therapeutic strategy to reduce the severity of disease and mortality in patients with sepsis and septic shock.



# MOLECULAR MECHANISMS OF PHENYLETHANOLAMINE N-METHYLTRANSFERASE GENE REGULATION ASSOCIATED WITH HYPERTENSION

## PRINCIPAL PRESENTER

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## ABSTRACT

Phenylethanolamine N-methyltransferase (PNMT) is the terminal enzyme in the catecholamine biosynthetic pathway, responsible for the synthesis of the neurotransmitter/neurohormone epinephrine. Increased epinephrine levels are correlated to increased sympathoadrenal activity and elevated blood pressure. Recent genetic mapping studies in rats and humans suggest that the PNMT gene is a candidate gene for hypertension. Furthermore, elevated PNMT gene expression is correlated with elevated blood pressure in hypertensive rats. However, the mechanism associated with changes in PNMT gene expression is not known. Studies from our lab have identified key transcriptional regulators of the PNMT gene such as Egr-1, Sp1, GR, and AP-2. We hypothesize that altered PNMT gene expression associated with hypertension is mediated by altered transcriptional regulation of the PNMT gene.

The current study investigates the mechanism by which dysregulation of the PNMT gene occurs in a genetic rodent model of hypertension. Results from the current study show that spontaneously hypertensive rats (SHR) have elevated systolic, diastolic, and mean arterial blood pressure compared to age-matched Wistar-Kyoto (WKY) rats at 14, 15 and 16 weeks of age. RT-PCR studies show a 1.5-fold induction of adrenal PNMT mRNA in SHR compared to WKY, as well as increased levels of transcription factors Egr-1 (3.2-fold), Sp1 (3.3-fold) and GR (1.3-fold) associated with PNMT regulation.

These results suggest that altered transcriptional activity may serve as a mechanism for altered regulation and expression of the PNMT gene, which may be involved in the development and maintenance of hypertension.

(Supported by a Banting Research Foundation Grant)

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# IONIZING RADIATION-INDUCED OXIDATIVE STRESS AND DNA DAMAGE IN LYMPHOCYTES OF VARYING BRCA1 EXPRESSION

PRINCIPAL PRESENTER

Lindsay Sutherland, M.Sc. student, Department of Biology, Lakehead University, Northern Ontario School of Medicine

CO-AUTHORS

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Dr. Neelam Khaper, Northern Ontario School of Medicine

## ABSTRACT

Inherited germline mutations in the tumour suppressor gene BRCA1 (BREast CANcer susceptibility gene 1) lead to an increased risk for various cancers. Evidence now suggests that epigenetic changes resulting in reduced or absent expression of BRCA1 is also an important causative factor in sporadic breast cancer. Besides its many known roles, a recent study has identified yet another function for BRCA1: to protect cells from oxidative stress, a contributory factor in the development of many cancers, including breast cancer. To date, there have been no studies that correlate BRCA1 expression levels with the cellular response to oxidative stress induced by ionizing radiation, a primary modality of cancer treatment. We hypothesize that altered expression of BRCA1 in peripheral blood lymphocytes affects their response to oxidative stress following exposure to ionizing radiation. Preliminary data using flow cytometry indicate that a 200cGy dose induces a significant amount of DNA damage through the induction of oxidative stress in lymphocytes. Currently, this study is comparing levels of radiation-induced oxidative stress between lymphocytes with varying levels of BRCA1 expression (from individuals with BRCA1 germline mutation, individuals with sporadic breast cancer, and normal controls). Two specific types of DNA damage are also being analyzed (oxidized base, 8-hydroxy-2'-deoxyguanosine as well as DNA double strand breaks). Intracellular levels of reactive oxygen species are assessed through the amount of fluorescence produced by oxidation of a 2',7'-di-chlorofluorescein (DCF) dye.

(Supported by the NCRF and NOSM).

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# EFFECTIVENESS OF P-DIETHYLPHENYLDIAMINE IN THE DETERMINATION OF ODOR-CAUSING SULFUR COMPOUNDS IN WATER

PRINCIPAL PRESENTER  
Breanna Duquette, Research Associate, Nipissing University

CO-AUTHORS  
Stephen Kariuki, Chemistry Division, Biology Department, Nipissing University  
Philippe Babady-Bila, Chemistry Division, Biology Department, Nipissing University

## ABSTRACT

The analysis of odor-causing sulfur compounds in water and other environmental samples has attracted significant interest by scientists, primarily because the quality of water can be affected by the presence of sulfides in water. In particular, the importance of hydrogen sulfide as well as some of the reduced sulfur species as environmental pollutants is a result of their toxicity, unpleasant odor even at trace level, and their reactivity with metals and metallic ions found in various environmental samples. We used p-diethylphenyldiamine to investigate the reduced sulfur compounds including polysulfides, thiosulfate, and polythionates as acid-volatile sulfides that have previously not received much attention. We show that the acidification of sulfide-containing samples produces hydrogen sulfide gas, which when reacted with p-diethylphenyldiamine produces an intense coloration which is determined using spectrophotometric means. The classes of the sulfur compounds investigated include simple sulfides, polysulfides, polythionates, thiosulfate, sulfites, and sulfates. The results indicate that p-diethylphenyldiamine is suitable for the analysis of reduced sulfur species in water down to nanomolar concentrations. The method is however not suitable for the analysis of oxidized sulfur species (such as sulfates) in water. Further investigation is in progress.

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# ROLE OF INTEGRIN RECEPTORS IN CARDIOMYOCYTE RESPONSE TO OXIDATIVE STRESS

PRINCIPAL PRESENTER

Lee J. Shewchuk, Research Intern, Division of Medical Sciences, Northern Ontario School of Medicine

CO-AUTHORS

Marina Ulanova, Associate Professor, Division of Medical Sciences, Northern Ontario School of Medicine

Neelam Khaper, Assistant Professor, Division of Medical Sciences, Northern Ontario School of Medicine

## ABSTRACT

Integrin receptors are essential in regulation of vital cardiac function. Reactive oxygen species (ROS) are involved in the signaling and organization of the cytoskeleton, thus suggesting that oxidative stress can have a profound effect on integrin expression and function. The aim of this project is to determine the expression pattern and function of integrins in HL-1 cardiomyocytes under oxidative stress conditions. Cellular response for integrins was determined using RT-PCR to detect mRNA. Protein surface expression was detected with immunostaining for integrins alpha-v, alpha-5, alpha-6, beta-1, beta-3 and beta-4 using flow cytometry. Changes in integrin expression were correlated with the levels of ROS using 5-(and-6)-chloromethyl-2',7'-dichlorodihydrofluorescein diacetate, acetyl ester (CM-H2DCFDA). Preliminary results have found several integrin subunits to be expressed in HL-1 cells under normal conditions. The expression of several integrin subunits were also altered at the mRNA level in cardiomyocytes treated with 100uM hydrogen peroxide for three hours. Future study is directed towards determining the cellular response to oxidative stress in relation to apoptosis by knocking down the integrin beta 1 subunit through siRNA as well as by inhibiting the integrin linked kinase.

