The Michael G. DeGroote Institute for Pain Research & Care

Toward the conquest of pain

Michael G. DeGroote
INSTITUTE FOR PAIN RESEARCH AND CARE

McMaster
University

Vision

Using the conceptual model of persistent post-surgical pain, bring together behavioural, clinical and basic scientists to develop a new understanding of the origin, mechanisms and treatment of chronic pain.

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A Generous Individual... A Pivotal Gift

About Michael G. DeGroote and his gift

In 2003, businessman Michael G. DeGroote made history when he made the largest single donation ever to a Canadian university or institution. His donation of $105 million has had a wide impact on health sciences research, education and care, and accelerated the pace of discovery at McMaster.

> "With this gift, I know McMaster will be able to make new breakthroughs and make a real difference in more people's lives."
>
> - Michael G. DeGroote, December 2003

McMaster's Faculty of Health Sciences followed a "people first" guideline in allocating the $105 million gift from Mr. DeGroote. Emphasis was placed on hiring international caliber experts in health education, research and care, particularly in the areas of pain, infectious diseases, stroke prevention and cancer. One of the key initiatives was the Michael G. DeGroote Institute for Pain Research and Care, which received a $15 million endowment.

Message from the Scientific Director

Once again, Dr. Panju and I are excited to welcome you to the Scientific Advisory Board meeting for the Michael G DeGroote Institute for Pain Research and Care. This has been a productive year, and the report includes updates on our supported students and investigators as well an overview of our work to engage the research community on the topic of chronic pain. We are pleased to welcome our Scientific Advisory Board members who represent a Who's Who of the National and International world of Pain Research and Care.

Our vision is to use the clinical problem of persistent post-surgical pain as an experimental model in which chronic pain, its causes, predisposing factors and treatments can be studied. We have now seen knowledge synthesis projects funded in the early stages of the IPRC turn into clinical trial protocols and have supported basic science projects which have fascinating sex difference clinical implications leading to reanalysis of previous trials from McMaster University. The Chronic Pain Network, one of five networks addressing chronic disease funded through the Canadian Institutes of Health Research Strategy for Patient Oriented Research, is now in its fifth and final year of initial funding. The Network has held strategic planning sessions to discuss its future and what legacy items it would like to see continue.

Our partnership with the Centre for Medical Cannabis Research is continuing to support research protocols addressing the peri-operative use of cannabis products.

The Institute is linked through common membership with the clinical practice of pain care in Hamilton, both acute post-operative pain and chronic pain including interventional, pharmacologic and behavioural care, and is working to broaden its relationships across the country. The Chronic Pain Centre of Excellence for Canadian Veterans, announced last July and launched on April 1, 2020 as an independent 'not for profit entity,' has McMaster and Hamilton Health Sciences as its key stakeholders. It is rapidly establishing a national and international presence.

Our aim is to direct the Institute's resources towards infrastructure and training. Fully one-third of our research budget is allocated to fellowships and graduate awards. In this way we hope to support the future of pain research in Canada

Thank you for your interest and support. We look forward to the future.

Norm Buckley, BA (Psych), MD, FRCPC
Scientific Director
Michael G. DeGroote Institute for Pain Research and Care
McMaster University

Institute for Pain Research & Care Fast Facts

7
full-time and part-time Institute staff members overseeing all operations and activities

10
research awards and projects funded every year

42
publications on the topic of pain by our members last year

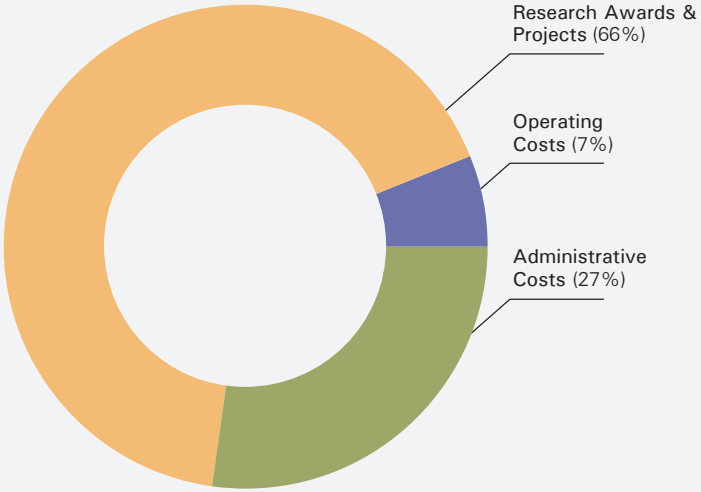
22
multidisciplinary research team members from nine health disciplines

$757,071
spent this year on research awards and projects

Institute for Pain Research & Care Budget 2019-2020

Budget Categories	Percentage	Amount
Administrative Costs	27%	$307,661
Operating Costs	7%	$85,051
Research Awards and Projects	66%	$757,071
TOTAL	**100%**	**$1,149,783**

More than 65% of our annual budget was spent directly on research awards (graduate studentships and postdoctoral fellowships) and research projects (seed grants, IPRC/MIRA catalyst grants and other funded research projects). The annual administrative cost was 27% of the total budget, while the operating cost (including community engagement throughout IPRC Symposium, Canadian Pain Care Forum meetings, IPRC Research Day) made up of 7% of annual expenses.



Additional to the research and operational activities within the Institute, our IPRC research and operational team administers close to 20 projects funded by various sponsors:

Sponsor	Amount	Number of projects
CIHR	$3,998,898.00	4
CPCOE	$1,200,000.00	2
Other	$674,761.00	5
CMCR	$552,311.00	2
McMaster University	$176,821.85	6
TOTAL	**$6,602,791.85**	**19**

CIHR = Canadian Institutes of Health Research
CPCOE = Chronic Pain Centre of Excellence
CMCR = Centre for Medicinal Cannabis Research

Institute for Pain Research & Care Graduate Studentships

Chad Brown, MSc
PhD Candidate

Project Title: A Human Neuronal Model of Pain to Identify Novel Drug Therapies
Supervisor: Dr. Karun Singh

Brief Overview and Progress to Date

This project aims to provide insight into how patients with Autism-spectrum disorder (ASD), more specifically genetic origins of ASD, perceive and transduce pain signals. The focus we be on two genes of interest, SCN2A, and SCN9A, these being top ASD-risk genes with many patients having pain comorbidities. Additionally, we hope to develop a novel platform for patient-focused drug-screening of cannabinoid derivatives.

Our preliminary results from multielectrode array experiments have indicated that 6 – 7 weeks in vitro is the optimal time to apply CBD or THC because we observed the strongest phenotypes with our SCN2A knockout neurons drastically falling off in all neuronal firing parameters. In addition, we have recently discovered an optimal time point (3 weeks) for synaptic plasticity as neural networks are dynamic. This will allow us to also test neural network dynamics in the absence of SCN9A, which is crucial for excitability. Our next steps include generating a dose-response curve for CBD and THC at the time points mentioned previously with concentrations of 1 uM, 3 uM, 10 uM, 30 uM, 100 uM and 1 mM. Lastly, we plan to generate SCN9A heterozygous and homozygous knockouts using CRISPR/Cas9 gene-editing mutants in our human isogenic cells.

Carley Ouellette, RN, BSc
MSc Candidate

Project Titles: RAM-Rescue Clinic: A Feasibility Study of an Interdisciplinary In-Person Clinic for Remote Monitored Post-Surgical Patients
Supervisor: Dr. Michael McGillion

Brief Overview and Progress to Date

This project examined the deployment of a remote monitoring and virtual care program, called SMArTVIEW. In a sample of the first 100 patients enrolled in SMArTVIEW, a content analysis was conducted to examine nursing interventions, including postoperative pain management, over the first 30 days following hospital discharge. Across the 50 patients included in this thesis work (i.e., the first 50 intervention arm patients), the SMArTVIEW nurses assessed pain 926 times in the postoperative course. A total of 128 nursing interventions were enacted to maintain postoperative pain in the mild range as best as possible; the nurses also addresses pain medication adherence and optimization 152 times in the 30-day postoperative intervention period.