(Supported by FedNor and the Northern Ontario School of Medicine)

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# DELIVERING A SCHOOL-BASED FRUIT AND VEGETABLE PROGRAM IN NORTHERN ONTARIO: KEY FACILITATORS AND NOTABLE CHALLENGES

PRINCIPAL PRESENTER  
Renée St Onge, Research and Development Specialist, Sudbury & District Health Unit PHRED Program

CO-AUTHORS  
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Susan Stewart  
Linda Khoshaba  
Betty Ann Horbul  
Bill Chircoski

## ABSTRACT

The Northern Fruit and Vegetable Pilot Program (NFVPP) was a government health promotion initiative implemented in partnership with the local health unit and the Ontario Fruit and Vegetable Growers’ Association. This initiative, which aimed to increase elementary school age children’s intake of fruit and vegetables, is important for northern Ontario, an area where access to fresh produce is limited. An evaluation was carried out to examine the facilitators and barriers to program implementation, and to measure the influence of the NFVPP on children’s cognition, behaviours, and consumption of fruit and vegetables. This presentation will focus on the process evaluation.

In-depth interviews were conducted with school personnel and project leaders. A purposeful sample of 28 participants was selected to ensure representation from a variety of perspectives including the various roles, school boards, school sizes and communities. Participants were asked to speak about their overall reaction to the program, what worked well, and what could be improved.

Results indicate that the NFVPP was positively viewed as a needed health promotion program for children in northern Ontario. The key facilitators included the funding for personnel and supplies and the participation of the school community. The main challenges identified are related to the produce - delivery, quality, variety, and waste - and may be specific to implementing a program in northern Ontario. Despite these challenges, the outcome evaluation found that the program significantly increased the daily consumption of fruit and vegetables at school and resulted in favourable preference changes in certain fruit and vegetables among the students. Of note, it was also pointed out by participants in the process evaluation that the northern region may be particularly suited to a program like this given that some students had limited exposure to fruit and vegetables. Specific steps are being taken to address the challenges identified.

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# THE INFLUENCE OF HYPERTENSION AND FIBER TYPE ON BASAL NITRIC OXIDE CONCENTRATIONS IN RAT SKELETAL MUSCLE

PRINCIPAL PRESENTER  
Sergio Fabris, 4th year student, Laurentian University

CO-AUTHORS  
T.C. Tai, Assistant Professor, Division of Medical Sciences, Northern Ontario School of Medicine  
Ashley Smith, Graduate Student, Laurentian University;  
Lisa Zhao, Graduate Student, Laurentian University;  
David MacLean, Associate Professor, Division of Medical Sciences, Northern Ontario School of Medicine

## ABSTRACT

It is well established that there is a differential distribution of the nitric oxide synthases (NOS; neuronal, eNOS; inducible, iNOS and endothelial, eNOS) in skeletal muscle which differ in their quantitative expression depending on fiber type. In rats it has been observed that the expression of nNOS (the most abundant form in skeletal muscle) is increased in type II as compared to type I fibers. In addition, the basal rate of NOS activity (nitric oxide (NO) production) has been estimated to be approximately 10 pmol/min/mg in rat skeletal muscle and correlates with the percentage of type II fibers. It has also been suggested that hypertension may alter the expression of nNOS in skeletal muscle and hence NO production, however direct measurements of nNOS expression and/or NO concentrations have never been made under these conditions. Therefore, the purpose of the present study was to determine NO concentrations in the white gastrocnemius (WG, Type II) and soleus (S, Type I) muscle of WKY (control) and spontaneously hypertensive rats (SHR). Basal WG NO levels were consistently lower, but not different ( $P>0.05$ ) between WKY and SHR rats, while S NO levels were also similar between groups. However, the WKY and SHR groups showed a 27~~7~~<sup>1</sup>% and 11~~3~~<sup>4</sup>% higher ( $P<0.05$ ) NO concentration in the WG as compared the S muscle, respectively. These data demonstrate that hypertension does not result in any significant changes in basal NO levels in rat WG and S muscle and may be partially explained by the fact that these measurements were made on resting skeletal muscle, where large increases in NO production are not routinely needed. However, this study clearly shows a greater NO concentration in type II versus type I muscle fibers supporting a greater distribution and activity of nNOS in fast twitch muscle fibers.

(Supported by NSERC)

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# ABORIGINAL PALLIATIVE CARE - A QUALITATIVE STUDY OF ABORIGINAL FAMILY MEMBERS

PRINCIPAL PRESENTER  
Natalie St. Pierre-Hansen, Research Intern, Northern Ontario School of Medicine/FedNor, Sioux Lookout.

## ABSTRACT

OBJECTIVE  
Qualitative exploration of the experiences of bereaved Aboriginal family members of palliative care patients.

DESIGN  
Qualitative study using semi-structured interviews.

SETTING  
Northwestern Ontario.

PARTICIPANTS  
Family members of patients who died in Palliative Care in a Northwestern Ontario Hospital were asked to participate in the study. (between 8-12 people will be interviewed)

METHOD  
Semi-structured interviews, lasting 30 to 45 minutes each, are recorded and transcribed verbatim. The transcripts are read by the research team and analyzed using the approach of crystallization and immersion.  
MAIN FINDINGS - In progress

CONCLUSION  
In progress

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# ENZYME-BASED DETECTION OF E COLI AND TOTAL COLIFORMS IN DRINKING WATER USING FIBRE OPTICS AND FLUORESCENCE

PRINCIPAL PRESENTER  
Neville Hewage, Department of Biology, Laurentian University and City of Greater Sudbury

CO-AUTHORS  
Mazen Saleh  
Ed Gardner; Department of Biology, Laurentian University and Sudbury and District Health Unit

## ABSTRACT

Substrates that have chromogens and fluorogens produce colour and fluorescence respectively, upon cleavage by a specific enzyme. These have been used for many years to detect and identify coliform bacteria, including the fecal pollution indicator escherichia coli. Escherichia coli and total coliforms, indirectly detect based on the enzymatic activities of  $\beta$ -glucuronidase ( $\beta$ -glu) and  $\beta$ -galactosidase ( $\beta$ -gal). These enzymes utilize the substrates; anthracene- $\beta$ -d-glucuronide and pyrene d-galactopyranoside. Substrate cleavage by the enzyme release the soluble fluorescent molecules 2-hydroxyanthracene and 1-hydroxypyrene, they are then selectively partitioned in a partitioning element within the sample holder. Fluorescence is coupled into the wave-guide and is selectively detected by a spectrometer. The level of fluorescence produced is detected by the spectrometer and used to measure the level of contamination with E. coli and coliforms presence and absence format. Microbial presence monitored indirectly basis of enzyme growth and release of cleaved products. Drinking water quality parameters such as turbidity, pH, fluoride and aluminum are continuously varying due to adjustment of treatment process due to changing raw water quality. It has impact on enzyme activity, cleaved products and also may have brunt on detection. We are investigating the utility of this system in monitoring the microbial quality of drinking water and detect single cell faster than conventional microbial method such as membrane filtration.

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# A COMMON MISUSE OF CONFIDENCE INTERVALS

PRINCIPAL PRESENTER

Bruce Weaver, Assistant Professor, Human Sciences Division, Northern Ontario School of Medicine

## ABSTRACT

Plots or tables showing point estimates with 95% confidence intervals abound in the medical literature. Many readers (and even some authors) use those confidence intervals to judge whether the difference between two point estimates is statistically significant. The common rule of thumb is that if the two 95% confidence intervals overlap, the point estimates are not significantly different at the .05 level. Unfortunately, this rule of thumb frequently leads to incorrect conclusions: i.e., a test that compares the two point estimates can be statistically significant despite very noticeable overlap of the two confidence intervals. Therefore, the common rule of thumb should be abandoned. The appropriate method for determining whether two point estimates differ significantly is to compare them via an appropriate statistical test (e.g., a t-test if comparing two means), or equivalently, to examine the 95% confidence interval for the difference between the two estimates. If the 95% confidence interval for the difference includes 0, the two point estimates do not differ significantly; if it excludes 0, they do.

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# THE MAKING OF AN EPIDEMIC: A REVIEW OF ABORIGINAL YOUTH AND TYPE 2 DIABETES

PRINCIPAL PRESENTER  
Robert J. Pastre, Medical Student, Northern Ontario School of Medicine

## ABSTRACT

The purpose of this study was to examine and summarize the available literature in the field of Aboriginal youth and Type 2 Diabetes. Specifically, causative factors and current preventative measures served as the focus of this study. Finally, this study aimed to identify gaps in the literature that may exist.

### METHODS

A literature review spanning 1998 to 2007 was performed on the topic of Aboriginal youth and Type 2 Diabetes. Keywords used in the computerized database search, alone or in combination were: Aboriginal, Native, children, youth, pediatrics, type 2 diabetes, and diabetes mellitus. The databases searched were Pub Med, Proquest, and EBSCO. A total of 30 papers were reviewed.

### RESULTS

The majority of the papers illustrated the evidence of an increasing incidence of Type 2 Diabetes among Aboriginal youth and attributed this epidemic to both environmental and genetic causes.

### CONCLUSION

Although much has been learned about this “new” epidemic in terms of its prevalence, causes, and prevention, gaps in the knowledge still exist and thus this topic warrants further investigation. In addition, more long term studies must be done in order to curtail this problem.

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# PERITONEAL CATHETER INSERTION USING THE MINI-LAPROSCOPE: THE 10 YEAR EXPERIENCE OF A SINGLE PHYSICIAN

PRINCIPAL PRESENTER  
Dr. Bill McCready, Professor, Northern Ontario School of Medicine

CO-AUTHORS  
Steven Poirier, Medical Student, Northern Ontario School of Medicine

## ABSTRACT

Insertion of a peritoneal catheter is an important step in providing care to those with end stage renal disease. A decade ago, the departure of two general surgeons coupled with a reduction in inpatient beds prompted the author to initiate the “bed-side” insertion of peritoneal catheters using a mini-laproscope. A total of 88 catheters have been inserted by the author and a retrospective review was conducted in the summer of 2007.

The results of the review will compare results to those reported in the literature. Success rates, early infection rate, time to first use, complications of insertion, hospitalisation rate, catheter life and exit site infection rates will be reported

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# AN ISOFORM OF ACTIN IS ASSOCIATED WITH THE CANCER STATUS OF OVARIAN AND BREAST EPITHELIAL CELLS

## PRINCIPAL PRESENTER

Carita Lanner, Assoc. Professor, Medical Sciences Division, Northern Ontario School of Medicine

## CO-AUTHOR

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Amanda Boyle, Northern Ontario School of Medicine  
Hailey Hobbs, Northern Ontario School of Medicine  
Nicole Gauthier, Northern Ontario School of Medicine  
Heather Peltsch, Northern Ontario School of Medicine  
Facundo Cutuli, Northern Ontario School of Medicine  
Stanislav Naryzhny, Sudbury Regional Cancer Center  
Hoyun Lee, Sudbury Regional Cancer Center

## ABSTRACT

An isoform of actin that appears to be associated with non-malignant ovarian and breast epithelial cells was detected in a study investigating cancer specific forms of the DNA replication processivity factor PCNA (proliferating cell nuclear antigen) in ovarian and breast cancer materials. The actin isoform may contribute to the transition to malignancy and has potential as a biomarker for the cancer status of ovarian and breast epithelial cells.