In September 2020, the project will transition into proposing a feasibility study of an interdisciplinary "rescue-clinic" co-led by perioperative nurses and physicians and allied perioperative care providers, in order to address unrelieved pain and other postoperative complications when in-person assessment and intervention is required during virtual postoperative care, to further reduce unnecessary emergency department visits and hospital readmissions. The focus of the work per se, supported by the IPRC studentship, will be detailed evaluation of the nursing role, including practice scope, interventions, and cost.

Institute for Pain Research & Care Fellowships

Xiaoqin Wang, MD
Postdoctoral Fellow

Project Title: Interventional Procedures for Management of Chronic Non-Cancer Axial Pain
Supervisor: Dr. Jason Busse, DC, PhD

Brief Overview and Progress to Date

The focus of this post-doctoral work at IPRC is to conduct a systematic review and network meta-analysis of interventional procedures for management of chronic non-cancer axial pain.

To date, we have analyzed the PICO (population, intervention, comparison, outcome) components for 60 RCTs and 30 SRs about interventional procedures for management of chronic axial pain from PubMed; summarized a list of interventions and related conditions of interest for search strategy and PICO question for our network meta-analysis; completed the search for electronic databases including MEDLINE, EMBASE, Central, CINAHL, and Web of Science, which resulted in a total of 14,881 records after removing the duplicates; completed the title and abstract screening and the full text screening, and included 129 RCTs; registered the protocol on PROSPERO (CRD42020170667); and drafted the protocol for journal submission.

We are on the stage of data extraction and are expecting to collect all the data by the end of September 2020. In the upcoming year, our goals are to: i) publish the protocol; ii) to complete the systematic review for publication.

Cheryl Chow, MSc, PhD
Postdoctoral Fellow

Project Title: Predictors and Trajectories of Pediatric Postsurgical Pain
Supervisor: Dr. Norm Buckley, MD

Brief Overview and Progress to Date

In support of the larger project of this study, we have submitted a literature review that examined the role of anxiety and its related in pediatric postsurgical pain (Chow et al., 2020, Can J of Pain). Moreover, we are currently working on another systematic review to identify research gaps in the existing literature and to examine risk factors (i.e., preoperative, intraoperative, and postoperative factors) in predicting pediatric acute and persistent postsurgical pain. To date, we have screened 7303 titles and abstracts through six databases and identified 98 articles for full-text screening. A total of 31 studies were deemed eligible for our review. We have completed data extraction from all 31 studies and assessed the quality of these studies. We have also conducted meta-analyses on eligible studies. We are currently updating the search and preparing for the write-up o the manuscript.

Over the past eight months, we recruited 40 patients for the CIHR-funded RCT in examining the effects of a table-based intervention in reducing pediatric anxiety and pain. Due to the pandemic, we had to put the project on hold since March 15, 2020. In the meantime, we will start coding videos that we captured in the operating room and will extract postoperative pain data from medical charts on these 40 patients.

Institute for Pain Research & Care Seed Grants

Topicals for Osteoarthritis Pain in Knee Surgery (TOPIKS): A Pilot Randomized Controlled Trial

Primary Investigator: Harsha Shanthanna, MD, PhD, FRCPC
Co-Investigator: Anthony Adili, MD, FRCSC
Start Year: 2019

Brief Overview and Progress to Date

The study is presently designed as a four-arm factorial design trial with the following 4 arms; 1) Topical CBD plus Placebo; 2) Topical NSAID plus Placebo; 3) Topical CBD plus Topical NSAID; and 4) Topical placebo plus placebo. We have also included an embedded in vivo bioavailability study and collaborated with Dr. Joseph Macri from the Hamilton Regional Laboratory Medicine Program. We have finalized our protocol and have applied for the Health Canada cannabis license. We have also been in discussion with medical cannabis companies to get an appropriate product formulation. Because of the COVID-19 pandemic, we were unable to perform some of the planned activities. We are optimistic about our present discussions with the company MediPharma, which is also involved in discussions about supporting other projects for the Michael G. DeGroote Centre for Medicinal Cannabis Research. With the support of this company, we plan to submit a Clinical Trial Application to obtain a No Objection Certificate from Health Canada for this investigational product. We are hopeful of initiating the trial later this year.

An Investigation into the Effectiveness of a New Transitional Pain Service (TPS) on Opioid Cessation After a Broad Range of Surgeries Done at Hamilton Health Sciences (HHS) and its Affiliated Hospitals

Primary Investigator: James Paul, MD, FRCPC
Start Year: 2019

Brief Overview and Progress to Date

The primary objective of this study is to determine effective is the TPS in getting patients off opioid analgesia at 12 months post-surgery compared to patients with usual pain care who are not referred to the HHS TPS. This study will be designed as a retrospective chart review using the Acute Pain Service database and records from the Michael G. DeGroote Pain Clinic. Cases and controls will be selected from patients within this established cohort study. The intent will be to use the TPS database to collect information about patients having undergone a wide range of surgeries and then use data collected to help determine the effectiveness of the TPS in weaning patients off opioids post-surgery compared to patients with usual post-surgical pain care at HHS.

Analgesic Effects of Cannabinoids in an Animal Model of Post-Surgical Chronic Pain: An Examination of Mechanism(s) for Sex Differences

Primary Investigator: Gurmit Singh, PhD
Start Date: 2019

Brief Overview and Progress to Date

The aim of this study is to examine sex differences that may underlie hormonally regulated immune responses to CBD administration in female and male adult Sprague-Dawley rats using an established sciatic nerve cuff model of post-surgical pain, which induces robust and long-lasting nociceptive responses.

Post-surgical pain is influenced by sexual dimorphisms in neurally mediated nociceptive responses as well as immune cell function. Cannabinoids may elicit central and peripheral analgesic responses through interactions with nociceptors, microglia, T cells and gonadal hormone-producing cells. While the effects of THC on acute pain have been well-documented, there is a paucity of research on the anti-nociceptive effects of other cannabinoids, with an unmet need to assess effects in chronic pain models. In particular, the evaluation of sex differences that may affect the efficacy of non-psychotropic neuroimmune-modulators such as CBD are lacking.

Administration of cannabinoids, particularly CBD and a 1:1 combination of THC:CBD, elicited an anti-hyperalgesia effect in males with chronic post-surgical NP. Specific immune cell markers associated with T cell differentiation and pro-inflammatory cytokines that are also involved in nerve repair were differentially up regulated by cannabinoids in males but not in females. Further study into this research is on pause due to COVID-19

Institute for Pain Research & Care Seed Grants

A Persistent Post-Surgical Pain Survey

Primary Investigator: Jason Busse, DC, PhD
Start Year: 2020

Brief Overview and Progress to Date

An influential survey of 5,130 patients attending 10 outpatient chronic pain clinics found that 23% attributed their complaints to a surgical procedure. According to Google Scholar, this survey has been cited over 350 times; however, there are limitations with this report. The sample was restricted to patients in North Britain, there are no details reported regarding the response rate, and the data was acquired between 1989 and 1992. These issues suggest that generalizability to the current Canadian context is uncertain. Our group has been awarded an IPRC Seed Grant to conduct a survey of patients attending 17 tertiary chronic pain clinics across Canada to establish perceptions regarding causal attributions for their chronic pain, as well as demographic information and management strategies they have pursued. Our findings will inform the proportion of chronic pain outpatients in Canada that attribute their condition to a surgical procedure and explore patterns of healthcare seeking.

A Temporal Evaluation of Cannabidiolic Acid-Methyl Ester Administration: Can Post-Surgically Induced Neuropathic Pain Be Blunted By Early Intervention in A Preclinical Rat Model?