The novel isoform of actin was detected using an antibody (B1 antibody) generated against a peptide containing ten residues from the interdomain connector loop in PCNA, an important binding domain involved in coordinating the activities of DNA polymerase and ligase. The B1 antibody was used to screen a panel of normal and malignant epithelial (ovarian and breast) cells and tissue samples. Protein lysates were prepared, resolved by two dimensional polyacrylamide gel electrophoresis (2D PAGE), transferred to membranes and immunoblotted. PCNA was detected in all cell types tested. Most interestingly, the B1 antibody detected a novel protein specifically in non-malignant cells. The novel protein has mass of about 42 kDa and a pI of about 5.3, as determined by 2D PAGE analysis and was found to be different from PCNA by immunoblotting with a panel of PCNA specific antibodies. Immunoprecipitation of the protein was performed using the B1 antibody, followed by 2D PAGE and Coomassie staining. Protein spots were cut from gels, destained and subjected to trypsin digestion for MALDI-TOF analysis. Positive identification was obtained for peptide spectra of control proteins, including PCNA, and the novel protein was identified as a form of cytoplasmic actin. Immunoblotting with actin antibodies support the identification of the B1 protein as an isoform of cytoplasmic actin, which could be either beta- or gamma- cytoplasmic actin.

Since PCNA does not share significant overall sequence homology with any actin proteins, a local alignment between PCNA and beta-actin was performed to search for significant homology between domains in PCNA and beta-actin. A ten-residue area of overlap with 50% homology between PCNA and beta-actin was detected. The ten residues correspond to the peptide sequence in PCNA that was used to generate the B1 antibody. The homology between PCNA and beta-actin in this region is likely the basis of the cross reaction between the B1 antibody and beta-actin and identifies a potential site of modification in beta-actin from cancer cells.

In addition, the B1 actin isoform from non-malignant breast epithelial cells exhibited a different MALDI-TOF peptide profile than spectra acquired from malignant epithelial cultures. Non-malignant cells were missing two peptides present in cancer cells and contained instead two novel peptides which could represent phosphorylation products

# BRINGING NUTRITION RISK SCREENING TO CANADIAN PRESCHOOLERS: DEVELOPMENT AND VALIDATION OF NUTRISTEPT (NUTRITION SCREENING TOOL FOR EVERY PRESCHOOLER)

## PRINCIPAL PRESENTER

Lee Rysdale, MEd, RD, Dietetic Officer, Sudbury & District Health Unit

## CO-AUTHOR

Janis Randall Simpson, PhD, RD, Assistant Professor, University of Guelph

Heather Keller, PhD, RD, Associate Professor, University of Guelph

Joanne Beyers, MA, RD, Community Nutrition Specialist, Sudbury & District Health Unit

## ABSTRACT

### INTRODUCTION

Health screening is common practice with young children and part of prevention and treatment. Despite evidence that poor nutrition and inactivity lead to many adverse outcomes, nutrition screening is not done partly due to the lack of a valid and reliable index. This presentation will provide an overview of the development of NutriSTEPT, a community-based, parent-administered, preschool nutrition screening tool.

### METHODS

NutriSTEPT was developed in English and French with more than 1500 multiethnic preschoolers and their parents from across Canada over the past 10 years. Steps included: 1) Feasibility: a draft NutriSTEPT with items developed from literature reviews, expert opinion and parent testing at school readiness fairs (n=120); 2) Further Item Identification: initial questions reworked in consultation with parents (n=500) and national, provincial and local nutrition professionals using an iterative process; 3)

### REFINEMENT

NutriSTEPT was refined and assessed for content and cultural appropriateness at both provincial and national levels (n=670); and, 4) Validation and

### RELIABILITY

NutriSTEPT was validated and tested for reliability in Ontario (n=450).

### RESULTS

This rigorous methodology produced a valid and reliable, bilingual, parent-administered nutrition screening questionnaire that is culturally sensitive and appropriate for multiethnic use across Canada. NutriSTEPT takes less than five minutes to complete and includes 17 questions addressing food and nutrient intake, physical growth, developmental and physical capabilities, physical activity, food security and the feeding environment. It fills a current gap in the health screening of preschoolers and early findings suggest approximately 10% of preschoolers are identified as needing primary prevention, which includes a comprehensive nutritional assessment and treatment.

### CONCLUSION

NutriSTEPT is a fast, simple way to assess eating habits, identify nutrition problems and ethical screening programs can direct parents of preschoolers at risk to appropriate community resources. Furthermore, NutriSTEPT data can be used for surveillance, and for planning and evaluating nutrition intervention programs.

# RESPONDING TO COMMUNITY NEEDS AND VALUING LOCAL KNOWLEDGE: DIABETES RESEARCH IN WIKWEMIKONG, ONTARIO.

PRINCIPAL PRESENTER  
Dr. Kristen Jacklin, Assistant Professor, Northern Ontario School of Medicine

CO-AUTHOR  
Melissa Roy, Wikwemikong Health Centre

## ABSTRACT

This presentation reports on the results of a collaborative research development process with the Wikwemikong Unceded Reserve, Manitoulin Island. Diabetes research was identified by the Wikwemikong Health Centre as their priority area for research in 2005. A collaborative partnership with a university-based researcher resulted in the initiation of a developmental pilot research project based on a participatory action research (PAR) model in 2006. The pilot project endeavored to draw on local knowledge of diabetes in order to develop a multi-year diabetes research strategy for Wikwemikong. Community focus groups, semi-structured key informant interviews and survey methods were used to elicit community member and health care worker’s views on diabetes in Wikwemikong as well as their research needs and priorities. Findings show that community members are concerned about the rate of diabetes in Wikwemikong and are supportive of the development of a multi-year diabetes research strategy in their community. Key areas of research focus identified during this project include: local epidemiology of diabetes and related complications; pathogenesis of diabetes in Aboriginal peoples; the role and efficacy of traditional medicine in the treatment and prevention of diabetes; the connections between mental health and physical health in the onset, progression and outcomes of diabetes in Aboriginal peoples; and, the effectiveness and quality of diabetes care in Wikwemikong.