Primary Investigator: Gurmit Singh, PhD
Start Year: 2020

Brief Overview and Progress to Date

The primary goal of our project is to evaluate whether anti-nociceptive responses elicited by CBDA-ME are enhanced by an early pre-surgical treatment regimen in both males and females. An important point to consider in using CBDA-ME to therapeutically manage neuropathic pain is the timeline of treatment initiation. Initiating treatment at an early stage post-nerve injury has been shown to limit the development of hyperalgesia in a rat model of peripheral neuropathic pain. Investigations into whether anti-nociception imparted by early (i.e. shortly after an insult that initiates persistent neuropathic pain, such as a surgery) cannabinoid administration is sustained weeks after treatment cessation are lacking. Nociceptors may initially be sensitized by inflammation that arises in response to nerve damage, and peripheral nerve fibers consequently develop patterns of ectopic neuronal discharge. Therefore, initiating cannabinoid treatment at an early stage post-insult to limit the development of chronic hypersensitivity may be a promising means to block the propagation of peripheral ectopic impulses into the CNS, curbing pain chronification. Importantly, CBDA inhibits aspects of the initial inflammatory process. It is possible that CBDA-ME, by modulating specific immune cell responses, could dampen inflammation or promote a more rapid resolution of this process in a sexually dimorphic manner.

Institute for Pain Research & Care / McMaster Institute for Research on Aging
Catalyst Grants

A User-Centered Approach to Develop a Pre-Surgical Rehabilitation Program for Patients with Lumbar Spinal Stenosis

Primary Investigator: Luciana Macedo, PhD
Co-Investigator: Lisa Carlesso, PhD
Start Year: 2019

Brief Overview and Progress to Date

The two primary aims of this project are to (1) investigate expectations, satisfaction and lived experiences of surgical patients with lumbar spine (LSS) surgery using a qualitative approach; and (2) Identify modifiable predictors of post-surgical outcomes in patients with LSS.

Data collection is still ongoing for Aim One of this project. We have conducted 20 of 25 interviews post-operative and have another five booked. Thus, post operative recruitment is complete. We have conducted 10 of 25 pre-op interviews (recruitment was halted due to COVID-19). We have five more pre-op interviews booked which will likely lead to saturation and completion of the recruitment phase. Given the richness of data provided to date, we expected a report and at least three manuscripts arising from the interviews.

Concerning Aim Two, we are on the last steps of data analysis. We have published the study protocol and are preparing a manuscript for publication.

As a result of this study, we started to plan our prehab program for LSS. Our research team has submitted two CIHR grant applications (one catalyst and one meeting grant) as well as one grant application to the North America Spine Society. We are in the process of preparing another application to pilot test the program.

A Feasibility Study to Assess the Added Value of Integrated Musculoskeletal BiofFeedback Device (IMBED) Combined with Neuromuscular Exercise and Education (GLA-Dtm) to Decrease Chronic Pain in Older Adults with Osteoarthritis

Primary Investigator: Pasqualina Santaguida, PhD, PT
Start Year: 2020

Brief Overview and Progress to Date

Our target recruitment of 24 patients at St Joseph's Hospital, Hamilton was achieved in February 2018.

There is evidence that the three most common sites of chronic pain (CP) in older adults (OldA) are the back, leg/knee or hip, and other joints as with osteoarthritis (OA). The Good Living with Arthritis in Denmark (GLA:D™) program has shown benefit and is distinct from previous exercise interventions because it focuses on neurological control and body alignment. However, the International Association of Pain point to significant "deficits in knowledge" in assessing and managing CP8 and less is known about this during exercise.

This feasibility study aims to assess the added value of adapted wearable Integrated Musculoskeletal BiofEedback Device (IMBED) to address CP in OldA with lower extremity OA when implementing the GLA:D™. Phase I will integrate three established technologies (digital pain mapping, EMG biofeedback, 3D motion tracking) for a new application during training with data logging and remote access over time. Phase II will compare the short and longer term outcomes of two groups (with and without IMBED) of OldA with OA during GLA:DTM training. To our knowledge such integrated technology has not been applied in CP assessment, management or training in Old A with OA; neither has the potential to improve training specificity and longer-term adherence to exercise been explored. The feasibility study will commence in November of 2020 due to COVID-19.

Institute for Pain Research & Care Supported Projects

Acute Musculoskeletal Injuries Evidence Reviews

Primary Investigator: Jason Busse, DC, PhD

Brief Overview and Progress to Date

Two new evidence reviews related to acute musculoskeletal injuries suggest other forms of treatments are as effective as opioids and have less risk of harms to patients. These reviews were led by the National Pain Center. The first review focuses on predictors of prolonged opioid use following initial prescription for acute musculoskeletal injuries in adults. Based on 13 studies with 13.3 million participants, the overall prevalence of prolonged opioid use for high-risk populations, such as patients receiving Workers' Compensation benefits, Veterans Affairs claims, or patients with high rates of substance use disorders, was 27%. Meanwhile, the prevalence among the general population was 6%. Potentially important targets to reduce rates of persistent opioid use were avoiding prescribing opioids for these types of injuries to patients with past or current substance use disorder and, when prescribed, restricting duration to seven days or less and to lower doses.

The second review explored management of acute pain from non-low back musculoskeletal injuries. There were 207 eligible studies with 33,000 participants that evaluated 45 therapies. Among the injuries of participants in these trials were sprains, whiplash, muscle strains, non-surgical fractures and contusions. Topical nonsteroidal anti-inflammatory drugs (NSAIDs), followed by oral NSAIDs, and then by acetaminophen, showed the most convincing and attractive benefit to harm ratio for patients with acute pain from non-low back musculoskeletal injuries. No opioid achieved benefit greater than NSAIDs, and opioids caused the most harms. These results provide compelling reasons to avoid opioid prescribing in the setting of acute, non-low back, musculoskeletal injury. Both evidence reviews were funded by the National Safety Council in the United States.

The Effect of Cannabidiol vs. Placebo on Persistent Post-Surgical Pain Following Total Knee Arthroplasty: A Randomized Pilot Trial

Primary Investigator: Vahid Ashoorion, MD, PhD
Co-Investigators: Kim Maddan, PhD, Harsha Shanthanna, MD, PhD, FRCPC, Behnam Sadeghirad, Pharm.D., MPH, PhD, Gordon Guyatt, MD, MSc, FRCP, OC, Anthony Adili, MD, FRCSC, Jason Busse, DC, PhD

Brief Overview and Progress to Date

More than 20% of patients who undergo total knee arthroplasty (TKA) develop persistent post-surgical pain (PPSP). Higher peri-operative pain is associated with increased risk of PPSP following TKA and, if reduced, may decrease the rate of persistent pain. Cannabidiol (CBD) has shown potential to reduce pain and inflammation, without psychoactive effects. We hypothesize that CBD may reduce both peri-operative pain and the rate of PPSP after TKA. The goal of our pilot trial is to establish the feasibility of a definitive trial. Specific feasibility objectives include determining our ability to: (1) recruit 40 patients over six months, (2) follow ≥85% of patients for 6 months, and (3) have ≥75% of patients comply with at least 75% of study treatments doses. Our pilot trial will enroll 40 patients scheduled to undergo TKA and randomize them to one of two treatment arms: (1) CBD plus standard treatment, or (2) Placebo plus standard treatment. Health care providers, patients, outcome assessors, and data analysts will be blinded to treatment allocation. Participants will be followed for 6-months after surgery. Outcomes collected include pain, function, opioid use, and the development of PPSP. This pilot study will establish the feasibility of a large, definitive trial. We have provisional ethics approval from HiREB and registered the protocol in clinicaltrial.gov. This project received a SEED grant from IPRC and won a CIHR grant. The next step is finding a license producer that provide Good Manufacturing Practice compliant product to launch the project.

Institute for Pain Research & Care Supported Projects

Predictors of Persistent Post-Surgical Pain Following Total Knee Arthroplasty: A Systematic Review and Meta-Analysis

Primary Investigator: Vahid Ashoorion, MD, PhD
Co-Investigators: Behnam Sadeghirad, Pharm.D., MPH, PhD, Li Wang, PhD, Gordon Guyatt, MD, MSc, FRCP, OC, Anthony Adili, MD, FRCSC, Rachel Couban, MISt, Jason Busse, DC, PhD
Start Year: 2017

Brief Overview and Progress to Date

This systematic review and meta-analysis aimed at investigating the predictors of persistent pain after total knee arthroplasty. We included 33 peers reviewed observational studies that explore, in an adjusted model, factors associated with the development of persistent post-surgical pain after TKA. We pooled data for 10 predictors reported by at least two studies, 128 predictors reported only by one study, and 17 predictors reported by one study showing significant association with chronic pain through an adjusted model. We are running the final analysis and preparing the manuscript for publication.

Comparative Effectiveness of Treatments for Prevention of Post-Operative Sore Throat in Adults Undergoing Tracheal Intubation: A Systematic Review and Network Meta-Analysis of Randomized Trials

Primary Investigator: Vahid Ashoorion, MD, PhD
Co-Investigators: Rachel Couban, MISt, Harald Herkner, MD, MSc, Harsha Shanthanna, MD, PhD, FRCPC, Gordon Guyatt, MD, MSc, FRCP, OC, Behnam Sadeghirad, Pharm.D., MPH, PhD, Jason Busse, DC, PhD
Start Year: 2020

Brief Overview and Progress to Date

Between 30% to 70% of adults experience postoperative sore throat (POST) following general anesthesia. Although clinicians often regard it as a relatively minor complication, patients perceive avoidance as being of great importance. Tracheal intubation is associated with a greater risk of POST. Various prophylactic treatments have been suggested to alleviate POST. We designed a systematic review and network meta-analysis of randomized controlled trials evaluating interventions to prevent POST. We systematically searched MEDLINE, EMBASE, Science Citation Index Expanded and Social Sciences Citation Index, CINAHL, Scopus, and Cochrane Central Register of Controlled Trials (CENTRAL) to identify randomized clinical trials that enrolled adults undergoing surgery with single lumen tracheal intubation under general anesthesia. Title/abstract and full-text screening yielded 163 randomized clinical trials. Using a standardized form, twelves reviewers working in six teams extract data independently. Our outcomes of interest include incidence and severity of POST up to 24 hours after extubation/surgery, meantime to onset of pain relief, mean-time to resolution of pain, incidence of cough, hoarseness, and adverse events. We will conduct frequentist random-effects network meta-analysis to assess relative effects of competing interventions. We will use a priori hypotheses to explore heterogeneity between studies and assess the certainty of evidence using the GRADE approach. This network meta-analysis will determine the comparative effectiveness of preventive interventions on POST.

Institute for Pain Research & Care Supported Projects

PAIN+ PREMIUM LITERATURE SERVICES

CPN | RDC CHRONIC PAIN NETWORK | RÉSEAU DE DOULEUR CHRONIQUE

McMaster PLUS

Primary Investigator: Alfonso Iorio, MD, PhD, FRCPC and Brian Haynes, MD, PhD, FRCPC

Start Year: 2016

Brief Overview and Progress to Date

PAIN+ CPN assists researchers in keeping up-to-date and applying the latest research in clinical practice. To save researchers time, articles are pre-assessed for quality by research staff and for clinical relevance and interest by practicing clinicians. A wide range of publications from multiple disciplines are surveyed.

PAIN+ CPN is a "one-stop" access to current best evidence from research on pain management, PAIN+ CPN offers:

- A searchable database of the best evidence from care literature.
- An email alerting system.
- Links to selected evidence-based resources.
- Patient-focused lay summaries of evidence-based research

The objective of this project is to develop and maintain an evidence-based information service for health care practitioners engaged in the management of acute and chronic pain, in collaboration with the PainHQ website. In addition to including original and systematic review articles of relevance to all aspects of clinical pain care, the service provides dedicated streaming of neuropathic and post-stroke central neuropathic pain data. This service provides a continuously updated, quality assessed, clinician rated on-line service, based on the McMaster PLUS Health Knowledge Refinery. Over 120 top clinical journals are included in the assessment process.

PAIN+ CPN also includes patient-focused lay summaries of select research from the PAIN+ database. Articles selected for lay summaries have direct relevance to the CPN strategic priorities and to patient experiencing chronic pain. Users are encouraged to rate potential article candidates for relevance using the Jury Rating feature. There are currently 36 Evidence Summaries on the PAIN+ CPN site. The summaries can be accessed without registering. PAIN+ CPN has 1,137 registered users as of July 30, 2020.

DeGroote PainHQ

Start Year: 2015

Brief Overview and Progress to Date

In September of 2015, McMaster University announced the launch of DeGroote PainHQ, an online resource for individuals living with neuropathic pain. PainHQ provides access to a range of evidence-based resources, curated by the experts, rated by the public and supporting over two million Canadians living with neuropathy.

The range of resources provided is, in part, what makes PainHQ unique. Personal stories, e-learning videos, webinars and expert blogs make up part of the site's diverse offerings. The goal is to educate on neuropathic pain and to help make the condition more accessible to the general public. Building on McMaster's strengths in evidence-based medicine, health education and e-learning, PainHQ is an innovative and sustainable resource for patient-centred care.

The PainHQ main site had 6,068 new users in the last year. Analytics indicate that users within the 25-24 age bracket continue to be the most active on the site, making up 25.56% of the total web traffic. This is followed by the 35-44 age bracket, which made up 20.24% of traffic. This is a change over last year, which saw the 45-54 bracket ranked second.

A breakdown of users by gender shows that women make up the majority of PainHQ users, accounting for 61.1% of web traffic. Most traffic to PainHQ (64.8%) was driven via organic searches, with 31.6% coming from direct referrals.

PainHQ currently has 1,434 Twitter followers and 545 followers with 540 likes on Facebook.

Institute for Pain Research & Care Supported Projects

SMArTVIEW - TecHnology-Enabled remote monitoring and Self-MAnagemenT—VIsion for patient EmpoWerment following Cardiac and VasculaR surgery. (THE SMArTVIEW, CoVeRed)

Primary Investigator: Michael McGillion, RN, PhD
Start Year: 2015

Brief Overview and Progress to Date

The aim of this project is to determine the effect of the SMArTVIEW intervention compared to standard care on the 45-day risk of a composite of hospital readmission, urgent care center and emergency department visits (not requiring hospital admission), in patients, aged 65 years or older, who undergo cardiac or major vascular surgery.

eHealth Technology Intervention: SMArTVIEW is a two-Phase Study, conducted in Canada (Hamilton Health Sciences [HGH]) and the United Kingdom (Liverpool Heart and Chest Hospital [LHCH]). Phase 1 includes usability testing; phase two includes a randomized controlled trial (RCT) (n= 800), as well as economic and qualitative substudies of the impact of SMArTVIEW on cost of recovery and patient recovery experience, respectively.

Progress to date: Phase 1, Usability Testing (n= 26 nurses; 11 patients), was completed last year in both CAN and the UK. Video and audio data were scored and transcribed for analyses. User testing results shaped optimal clinical workflow and training requirements for Phase 2 (RCT); the manuscript has been resubmitted to the J Med Internet Res following favourable reviews and minor comments. The RCT protocol was published in 2017 (J Med Internet Res). A state of the science paper on remote monitoring, including the SMArTVIEW approach was published in the Can J Cardiology in 2018. A paper specific to the approach to pain intervention within SMArTVIEW was published in the Can J Pain in 2019. The user testing study was published in the J Med Intern Res in 2020.

The UK site was opened for recruitment, following systems installation and testing, on Oct 16th 2019. To date, 570 patients have been randomized. Due to additional funding, the sample size was increased from 600 to 800. On March 12, 2020, recruitment was placed on hold at both the Canadian and UK sites due to the COVID 19 pandemic. Study recruitment will resume at both sites in mid-September.

At-home: Currently, in the intervention arm, there are 287 patients who have completed the at home phase of the study with near 100% compliance and outstanding positive feedback.

In 2019, we completed a content analysis was undertaken to examine the documentation of vir-tual nursing work in order to identify advice, recommendations, or corrective actions that were undertaken by the SMArTVIEW nurses during daily video visits. Themes and sub-themes gener-ated captured physical, psychosocial, and pharmacologic domains of care. The coding scheme was refined as new insights emerged.