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# ICEPHC: INITIATIVE FOR CLINICAL EVALUATIONS IN PRIMARY HEALTH CARE - UNLOCKING THE POTENTIAL FOR COLLABORATIVE RESEARCH IN NORTHERN ONTARIO

## PRINCIPAL PRESENTER

Dr. Tim Zmijowskyj, M.D., Associate Professor, Family Medicine and Division Head, Clinical Sciences, Northern Ontario School of Medicine

## CO-AUTHOR

Dr. Roger Strasser, M.D., CEO and Founding Dean, Northern Ontario School of Medicine

Dr. Greg Ross, Ph.D., ICEPHC Senior Strategist and Associate Dean Research, Northern Ontario School of Medicine

Dr. Martha Scott, Ph.D., Research Coordinator, Northern Ontario School of Medicine

Dr. Kristen Jacklin, Assistant Professor - Aboriginal Health, Northern Ontario School of Medicine

Dr. Marion Maar, Assistant Professor - Aboriginal Health, Northern Ontario School of Medicine

Dr. Raymond W. Pong, Research Director, CRaNH

John C. Hogenbirk, M.Sc., Senior Researcher, CRaNH

Sarena McLean, HBA, M.Sc., Biostatistician, ICEPHC Team, Northern Ontario School of Medicine

Anna Hamilton B.Sc.Nursing, M.B.A., Training Coordinator ICEPHC Team, Northern Ontario School of Medicine

Tricia Larose, B.A., B.Sc., Research Assistant, ICEPHC team, Northern Ontario School of Medicine

Vic Sahai, M.Sc., Senior Director Performance, Contract and Allocation, North Simcoe Muskoka LHIN

Other Community Level Partners.

## ABSTRACT

In 2007, the Northern Ontario Initiative for Studies in Primary Health Care (later ICEPHC) of the Northern Ontario School of Medicine received \$500,000 in funding from the MOHLTC to undertake primary health care research in Northern Ontario. This initiative, under the direction of Dr. Tim Zmijowskyj, is now known as ICEPHC - 'Initiative for Clinical Evaluations in Primary Health Care'. The mandate of the initiative is to support and develop primary care research of benefit to all Northern Ontario residents. The mission of ICEPHC is aligned with NOSM's social accountability mandate and is relevant to those who practice in urban and rural and remote communities of Northern Ontario. The initiative has retained team members to provide services of study coordination and design, grant/manuscript writing, and training in research fundamentals. Team members are involved in original research and build capacity for independent research in clinical and community settings. The overall focus of Year 1 Funding was to examine quality of care in chronic disease management, with a particular emphasis on type 2 diabetes (T2DM) and Mental Health. The ICEPHC initiative is currently supporting a number of collaborative projects including: community driven research regarding the epidemiology of type 2 diabetes in Aboriginal communities of Manitoulin Island (Dr. Kristen Jacklin in partnership with the Wikwemikong First Nations, and Dr. Marion Maar - UCCM communities), a study of a clinical model of care to address physical health needs of the Severely Mentally Ill in Sudbury, Ontario, a study to examine quality of care and access issues for people with type 2 diabetes enrolled in the Dryden Family Health Team and other studies related to the accessibility of primary care providers. The services, mission and research of ICEPHC will be explored in this presentation and opportunities for collaboration with various individuals and institutions will be discussed.

# A RANDOMIZED CONTROL TRIAL OF THE ‘TRANSITION INTO PRIMARY CARE PSYCHIATRY’ MODEL OF SHARED CARE

PRINCIPAL PRESENTER  
John M. Haggarty, M.D., Medical Director, Community Mental Health Services, St. Joseph’s Care Group

## ABSTRACT

**OBJECTIVE**  
The purpose of this study was to investigate patient outcomes of a pilot model of shared care, the Transition into Primary care Psychiatry (TIPP).

**METHOD**  
The cluster randomized control trial (RCT) took place in two Canadian cities, one northern and one urban, over a period of 12 months. Twenty-seven family physicians with 49 eligible patients living with severe, chronic mental health problems and recently discharged from outpatient psychiatry services were recruited. Ratings of patient distress, quality of life, and perceived need for services outcomes were reported. Qualitative feedback from clinicians, and patients regarding the studies’ process and outcome were also considered. In both sites, the treatment group received the TIPP model of shared care from the family physician with support from TIPP clinicians and the control group received ‘care as usual’ (CAU) from their family physician.

**RESULTS**  
There were significant differences in change over 12 months between TIPP and CAU groups on measures of psychiatric symptoms and quality of well-being, but not perceived need for care. Feedback from both physician and patient participants are supportive of the study procedures and the TIPP model.

**CONCLUSIONS**  
Participants in the TIPP intervention reported increased recognition of symptoms, and certain aspects of quality of life, when compared to controls. The clinical model and research procedures were well received. The TIPP model is a viable possibility for use as a best-practice model of shared mental health care. Future research should include the use of larger samples, and give careful consideration to selection of outcome measures and possible moderating factors.

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# EPILEPTOGENIC CORTICAL DYSPLASIAS: NEUROPHYSIOLOGY AND NEUROPATHOLOGY

## PRINCIPAL PRESENTER

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## CO-AUTHORS

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## ABSTRACT

Almost 1700 Northern Ontarians have medically intractable epilepsy of which cortical dysplasia (CD) is a principal etiology.

Although epileptogenic CD usually appears as discrete MRI lesions, resective surgery reduces seizures significantly in only 67% (Palmini et al 1991; Bingaman and Catalepe, 2001). To initiate a multipronged investigation into this discrepancy, we reviewed pre-operative EEGs of 50 consecutive patients who underwent resective surgery for CD-related intractable focal epilepsy.

## METHOD

The entry criterion was demonstration of one or more types of CD, disclosed by histological examination of resected specimens. These specimens were reviewed for confirmation of diagnosis and classification into the different subtypes of CD (Palmini et al 2004). Sufficiently congruent data for seizure localization from semiology, EEG and MRI were required for surgical candidature. Archived EEG reports, categorised according to our classification system (Lemieux et al 1984), were reviewed for localization of epileptiform (ictal and interictal) and non-epileptiform abnormalities occurring during wakefulness or sleep.

## RESULTS

Several EEG abnormalities reflected widespread cortical dysfunction 1) independent bi-hemispheric abnormalities (spikes, delta, theta) in 25 (50%) 2) EEGs of 22/25 (88%) had focal spikes in each hemisphere, and 3) 14/50 (28%) had spike-waves (SWs) or other bisynchronous epileptiform patterns. Abnormalities were more widespread in extra-temporal than temporal patients: 1) greater average number of lobes with focal spikes (mean= 3.14 vs.2.14;  $p=0.02$ ), and 2) higher incidence of SWs.

## CONCLUSIONS

Multifocal and bilateral EEG abnormalities in patients undergoing resective surgery for CD-based intractable epilepsy may underlie less than expected surgical effectiveness.