Nursing documentation was analyzed for 35 intervention patients who completed the hospital-to-home virtual care program. For these patients, 934 video calls were completed over the 30-day course of the hospital-to-home program; 29% of video calls included a family member. In total, 86% of patients (30/35) completed at least 27 of 30 daily scheduled video calls. Across calls, 1,380 recommendations or corrective actions were made by the SMArTVIEW nurses in order to support patient recovery, including: 61 documented instances of psychosocial support; 433 pharmacologic interventions (23 medications adjustments, 2 medication errors addressed); 756 interventions to address vital signs and symptoms; and 130 pain assessments.

Findings suggested a high degree of compliance with the RAM and virtual hospital-to-home intervention protocol, and while SMArTVIEW nurses are guiding recovery across all domains of care, further clarification of focused areas of nursing recovery support was required for full tri-al deployment. Results were used to refine implementation of the SMArTVIEW intervention.

Institute for Pain Research & Care Supported Projects

FORESITE-VISION: 'Further Observation for Chronic Pain and Poor Functional Recovery Risk Factor Examination at Selected SITEs (FORESITE), A Study in Partnership with The Vascular Events In Surgery patIents cOhort evaluatioN – Cardiac Surgery (VISION Cardiac Surgery)

Primary Investigator: Michael McGillion, RN, PhD
Start Year: 2015

Brief Overview and Progress to Date

Funded by the CIHR and HAHSO, the specific objectives of FORESITE VISION are to examine the influence of cognitive factors, namely, pain-related beliefs and gender-based pain expectations, on the following outcomes up to 1 year following cardiac surgery: the development of CPSP, functional status, and patient-level cost of illness.

FORESITE October 2019 Update: Enrollment: 1,410 enrolled and one year follow up is complete. Completed: Recruitment closed at UCL Site (US), HGH, Kingston (CDN) and Prince of Whales Hospital (China) and follow up data collection is completed at these sites. All data from these sites have been cleaned; 46,000 database queries have been addressed. Data analyses are presently underway.

Sub-study of FORESITE:
Examination of Nurse-Modifiable Risk Factors for Chronic Post-Surgical Pain following Cardiac Surgery

Principal Investigators: Henry, S. (Phd Student), McGillion, M.,
Co-Investigators: Busse, JW., Car-roll, SL., Choinière, M., Clarke, HA., Coyte, PC., Devereaux, PJ., Ebrahim, S., Guerriere, DN., Hoch, JS., Isaranuwathai, W., Katz, J., Lamy, A., MacDermid, J., Martorella, GA., Mulla, S. Victor, JC., Watt-Watson, J., Whitlock, R.

Background for PhD thesis work: To date, over 30 perioperative factors have been examined for their potential to confer risk for CPSP following cardiac surgeries. Among these, a select few show promise as feasible targets for nursing intervention including the following: baseline anxiety and depressive symptoms, acute postoperative pain intensity, and cumulative postoperative opioid consumption. While evidence in favour of the prognostic significance of these risk factors is mounting, the magnitude of effect found across studies for each risk factor appears to be either weak or equivocal. A plausible explanation is that studies have likely included those with mild symptomatology in their adjusted risk models; those will moderate to severe baseline symptoms have not been singled out, per se. In order to determine, definitively, whether these modifiable risk factors confer vulnerability for the transition to CPSP following cardiac surgery, robust prospective studies, which examine risk factor severity in representative samples, are required to confirm prognostic value. The aim of this sub-study is to explore the association of the following factors with CPSP: moderate to severe baseline anxiety and depression; moderate to severe acute postoperative pain; and cumulative postoperative opioid consumption. A prospective cohort study of 645 in-patients undergoing cardiac surgery, recruited from Hamilton Health Sciences over a 2-year period. At baseline, data on pre-specified model covariates (e.g., non-modifiable risk factors for CPSP, such as age) and independent variables include state anxiety, depressive symptoms, will be collected. Acute pain intensity, and cumulative opioid analgesic consumption will be collected postoperative days 1 to 3, and CPSP outcome data are being collected at 6 months postoperatively. This research study will potentially identify modifiable risk factors which may contribute to CPSP following cardiac surgery.

FORESITE Sub-study August 2020 Update: Enrollment: 753 enrolled Completed: Recruitment now closed HGH (CDN). Postoperative days 1 to 3 charts are audited for 1,410 patients, 10,000 database queries addressed. Data analyses are complete. Results: This substudy found that increased postoperative analgesic consumption and acute postoperative pain intensity are associated with the development of chronic postsurgical pain, highlighting the importance of multi-modal pain management strategies facilitated by nurses in the early postoperative phase following cardiac surgery. Baseline anxiety and depression were not found to be associated with the development of chronic postsurgical pain in cardiac surgery patients. Thesis defense of these results for Ms. Henry will take place in the fall of 2020.

Annual Institute for Pain Research & Care Research Day

Dr. Premysl Bercik discusses gut microbiota for health at the second Annual Intstitute for Pain Research and Care Research Day, held February 12, 2020.

Attendees of the Institute for Pain Research and Care's second Annual Research Day were welcomed by Dr. Mike McGillion, Assistant Dean of Research at McMaster's School of Nursing, as well as IPRC executive member. Taking place on February 12, 2020, at the Royal Botanical Gardens, in Burlington, Ontario, the event was open to anyone in the McMaster Community with an interest in pain research.

Following a breakfast and networking session, Dr. Emilie Belley-Cote, an investigator with the Population Health Research Institute, started off the presentation component of the conference discussing their new perioperative division and program. Dr. Li Wang, of McMaster's Department of Anesthesia, spoke about a systematic review and meta-analysis of observational studies regarding persistent post-surgical pain after breast cancer surgery. Dr. Premysl Bercik, of the Department of Medicine, concluded the first half of the conference with a presentation about chronic abdominal pain and the critical role of gut microbiota.

Following a break, the second portion of the conference began with Institute for Pain Research and Care's Dr. Yasir Rehman's presentation on litigation on return to work after tibial fracture repair. Dr. Eleni Hapidou, of the Department of Psychiatry and Behavioural Neurosciences, discussed pain management program outcomes in Veterans with chronic pain in comparison with non-Veterans, which was followed up with a talk by Department of Anesthesia's Dr. Jason Busse about the research agenda for the new Chronic Pain Centre of Excellence for Canadian Veterans.

The day concluded with a group discussion and additional opportunities for networking.

The Chronic Pain Network

Chronic Pain Network Steering Committee members engage in discussion at the Chronic Pain Network's in-person strategic planning session in Toronto, September 2019.

Now in its fifth and final year of funding through the Canadian Institutes of Health Research's Strategy for Patient Oriented Research (SPOR) initiative, there has been an increased emphasis on sustainability planning, within the Chronic Pain Network (CPN), to ensure its work can continue. In September of 2019, members of the Network's Steering committee met in Toronto to discuss areas of focus for the next iteration of the CPN. The Clinical Research Network (CRN), was identified as one of four areas of continued interest.