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# REPEATED DISTRESS ASSESSMENT USING A SHORTENED HADS

PRINCIPAL PRESENTER

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ABSTRACT

New patients at the Cancer Centre in Thunder Bay complete the Hospital Anxiety and Depression Scale (HADS) during their first appointment. We have collected baseline psychological distress data on 5,750 newly-diagnosed cancer patients. While we know a lot about patient distress on “Day 1”, we know less about how psychological distress fluctuates over time and how best to serve those in need of psychosocial intervention at different points in their illness and treatment. Making it possible for patients to easily convey something of their current mental state has been useful for the counsellors in Supportive Care. Our clinical practice includes routine distress screening at regular intervals with all psychosocial clients. For this purpose, we created the HADS-6, a shortened version of the 14-item HADS (HADS-14), by selecting three items from each subscale that correlated most highly with the subscale score. There is a strong correlation between the HADS-14 and HADS-6 ( $r = .950, p < .001$ ). A HADS-6 score of  $\geq 6$  captures 96% of the HADS-14 threshold cases. Our use of HADS-6 minimizes patient burden and enables clinicians to track clients’ distress across time and be more responsive to shifting needs. Data collection and analysis is on-going. We will report on the first 100 new clients to Supportive Care since the implementation of this change to our clinical practice and present findings with respect to initial and subsequent distress levels on the basis of client demographics (e.g., patient vs. patient-partner, gender, age), disease site involved, and the nature of the psychosocial intervention.

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# IDENTIFYING THE INCIDENCE OF INVASIVE HAEMOPHILUS INFLUENZAE DISEASE IN NORTHWESTERN ONTARIO

PRINCIPAL PRESENTER  
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CO-AUTHORS  
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## ABSTRACT

QUESTIONS  
Is Northwestern Ontario experiencing an increased incidence of invasive Haemophilus influenzae disease? Are Aboriginal people disproportionately affected by invasive Haemophilus influenzae disease compared to the rest of the population in Northwestern Ontario?

RATIONALE  
A recent study conducted by the Immunization Monitoring Program, ACTive (IMPACT), found a significant increase in type a (Hia) and non-serotypable (NST) H. influenzae invasive disease in Canada during the era of universal immunization against H. influenzae type b (McConnell et al, Pediatr Infect Dis J, 2007). Approximately 75% of children with invasive Hia disease were of Aboriginal descent, with an alarming mortality rate of 16%. Since IMPACT does not cover northern Ontario, the incidence of invasive H. influenzae disease in this region with a significant proportion of Aboriginal population is unknown. Our study proposes to determine whether H. influenzae represents a serious public health concern in Northwestern Ontario alike other regions in Canada.

METHODOLOGY  
Hospital records from 2002-2007 at the Thunder Bay Regional Health Sciences Centre (TBRHSC) will be searched for invasive diseases that H. influenzae can cause, such as meningitis and septicaemia. In addition, laboratory records will be searched for bacteriologically identified cases. Records that match the criteria of invasive H. influenzae disease will be reviewed to determine patient’s background. In addition to this retrospective analysis, new invasive H. influenzae isolates will be gathered from TBRHSC and serologically characterized. This study has been approved by the research ethics boards at TBRHSC and Lakehead University.

PRELIMINARY RESULTS  
In 2007 the TBRHSC identified 4 isolates of Haemophilus influenzae from blood cultures: two Hia and two NST. As the preliminary data show that invasive non-type b H. influenzae exists in Northwestern Ontario, it is important to conduct this study to determine whether this represents a serious public health issue in the region.

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# REDUCING PAIN AND ENHANCING EFFECT OF LOCAL ANAESTHETICS IN PLASTIC SURGERY

PRINCIPAL PRESENTER  
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CO-AUTHORS  
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## ABSTRACT

### INTRODUCTION

Reducing pain from local anaesthetic (LA) injections and enhancing effect are desirable clinical goals in plastic surgery. Buffering LA solutions with sodium bicarbonate (NaHCO<sub>3</sub>) to increase pH has thus been suggested. The aims of this laboratory investigation were: (1) to determine the appropriate volume of 8.4% NaHCO<sub>3</sub> required to increase the pH of various lidocaine and bupivacaine solutions, both alone and in combination, without macroscopic precipitation; and (2) to identify which LA solutions might best be buffered clinically to enhance LA effect.

### METHODS

8.4% NaHCO<sub>3</sub> was mixed with 13 different LA solutions of lidocaine and bupivacaine, and combinations of each, both with and without epinephrine, either added commercially or at time of measure. Solution pH was recorded pre- and post-alkalinization, with precipitation points noted. Recommended ratios by volume of anaesthetic to buffer for each mixture were calculated. Relative increases of non-ionized fraction from buffering were determined using Henderson-Hasselbalch calculations, with higher non-ionized fractions predicting enhanced LA effect.

### RESULTS

LA to NaHCO<sub>3</sub> volume ratios required to increase the pH of LA solutions without precipitation ranged from 9:1 to 500:1. LA solutions with commercially added epinephrine have lowest initial pH, and when buffered, have highest relative increases in non-ionized fraction (ranges 102 - 103). Plain lidocaine, or combinations of lidocaine with bupivacaine that are either plain or with freshly added epinephrine, have the lowest relative non-ionized fraction increase. Bupivacaine solutions (with and without epinephrine), when buffered, have higher increases in non-ionized fractions than lidocaine, except for lidocaine with commercially added epinephrine.

### CONCLUSIONS

This laboratory study provides a guide for clinicians considering buffering LA's to maximize active non-ionized fraction, which theoretically shortens onset of anaesthesia, contributing to reduced infiltration pain. We recommend that buffering be used for locals that are initially most acidic, that is, the commercially prepared solutions of bupivacaine and lidocaine with epinephrine.

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# THE ROLE OF BACTERIAL VIRULENCE FACTORS IN PSEUDOMONAS AERUGINOSA-INDUCED APOPTOSIS OF LUNG EPITHELIAL CELLS

PRINCIPAL PRESENTER

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Marina Ulanova, MD, PhD, Associate Professor, Medical Sciences Division, Northern Ontario School of Medicine, Lakehead University Campus

## ABSTRACT

*Pseudomonas aeruginosa* is an opportunistic pathogen that is the leading cause of pulmonary infection in cystic fibrosis (CF) patients. In the process of CF chronic pulmonary disease, the bacteria significantly change the phenotype as an adaptation to both host defense mechanisms and antibacterial therapy. It is known that *P. aeruginosa* infection of lung epithelial cells (LEC) leads to the apoptosis through both the intrinsic and extrinsic pathways. The role of various bacterial virulence factors in induction of apoptosis is incompletely understood. Our objective was to examine apoptotic events in LEC following the infection with *P. aeruginosa* motile and piliated strain PAK wild type (WT), or mutants lacking major virulence factors. A549 cells were infected with PAK WT, or pili-, flagella-, or LPS-deficient mutants for 6 hours and analyzed by flow cytometry using staining with Annexin V. Following infection with PAK WT strain, 46% cells showed increased apoptosis over its background level detected in noninfected LEC. Neither pili- nor LPS-deficient mutants showed any increase in apoptosis over control, while the flagella deficient strain showed a 29% increase. These results indicate that *P. aeruginosa* pili and LPS are critical for induction of apoptosis in LEC and are significantly more important than flagella. Further studies will be performed on a series of 27 fully genetically and phenotypically characterized clinical isolates of *P. aeruginosa* obtained from CF patients over their lifetime. This work will be done in collaboration with Danish Cystic Fibrosis Center (Copenhagen). Apoptotic LEC responses to clinical isolates of *P. aeruginosa* obtained from the same patient during longitudinal observations have never been addressed. This project will greatly further our understanding of cellular responses occurring over the course of *P. aeruginosa* chronic pulmonary infection.

Funding: NSERC

This laboratory study provides a guide for clinicians considering buffering LA's to maximize active non-ionized fraction, which theoretically shortens onset of anaesthesia, contributing to reduced infiltration pain. We recommend that buffering be used for locals that are initially most acidic, that is, the commercially prepared solutions of bupivacaine and lidocaine with epinephrine.

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# RECURRENT RENAL CELL CANCER: 10 YEARS OR LONGER AFTER NEPHRECTOMY

PRINCIPAL PRESENTER  
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CO-AUTHORS  
Yolanda Chivulescu, Hamilton

## ABSTRACT

**PURPOSE**  
Localized renal cell carcinoma responds well to surgery. Patients often question how long they have to be on surveillance after their surgery. Most recurrences occur within 10 years. We attempted to determine if there are patients presenting 10 years or longer after nephrectomy. Mode of presentation, diagnostic tests and treatments administered where studied.

**METHODS**  
This was a retrospective case-study from a single urologist practice in Northern Ontario. The office’s clinical notes, diagnostic imaging studies and pathology reports were reviewed. The types of therapy, response rates and follow-up were studied.

**RESULTS:**  
We found 3 patients, 2 men, and 1 woman aged between 47- 67 years. Their second or secondary tumors were discovered 11, 11, and 13 years respectively following nephrectomy. Sites of tumors were lungs (1), solitary kidney (2), and tail of pancreas (1). Treatment consisted of thoracotomy and tumor excision and interferon (1), partial nephrectomy (1) and TARGETs therapy (1). Of the 3 patients, 2 are alive with no evidence of disease (1) and stable disease (1). The third patient was lost to follow-up.

**CONCLUSION**  
Careful long term follow-up is recommended in patients with a history of renal cell carcinoma. Diagnostic imaging modalities should be used during surveillance to detect any asymptomatic metastases at an early stage. Detect conclusion is TARGETs therapy should be considered when surgery is not feasible. Collaborative future studies are recommended.

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# LITERACY: A FUNDAMENTAL RESOURCE FOR GLOBAL HEALTH

PRINCIPAL PRESENTER  
Christine Gabali, Ed.D, President and Founder, IASE

## ABSTRACT

One of the main challenges facing immigrants is illiteracy. UNESCO estimates there are one billion or 26 percent of non-literate adults in the world, and ninety-eight percent live in developing countries. As the predominant type of migrations has been from rural to urban for economic opportunity, non-to-low literacy is at the center of one of the main challenges facing these individuals affecting their health outcomes.

This abstract presents a program by IASE (International Alliance in Service and Education), a non-profit organization that has focused on literacy. The WEL© (Workplace Education Literacy) program started as a pilot program for non-to-low literate Latino adults in the workforce. The pilot ran for three months. The multidisciplinary curriculum intertwined literacy with life skills education that included health. After three months, the participants improved not only in language skills but also in their own well being. Participants, the majority of whom were immigrants from Mexico and Central America, developed the self confidence to seek information about issues that directly affected them and their families. In turn, their physical and mental health improved; and they became more socially integrated as feelings of embarrassment, vulnerability or confusion lessened in the process.

The implications of such a program for the future may be significant. The WEL© seems to contribute to workplace efficiency as a by-product and autonomy in educated health decisions. The program has been successfully conducted at institutions and organizations such as Stanford University, and is available at other venues based on the community's specific needs.

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# LACTATE AS A SOURCE OF OXIDATIVE ENERGY IN THE BRAIN: A RETHINKING OF THE BRAIN ENERGY BUDGET

## PRINCIPAL PRESENTER

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## CO-AUTHORS

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## ABSTRACT

The brain is the most energy-intensive organ in the body. Although various substrates are utilized by cerebral cells to generate ATP, the precise molecular mechanisms of how lactate contributes to the brain energy budget have not been fully unravelled yet. This monocarboxylic acid is usually considered an end-product of anaerobic respiration. Using astroglial cells as a model system, we have demonstrated that lactate is a substrate for mitochondrial-oxidative ATP production. Metabolomic and proteomic analyses revealed that mitochondrial lactate dehydrogenase (LDH) were involved in the oxidative metabolism of lactate. Mitochondria isolated from astrocytes readily consumed lactate with the concomitant production of ATP. This finding changes our understanding of lactate metabolism and provides an important clue on how the brain fulfills its energy requirements. Furthermore, this discovery may aid in understanding the link between energy deficit and various neurological disorders.