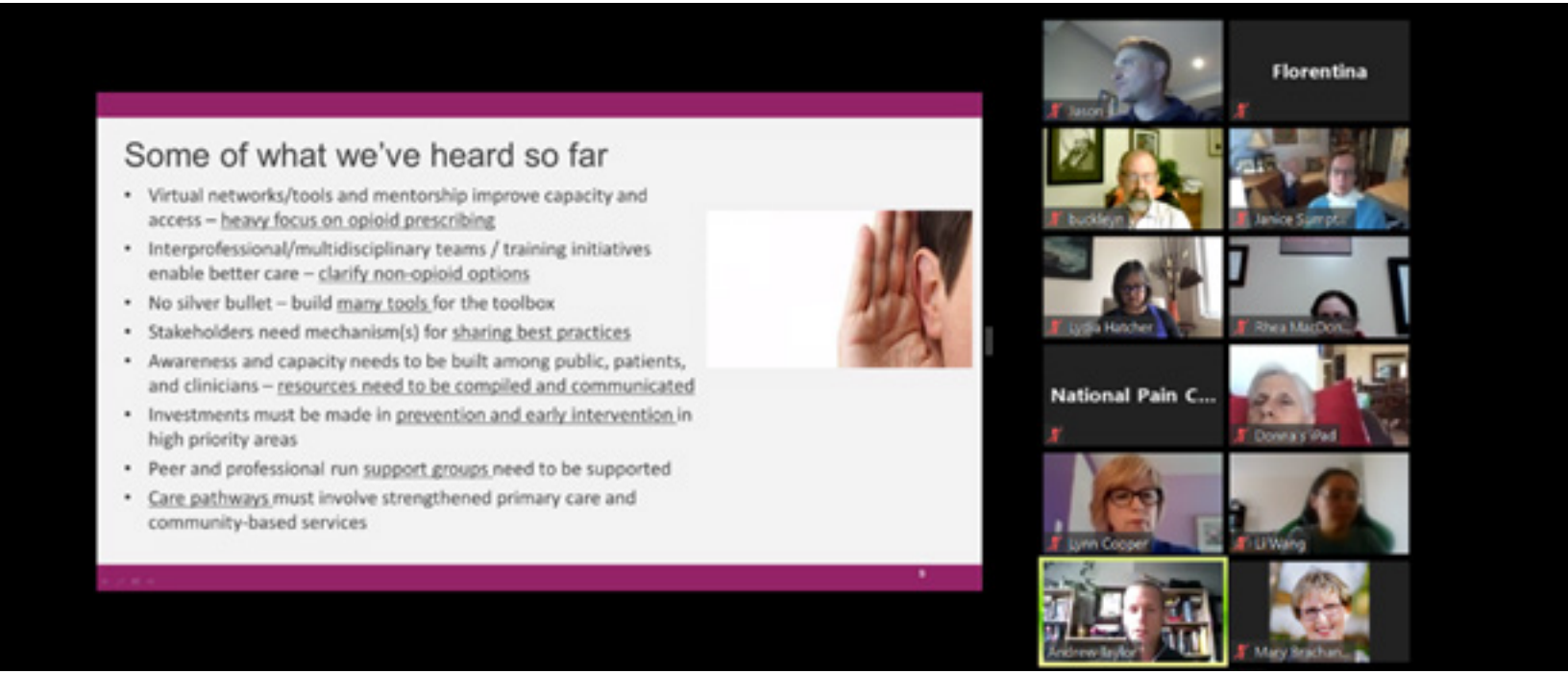
Originally composed of 12 pain treatment clinic sites across Canada, in recent months the CRN has added three new sites in the province of Quebec. To date, CRN research has included 106 single-centre research projects (utilizing only one CRN site) and seven multi-centre projects.

Patient Engagement was another area identified as a continued priority for future versions of the CPN. The Network's Patient Engagement committee has created a multitude of tools for researchers looking to engage patients and recently published a manuscript on guidance for authorship and acknowledgment with patient partners. Two CPN patient perspective partners also sit on Health Canada's Canadian Pain Task Force, providing a lived experience perspective in the governments efforts to address the opioid epidemic.

The Network is currently in the beginning stages of planning a virtual meeting for 2021, to wrap up its fifth and final year.

The Chronic Pain Network currently has 20 active patient perspective partners and caregiver representatives across Canada, including representatives from Indigenous communities. Patient perspective partners are engaged in the Network committees and contribute to the research priorities.

National Faculty Meeting



A screenshot of the National Faculty meeting, held virtually on May 8, 2020.

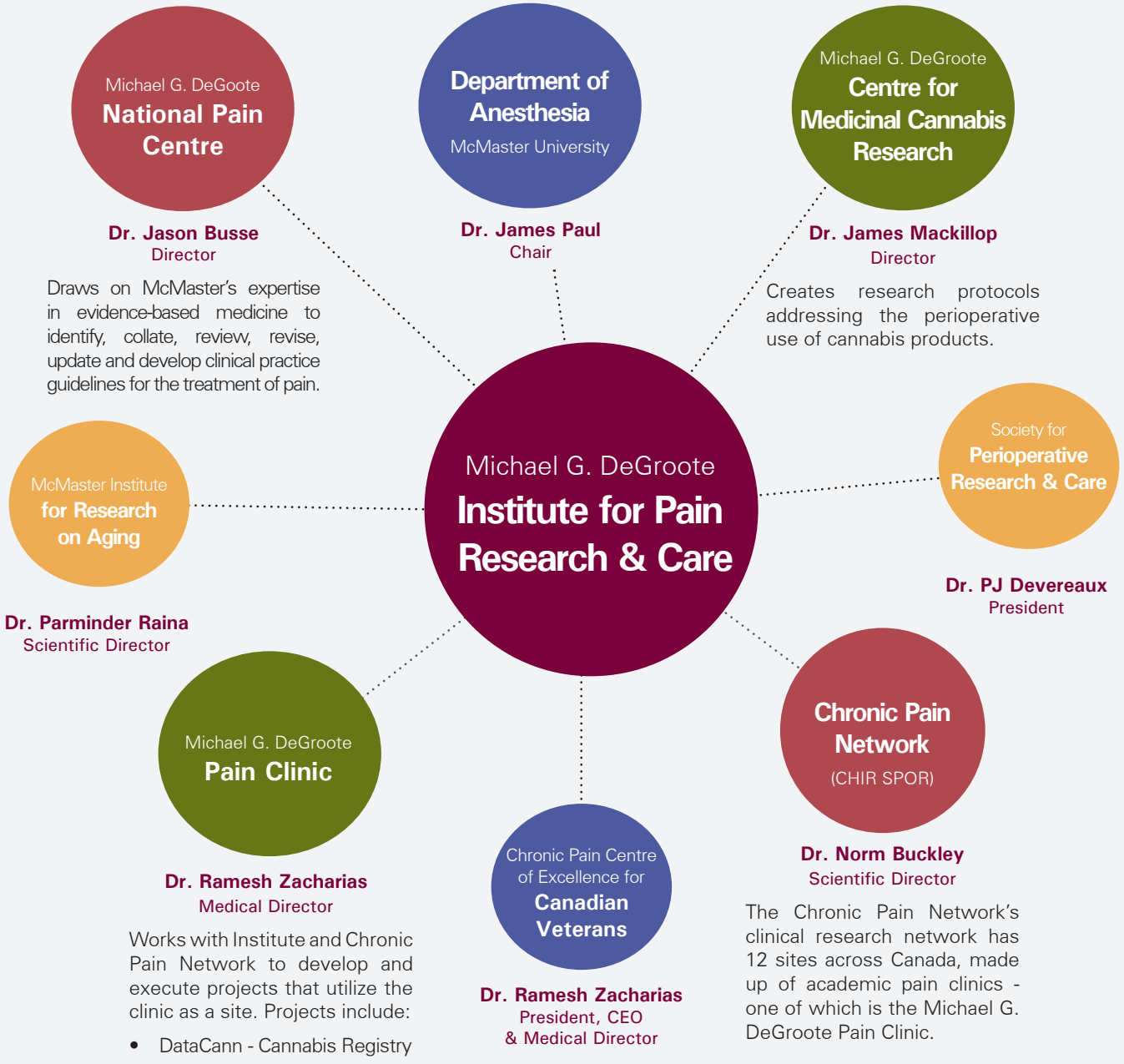
This year, COVID-19 restrictions saw the National Pain Centre's National Faculty meeting go virtual. The National Faculty was established to steward the Canadian Guideline for Opioids for Chronic Non-Cancer Pain. Since the completion of the initial guideline in 2010, working groups within the National Faculty have continue to meet regularly to address issues such as patient and public education, knowledge translation to physicians and pharmacists and evaluation of guideline impact.

Dr. Norm Buckley welcomed attendees from across the country before introducing Dr. Jason Busse as the new Director of the Michael G. DeGroote National Pain Centre. In addition to his role with the National Pain Centre, Dr. Busse serves as the Associate Director of the Michael G. DeGroote Centre or Medicinal Cannabis Research and the Research Director for the Chronic Pain Centre of Excellence for Canadian Veterans. Dr. Busse was also the first presenter of the day, providing an overview of a new systematic review related to the management of acute, non-low back pain that will support a new American College of Physicians guideline on the treatment of pain resulting from musculoskeletal injuries in adults.

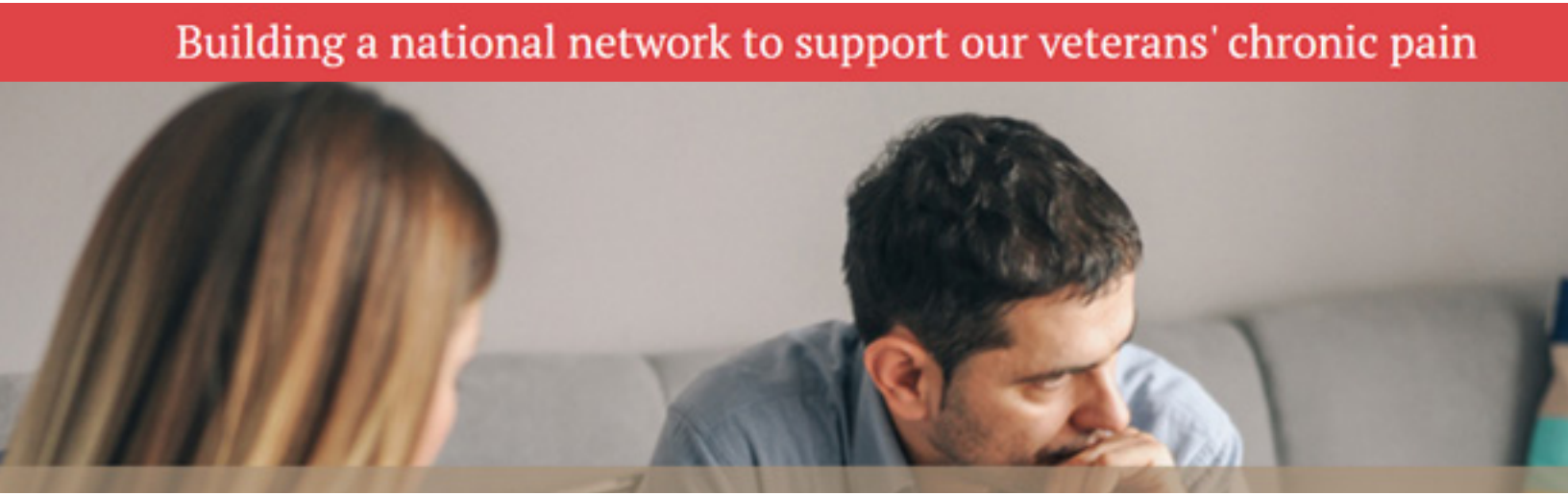
Following Dr. Busse's presentation, Andrew Taylor, Canadian Pain Task Force Secretariat with Health Canada, provided an update on the most recent activity of the Canadian Pain Task Force. The Task Force was announced in April 2019 at the Canadian Pain Society 2019 Annual Scientific Meeting. The Task Force has published one report to date and assessed how chronic pain is currently addressed in Canada.

The meeting wrapped up with a review of the Faculty's Logic Model for important updates, as well as discussion of strategies for the working groups moving forward.

Institute for Pain Research & Care
Partners and Collaborations



Centre of Excellence for Canadian Veterans with Chronic Pain



The Chronic Pain Centre of Excellence was announced in July 2019 and launched in April 2020 at McMaster University.

The Chronic Pain Centre of Excellence for Canadian Veterans launched on April 1, 2020 at McMaster University. Funded by Veterans' Affairs Canada (VAC), the Centre's Vision is to improve the well-being of military veterans suffering from chronic pain and their families. The Mission includes fostering a national network of interdisciplinary pain management centers using research and evidence-based strategies to care for military veterans and their families.

MGD Institute for Pain Research and Care administrative team and Chronic Pain Network coordinating team, hosted at the Institute, have been instrumental to the creation of the Centre, drawing on their extensive experience with research and research networks, advocacy and engagement.

What drives the new Chronic Pain Centre of Excellence for Canadian Veterans is the principle of veteran engagement in its operations and research, including creating a national Advisory Council of Veterans. Engagement has already begun through consultation with veterans about all aspects of the new Centre of Excellence. Following the CIHR principles of Patient Engagement in Research, the Centre of Excellence partners with veterans and their families to develop a deep, genuine understanding of the day-to-day challenges they face with regards to chronic pain, so that the Centre's research outcomes can re-shape chronic pain management in a way that works for veterans. Through the engagement process veterans, and their families, are helping to set the Centre's research agenda, inform evidence-based best practices, and ultimately determine locations for chronic pain clinics to improve veterans' access to care.

The Centre of Excellence will conduct research to improve our understanding of pain and improve our ability to treat pain with evidence-based recommendations for clinicians treating veterans. While the patient population for the Centre of Excellence is veterans, our learnings from partnering with veterans at the Centre of Excellence may ultimately help both veterans and civilians alike, and improve our understanding of and care for chronic pain for all Canadians. In conducting its research, the Centre of Excellence will use frontline clinical data provided by patients, as well as data from a variety of sources. In order to support both the clinical care and the clinical research, an informatics structure is being created to facilitate the gathering of data which will allow us to ensure that patient care is both timely and evidence based. This informatics structure involves the creation of software that collates and analyses the Centre of

How we're here for you

KEEPING HOPE ALIVE

The Chronic Pain Centre of Excellence partners with veterans and their families to lead a national community of care and shape the future of veteran-first chronic pain management. At the Centre of Excellence, we put veterans at the heart of everything we do: from setting the research agenda, to developing evidence-based practices, and helping veterans access care closer to home.

Within the Centre of Excellence, there exists:

- Advisory Council of Veterans that advises on the priorities of veterans and their families in order to guide the overarching goals and objectives for the Centre of Excellence. This includes exploring barriers to care, understanding the lived experiences of veterans and their families suffering with chronic pain to inform research priorities, and determining locations for pain clinics that veterans can access through their benefits, in order to ensure the Centre of Excellence's research is directed at addressing the real-world needs of veterans and their families.
- Scientific Advisory Board, comprised of an international group of pain scientists, to provide guidance on research objectives, priorities, and processes. This includes assisting in the process of pursuing research priorities, receiving and assessing proposals for research projects to address veteran identified priorities and to advise the Centre of Excellence on optimal research strategies.
- Board of Directors that oversees the operations and financials of the Centre of Excellence as a not-for-profit.
- Administrative team responsible for the day-to-day operations of the Centre.

Excellence's different data sets in order to streamline research, and ultimately develop research-based learnings and best practices for care delivery.

The Centre's activities include identifying the research and care priorities of veterans living with chronic pain. Some work will explore barriers to chronic pain management, strengths & weaknesses of the discharge process from active service, the length of time to VAC claim approval including referral processes, the length of time to connection with civilian healthcare services, frequency of contact from VAC case managers, and the additional challenges veterans and their families face due to the intersection of mental illness with chronic pain, including feelings of isolation and hopelessness.

The Centre's activities and objectives in the longer-term will be informed by its engagement with veterans, advisory boards, Board of Directors, ongoing research, and engaging with the clinics delivering care to fine-tune the research learnings that are most applicable in practice. These activities can include initiating clinical trials to further develop new therapies for managing pain, building the network of pain clinics and researchers across Canada, and continuously measuring the metrics associated with timely access to care and quality of life for veterans and their families.