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# APPLYING MOLECULAR EPIDEMIOLOGY APPROACH TO STUDY PRENATAL HEALTH HAZARDS AMONG FEMALE TOBACCO WORKERS IN GUJARAT, INDIA

PRINCIPAL PRESENTER  
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CO-AUTHORS  
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## ABSTRACT

Tobacco is one of the most commonly consumed non-food agricultural products across the world. Bidi is a hand-rolled form of cigarette commonly used in South Asia. Tobacco industry workers in India frequently suffer from a number of occupational hazards. They are subject to significant levels of pesticide exposure, ergonomic stress, mechanical trauma and the exposure to green and dry tobacco leaves. The women of reproductive age group and children form a large section of these workers. Prior studies using biomarkers to track the biological processes among women workers in the industry have shown increased chromosomal damage in target and non-target cells of tobacco processors. We are proposing a prospective cohort study design using molecular epidemiology tools with an aim to establish a positive association between prenatal tobacco exposure and childhood respiratory illnesses. The cases will be selected from among the women of childbearing age in the tobacco farming industry in Gujarat state in India. The study will include parallel controls: (i) nonsmoker pregnant women employed in bidi industry, (ii) rural nonsmoker pregnant women with exposure to non-tobacco farm employment, (iii) urban nonsmoker pregnant women without any of aforementioned exposure. Specific biological markers of tobacco exposure will be selected and all the subjects tested for it during the specified duration in the pregnancy. The study subjects and their offspring will then be followed up over time for a number of potential adverse health outcomes. It will be assessed if a clear dose-response can be obtained for any or all of the end points. The findings of the study are likely to be applicable to an estimated 3 million people across the world. This study design is example of application of molecular epidemiology techniques to study public health problems.

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# THE ASSOCIATION BETWEEN HOSPITAL TYPE AND POST-OPERATIVE MORTALITY IN HIP FRACTURE SURGERY

PRINCIPAL PRESENTER  
Brandon Entwistle, Medical Student, Northern Ontario School of Medicine

## ABSTRACT

The post-operative outcomes of patients undergoing hip fracture hemiarthroplasty in a community hospital were compared to patients undergoing the same procedure in a tertiary care institution. It was felt that hip fracture hemiarthroplasty in a community hospital would decrease surgical waiting times and may as a result decrease post-operative morbidity and mortality when compared to a larger tertiary care centre. In the tertiary care hospital group 25 of 245 patients (10.2%) died during the 30 days following their surgery compared to 5 of 101 patients (5.0%) in the smaller community hospital group. In the tertiary care group there were 1.18 complications per patient compared to 0.67 complications per patient in the community hospital group ( $p = 0.05$ ).

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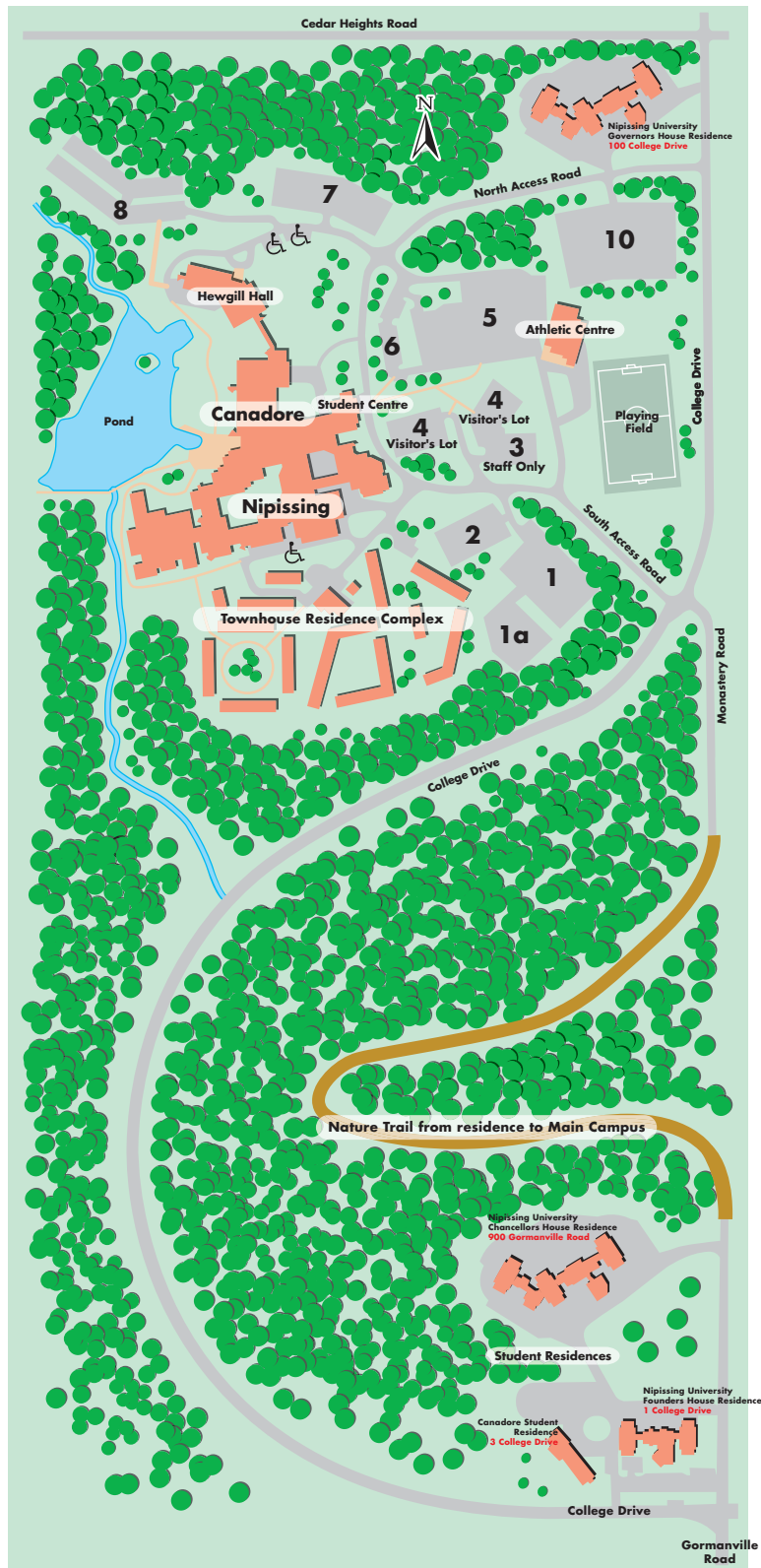
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# CAMPUS MAP



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