Canadian Pain Care Forum

Established in 2016, the Canadian Pain Care Forum brings stakeholders from across the country together to consider current issues and policy affecting how pain is addressed in Canada. The Canadian Pain Care Forum meets quarterly, with in-person meetings held in the Greater Hamilton Area, and virtual options for those at distance. Virtual connection has become the norm during COVID. Organizations currently affiliated with the Canadian Pain Care Forum include non-profit patient/consumer education and advocacy organizations, healthcare professional(s) associations, policy organizations, medical services organizations, academic health-science centres, law enforcement, addiction treatment, and pharmaceutical and medical products businesses. Participation is open to all organizations who have demonstrated interest in and desire to improve national and/or provincial pain care public policy. Respectful debate and differing opinions are welcome.

Members of the Canadian Pain Care Forum were able to meet in-person, as usual, in January 2020. However, subsequent meetings have been moved to a virtual setting to adhere to restrictions enacted in response to COVID-19. Highlights from recent meetings include updates from Canadian Pain Task Force Secretariat Andrea Currie, presentations from Patient Perspective Partners Lynn Cooper, Pain Research and Education Advisor with the Canadian Injured Workers' Alliance, as well as Jacques Laliberté, founding President and CEO of l'Association québécoise de la douleur chronique (AQDC), and Billie Jo Bogden, CEO and Co-Founder of the PEOPLE Centre, in Ottawa, centred around the impact of COVID-19 on those living with chronic pain, and updates from Chronic Pain Network researchers Dr. Patricia Poulin and Dr. Jennifer Stinson.

Dr. Poulin presented her team's work on the creation of The Pain Portal with a talk titled, The Pain Portal: Building on Lessons Learned from Wellness Together Canada to Improve Access to Chronic Pain Care. The Pain Portal helps adults with pain get connected to mental health and substance use support, resources, and counseling with a mental health professional, all using an online portal that is accessible 24/7, with no fees, and is for everyone. Dr. Stinson

Jennifer Stinson presents virtually at the Canadian Pain Care Forum Meeting September 18th, 2020.

discussed her team's work focused on chronic pain care in the pediatric population with her talk titled, Stepped Care Solutions to Reduce the Impact of the COVID-19 Pandemic on Mental Health, Substance Use, and Functioning in Youth Living with Chronic Pain: A Pan-Canadian Study. Stepped Care is a resiliency-based approach that favours providing rapid access to the least intensive intervention that is tailored to the person's needs, preferences, and readiness to engage in behavioural change.

Funding: CPCF membership is voluntary, and members attend at their own expense. Meeting expenses are underwritten by the Michael G. DeGroote Institute for Pain Research and Care and the National Pain Centre, at McMaster University, through the generous gift which Mr. DeGroote has given to support pain research and care in Canada.

“The unencumbered funding from Mr. DeGroote to support this Research Institute has permitted a broad range of activities which have already had a measurable impact upon pain care policy in Canada.”

- Dr. Norm Buckley

Team

Directors

Norm Buckley
Scientific Director, *Michael G. DeGroote Institute for Pain Research and Care*; Director, *Michael G. DeGroote National Pain Centre*; Professor, *Department of Anesthesia*, McMaster University

Akbar Panju
Medical Director, *Michael G. DeGroote Institute for Pain Research and Care*; Professor and Vice-Chair (Clinical), *Department of Medicine*, McMaster University

Scientific Advisory Board Members

Manon Choinière
Professor, *Centre de recherche du Centre hospitalier de l'Université de Montréal*

Mark Lema
Professor and Chair, *Department of Anesthesiology*, Jacobs School of Medicine & Biomedical Sciences State University of New York, Buffalo

Ian Gilron
Director of Clinical Pain Research, Professor of Anesthesiology and Biomedical Sciences, *Faculty in the Centre for Neuroscience Studies at Queen's University*

Joel Katz
Distinguished Research Professor of Psychology *Canada Research Chair in Health Psychology* *York University*

Henrik Kehlet
Professor of Perioperative Therapy at *Rigshospitalet, Copenhagen University*

Executive Members

Jason Busse
Associate Professor, *Department of Anesthesia Michael G. DeGroote National Pain Centre*; Joint Member, *Department of Health Research Methods, Evidence and Impact (HE&I)*, McMaster University

Ian Rodger
Professor Emeritus, *Department of Medicine*; McMaster University

Eleni Hapidou
Associate Clinical Professor (PT), *Department of Psychiatry and Behavioural Neurosciences*; Psychologist, *Michael G. DeGroote Pain Clinic*, McMaster University Medical Centre, Hamilton Health Sciences

Gurmit Singh
Professor, *Department of Pathology and Molecular Medicine*, McMaster University

Michael McGillion
Associate Professor and Assistant Dean Research, *School of Nursing*, Heart and Stroke Foundation/Michael G. DeGroote Endowed Chair of Cardiovascular Nursing Research McMaster University

Florentina Miftodi
Manager, *Finance and Administration* Michael G. DeGroote Institute for Pain Research and Care; Michael G. DeGroote National Pain Centre

James Paul
Associate Professor & Chair of Anesthesia, Research Chair & Director, *Acute Pain Services Department of Anesthesia*, McMaster University

Research Members

James Bain
Professor, *Department of Surgery*; Head, *Division of Plastic Surgery*, McMaster University

Nez Elik
Associate Professor (PT), *Department of Psychiatry and Behavioural Neurosciences*; Psychologist, *Pediatric Chronic Pain Program*, McMaster Children's Hospital, Hamilton Health Sciences

Randi McCabe
Professor, *Department of Psychiatry and Behavioural Sciences*, McMaster University

Harsha Shanthanna
Associate Professor, *Department of Anesthesia* McMaster University;

Mohit Bhandari
Professor and Associate Chair of Research *Department of Surgery*; Associate Faculty, *Department of Health Research Methods, Evidence and Impact*, McMaster University

Laura Katz
Assistant Clinical Professor (PT), *Department of Psychiatry and Behavioural Neurosciences*, McMaster University; Psychologist, *Michael G. DeGroote Pain Clinic*, McMaster University Medical Centre, Hamilton Health Sciences

Behnam Sadeghirad
Biostatistician, *Michael G. DeGroote National Pain Centre*, McMaster University

Li Wang
Assistant Professor, *Department of Anesthesia*; Michael G. DeGroote National Pain Centre, McMaster University

Lisa Carlesso
Assistant Professor, *School of Rehabilitation Sciences*, McMaster University

Joy MacDermid
Professor (PT), *School of Rehabilitation Sciences*, Institute for Applied Health Sciences, McMaster University; Professor, *School of Physical Therapy*, Western University

Anne Scheidecker
Chronic Pain Management Fellow, *Department of Anesthesia*, McMaster University

Philip J. Devereaux
Director, *Division of Cardiology*; Professor, *Division of Cardiology*, Department of Medicine; Professor, *Department of Health Research Methods, Evidence and Impact*, McMaster University

Luciana Macedo
Assistant Professor, *School of Rehabilitation Sciences*, Institute for Applied Health Sciences McMaster University

Holger Schünemann
Professor, *Department of Health Research Methods, Evidence and Impact (HE&I)*, Director, *Cochrane Canada*, McMaster University

Staff

Kimberly Begley
Managing Director, *Chronic Pain Network*, McMaster University

Victoria Borg Debono
Project Coordinator and Scientific Writer *Michael G. DeGroote Institute for Pain Research and Care*; *Chronic Pain Network* McMaster University

Rachel Couban
Librarian, *Michael G. DeGroote National Pain Centre*, McMaster University

Megan Groves
Communications Coordinator, *Michael G. DeGroote Institute for Pain Research and Care*, *Chronic Pain Network*, McMaster University

Donna Marfisi
Administrative Assistant, *Michael G. DeGroote Institute for Pain Research and Care*, *Chronic Pain Network*, McMaster University

Mission

The mission of the Michael G. DeGroote Institute for Pain Research and Care is to become a cutting edge institute in the area of chronic pain and a magnet for researchers and trainees in the field.

Institute for Pain Research and Care, McMaster University
1280 Main Street West, MDCL 2101, Hamilton ON, Canada, L8S 4K1

Phone: 905.525.9140 Ext. 22743
Email: npc@mcmaster.ca Web: healthsci.mcmaster.ca/pain-institute